

SNV

INTRODUCTION TO COLLABORATIVE WATER MANAGEMENT

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GENERAL INTRODUCTION

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0. INTRODUCTION

0.1. **Focus of this paper**

This paper is a general introduction to water management written for the water portal of SNV. It contains a selection of topics with short explanations and links to more detailed information about each topic on the internet¹.

The aim of the paper is to give an overview and provide quick entries to the most prominent approaches and debates at the moment. It is intended to be a living document, that is, it provides a general structure and basic information that has to be completed and updated over time. All are invited to contribute to the several parts of the document, and to suggest new topics.

Though giving considerable attention to holistic and integrated approaches, the paper is written mainly from the perspectives of the irrigation water management sector and drinking water supply and sanitation sector. Yet, it is not structured along these two main sectors: it is structured along the main debates in the water sector. By this structure it intends to highlight similarities in the debates in the different sectors and also to motivate experts from one sector to look at the other sector, compare and learn.

The paper does not include on the technical knowledge and skills required for water management, as this is considered basic knowledge of water management professionals. Also the latest technological developments are beyond the scope of this paper. The following list of approaches and debates on water management will be presented. For each topic, as far as possible, advocators as well as critics are mentioned, and also electronic links are given to other resources on the internet.

- Holistic approaches to water management
- Participation
- Privatisation
- Water financing
- Equity, gender, water rights

0.2. **Why water?**

There are many ways to defend the choice for water as an entry point for poverty alleviation and change. Most people point to the importance of water for livelihoods, the fact that water is a vital resource for all human and other natural life. In addition to that attention is drawn to existing and potential water conflicts, how groups of people are deprived from access to good quality water, global and local inequalities in access to water, as well as present and future scarcity of water. It is argued that good governance of water is central to good governance in general and even that the first complex civilizations have risen as part of the degree of organisation achieved in large-scale irrigation systems.

All these valuable arguments about the importance of water, are quite adequately summarised in the first of the Dublin principles [1992]:

Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment.

To give some facts, **freshwater is finite** because the total amount of water on earth is unchangeable; it remains the same over generations though in different states and

¹ I would like to thank my colleagues Lieve van Elsen, Michiel Verweij, Has Willet, Teun Bastemeijer, Amparo van der Zee, Milton Fernández and Rob Ukkerman for reviewing earlier versions of this text.

locations in the hydrological cycle changes². Obviously the amount of freshwater on earth is very small in comparison to salty water (it is estimated that 97% is salty). The remaining 3% is thus fresh water, but of this 79% is stored in ice caps. The rest of fresh water (21%) fulfils the numerous amount of functions water has in human and natural life: economic, social, cultural, ecological among others.

GUIDING PRINCIPLES OF THE DUBLIN STATEMENT ON WATER AND SUSTAINABLE DEVELOPMENT

Concerted action is needed to reverse the present trends of overconsumption, pollution, and rising threats from drought and floods. The Conference Report sets out recommendations for action at local, national and international levels, based on four guiding principles.

Principle No. 1 - Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment

Since water sustains life, effective management of water resources demands a holistic approach, linking social and economic development with protection of natural ecosystems. Effective management links land and water uses across the whole of a catchment area or groundwater aquifer.

Principle No. 2 - Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels

The participatory approach involves raising awareness of the importance of water among policy-makers and the general public. It means that decisions are taken at the lowest appropriate level, with full public consultation and involvement of users in the planning and implementation of water projects.

Principle No. 3 - Women play a central part in the provision, management and safeguarding of water

This pivotal role of women as providers and users of water and guardians of the living environment has seldom been reflected in institutional arrangements for the development and management of water resources. Acceptance and implementation of this principle requires positive policies to address women's specific needs and to equip and empower women to participate at all levels in water resources programmes, including decision-making and implementation, in ways defined by them.

Principle No. 4 - Water has an economic value in all its competing uses and should be recognized as an economic good

Within this principle, it is vital to recognize first the basic right of all human beings to have access to clean water and sanitation at an affordable price. Past failure to recognize the economic value of water has led to wasteful and environmentally damaging uses of the resource. Managing water as an economic good is an important way of achieving efficient and equitable use, and of encouraging conservation and protection of water resources.

Dublin principles, source: <http://www.wmo.ch/web/homs/documents/english/icwedece.html>

Box 1. Dublin principles

The word "**vulnerability**" in the first Dublin principle also emphasises the fact that quality and availability of freshwater is frequently threatened by human action as well as disasters. Local stories about severe contamination, reducing flows, watershed degradation, and water deficient cities are known. Several reports now talk about a global shortage and even water wars by 2050, due to diminished availability of water in quality and quantity in combination with increased demand due to population growth and increased use of water for multiple purposes (see the facts and figures sheet from the [World Water Assessment Programme \(WWAP\) of UNESCO](#) for detailed figures on water availability and use.)

Causes of increases in water shortage are sought both in human behaviour, such as persistent inefficiency in conduction and use of water, unequal rights and unequal distribution of water, lack of investment in infrastructure and water conservation etc. as well as in major natural phenomena such as drought, climate change and global warming and so on. Causes brought about by human behaviour are (generally) more readily influenced, hence the importance of good water management.

And finally but foremost, **fresh water is essential to sustain life**, development and the environment. This is almost beyond explanation. Water is necessary for human and

² See also: www.aguabolivia.org for the Andean Vision of Water ("La Visión Andina del Agua").

animal life and health, to sustain ecosystems, economic activities and options. Water management is linked to social organisation and cultural meaning. The way water is used depends upon the people's form of living (life-style) and water scarcity can imply radical changes in a way of living. In the same sense, improvements in water access, control, opportunity (continuity), quantity and/or quality have an enormous potential impact on livelihood systems. Plenty of examples are available from all sectors³.

Due to the –more or less- general acceptance of importance of water and the promotion of the Dublin principles⁴ and also due to the increased awareness of the impact of improved water services on poverty alleviation, good governance of water has become one of the major international development challenges for many actors. This is reflected in the number of **events, conferences** held, intensified in the last decade, as well as the prominence of access to water goal among the [Millennium goals](#). The **7th Millennium Development Goal** explicitly refers to water:

Attributes of water

Attributes of water availability are expressed differently for different uses. In this text the following attributes are used: quantity (the amount of water available), quality (bio-physical and chemical characteristics of water) and opportunity (timeliness of its availability in relation to the needs of users). Generally in the drinking water sector, continuity is used, being a 24 hour a day opportunity.

Box 1. attributes of water

Ensure environmental sustainability: Integrate the principles of sustainable development into country policies and programmes; reverse loss of environmental resources; Reduce by half the proportion of people without sustainable access to safe drinking water; Achieve significant improvement in lives of at least 100 million slum dwellers, by 2020.

(An overview of the worldwide conferences, its main decisions, as well as links to related documents can be found at the WWAP website "[1972-2003 Milestones from Stockholm to Kyoto](#)").

Among others there have been the following **international conferences**:

- Stockholm conference 1972
- Dublin conference 1992
- [Rio conference 1992](#)
- World Summit in Copenhagen 1995
- UN Fourth World Conference on Women, Beijing 1995
- The World Summit in Johannesburg in 2002
- Four World Water Fora (Marrakech, 1997; The Hague, 2000; [Kyoto, 2003](#); Mexico, 2006)

Also important internationally are:

- The International Drinking Water and Sanitation Decade (1981-1990)
- The International Decade for Natural Disaster Reduction (1990 - 2000)
- [The Millennium Goals](#)
- The International Decade for Action on Water (2005- 2015)

³ Health impacts due to improved drinking water quality, economic impacts due to diversion of flow or implementation of large irrigation schemes, economic impact on small industries, inequalities in mega-cities where rich neighbourhoods wash cars and irrigate gardens, while poorer neighbourhoods line up with jerrycans for the watertank to arrive, inequalities in irrigation between head- and tailenders, traditional and new irrigators, male and female irrigators, religious obligations to provide drinking water to people when asked for, cultural festivities confirming water rights, sophisticated purification technology required in industrial nations due to the increasing use of products containing polyaromatic hydrocarbons in all spheres of life, protests against water export from one country to another.

⁴ The fourth principle, though, is much questioned. See also section on rights based approaches to water.

- The [WASH campaign](#) initiated by the WSSCC in Dakar in 2003
- The Ecosystems Millennium Assessment: www.millenniumassessment.org).
- The "Sachs" Report: "[Investing in Development, a practical plan to achieve Millennium Development Goals](#)" prepared by UNDP.

And a number of new initiatives, programmes, platforms and organisations have been formed, such as:

- The [Water Supply and Sanitation Collaborative Council](#) (WSSCC), formed at the end of the United Nations International Drinking Water and Sanitation Decade (1981-1990)
- The [Global Water Partnership](#) (GWP) formed in 1996 by the World Bank, the United Nations Development Program (UNDP) and the Swedish International Development Agency (SIDA)
- [World Water Council](#)
- The [World Water Assessment Programme](#) (WWAP), created in 2001
- The [Joint Monitoring Programme](#) for Water Supply and Sanitation (JMP) implemented by UNICEF and WSH-WHO

A part from these global initiatives, there are many national, regional and local initiatives that aim to contribute a improved water management. Also there has been a rise in water activism⁵, specifically in response to liberal proposals for improved water management as promoted by the World Water Council, The World Bank and IMF. Furthermore the **effectiveness of large of global conferences** is questioned: a survey has been done by the report Third World Water Centre in Mexico (see box 3).

Since the early 1970s, the United Nations has organized a series of mega-conferences to address pressing global problems. It started with the Conference on the Human Environment in Stockholm (1972), and was followed by Population (Bucharest, 1974), Food (Rome, 1974), Women (Mexico City, 1975), Human Settlements (Vancouver, 1976), Water (Mar del Plata, 1977), Desertification (Nairobi, 1977), Science and Technology for Development (Vienna, 1979) and New and Renewable Sources of Energy (Nairobi, 1981). Twenty years later, several of these issues were revisited: Environment (Rio de Janeiro, 1992), Food (Rome, 1994), Population (Cairo, 1994), Women (Beijing, 1995), and Human Settlements (Istanbul, 1996). Environment was further considered in Johannesburg in 2002. However, water was considered only once, in Mar del Plata in 1977: there has been no follow-up in terms of a mega-conference on this subject since then, under the aegis of the United Nations System.

The World Water Council initiated the World Water Fora. The First Forum, organized in Marrakech in 1997, was a modest affair. The Second Forum, in The Hague, in 2000, was attended by some 4,600 people, and thus became a mega-conference. According to the organisers, the Third Forum in Japan, in 2003, had some 24,000 participants. Many experts have questioned this high attendance figure as a serious over-estimate. The costs of these world water fora have escalated very rapidly. For example, the Secretariat cost of the Third Forum has been estimated at \$28 million, a sum that was more than 15 times the cost of the entire First Forum in Marrakech.

The general view that emerged from the survey was that the mega-conferences have their own momentum, and they respond to the needs and agendas of certain specific institutions and people. Accordingly, they are likely to continue for a while in their present format, perhaps only with marginal and incremental changes, irrespective of what the majority of water professionals and water-related institutions think about their impacts and effectiveness. Thus, it is somewhat unrealistic to expect that the Fourth World Water Forum in Mexico City, in March 2006, will be materially different from the Japan Forum. The perception is that the same group of people and institutions that were responsible for organising the Third Forum are the driving forces behind the 4th Forum. Thus, at most, one should realistically expect only minor changes.

The main key lessons identified by the respondents are the following:

Mega-conferences generalise problems and solutions even though the world is not homogenous. They override a country's specific needs and requirements, and consideration of the availability of management, technical and financial capacities. The devil is in the details and not in large generalised talk fests. It is not rewarding to assemble thousands of people with different views, agendas, interests and

⁵ See for example www.fame2005.org, www.tni.org, www.thewaterpage.com, www.blueplanetproject.net/english/, www.canadians.org, www.aseed.org/water/en, www.citizen.org/cmep/water

expertise, to discuss unreachable goals and targets, without considering possible implementation of what often are wishful-thinking decisions.

Mega-conferences should be specifically focused on perceived needs and issues and they should have clearly stipulated goals and objectives. The process used for their organisation should assure formulation of understandable and implementable recommendations for actions, and provide mechanisms to ensure the availability of realistic levels of funding to implement the recommendations. Regular repetition of the same old water issues and problematic is a sure recipe for overkill in terms of impacts and relevance, both inside and outside the profession. The conferences appear to have already reached the point of diminishing returns. They do create temporary awareness of water-related issues, which evaporate quickly in the absence of follow-up actions, monitoring and evaluations. The events have thus lost their moral authority. Donors are still influencing the outcomes to suit their own views and agendas, irrespective of actual needs and requirements of developing countries. They should make country or region-specific recommendations, and should not be overloaded with pedestrian, outdated and irrelevant presentations. One way to look at mega-conferences is that they are social events. Thus, people should not have high expectations of their impacts.

Third World Centre for Water Management, Mexico, April 2005

Box 2. Report on the effectiveness of large global conferences

0.3. Which water?

It seems appropriate to give at least some specifications about which water we are talking about in this paper. This may appear artificial to some people, yet the need to define clearly which water one is referring to, can be decisive in debates about legislation, issues of ownership and user rights of water. For example in many countries where water is considered a public good "owned" by the Nation State, groundwater is left out of the realm of state control. One of the legislative proposals in Peru only referred to water in natural courses, letting water in human constructed infrastructure, pipes, reservoirs or canals out of the picture. [Paulet, 2003]

Moreover, disciplines distinguish **different kinds of water** according to their field of knowledge, often referring to colours. Here only a few of the names of water are listed, mainly from disciplines working in drinking water and/or irrigation. Probably the list could be tripled adding other disciplines and water uses.

- Blue water, referring to superficial water in lakes, rivers and canals
- White water, in the polar ice caps and mountain glaciers. There are others, however, who refer to white water as the part of the rainfall that feeds back directly to the atmosphere through evaporation from interception and bare soil.
- Groundwater, in shallow or deep layers
- Fossil aquifers, underground reservoirs of water that are not replenished.
- Green water, referring to water absorbed in the unsaturated soil
- Drainage water, generally in agriculture, referring to water transported out of the field.
- Waste water, a general term for used domestic or industrial water
- Black water, water with human excrements the mixture of water and faeces flushed from WCs and pour-flush toilets.
- Grey water, the sullage from kitchens and bathrooms. Grey water contains much lower pathogen levels and has a lower oxygen demand than black water and therefore represents a much smaller health and/or environmental threat.
- Virtual water, referring to the water used in the production process of an agricultural or industrial product. Virtual international water trade is then the water used in the production of goods for international trade of crops and livestock products. [Hoekstra, A.Y. and Hung, P.Q. 2002]
- Plastic water, referring to bottled water.

It does not require mayor hydrological knowledge to understand that all water is related in the **hydrological cycle** and that "proper" water management should apply a

systems approach. It does however, require mayor hydrological knowledge to apply that systems approach, while knowing how much water there is in each part of the hydrological cycle, how different flows of water relate (in quantity and quality) and how this can be managed in a certain area, is almost impossible. Even if one would consider only the technical aspects of water management, a full understanding of the hydrological cycle and its interactions in a specific area is very complex. For example, in spite of common used discourse, trees will not always enhance water storage in watersheds nor water availability in dry seasons [Bruijnzeel, 2004], also little is known with regard to the sustenance of rainfall and the function of water vapour flows for maintaining ecosystems [Rockström, et al 1999]. And, in spite of being the most important proposed territorial unit for water management reform, watersheds do not always function as hydrological units due to characteristics of underground storage and flow⁶.

These are only a few examples of the gaps of technical knowledge that exist in the field of water management as well as an example of the complexity and uncertainties water management deals with. It does not imply that calculations of water balances are not important: they are! It is only to say that:

1. In most calculations there is an uncertainty factor that should be considered in decision making about water management. Sometimes this is not recognised, figures are presented as facts, and power remains in the hands of those who do the calculations⁷.
2. Some models for water management –even stipulated in legislation- assume the existence of data and facts that cannot be obtained or only be obtained at very large costs⁸.

0.4. Water for whom?

Water is essential for all aspects of life and its function is not limited to human interest alone. In addition to uses of water such as drinking water, livestock, agriculture, fisheries, tourism, industry, mining, recently more attention has been given to ecological flow, or the minimum flow needed to maintain an ecosystem. As mentioned above different uses and different users of water each have their own requirements with regard to quantity, quality and opportunity, and these may be conflicting and may not always be compatible with the availability of water.

Most water legislation establishes a scale of priorities for different uses of water, generally starting from domestic use, then livestock, agricultural, fishing, industry, recreation etc. However, for actual allocation priorities in times of scarcity, local procedures may be more important, and sometimes providing "perverse" incentives. For example, in Chancay Lambayeque system in North Peru, rice used to have priority over grains such as maize and beans in times of scarcity. So cultivating rice would give higher water security to individual farmers, in spite of its negative impact on soil salinity and its high water demands.

Box 3. water priorities

A distinction is made between **consumptive and non-consumptive water uses**, the latter returning the used water to water courses, for example the use of water for the

⁶ Generally groundwater streams are considered to flow according to the watershed's layout. In that case, a watershed can be considered a real hydrological unit. However in mountainous areas, aquifers flow through cracks that even may cause a flow perpendicular to the river and in different watersheds.

⁷ An example is the calculation of the water availability forecasts for Buttala irrigation system, Sri Lanka, but also in Chancay-Lambayeque, Peru [Bruijn, 1999]. These figures are presented as facts to farmers and water allocation is decided on that basis.

⁸ For example some experts propose a volumetric individual water rights in the case of Peru will result in greater water security to individuals. This proposal assumes that discharges can be measured and registered, which is very improbable in a country with a general lack of measurement structures, and where not even all existing water flows are registered. [Hendriks, 2004]

generation of power. Non-consumptive water uses are not always without impact on other water uses though, because they affect opportunity and quality of water for other users. Differences may arise for example when a hydroplant wants to release a constant volume of water for generating electricity from a reservoir, while users for agricultural purposes would like to store the larger part of that water for the dry season.

Drinking water supply is the first and most important use of water, for which it has priority over all other uses in almost countries. Global figures on drinking water availability are gloomy. The World Health Organisation considers a minimum amount of water per capita per day is considered 50 litres, and even this amount is not available to about 1.1 billion people [WWAP facts and figures]. Very much related to drinking water supply but receiving with much less attention is sanitation provision, of which 2.4 billion are deprived. Consequences in the form of diseases, increased workload, and health care costs weigh heavy on people's livelihoods. Inequality is enormous, rural areas being the less favoured.

The Universal Declaration of Human Rights of 1948 guarantees all people the right to standard of living adequate for their health and well-being. In 2002, the [United Nations Committee on Economic, Social and Cultural Rights](#) recognised that water itself is an independent human right. See also the [explanation on the Freshwater 2003 page](#).

Box 4. water is a human right.

Options for drinking water supply systems range from self-supply in remote rural areas, to small community supply to sophisticated systems of catchment, purification and distribution in large cities. Small supplies typically receive less attention and less resources than large supplies [WHO, 2005]. Equally options for sanitation systems range from on-plot sanitation to large systems of collection and treatment of wastewater, reuse of treated water and sludge disposal (see [Brikké and Bredero, 2003](#), on technology choice for community water supply and sanitation) Quality of drinking water and quality of effluents discharged into rivers and lakes is varying, and not always according to WHO guidelines (see [WHO Guidelines for Drinking-water Quality, Sanitation and Hygiene](#)). Many systems encounter problems because service does not attain minimum quality and continuity (opportunity) standards. Moreover, most systems are not sustainable financially.

While drinking water supply serves most users, at least directly, irrigation accounts for most of the volume of water use. About 70% of all available water is used for irrigation, producing not only cash crops for the regional and global economy, but also playing a vital role in sustaining poor people's livelihoods, reducing risks of crop loss though complementary irrigation and improving diets through irrigation of home gardens.

Irrigation systems may be gravity or pumped systems, conveying water in open channel (lined or unlined) or in pipes (under pressure or not). Field application may be sprinkler, trickle or surface irrigation, the latter having various application practices. Andean farmers are known for their skilled systems of field application of surface irrigation. [suggested reading...?] Drainage is as indispensable part of irrigation as sewerage is of drinking water supply. See the [FAO AGL site](#) on general technical issues of irrigation, also the [irrigation and drainage papers](#), [FAO AGL -IES site](#) on irrigation equipment and the [Participatory Training and Extension in Farmers' Water management](#) on field water management, as well as other topics related to the management of water users' organisations.

Much irrigation systems encounter problems though, related to operation and maintenance, efficiency, equity in distribution, social organisation. It is estimated that poor drainage and irrigation practices have led to water logging and salinisation of approximately 10% of the world's irrigated lands. [WWAP facts sheet]. A part from on-site problems, there are also potential negative effects off-site, for example on upstream water users when water storage is constructed or for downstream water users when water is contaminated with agrochemicals, organic waste etc. On the other hand, also irrigation water quality is often affected by the discharge of untreated waste water of urban centres onto water courses, by rapidly expanding cities invading drainage channels and solid waste disposal in irrigation channels.

After drinking water and irrigation, **industry** is a mayor water user as well as **mining**. Industry's share of water varies of 59% in high-income countries against 8% of total water use in low-income countries. These volumes are expected to increase. Industry and mining sector often generate more profit than drinking water supply and irrigation, thus being one of the sectors with highest "water productivity" per m3 (in terms of US\$ generated per m3 of water). This figure would change however, if environmental costs are taken into account: Some 300-500 million tons of heavy metals, solvents, toxic sludge, and other wastes accumulate each year from industry, the food sector being the most important polluter. [WWAP facts sheet]. Contamination in developing countries is relatively higher, due to the obstacles they face in setting and enforcing environmental thresholds. The prevalent practice of open pit mining, the most common form of mining for gold, copper, iron, aluminium, and nickel among other minerals nowadays, has impact on hydrology because large parts of soil are moved and compacted, even though water used on the site for mineral extraction is generally treated and re-used in a "closed circuit". (see www.mine-engineer.com/mining/open_pit.htm for basic information and www.minesandcommunities.org/index.htm for critical accounts on open pit mining.)

Hydropower is a non-consumptive water user that represents 19% of total electricity production. It seems that there is a potential to triple this percentage, mainly by developing sources in Latin America, Central Africa, India and China. Negative impacts of the creation of hydropower relate to the creation of the height difference necessary for generating energy. [WWAP facts sheet] See some [facts about hydropower](#) Due to those [negative impacts of large dams](#) there is now an international lobby against such kind of infrastructural works. Internationally important is the [World Commission on Dams](#) and the [UNEP Dams and Development Project](#). An important alternative is the construction of small scale hydropower.

Other non-consumptive uses are fisheries (fish farms) and recreational use of water, but these uses may affect water quality by products (anti-biotics e.g.) used in fish farms and the (solid) waste generated in recreation.

The need for water for the maintenance of **ecological functions and ecosystems** in general is referred to in several ways:

- Minimum level of contamination
- Minimum amount and quality of water for the maintenance of ecosystems
- Ecological flow

Some consider ecosystems as another "user" of water for whom quantity, quality and opportunity should be considered. Others think that this is not ethical, and also that water for ecosystems is non-negotiable as it supports all forms of use, so-called "terrestrial ecosystem services" and life in general. They consider that water is not an economic commodity, but the basic element of the ecosystems on which the well-being

of humanity depend. From there the call to acknowledge that all land use choice involve water use choices, and should be evaluated as such⁹.

According to the WWAP fact sheet, the main threats to ecosystems are currently:

- Population and consumption growth.
- Infrastructure development (dams, urban growth, highways).
- Land conversion (deforestation, agriculture, urban growth).
- Overharvesting and overexploitation (overfishing, wasteful irrigation).
- Release of pollutants (human waste, agricultural and industrial chemicals).
- Introduction of exotic species (replacing and overwhelming indigenous species).

Asking the question "Water for whom?" not only refers to different uses, the ecosystem and allocation of this resource among them, but also to territorial allocation of water and distribution among individual users, in other words considerations of equity among different socio-economic and cultural groups (see the chapter on equity, water rights and the right to water).

⁹ In the Netherlands this idea is applied to local landuse planning. Since 2003, a so-called water test ("water toets") is applied to all planning proposals. Information about the water test can be found at: www.watertoets.net The water test is done additionally to the more extensive environmental test.

1. HOLISTIC APPROACHES TO WATER MANAGEMENT

As an answer to increased use of water, the threat of water scarcity and the fragmented water authorities in many regions, holistic approaches to water management have gained popularity. Among the most important holistic approaches are:

- Integrated water resource management (IWRM), emphasising the presence of different water users and uses.
- Watershed management (putting hydrological interrelations in the forefront)
- SWAp, sector wide approach, specifically for water and sanitation, emphasising the need for a articulated approach of agencies in order to enhance impact of investment on health and well-being.
- Livelihoods approach (people oriented)
- “Gestion de Terroir”, local level integrated planning of land and water mainly at the level of local governments

All these approaches share – to a certain extent- similar views on development and participation. They are not mutually exclusive and some are actually evolving into one approach.

1.1. IWRM: focus on stakeholders

Integrated Water Resource Management is an approach that emerged from the Dublin principles as a way to put them into practice. There are many definitions of integrated water resource management, but it is the [GWP](#) who has become the (self-appointed) promoter and leader of the approach. Their definition is as follows:

Integrated Water Resource Management (IWRM) is a philosophical approach to the development of water, that seeks to take a holistic approach to balancing the competing demands upon it – domestic, agricultural, industrial, and environmental, to provide the maximum sustainable benefit in the most equitable manner possible. In the words of the recently published World Water Vision ‘The world’s freshwater resources will be managed in an integrated manner at all levels, from the individual to the international, to serve the interest of humankind and planet earth – effectively, efficiently, and equitably’.

IWRM is therefore about all water, ‘blue’ surface and groundwater, ‘green’ soil moisture, ‘grey’ and ‘brown’ wastewater, and even ‘white’ water vapour. It is about realising that all the different water sub-sectors (water for food, for domestic use, for industry, and for the environment) are part of a single continuum, governed by the workings of the hydrological cycle. It is most importantly about realising that fresh water is finite, and that any consumptive use has an opportunity cost in terms of the other potential uses to which it cannot now be put.

IWRM is also about people and the environment. It is about realising that people should be allowed to manage their own water resources, at the most appropriate level. That ‘the environment’ is both a source and user of water, and has distinct needs of its own, which if not met may lead to damage of ecosystems, and the humans who rely on them.

Finally, IWRM is about management – about making decisions so that water resources are sustainably put to use to achieve the greatest good of the greatest number. This implies often difficult decision making, with both winners and losers - it is now accepted that economic criteria must be used to help make these decisions, but equity and minimum rights must be observed and respected. However, it also implies that the knowledge underlying decision making should be available in an appropriate form, to all stakeholders, and that decisions be made in an impartial, and transparent manner based upon this information. Therefore IWRM means increased collaboration both within the water sector (between different sub-sectors and disciplines) but also between the water sector and other sectors.

Box 5. Definition of the GWP of IWRM

So the IWRM approach promotes co-ordinated development and management for water, land and related resources in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems (Global Water Partnership, 2000). It seeks **to overcome the fragmentation** characteristic of water management in many countries: health aspects

dealt with by the ministry of health, environmental aspects by the ministry of environment or natural resources, productive aspects by the productive ministries (agriculture, mining, industry) according to the use involved. The IWRM approach promotes integration between water for different uses (including ecological) and different layers of decision making. See the diagram of illustration by the GWP, 2000, Figure 1).

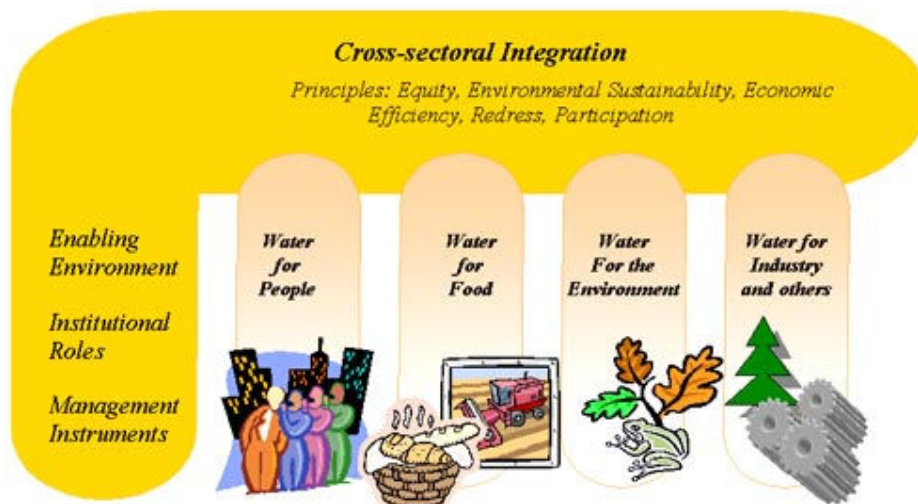


Figure 1. Diagram of cross-sectoral integration of multiple water uses of GWP

The IWRM approach is beneficial for sustainability because it visualizes competing uses and interests. In principle **this enables inclusive and negotiated solutions**. For example the IRC states the following benefits of the IWRM approach for the water and sanitation sector:

"These actual or potential conflicts often threaten the security of supplies for WATSAN and, ..., IWRM has a great deal to offer in this context. IWRM also provides a framework for WATSAN activities to better consider and manage their own impacts on other water users, especially inadequate sanitation and wastewater treatment. Throughout the South, low sanitation coverage and widespread discharge of untreated wastewater have considerable impacts on downstream (and underground) water." [\[IRC Thematic Overview Paper on IWRM and WATSAN \]](#).

As one colleague stated: the most important contribution of the IWRM approach is that it draws attention to the need for integration. Integration of the different functions of water (ecological, productive and social function), integration of the different uses, of the different users and those currently excluded from use, integration of different levels of management (national, local, micro), integration of different visions of water (for example the [Andean vision of water](#)).

However, the **IWRM approach is not a substitute for sector policies and management**. It is complementary. Superficially understood, holistic approached lead to centralisation and gigantism¹⁰. The following figure (figure 2) from Axel Dourojeanni

¹⁰ Interviews with: Jan Lundqvist: "IWRM is not a substitute for sectoral policies" and interview with: Ramaswamay R. Iyer "IWRM carries the seeds of centralism and gigantism" in: "[A critical view on integrated water resource management, definition, implementation and linkage to policy reviewed](#)", SIWI feature topic.

illustrated the point of subsidiarity between good sectoral management and IWRM, as well as the need for developing clear terminology different management levels. (see also Figure 2)

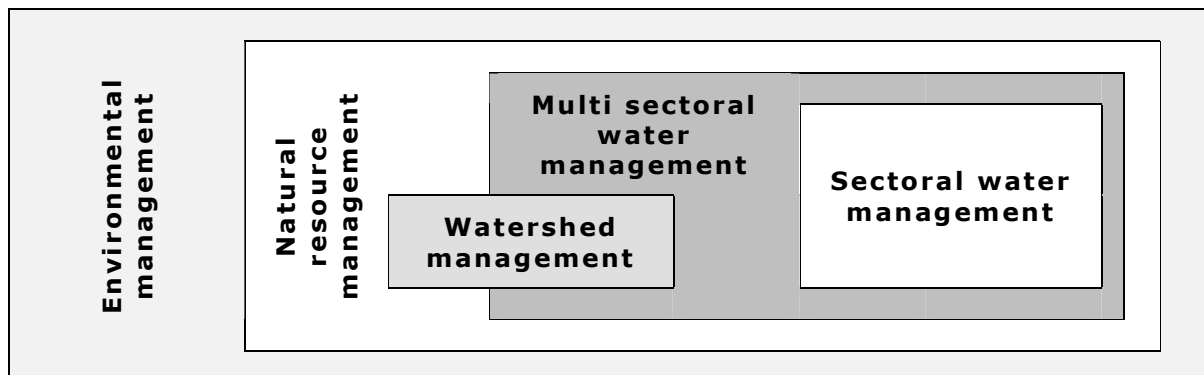


Figure 2. Hierarchy for watershed management activities, (Source: Dourojeanni, 2001)

The above figure also shows the **relation between environmental management and integrated water management**. He states that theoretically good environmental management would automatically result in good integrated water management. Tendency is to combine all responsibilities in own (large) environmental agency that decides how to preserve the natural environment, and how to use the water (among other natural resources). In practice this a difficult goal to reach because it supposes the concentration of too much specific knowledge, information and skills in own agency, as well as the involvement of too many actors. Moreover, it is a point of discussion whether environmental management actually englobes all aspects of water management, including productive and and social/cultural functions of water.

Another argument for separating environmental management and water management responsibilities, is the fact that in many cases environmental, social and productive positions represent **opposing interests and forces**. It requires explicit willpower to balance these interests and make them compatible. This means that putting all water management decisions (productive, social and environmental) under one institutional mandate, ministry or public institution, may not be the most sensible thing to do [Dourojeanni, 2001]. In spite of this point of view, there are also countries where water management is brought under a central mandate, such as the recently created ministry of water in Bolivia. In such cases, strong leadership to balance different interests is needed.

Operationalisation of the IWRM approach typically includes the need for national water strategies, national water planning, etc, which theoretically would balance supply and demand. Such exercises are often criticised because in practice most developing countries do not have reliable information about water availability nor demands at this scale, so that many strategies remain general and vague. Not surprisingly, some people propose to start IWRM at local level, avoiding, in initial phases, large water balance studies.

Another line of operationalisation of IWRM is sought in the promotion of watershed management. For example, the [European Water Framework Directive](#) (EWFD) is a framework to move towards River Basin Management in Europe. European member states that share a same River Basin must jointly develop a trans-boundary management plan. Also the EWFD sets explicit targets for the quality of surface water and groundwater, that ultimately have to be achieved by 2015.

However, contrary to what many believe, IWRM does not necessarily imply watershed management. The following is the point of view from the GWP:

"There is increasingly consensus that true IWRM can take place only where the necessary platform has been created, usually at the basin level (see for example Jaspers, 2003). While this view has much to support it, we prefer to see this as being one end of a spectrum of application of IWRM. Insisting on the prior creation of a suitable enabling environment with a whole new tier of institutions, can become disempowering for individuals and projects trying to find a way to engage with IWRM in their own work at their own level. This is especially true in much of the South, where institutional capacity for IWRM is limited and will take years to develop. The best examples of 'implemented' IWRM are from 'northern' countries like the Netherlands and France, although a major OECD report found that even the most advanced countries are very far from full compliance with the Dublin Principles' (OECD, 2003). In addition the 'basin' view risks ignoring the many cases where that level is NOT where the most severe water resource problems are found. This exclusive emphasis on the basin scale tends to overlook the second Dublin principle of management at the most appropriate level. A good example of this is local-level competition for groundwater in hard rock areas where the resource is highly localised, as is the case in much of south-central India, and there are many situations where local communities effectively manage water based upon traditional and customary laws – arrangements that could be jeopardised by new basin institutions and water allocation mechanisms."

More than a (rigid) methodology, IWRM is a **way of thinking**. Operationalisation of this vision is very context specific and should include a lot of creativity and learning by doing in order to be successful. There are some initial experiences that help the operationalisation of IWRM, GWP has created an (internet based) [tool box](#) with experiences and methods for reference.

It is worth mentioning that in spite of the questions and criticisms raised about the IWRM approach and its applicability, there is no doubt about the enormous impact the approach has on overcoming sector boundaries.

1.2. Watershed management: focus on hydrological interactions

Watershed management has been presented as the solution to fragmented, dis-coordinated and little participatory water authorities that exist in many countries. Mostly watershed management is linked to IWRM (integrated water resource management), as the way to bring about the desired changes mentioned in IWRM, however IWRM does not always need to imply watershed management (see part on IWRM). The concept of watershed management, as such, is older than IWRM and many (different) things are brought under this heading¹¹:

- From an environmentalist, conservationist perspective, watershed management implies watershed protection, reforestation, natural reserves, critical zones, soil- and water conservation measures. Sometimes population is even viewed as a complicating element for good conservation.
- From a hydraulic perspective, watershed management refers to water as the articulating element in the watershed, with emphasis on the participation of some actors, such as water users' organisations.
- From a system perspective, watershed management refers to the whole of resources, stakeholders, activities, englobing almost all aspects of human and natural life.

¹¹ The following examples of views about watershed management were taken from Vogel and Rojas, 2004.

▪
In addition to the above examples, many more could be given. A **variety of interpretations** have developed, which does not facilitate communication about the topic. One of the most well-known authors on watershed management, Axel Dourojeanni, presented the figure below (see Figure 3) for distinguishing different approaches to water management.

Figure 3. Classification of management activities in watersheds according to Dourojeanni
(Spanish terms below in brackets)

		Object of watershed management		
Management phases (etapas de gestión)	For use and integrated management	For use and management of natural resources	For use and management of water only	
			Multi-sectoral	Sectoral
1. Preliminary	a	b	c	d
Investigations, plans and projects (ordenamiento)				
2. Intermediate (investment)	River Basin Development (desarrollo integrado de cuencas o desarrollo regional)	Natural Resources development (desarrollo o aprovechamiento de recursos naturales)	Water Resources Development (desarrollo o aprovechamiento de recursos hídricos)	Water Resources Development (agua potable y alcantarillado, riego y drenaje, hidroenergía)
3. Permanent (operation and maintenance, management and conservation)	Environmental management (gestión ambiental)	Natural Resources Management (gestión o manejo de recursos naturales)	Water Resources Management (gestión o administración del agua)	Water Resources Management (administración de agua potable, riego y drenaje)
		Watershed Management (Manejo u ordenamiento de cuencas)		

Source: [Dourojeanni, 2001](#)

Dourojeanni argues that watershed management, integrated management, sustainable management etc. is not about changing names, but about creating step by step capacity to manage watersheds appropriate for the local context. The figure (see Figure 3) presents about 10 approaches that according to him are not sufficiently differentiated¹². The main contribution of this figure is the distinction, on the one hand, of the object of management:

- Sectoral water management (drinking water & sanitation, irrigation & drainage, hydro energy and so on) -d
- Multi-sectoral water management (water for different purposes) -c
- Natural resource management (water being one of the natural resources) -b
- Integrated development (where natural resources are one of the issues) -a

And on the other hand, the distinction made between three different phases of management:

- Preliminary stage (1): studies, formulation of plans and projects.
- Intermediate (2): the investment stage for river basin development with a view to the use and management of its natural resources for purposes of economic and social development. This stage corresponds to the notion of "development" as in "river basin development", "water resources development" (the corresponding term in Spanish being "desarrollo de cuencas" or "desarrollo de recursos hídricos").
- Permanent (3): the operation and maintenance stage of structures and management and conservation of natural resources and elements. This phase corresponds to the notion of "management" (a term, which, has as many as four meanings in Spanish: "gestión", "administración", "ordenamiento" and "manejo"). [CEPAL - SERIE Recursos naturales e infraestructura N°29]

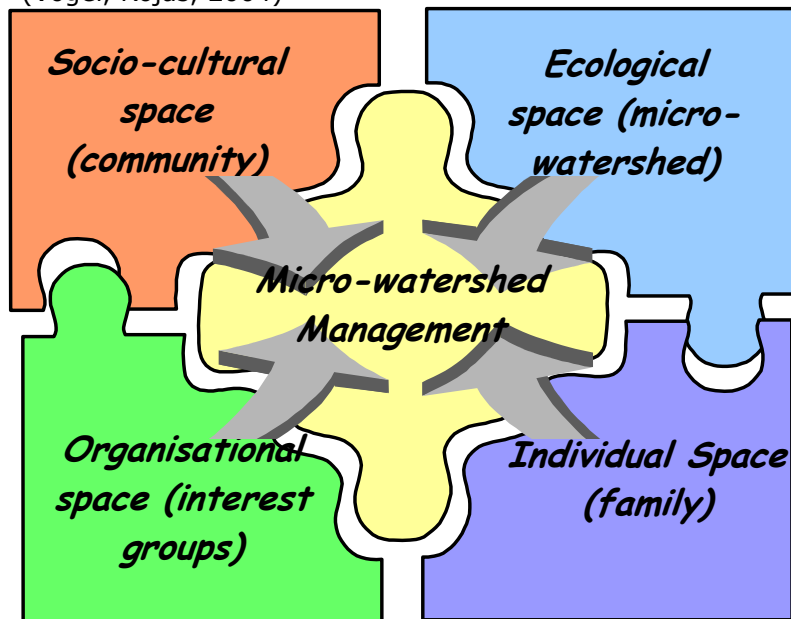
Moreover, he states that in all river basins people are daily performing thousands of actions, but the mere implementation of actions does not imply that they are automatically part of a process of river basin management, let alone that they are integrated. There such actions should first be co-ordinated with one another taking into account their joint effect on the dynamics of the river basin and its people. This is not the same as co-ordinating all the actions executed in a river basin.

Another way of illustrating the same point, **the need for complementary action**, is the puzzle of 5 pieces used by Vogel and Rojas [2004] for the description of their "multi-spatial approach" to micro-watershed management in their work with the National Programme for Watershed Management and Soil Conservation of Peru (see Figure 4).

Figure 4 illustrates how different types of activity are carried out in different territorial units/levels by different organisational groups. All have an effect on the micro-watershed, and to the point that these activities are coordinated and articulated (fitted to each other as a puzzle), this may result in micro-watershed management. Important is to note that not all activities have to be planned, designed for, nor implemented from a central level of command (at the micro-watershed); they just need to be coordinated, and articulated, especially with regard to their effect (as individual activity or as aggregated effect) on the micro-watershed. In principle, issues should be dealt with at the lowest level possible (subsidiarity). Sustainability of the micro-watershed is then not so much a situation that has been planned for and achieved by a central watershed management organism, but more the **emerging property** of a number of activities of different stakeholders in a learning process. This is also called adaptive management.

¹² Obviously there are more approaches and concepts, not included in this figure, but it does summarise some of the most frequently used concepts.

Figure 4. Multi-spatial approach to watershed management (Vogel, Rojas, 2004)



The different spaces mentioned in Figure 4 are for example:

Social space	Territorial space	Organisational space
the household	Field, farm	A family group
Interest group ¹³	Group of fields in an irrigation system (for example)	Irrigation waterusers' association
Interest group	Pasture lands	Livestock owners' organisation
Community	Area belonging to that community	Communal organisation
Municipality	Area belonging to that municipality	Local government
Micro-watershed	Area of micro-watershed and possible other areas of influence	Committee for micro-watershed management, or association of communities of the particular micro-watershed.

Box 6. Example of different spaces in a multi-spatial strategy to micro watershed management

These kind of distinctions are useful, because they visualise the different work processes at different levels as well as the different bodies of knowledge involved. In stead of fighting over different approaches and names, these are attempts for providing a framework for relating them. Actually the puzzle figure shows that there is so much work at so many different levels, that it would be impossible for one institution or organisation to commit itself to everything: the **need for collaboration and articulation** is obvious. So once rights and obligations, roles and responsibilities can be made clear for each one, then joint action can be defined on water source protection (in watersheds), control of contamination or protection against natural disasters, etc. At the moment many water sectors claim to do "something" about all of these issues, but nobody has direct clear responsibility [see also Jouralev, 2003].

¹³ There are many posible interest groups that may be stakeholders in an area.

"Gestión" and "manejo"

In Spanish a useful distinction is made between "gestión" and "manejo". "Manejo" refers to the whole of activities that have to be carried out to for good use of natural and productive resources. While "gestión" includes "manejo", but also the joint action of different stakeholders that share a vision of the future, plan, involve citizens and promote interinstitucional cooperation. "Gestión" is a wider concept than "manejo", because the latter concentrates mainly on the technical aspects of conservation. In this sense "ordenamiento" is very similar to "manejo".

Also, nowadays "gestión integrada" is used to refer to integrated management, integrating for example across sectores (different wateruses), while the term "integral" is used for referring to the whole workprocess in one sector.

Box 7. Gestión and manejo

One of the **main problems** of watershed management arise from its name: many people think the management should start at the watershed, leaving the people, organisations and communities in the area somewhat out in the picture. From this point of view, a first step for watershed management is typically the creation of a (large) database of information about the watershed, and not so much time is given to finding a plausible strategy for involving the different stakeholders. Also from this point of view, the fact that municipal boundaries do not coincide with watershed boundaries is considered a problem. The following statement of Dourojeanni puts into perspective this way of working:

"The territory covered by a river basin is not, of course, the only area within which development actions can be directed and co-ordinated in order to take account of environmental considerations. The limits of the surface waters which form the river basin do not necessarily coincide with those of the ground water, obviously do not cover the areas of the seas and oceans where much of the hydrological cycle is generated, and are not so relevant in relatively flat areas or extremely arid regions. The use of the territory of a river basin for environmental management purposes is therefore merely one option, whose validity will depend on the geographical characteristics of the environment. It is an important option from the environmental standpoint because, as already noted, it furthers coordination among the users of a single shared resource, such as water, and above all facilitates monitoring of progress in water pollution control, through its effects on water quality. This does not mean, however, that the territory of a river basin is the only space needed for management of natural resources or the environment in general.

This observation is important for doing away with the mistaken belief held by some persons that the entire development of a region or its environmental management can be carried out solely on the basis of limits corresponding with those of river basins. It could be said that taking account of the limits of river basins is a necessary condition for incorporating environmental aspects, especially those relating to water and its "associated" resources, but it is not sufficient as an area of jurisdiction for managing human development."[Dourojeanni 2001b]

In **SNV's advisory practice in Peru**, an effort was made to start off with stakeholders' involvement and their political- administrative structures and other existing organisations. As a working concept, the term "micro-watershed for management" was used. The boundaries of this area would include the area of the micro-watershed, plus the whole territory of all communities that are totally or partly part of the micro-watershed. This way it was explicitly recognised from the start, that some issues in the micro-watershed would involve more than only the micro-watershed itself.

Only afterwards, after initiating dialogue with stakeholders, relevant information was gathered¹⁴. Subsequently to information gathering, responsibility for information management may be delegated to one of the local actors, but care should be taken that it remains common property (and use). Three important principles were:

- A participatory process aiming at “self-management of natural resources” by communities is main aim. Therefore presence in the field, understanding of people’s livelihoods and facilitation skills of field staff is essential.
- The interinstitutional dialogue and consensus building is basic for a successful process. From the start on allies have to be found and established.
- The learning process towards watershed management is a shared process and evolutionary one. It will be planned in the first year, and nobody will be able to oversee all aspects and complications involved in the beginning. All different kinds of knowledge and perspectives are necessary, and therefore in all activities mechanisms have to be found to involve local organisations and people, empowering them in the learning process.

All learning processes have to start off somewhere, probably not everything is known in advance, not even who are the relevant stakeholders. The issue who participates in (participatory) watershed management is a key question. Therefore **stakeholder analysis** should be considered a reiterative process. (see the work from IIED on [collaborative management of natural resources](#) and also the work of [Multiple Stakeholder Processes resource portal](#) and the [Multiple Stakeholder Platforms for Integrated Catchment Management](#) at Wageningen University.

The fact that not everything is known in advance, also applies to the organisational structure required for watershed management. However, it has become almost a dogma in some countries of Latin America that **water authorities** should be re-organised (or created) on the basis of watersheds. Several legislative processes are under way, to propose collaborative catchment authorities, in spite of the fact that physical layouts of watersheds, the level and form of social organisational to mention a few things, are enormously diverse along the continent. There is not yet much clarity about the function of such authorities.

Jan Hendriks [2004] states that in the whole of Latin America, very few examples of watershed authorities are available. He points out that first of all it is not feasible to create new structures (institutions, competences, institutional powers), without doing away the existent ones. That is to say, by creating new structures, while maintaining existing ones, simply parallel powers develop. There is no consensus about this point: in a recent report on Water Administration in Latin America, CEPAL/DRNI¹⁵ praises the administrative models adopted by México, with the creation of the National Water Commission and Watershed Commissions, and the creation of the National System for Water management in Brazil, and it’s National Water Agency.

In addition to that, some people ask how realistic is it to propose watershed management structures that require such a level of presence in the field (and thus human and other resources) for its success, while at the same time this structure is not integrated to other –also precarious– public administration organisms (because of territorial incompatibility)? This considering the fact that in many developing countries not even the present political administration of the state has the human

¹⁴ For this, a whole methodological package was developed between PRONAMACHCS, GOPA-GTZ and SNV- The package is called Pcubo, planificación participativa de Pronamachcs.

¹⁵ Administración del Agua en América Latina, situación actual y perspectivas, Ballester, M. et al, CEPAL/DRNI 2005, 76 p.

and capital resources research out and to be present in all communities in the country.

Hendriks [2004] opinion is that:

"It is striking that –although in most countries of the Andean region there are no advances of a change of water institutionalization on the basis of watersheds-, there is, in almost all countries, a surge of participatory organisations, created by NGO's and individuals, that allow a space for analysis, discussion and proposals for water management. In many cases these are related to local government. So perhaps one of the lessons of this process of watershed management is that it does not necessarily involve the creation of a watershed management structure (with all its complications and possible conflicts in relation to territory, authority etc.), but that this perspective may prosper through the joint effort of several actors whose interaction may– at some point- be nor med by law."

This tendency, of the creation of **water management platforms** in the Latin American countries, is also confirmed by Ballesteros et al [2005], even if water legislation does not consider such type of organisations. However, they point out that this is a slow and difficult process, especially due to the lack of legal support. Contrary to the view of Hendriks, Ballesteros et al consider that such watershed management organisations will not be sustainable as long as there is no good national water administration, which preferably according to these authors, should precede the creation of watershed entities. (See: [Administración del agua en América Latina: situación actual y perspectivas](#), Ballesteros et al, 2005)

All these remarks are not to say that watershed authorities should never be legislated for. It is to underpin the importance that this decision should come from clear management needs felt by local actors, rather than from pre-designed models of watershed management. In some cases, these needs will exist at watershed level, in others perhaps not.

Inspiring in this respect is the work of the MSP group (multiple stakeholder processes) as well as the work on water conflicts. Many people consider that conflicts may result in a sense of urgency felt by stakeholders, which may be an incentive and entry point for watershed management and perhaps opening the door for measures such as payment for environmental services. (See also the UNESCO project [From Potential Conflict to Co-operation Potential PC-CP](#))

1.3. SWAp: focus on the sector

The concept "Sector-Wide Approach (SWAp)" has emerged to encompass a range of changes in the practice of development cooperation, aiming at working in a broad alliance of donors supporting a similar sector. So instead of each donor bringing in its own quality criteria, the focus is at developing a consistent policy framework in consensus among all, government and donors.

The **approach aims at** increasing the overall effectiveness of a particular sector, for example water & sanitation, through joint analysis and target setting. It combines institutional development, quality improvement and the improvement of water & sanitation services. In that way the SWAp approach intends to overcome problems of duplication and contradiction in methodology, investment strategy etc. It also intends to increase capacity and ownership at government level.

A SWAp is basically a joint learning process for governments and donors. A lot of emphasis is given to capacity building, monitoring and building confidence and goodwill. Through joint reflection it is hoped that all parties involved will adhere to

similar criteria for planning and investment, as well as adopt similar procedures and methodologies.

For governments, a SWAp reduces the time required to deal with each and every different donor applying different quality standards and administrative procedures. It should also lead to diminish overlapping of funding and capacity building initiatives, and ultimately lead to more efficient use of scarce funds.

SWApS may lead to agreements on funding mechanisms, such as budget support or basket funding. Other options include "organisational budget support", as an interim phase in the move from project support to more sector oriented support. Such support should be based upon widely approved long-term strategies for change in those institutions [Danida SWAp strategy for Bangladesh government].

Obstacles mentioned in relation to SWAp are:

- The fact that in spite of the SWAp process, many ministries may have on-going projects as a significant proportion of their activities. So problems arise such as parallel responsibilities for project monitoring, parallel reporting systems and simultaneous development of new initiatives.
- Themes such as pay reform, procurement, poverty alleviation and environmental sustainability are cross-cutting in nature, and as such go beyond the borders of the group committed to the SWAp.
- Some cross-cutting issues are the responsibility of specific institutions or committees. In that case it may be difficult to achieve that activities and expenditures of these institutions/ committees are incorporated in the overall SWAp process, as they are reluctant to loose control [Danida SWAp strategy for Uganda government].

As SWApS generally part at national level and tend to increase government control over investment, increasing national ownership, they are sometimes viewed as top-down, non-participatory and concerned with centrally driven agendas, needs and capabilities of the public sector. They are by definition sectoral, and may hinder cross-sectoral measures. SWAp may also fuel the assumption that aid should always be disbursed through government channels [www.livelihoods.org of DFID]. There is however no inherent limitation on initiating similar processes of learning at local level for a particular sector and include non-governmental actors.

An influential document on SWAp in the water and sanitation sector is: "Sector Wide Approaches for Water and Sanitation Development", published by the Dutch Ministry of Foreign Affairs on the basis of a workshop in Geneva in October 2000¹⁶. The following main suggestions come from that document:

- SWAp must be viewed as a process of gradual strengthening of partner capacity rather than a blueprint or prerequisite for funding.
- SWAp for the water supply sector will need to explicitly allow for the participation of multiple actors and stakeholders and a diffuse (and decentralised) organisational network. Ownership of SWAp must reflect this diversity, and should not rest solely with national government. In addition, SWAp will need to be used flexibly to allow for the different ways that countries deal with "sub-sectors" within the water and sanitation sector: rural water supply, urban water supply, drainage etc.
- SWApS cannot be blueprints, but must be developed differently according to local opportunities and constraints and must be seen as a process of gradual strengthening of partner capacity. Budgetary support for the full implementation of a nationally owned sector programme and the capacity to implement it

¹⁶ "Sector wide approaches for water and sanitation development", Moriarty, P., Visscher, J.T., Saade, L., Blokland, M., Ministry of Foreign Affairs, (IRC & IHE Delft), 2002, 110 p.

should be seen as being an aspiration or target rather than a prerequisite for funding. Other the countries with the greatest support will be those least able to qualify for budgetary support.

- Water and sanitation sector SWAp should be developed within a framework of wider water sector planning. This may take the form of a specific water resources, or the co-ordinated development of a number of "sub-sector" SWAp that taken together ensure that water is managed according to the principles of integrated water resource management.
- Ensuring adequate attention to sanitation and hygiene promotion within water and sanitation or integrated water resource management focused SWAp will remain a challenge that must be addressed if the current situation of far greater numbers lacking adequate sanitation than access to water is to be met.
- A national monitoring framework is required to assess the progress made in SWAp. Physical, financial, institutional and performance indicators must be developed for this. The framework should be developed by national governments as part of the SWAp process, and monitoring and reporting should be internalised within government structures. All sector stakeholders should be given access to the monitoring data in an appropriate format.
- Development of capacity at all levels and within all stakeholder groups will be essential to the SWAp process. This will require a substantial shift in how funds are allocated and used, which may at least initially seem to conflict with other criteria such as poverty focus. However, careful planning and implementation and a long term process based approach will minimize these risks. Approaches to capacity building that emphasises learning by doing- rather than external learning- will ensure that ability is developed with loss of focus in infrastructure development.
- While direct budgetary support is the overall goal of SWAp, bilateral or parallel funding for new and innovative approaches and the targeting of specific groups such as women and the very poor can continue within the context of SWAp. However, this parallel funding must be for outputs that are clearly included within the SWAp and should not add a significant extra burden in terms of different financial monitoring or other administrative costs.

1.4. Livelihoods approach: focus on people ¹⁷

The livelihoods approach is a vision of development that puts people at the centre, and in the first place tries to understand their choices and decisions. There are several definitions for the concept livelihood and livelihood strategy:

"A livelihood is ...the capabilities, assets and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base" (Chambers & Conway, 1992)."

"A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base" (Carney, 1998, DFID definition).

"Livelihood strategies are the full portfolio of livelihood activities, but linked to an understanding of the choices and decisions underlying them. They include: how people combine their income generating activities; the way in

¹⁷ Large parts of the text of this chapter originate from the guidance sheets of DFID, see www.livelihoods.org

which they use their assets; which assets they chose to invest in; and how they manage to preserve existing assets and income. Strategies may reflect underlying priorities, such as diversifying to minimise exposure to risk. They are diverse at every level. For example, members of a household may live and work in different places, engaging in various activities, either temporarily or permanently. Individuals themselves may rely on a range of different income-generating activities at the same time, and are likely to be pursuing a variety of goals.” [IRC Thematic Overview Paper, WATSAN and livelihoods]

The livelihoods approach intends to understand – together with people themselves – the factors that shape their livelihoods, in order to explore whether and how they would like to see change. From that starting point, specific constraints to change are identified both at macro and micro level: different levels at which policies are formulated and applied and the linkages between those levels. It promotes reflection and mutual learning between people about these constraints, their meaning and opportunities to address them, without suggesting that everything is in their hands only.

One of the **central aspects** of the livelihoods approach is that broad all-inclusive analysis does not necessarily leads into all-inclusive activities/programmes. This is also the difference between the livelihoods approach and the integrated rural development approach that leads to the establishment of large rural development projects.

Characteristics of the livelihoods approach are¹⁸:

- It is non-sectoral and applicable across geographical areas and social groups.
- It recognises multiple influences on people, and seeks to understand the relationships between these influences and their joint impact upon livelihoods.
- It recognises multiple actors (from the private sector to national level ministries, from community based organisations to newly emerging decentralised government bodies).
- It acknowledges the multiple livelihood strategies that people adopt to secure their livelihoods.
- It seeks to achieve multiple livelihood outcomes, to be determined and negotiated by people themselves.

Advantages mentioned of the livelihoods approach are that it attempts to bridge the gap between macro and micro problem analysis, by emphasising the importance of information flows between those levels, in particular from communities to policy makers. It states that much macro policy is developed in isolation from the people it affects and in addition to that rarely achieves the impact it intends. This is especially true for water legislation in Latin America, where volume based distribution is assumed without any means to define neither available volumes nor presence of responsible government officials in the field¹⁹. By explicitly taking into account different levels at which policies are formulated and applied, the approach is particularly suited for use during decentralisation processes.

Another advantage of the livelihoods approach is that it builds upon solid participatory methodology for social analysis and implementation. However, this does entail the risk that too much emphasis is given to localised needs, losing the

¹⁸ From DFID guidance sheet

¹⁹ See paper from Jan Hendriks, “Legislación de Aguas y Gestión de Sistemas Hídricos en Países de la Región Andina”, 2004.

broader national context and interests. Good facilitation skills are a pre-requisite and thus a limiting factor for the use of this approach.

In relation to the water supply and sanitation sector, the livelihoods approach helps to recognise productive uses of households and to include them in demand oriented methodologies, design and demand management strategies. This should ultimately result in more sustainable systems. It does not imply, however, that water should always be provided for both needs nor that it should come from the same source. The livelihoods approach also helps the WATSAN sector to recognise the contribution of productive uses of water to people's well-being and health, especially for women. Moreover, the livelihoods approach is compatible with the search for community management of water supply and sanitation services, as well the search for cost sustainability of systems. (IRC Thematic overview paper on WATSAN and livelihoods)

DFID proposes the following characteristics for successful implementation of a livelihoods approach:

- It should be people-centred since sustainable poverty eradication must directly involve the people and recognise their cultures, assets, skills, strategies, and ability to adapt. People should be the concern for development such that resources and forms of organisation, including governments, revolve around them. Thus, the pursuit of sustainable livelihoods approaches must target institutional changes in order to ensure a consistent positive transformation.
- In order to fully understand the components of the above, the process must be participatory and ready to respond to the voices of the poor. This will ensure that the views and perceptions of the poor are duly integrated in the planning process. The people should be involved in the identification, selection and the setting of priorities. This requirement implies that planners should adopt planning frameworks that are easy to comprehend.
- Participatory approaches require that interventions be located at various levels of the development process. Participation must be for both local and higher level development.

See also: [Managing Natural Resources for Sustainable Livelihoods: Uniting Science and Participation](#), by Earthscan/IRDC, 2003.

1.5. Gestion de Terroir, local level integrated land and water management²⁰

Gestion de Terroir (GT) experiences in Francophone (Western) Africa²¹ provide a useful example of one distinct approach to local level Integrated Land and Water Resources Management. Gestion de Terroir shows many similarities with approaches such as 'watershed management' and 'participatory land-use planning' in Anglophone countries, as well as with "ordenamiento territorial" en Latin America. In fact, concrete Gestion de Terroir projects in francophone Africa often focus at watershed or forest areas, including several village territories.

²⁰ The text of this part comes from the SNV Reference CD on land and water management, written by Wybe van Halsema, 2004.

²¹ An example is the work done by the NGO ENDA-Tiers Monde: http://www.enda.org.ma/devterritorial_taza.php

The GT approach has developed in francophone Africa basically as a response to the growing concerns about environmental issues. Its development can be **characterised** by 3 phases:

- Growing attention for environmental issues, first of all triggered by the so-called 'fuel wood crisis', leading to an approach that looks at sustainable use of environmental resources in a village land-use perspective. Projects typically deal with agro forestry, soil and water conservation, grazing reserves etc., and have a strong spatial zoning component. For instance, a GT project from this period would develop a village land-use plan with zones for forestry, exclusive village grazing, agriculture, etc.
- Insight that attention on environmental issues cannot be disconnected from its socio-economical context, and will not be successful if basic socio-economic needs are not covered. So the approach integrated more general village development activities. Projects typically deal with a combination of the above and development issues such as water management, food security, agricultural extension, etc.
- Insight that village developments will not be sustainable if the approach does not address village (and higher level) institutions and organisational arrangements. This links up with the political changes for decentralisation towards local level ('développement local'), requiring the need for institutional strengthening and capacity building at local level. Projects typically pay much attention to organisational change, human capacity building, legal issues and reforms, delegation of management responsibilities to local level etc.

Thus, one can note an evolution from environmental attention, to a more integrated approach, to an approach that includes organisational and institutional aspects. One can still find projects mainly in the third category, with mixed attention for environmental, socio-economic and/or institutional development aspects. Some of these projects are still referred to as GT, other projects shifted their focus on socio-economic or institutional aspects. One major **distinctive feature** of GT projects appears to be whether it deals with spatial aspects of land-use (at a village level), often including the use of aerial photographs, satellite images and GIS systems. Where zoning is not a main issue, it seems that 'Gestion des Ressources Naturelles' has become a more generally applied term.

The following review of GT applications has been based on a selection of relevant literature (see bibliography) and web-sites. Particularly interesting and recent is the review by Olivier Dubois et. al (Supporting Natural Resource Management and Sustainable Livelihoods; 2003)

The GT approach focuses at sustainable use of natural resources, particularly agricultural, forest, grazing and water resources. It has from the beginning claimed to be:

- Participatory
- Inter-sectoral and inter-disciplinary
- Decentralised and bottom-up
- Well co-ordinated but flexible

The first element – **participatory** – has so far received most attention, and has so far been most successful. The other 3 aspects have had mixed successes. It is noteworthy that in francophone Africa the institutional 'window' for participatory development was provided by NRM, particularly in forestry projects, as an alternative to top-down (state driven) development approaches. The participatory approach as the main part of GT was adopted during the 1984 CILLS Conference in Nouakchott. After this conference only few countries took the political measures to

institutionalise this approach (e.g. Burkina Faso), but all other francophone African countries have gradually developed this approach by project practice.

The main **strengths** of the GT approach can be summarised as:

- Systematic attention for environmental issues within development plans, although too often based on views and perceptions of outsiders.
- Mainstreaming participatory development as a new approach, with major attention for the needs of local people when designing development plans, and the need to involve actors and stakeholders from different sectors and organisations
- Emphasis on developing human capacities rather than developing concrete infrastructure.
- Awareness on the importance of institutional development as part of development processes, particularly the emergence of local institutions for managing the natural resources (some of which have also engaged in partnerships with external support organisations, and have become involved in policy dialogue).
- The adoption of a long-term programme rather than project approach, and the systematic incorporation of a participatory process and training components in these programmes.

However, in spite of strengths, GT projects and programs now tend to revert back to 'normal' rural integrated development programmes, with very limited attention to environmental issues and capacity building. The focus is mainly on short-term micro-finance investments and economic enterprises, based on people's socio-economic needs, with little attention for long-term sustainability issues.

More specifically, the following **weaknesses** and associated challenges remain to be addressed:

- The need to focus on concrete impacts, and not only at the mechanisms such as participation and/or organisational capacity building. Little attention is given to assessment or monitoring of the impacts of the GT approach on the environment and/or socio-economic development. It is particularly unclear whether and to what extent the GT approach has strengthened the linkages between NRM and poverty alleviation (by developing improved management systems for those resources that are important for poor socio-economic groups, and by improving their entitlements and endowments over these resources). Alternatively, improved (incomes from) NRM is beneficial for a selected group of relatively rich stakeholders. Systematic monitoring and evaluation should focus at the relations between the GT approach, institutional change, and concrete development impacts.
- Participation is still too much seen as a panacea. Participation by villagers, extension agents and project staff in diagnostic and planning has improved, as well as communication between these different actors. But there has been a tendency for dominance of normative views by outsiders, overlooking local norms and values. Also, there are still problems of legitimate representation of villagers (by their leaders?), powerful parties dominating the outcomes, and women participating in an obligatory way, but not being really influential. The issue of gender equity requires more than simply proposing tools and techniques to involve women. Capacity development of different gender groups is also required.
- The need for organisational change and integrating participatory approaches in local institutions. Real change will only occur when a process of organisational change is involved, involving the absorption (institutionalisation) of principles of participatory development. Too often new local organisations are formed, but these remain very instrumental (managing the activities linked to NRM only). Little attention is given to

capacity building of existing organisations, and the role and legitimacy of different organisations in existing land-use dynamics. At a higher level, co-ordination structures are either absent or not functional. In the Thies region in Senegal a Forum Participatif has been established with the aim to unite the different institutions involved, secure communication and mutual learning.

- The need to link up decentralisation, local governance and participatory development. The GT approach has so far been mainly applied by NGOs, development projects and state technical services, but there is need for local government structures that have a legal status and have been elected, to apply the GT approach. To be able to do so, they will need capacity strengthening, devolved powers and organisational support. Their training must expand to fields and issues raised above, such as the organisational and institutional aspects, local governance, monitoring and evaluation, and flexibility of the GT approach.
- The need to stimulate private initiatives and involve the private sector. Too much emphasis has been put on community based planning. Most GT projects overlook the growing tendency for more entrepreneurial activities to generate incomes and develop new products and markets. One solution could be to develop a community vision and individual activities, supported by incentives and organisational and business training.
- The need to address issues of equitable land tenure and resource ownership. The tendency has been that agricultural intensification and private land ownership go hand in hand, This implies that land owners who are able to continue cropping on the same piece of land, by applying appropriate conservation and fertility management, acquire de facto private ownership rights. Relatively wealthy farmers have much better opportunities to do so, leaving poor farmers increasingly land-less and unable to share in the benefits of land intensification.

From an environmental perspective, the following **challenges** remain:

- The need to scale up results and impacts from small areas (villages) to larger areas. There is limited exchange between villages and between ethnical groups, there are difficulties in boundary setting and planning at inter-village levels, and there is limited expansion of small scale successes to larger areas. Yet, for NRM and biodiversity conservation an ecosystem approach is required. This requires linkages with higher level institutions and policy makers to apply successful approaches at a wider scale and/or integrate relevant issues at policy level. This issue also raises the question of how participatory approaches can be applied on a wider scale, without losing genuine participation out of sight.
- There is a tendency for zoning to consolidate the existing situation (status quo), and not bring about necessary changes that fit into a more long-term vision. This is not surprising, as changes in existing land allocation will not be easy. However, to make optimal use of land potentials, and benefit from comparative advantages of certain regions, such changes might be necessary.
- To date there have been few if any successful approaches of GT to pastoral land-use. Pastoral land-use in resource poor dry lands is characterised by opportunistic and highly flexible and mobile management regimes. Zoning of grazing lands in drylands has not been very successful, and their management remains a particular challenge. An IUCN report states that the GT approach has not worked because zoning has been mainly tied to the struggle for power rather than a recognised need to better manage natural resources. Rather, an approach of social management units might work better. One new approach is that of holistic rangeland management. One

principle of holistic management is that of maintaining and 'celebrating' diversity, including natural biodiversity.

It becomes increasingly clear that local level land management must be supported by **enabling policies**. Since national policies are often not favourable to support local level land management, policy reforms are required. Decentralisation efforts appear to offer new opportunities for such policy changes. Thus, there are strong linkages between local governance and local level land management. A recent conference was held in Bobo Dioulasso (Burkina Faso) on local governance of NRM, organised by the CILSS. It was stated that the linkages between local governance and NRM are still weak, particularly in terms of equitable participation in local decision making. It was found that there is now a multitude of participatory methods, but it is unclear to what extent these methods really lead to effectively attributing decision-making and political power and responsibility to local actors. It appears that in spite of an increasing degree of participation, there have been few real policy changes. A major challenge is to strengthen capacities of local governments and to institutionalise GT plan at that level²². (See also: [Institutionnalisation de la Participation dans la Gestion des Terroirs au Sénégal: Cas de la région de Thiès](#) by IIED)

There are intricate relations between **land tenure** and local governance. Many recent debates associated with GT are on issues of land tenure and resource ownership. First of all there is a growing tendency to accept de facto land rights and regulations, even if these are not in line with de jure rules, simply because this is how it works. Secondly, there is a tendency for wealthy land-users to acquire land ownership, while poor land-users are left without. Local governments appear not to interfere, and leave conflicts to be solved at local levels, which seem to lead to a 'survival of the fittest'. This attitude could be explained by a lack of capacities and resources, but also the interests of local governments who often are wealthy land owners themselves. Although highly sensitive, this is an issue that would require major attention by development workers.

Decentralisation is a major policy option being pursued by many governments. It involves the devolution of powers and responsibilities over a range of subjects from central government to lower levels, such as the region, or district administration, and elected bodies. The arguments in favour of decentralisation are based on the principle of subsidiarity, and include the idea that local peoples' influence will be increased through closer contacts with the administration, and that election of local representatives should ensure a greater responsiveness to local interests and needs. At the same time, it is argued that the high degree of diversity found within any country requires that national strategies will always need to be tailored to local conditions. Moreover, it is acknowledged that the limited financial and administrative resources of for instance most West African states make it inappropriate for government to be heavily involved in managing land at local level. Thus, decentralisation as a set of processes is under way in many countries, and will have many implications for how questions of land and access to resources are handled. Nevertheless, governments retain important functions within such a process, which include provision of the broad framework and principles underlying rules of tenure and access, and ensuring the transparency and accountability of local structures.

²² Thanks to Amparo van der Zee for adding this point.

2. PARTICIPATION

Participatory approaches have spread everywhere. Participation itself has become a word so widely used, that almost everything goes. Therefore, in this chapter, first a general issues on participation and participatory approaches are presented, and then some prominent applications of participatory approaches in the field of water management are summarised. These are:

- Participation in Water Supply and Sanitation: Demand oriented approach
- Participation in Irrigation: Participatory Irrigation Management
- Participatory Watershed Management

In the final section, the topic "Institutionalising participation" will be reviewed.

2.1. General issues on participation and participatory approaches

Participation is a very broad concept, with diverse and some times contradictory interpretations. This is also illustrated by the way in which the concept evolved over time [Pimbert 2004]. (See Box 8.)

"For example, in the 1980s participation was defined as a process by which participants or client groups influenced the direction and execution of development programmes to enhance well-being in terms of personal growth, income, self-reliance or other values (Paul, 1986). Using an empowerment perspective, Rahman (1993) described participation as a collective effort by people concerned, stimulated by their own deliberations, the creation of free and independent organisations, voluntary pooling of efforts, sharing of risks, responsibilities, resources and benefits. People's main aims were self-development and gaining a say in decisions. These value-laden views on participation have led to the development of two overlapping, and at times conflicting, approaches. The first sees participation as a mechanism to increase efficiency and effectiveness. It assumes that if people participate, they are likely to agree and support the policies, programmes, technologies, projects and services being offered to them. The second views participation as a fundamental right and a process in which community members and other citizens mobilise for collective action, empowerment, institution building, inclusive deliberation and politically negotiated processes. A third and distinct approach to participation is advocated by the Bretton Woods institutions, the World Trade Organisation (WTO) and transnational corporations (Nair, 2003). In this newly emerging view of societal participation, citizens are seen as clients or consumers and are asked to participate by paying for goods and services provided by the market and the more economically efficient actors."
[*Institutionalising participation and people-centered processes in natural resource management, Pimbert, 2004.*](#)

Box 8. Evolvement of the concept of participation (Pimbert 2004)

To define more precisely the content of variations in the **meaning of participation**, "participation ladders" have been developed – a gradual scale for participation (see Figure 5). There are many variations on this way of defining the kind of participation, this ladder of [Geilfus](#) being among the first. For training purposes, a participation ladder can be constructed according to the development of thinking about participation of the specific organisation where training is conducted.

Explanation of the steps in the participation ladder (Geilfus, 1983):

Passivity: People are informed. They have no influence whatsoever in decisions or implementation of the project.

Providing information: People participate responding to questionnaires. They do not have the possibility to influence in decisions or the use of the information.

Consultation: People are consulted by external agents who listen to their point of view. They do not have influence in decisions taken on the basis of these consultations.

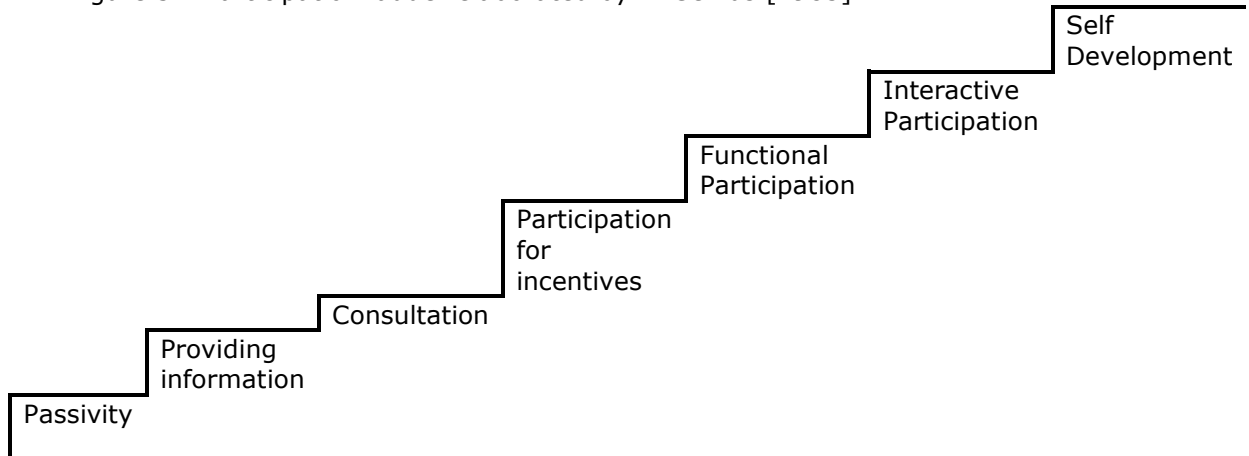
Participation for incentives: People are involved providing mainly labour or other resources (land) in exchange for certain incentives (such as material, training). The project requires their participation, but they do not have direct influence in decision making.

Functional participation: People participate by forming work groups to respond to specific goals of the project. They do not have influence over formulation, but they are taken into account in monitoring and adjusting the project's activities.

Interactive participation: Local organised groups participate in formulation, implementation and evaluation of the project. This implies structured learning processes and a gradual tranference of control over the project towards them.
Self development: Local organised groups take the initiatives without waiting for external intervention. Interventions are done in the form of advisory processes or as partners.

Box 9. Explanation of the steps of the participation ladder as defined by Geilfus, 1983

Figure 5. Participation ladder elaborated by F. Geilfus [1983]



Some other definitions of participation are:

"Participation is a process through which stakeholders²³ influence and share control over development initiatives and the decisions and resources which affect them. -- Participation Learning Group Final Report" [The World Bank Participation Source Book]

"We define participation in development as a process of equitable and active involvement of all stakeholders in the formulation of development policies and strategies and in the analysis, planning, implementation, monitoring and evaluation of development activities. To allow for a more equitable development process, disadvantaged stakeholders need to be empowered to increase their level of knowledge, influence and control over their own livelihoods, including development initiatives affecting them.

Participation in development is also seen as an organized effort within institutions and organizations to increase stakeholder access and control over resources and related decision making that contributes to sustainable livelihoods. Participation is furthermore viewed as an iterative process involving the continuous re-adjustment of relationships between different stakeholders in a society in order to increase stakeholder control and influence over development initiatives that affect their lives." [FAO participation page]

Any text on participation cannot go without mentioning the work of **Paulo Freire**, even though he did not talk about participation, but about "transformation", "liberation" and "critical awareness". One of the very inspiring aspects of his view

²³ In this definition the authors shifted their focus from popular participation (participation of the poor and others who are disadvantaged in terms of wealth, education, ethnicity, or gender) to *stakeholder participation*-the participation of all relevant stakeholders in the development process.

on change is the direct **link between emotion and motivation** to act²⁴. It points to fact that much education ignored people's feelings, and tries to concentrate on facts, reason and action. Freire argues that emotions play a crucial role in change, only by starting with the issues on which people have strong feelings, attitudes of fatalism and apathy can be overcome. This insight is also relevant for participatory processes and for training processes. For example, in his work on facilitation skills for water management professionals, Kees Blok²⁵ included the aspect "interaction" in his methodological designs. He would take into account feelings and interaction among participants for each activity individually and during the course as a whole, in order to assure that the training connects to participants' experiences, feelings and attitudes, and in order to create conditions for interaction that motivates learning.

Another inspiring aspect of the work of Paulo Freire is the weight he gives to **participants choosing themselves the content** of their education, as well as deciding themselves about the need and extent of change. Applied to participatory processes this highlights the fact that much is still centred to thinking about and for the people in stead of thinking with them. There is increasingly consensus, that this concern about attitudes of facilitators and other professionals is one of the most essential elements for success of participatory processes.

Facilitation skills are also important to avoid falling into the trap Boelens [1998] describes as **Institutionalisation of 'equitable distribution'**, Often institutions create a world and a vision by addressing those problems that they themselves can formulate and by asking only those questions that they themselves can answer. He states that "peasants' participation or "demarginalisation" is a much abused concept. It often refers implicitly to participation and inclusion in the model, objectives and decisions of the intervening parties. It is rarely understood as the endogenous organisation of a process of social mobilisation. In stead of including people in a globalised concept of participatory development with predefined ideas about equity and knowledge, Boelens says, it should be the voice of people, their point of view and their autonomously defined interests, that should be included.

Similarly, some people argue that participation itself is a top-down word, or at least it should not be applied to users, who are not participating but just making decisions about their life; outsiders are participating and -in most cases- should limit their role to "facilitation" of a decision-making process. Obviously, much of this discussion depends upon who are defined as users, who are stakeholders and who are "outsiders".

Others again, in stead of participatory, prefer to stress the fact that it's a joint decision-making between government and other stakeholders or users' organisations, so participatory management of natural resources becomes **co-management of natural resources**. See the work from IIED on [collaborative management of natural resources](#))

Interestingly this shift of thinking (to co-management) changes the questions posed to the participatory process. In stead of asking about the degree of participation (step on the participatory ladder), it asks which areas are under exclusive control of government, which under exclusive control of users' organisations, and which areas are jointly managed (and how this is done) (see Box 10).

²⁴ The REFLECT network draws upon this insight. See [Reflect Action](#) for more information. And also de [Consejo de Educación de Adultos de América Latina](#) (CEAAL)

²⁵ "Capacitándonos", Kees Blok, 2000, SNV, IPROGA, IMAR, CEDEPAS

Different areas of competence in water management may be under government control, users' control or joint control, such as:

- Water ownership
- Water allocation
- Construction
- Water distribution
- Operation and maintenance of the water supply system, drainage or sewerage (this may refer to different levels and parts of the water system)
- Fee collection
- Financial administration
- Otorgar licencias/ giving out permits
- Control of water quality, quantity measurement
- Imposition of sanctions
- Conflict management
- Defining norms
- Defining environmental standards

Box 10. Different areas of competence in water management possibly subject to co-management

There are **several global trends** that enhance the use of participatory approaches. First of all the so-called crisis in representative democracy and the fact that in many countries people have lost confidence in their governments, representatives and so on. The call is therefore for participatory democracy that complements traditional democratic structures, sometimes as part of a decentralisation process²⁶.

There are many variations of participatory methodologies and a lot of books written on participatory methods/ techniques. Some of the most well-know methodologies are:

- PRA, [participatory rural appraisal](#)
- RRA, [rapid rural appraisal](#)
- PTD, [participatory technology development](#)
- RAAKS, [rapid appraisal of agricultural knowledge systems](#)
- PALM, participatory learning methods
- PAR, participatory action research
- FSR, farming systems research
- MARP, *méthode active de recherche et de planification participative*

Box 11. Participatory methodologies, methods and techniques

In field of environmental management, failures of conventional conservation projects have lead to the recognition that environmental governance is a reflection of local environmental management capacities. But also, confidence in the infallibility of science and experts has diminished, and a greater recognition of the value of local, contextualised knowledge impulses participatory approaches.

With these **mainstreaming impulses for participation**, a number of changes in the scope and focus of participation have occurred (see also Pimbert 2004, [Institutionalising participation and people-centered processes in natural resource management](#), annotated bibliography):

- While on an average, participatory processes were small-scale very localised practices, mainstreaming (and globalisation) has lead to participatory processes at national and international level (also with help of the internet).
- While participation was generally part of a project methodology (participatory project planning and so on), that would cease to exist after the project, the challenge is now on changing policy processes and institutionalising participation in government organisations.

So mainstreaming forces have created a lot of space and acceptance for participatory approaches at different levels and scales, but **critics** point to the fact

²⁶ See also the portal on local governance.

that quality is crucial and failure of participatory approaches may lead to widespread disillusion with the approach. More specifically their concerns are about:

- The implicit assumption in participatory approaches that all are equal and have equal opportunities to participate. The question is how to account for differences in capacities, opportunities and power, especially in large scale participatory processes. Gender specialists in particular have done a lot of work on this aspect of participation. (see chapter on equity, water rights and right to water).
- An other pitfall for participatory approaches is the assumption that the workshop is the most important space for decision making, whereas in many cases it is not (or not at all) a space of decision making. For example in many cases, participatory monitoring and evaluation is done with the people who are actually participating, but what is the opinion of those who do not. A critical analysis of those who participate, those who don't and the different social arenas of decision making, may reveal that a particular participatory process has little or no impact on water distribution for example.
- In the context of liberalisation and the down-sizing of government services, some state that participation is just an elegant way to transfer responsibilities (costs) without resources nor mandate.

These criticisms on participatory approaches are very real, but do not discard the use of such approaches. The question is how to assess and ensure the quality of participatory approaches and avoid too simplistic approaches. Especially during mainstreaming and up-scaling, there is a risk that participatory approaches arise more from financial restrictions, donor conditions and institutional deadlines, then from a genuine interest in promoting people's involvement and ownership.

In the following text, the some prominent applications of participatory approaches in the field water management are summarised.

2.2. Participation in Water Supply and Sanitation: demand responsive approaches

Demand responsive approaches have gained strength in the water supply and sanitation sector with the publication of the lessons of the International Drinking Water and Sanitation Decade by Cairncross [1992], these showed that "progress and continuing success depend most on responding to consumer demand." In other words, for sustainability of water systems, use, maintenance and equity in access, it is essential to provide people with the service they want. Some definitions:

Demand responsive approaches base the level of service on what men and women in the community want and what they are willing and able to contribute in return.

Demand responsive approach: Allowing women and men in the community to take part in assessing their service and quantifies the outcomes. [Metguide]

Demand responsive approaches give each community and the various groups in that community the informed choice of service and service management systems. This means that all locally relevant groups, get information on all relevant aspects and implications of the various water supply options²⁷. [Smet and van Wijk, 2002]

²⁷ For example, quantity and quality of the water provided, potential implications for health, costs, walking distances, options for sharing service and costs, service regularity and reliability, ease in maintenance, administration.

Demand, the informed expression of desire for a particular service, assessed by the investments people are prepared to make over the life time of the service to receive and sustain it. These investments may consist of financial and economic resources as well as the time and interest that users are prepared to commit. (Deverill et al, 2002²⁸)

Demand is met by enabling people to choose their preferred service from a range of feasible options. For this to be possible, people should first be informed about the different options, their level of service, costs and maintenance requirements. So field workers need a facilitation skills and time in order to be able to inform people without imposing a particular option to them. This is a delicate role, because in some cases, demand must be stimulated before it can be identified. This is particularly true for sanitation improvements (see Box 12). Such, non-explicit, demands are called hidden or latent demands. It's promotion is known as social marketing ([Social Marketing Institute](#), [Conference on Social Marketing by WSSCC](#)).

Participation in Sanitation: Community-led total sanitation²⁹
A new approach being pioneered by the author (Dr Kamal Kar, Social and Participatory Development Consultant from Calcutta, India) with Village Education Resource Centre (VERC), Water Aid in Bangladesh and other agencies concentrates on empowering local people to analyse the extent and risk of environmental pollution caused by open defecation, and to construct toilets without any external subsidies. This community-led effort has had a huge impact. Open defecation has been completely stopped by the community in more than 400 villages in Bangladesh, and the methodology is now being adopted in parts of India and elsewhere in Asia and Africa. This new empowering approach towards the provision of services and infrastructure has serious policy implications for other such programmes. Firstly, financial subsidies from agencies should be used to facilitate and enhance community understanding of the risks of open defecation and to train community catalysts that can spread the programme, rather than being used to invest in material and physical infrastructure. Secondly, agencies must employ a flexible approach in working with communities in order to allow the latter to take the lead in addressing problems in their own way, instead of dictating practices. Thirdly, success must be measured on the basis of the final impact (elimination of open defecation) instead of the final output (construction of toilets of externally prescribed designs). This new approach demonstrates the impact a simple facilitative process can have on changing age-old practices, where the onus for progress is placed almost entirely on the community. [Kar, 2003].

Box 12. Participation in Sanitation: Community-led total sanitation (Kar, 2003)

According to Wedgwood [2005], it has become increasingly clear that **different perceptions of the meaning of key terms** and phrases such as 'demand', 'needs' and 'willingness to pay' have impeded the development of an effective demand responsive approach. She distinguishes the following understandings of demand:

- Demand as an assumed level of consumption: quantity water demanded and level of service (shared waterpoint, domestic waterpoint etc.) demanded. This can vary enormously along households and communities.
- Demand as a right for water³⁰: human rights activists have advocated for the recognition of a basic amount of water for every person, irrespective of his or her ability to pay. Alternative finance mechanisms should be found to ensure

²⁸ See also: "[Designing water supply and sanitation projects to meet demands in rural and peri-urban communities, concepts, principles and practice](#)", Deverill et al, WEDC, 2002, 148 p.

²⁹ See also [Subsidy or self-respect?: community led total sanitation: an update on recent developments.](#)

³⁰ The rights based view of demand emphasises the need to ensure that people are able to participate in the processes involved, both collectively and individually, and are not treated as passive beneficiaries. This is not contradictory to the view of demand responsive approaches. However, the demand responsive approaches are sometimes seen as anti-poor because the emphasis they give to willingness to pay, and the belief that this implies that households who are unable to pay will per se receive low-quality services. Rights based approaches tend to propose supply-led services and alternative sources of funding.

that right. The proposed quantity is 50 litres per person a day, which is considered a basic need.

- Demand can also be described in economic terms - willingness to pay for a particular service. Willingness to pay is simply the economists' definition of demand and therefore represents a preference by the project beneficiary to contribute labour, time or cash to receive an improved water supply. Demand expressed in this way is known as effective demand - demand that is backed up by the means to support an individual's expressed desire for improved water supply services.

In relation to the last point, development professionals often say that people are **willing to pay**, whereas they cannot afford it. This is a confusion, because economists tend to think of willingness to pay as an effective demand, in other words it refers to ability and willingness to pay. In addition to that a formal survey for defining the willingness to pay is too costly for most small towns and for rural areas. So the main constraint for implementing demand responsive approaches in these areas is to find an effective way of measuring demand.

Demand responsive approaches are widely promoted by organisations such as the World Bank with the objective to lower implementation costs of projects and for services to become sustainable. There are however **critics** to the implementation of demand responsive approaches, who claim that:

1. Willingness to pay for a service is often not supported by ability to pay, resulting in an overall reduction in water consumption and a reversion to 'traditional' and less-safe sources.
2. To be able to make decisions people should have knowledge about the options as well as advantages and disadvantages of these options. Ensuring equal opportunity and capacity to participate in such decisions is often lacking³¹.
3. Different groups of people have different demands of the level of desired service, methodology needs to account for that. Moreover, it has to be taken into account that meeting the demand of some may limit the use of others.
4. In similar way as the above, there will always be a group of people that still need the welfare approach to ensure that they are not excluded. [Deverill et al, 2002].

With regard to equity in decision making about demand, the **checklist** developed by IRC is a useful tool: Demand Responsive Programming - Equity - The demand- and equity equation (at the IRC website, www.irc.nl).

Most criticism in relation to demand responsive approaches come down to methodology and good facilitation skills. It is therefore worth noting that demand assessment is not intended to be a one time event at the start of an investment cycle, but a continuing process throughout that cycle. For example, initial demands may be influenced mainly by the knowledge people have of a water supply system in a neighbouring community. Starting with this demand, different options should be identified (including technical, social and financial aspects), and shared with people. This may take time, and should result in a preferred option for each household, negotiations, collective alternatives etc. Furthermore, institutional arrangements should be discussed to ensure sustainability of the service.

³¹ The major weakness in the demand responsive approach is that little effort has been made to develop methodologies to *inform* people about new water supply services and understand the level and type of contribution they can make.

One of the most influential methodologies developed for this purpose is the **Methodology for Participatory Assessment (MPA)** –developed by IRC with WSP, which allows women and men in the community to take part in assessing their service and quantifies the outcomes of participatory tools for statistical analysis.

Below are four rules considered by IRC for the design and implementation of demand-responsive projects. These relate to eligibility, choice of technology, sharing implementation costs and, lastly, community payment and management for sustained operation.

- a. Eligibility criteria
The project does not select the communities or user groups, but sets rules on how communities can become eligible for services, usually through applications and payment. Information about these rules must be disseminated broadly.
- b. Technology choice and service levels
A range of technologies and service levels should be offered to each community together with clear information about their costs and the continuing financial or management implications for the community. The community selects a technology based on the amount it is willing and able to pay.
- c. Cost-sharing for implementation/construction
The community pays in cash, kind, labour or a mix of these to cover a portion of the construction costs. For water schemes, one approach is for communities to pay a small percentage (usually about 5% to 20%) with the remainder being subsidised. Another approach is for the government to set a ceiling on the amount of subsidy. For example, it could set a single, fixed subsidy level for all technologies, above which the community must pay. This means that communities must make financial choices about the level of service and technology.
- d. Community payment for sustained operation
Sustained operation requires local payment and management. The community may organise operation and maintenance activities directly or contract these to other groups. The issue of whether the community pays for major capital replacements still seems undecided within many projects. (see also [page on the IRC website](#))

2.3. Participation in Irrigation: participatory irrigation management

The term participatory irrigation management (PIM) refers to the involvement of users' organisations in the operation, maintenance, administration and/or the whole management of the system. It is thus a very broad term that may refer to various degrees and forms of participation in system management, with various levels of responsibility and autonomy.

The discussion on participatory irrigation management starts in the nineties, actually as part of the irrigation management transfer (that is transfer from state to users' organisations). Irrigation management transfer is partly motivated by financial constraints and poor performance of irrigation agencies, but for another part it is motivated by the expectation that farmers will do better due to their direct interest in the systems performance and detailed knowledge about their systems. Participatory irrigation management is a widely accepted approach, although some professionals rightly point out that for most schemes the government never was very involved at all, or that government agencies only recently took management away from farmers. (So it should be called management devolution instead of transfer)

In order to **distinguish different kinds of management arrangements** for irrigation systems, Yoder (1994) makes a distinction between agency-managed, jointly managed and farmer managed systems. However, also the size of systems and the kind of water source& infrastructure it depends upon should be taken into account when considering different kinds of management arrangements. That is to say, governments have only been involved in the management of those systems that either have been constructed through large infrastructural projects and/or systems that are so large they are strategically important. The majority of small-scale Andean systems are constructed, maintained and operated by users and never received much financial or technical assistance from the government at all. These are per definition farmer managed systems. The focus of participatory irrigation management is mainly on the other kind of (large-scale) irrigation schemes³². In such systems, common problems are the effectiveness and efficiency in water distribution, the problem of mobilizing resources for sustainable operation and management of the system and the capacity of the systems authority to enforce water distribution schemes, sanctions and so on.

Much of the **work on participatory irrigation management** has concentrated on the kind of users' organisations needed for sustainable participatory management, ways to make them transparent and accountable to other users, as well as the kind of assistance such organisations require. For that purpose a lot of research has been done on systems traditionally managed by farmers, as well as a large range of "transferred" systems. Influential has been the work of Eleanor Ostrom who distinguishes between constitutional, management and operational rules in organisations (see Box 13), as part of a general discussion about the kind of rules and rule making that favour participatory management.

Ostrom considers three cumulative layers of rule making: operational rules, collective choice rules and constitutional rules. Operational rules refer to the when and where and how to withdraw water, who should monitor, and what information should be exchanged for this. Collective choice rules are the rules for making management policies. The selection of stakeholders refers to the highest layer: constitutional choice rules. These rules determine who is eligible to participate and what specific rules will be used to make the collective choice rules.
Abstract from Ostrom, 1992

Box 13. three cumulative layers of rule making (Ostrom 1992)

But also the International Water Management Institute ([IWMI](#)) carried out a lot of research on topic. Since 1995 the International Network on Participatory Irrigation Management ([INPIM](#)) has been formed, aimed at contributing to efficiency and sustainability of irrigation systems through knowledge management. Irrigation and Water Engineering Group ([IWE](#)) of Wageningen University and Research Centre worked on the topic, especially with regard to irrigation systems as socio-technical systems³³, and the understanding of human agency, power and water control in irrigation systems. From its advisory to organisations involved strengthening of participatory irrigation management, SNV developed a broad methodological knowledge on such processes [[links to publications of SNV](#)].

All this work has provided a broad range of **ideas and insights** for the functioning of participatory irrigation management in large systems and in general. Some of these are:

³² In Latin america these would be schemes of approximately 10.000 hectares or more.

³³ Mollinga (1998) states that irrigation systems are socio-technical in three ways: irrigation technology choice put demands on the management structure (O&M, decision making), the design and modifications of irrigation technology is the result of social processes between different stakeholders, technology choice determines the possible kinds of production systems and thus has an impact on livelihoods.

- Knowledge about water control at tertiary level is indispensable for understanding systems management and efficiency problems. Organisation at tertiary level may be necessary in large systems to enable, in order to really involve farmers.
- The role water distributors (“canalero”, “repartidor”) and how these are accountable to the different levels in the waterusers’ organisations (and water users) is essential for confidence of water users in the system.
- Contrary to some beliefs, there are no fixed rules about the amount of water manageable for farmers at field level.
- Also, sophisticated measurement structures do not guarantee water efficiency, as an experienced eye of a water distributor can be almost as accurate (J. Vos, 2002). Some measurement structures may, however, help transparency and more equitable distribution.
- Especially with regard to administration and fee collection, computerised systems have given good results (Chancay-Lambayeque, Licto, Strengthening of Waterusers’ organisations in the Peruvian Coast).
- Deficient water service and lack of payment of water fees are two sides of the same problem and evolve into a vicious cycle of deterioration of the system, because the lack of funds further affects already deficient O&M. In order to break this cycle a package of “social promotion” and management improvements is needed: communication strategies, distribution improvements and administrative improvements.
- If membership of waterusers’ organisations is based too strictly on the criteria of landownership, may limit the involvement of the real stakeholders in irrigation (such as tenants, female farmers, and young farmers) and threaten the effectiveness of the organisation.
- Illegal substruction of water by non-users can best be controlled by registration those people was users (with different rights and obligations) and making them contribute to the system.

The list of lessons learned is enormous and by no means all is sorted out. Moreover, management of large schemes is highly political, and management by farmers’ organisations does not per se imply that common farmers are more involved nor that distribution will be more equitable or transparent. Though a lot of work is done for the strengthening of users’ organisations to improve such aspects, no naive expectations should be held about the degree of “social justice” achievable in large scale irrigation systems. Obviously this is also related to the fact such systems do not exist in isolation of the outside world, which leads to the following point.

Although a lot has been written about participatory irrigation management describing the system and the waterusers’ organisation, mostly such systems are not exclusively farmer managed in practice. Mostly **irrigation agencies, water agencies or agrarian agencies** still have a lot of formal and informal power over the system and the users’ organisations. This is even evidenced in most legislation, where the state still has extensive powers to control users’ organisations, influence election procedures, and in many cases remains the formal owner of infrastructure. Moreover, the power of waterusers’ organisations to implement sanctions is generally limited, and many large scale systems still receive subsidies from the government for maintenance of main infrastructure.

Participatory irrigation management in fact requires as much change from the part of agencies as from the part of the waterusers’ organisations. The answer is not abandonment by the agencies, but a change of their roles and responsibilities, finding new checks and balances, and most of all constructing a new relationship with the users’ organisations (less paternalism and clientelism). Experiences suggest that such processes of change and the strengthening of

waterusers' organisations in general are better accompanied by "outsiders", such as NGOs, then by the water agencies themselves, at least in the initial phases.

With regard to participatory management in small schemes, the relation between government agencies, national legislation and waterusers' organisations is also a critical issue. Not always regulation of such schemes has a positive impact on efficiency, equity and sustainability of systems. This is mainly due to the fact that regulation poorly takes into account locally existing management practices and rules. Interesting in this respect is the work done by the [WALIR](#) (Water Law and Indigenous Rights).

2.4. Participatory watershed management

Participatory watershed management is a variation of watershed management, with the specific characteristic that it seeks active involvement of multiple stakeholders in management. It is also called collaborative watershed management. See the part on watershed management in this text for general aspects.

A first and crucial step towards participatory watershed management is [stakeholder analysis](#)³⁴, aimed at identification of relevant stakeholders, their organisations and their interests. Stakeholders are not limited to land owners in the watershed. Most likely it will be a mix of people and organisations that either have property, live and/or work in the watershed. Stakeholder analysis is a iterative process that may take a long time, even after activities have started.

In many parts of the world, participatory watershed management is out of the question, because the watershed is too large, too complex, and, most of all, the degree of organisations of the people does not allow for participation at that scale (yet). This is a significant issue, because per definition participatory watershed organisations should not be floating in the air. Therefore most participatory watershed management processes start at **micro-watershed level**.

It is now increasingly recognised that stakeholder identification alone is not sufficient motivation for participation. Even a common interest is generally not enough for stakeholders to start working collaboratively. Collaborative action starts by a **sense of urgency** experienced by (at least a part of the) stakeholders, in many cases this sense of urgency is a major conflict over resource use (mostly water) or a natural disaster³⁵. For example the water platform of Ayacucho started as a response to a conflict over water that involved the city of Ayacucho, and both the platform IMAR and IRAGER in the the North of Peru started off as a response to irrigation management transfer, and in Nicaragua, quite some collaborative initiatives raised in response to the disaster caused by hurricane Mitch. The question is of course to what extend such multiple stakeholder initiatives should and are able to continue afterwards the urgency is faced (and what kind of transformations they should undergo to do so).

It is noteworthy that the cases mentioned above are not watershed organisations, but operate(d) in different territorial units. For collaborative action at watershed level (or micro-watershed), what could create a sense of urgency? Interesting in this respect is the work of the [PC-CP project of UNESCO](#), the work on multiple stakeholder platforms: [Multiple Stakeholder Platforms for Integrated Catchment Management](#) and on agricultural knowledge systems (AKIS) at Wageningen University and Research Centre as well as the International Agrarian Centre. Also very relevant is the work of FAO, the [Latin American Watershed Network \(Redlach\)](#).

³⁴ See also the tools for stakeholder analysis of RAAKS: [RAAKS tools](#)

³⁵ Available funds also create a sense of urgency, but prtvides a fragile basis for continuing collaboration.

Some **lessons** are:

- First of all it should be born in mind that it is a time-consuming, long term process to develop any form of collaborative watershed management.
- Secondly, it is an illusion that this whole process can be known, planned or overseen from the beginning. Also not all social, ecological en technical complexities will be understood from the beginning. It is first and foremost a learning process for stakeholders as well as facilitators.
- It is of no use creating new watershed organisations (micro-watershed organisations, sub-watershed organisations etc.) if there is not yet a felt need for such an organisation at local level.
- Most participatory watershed management processes start at village/ community level, in most cases with some sort of participatory appraisal and planning.³⁶ This is very positive because it strengthens local capacity and has a firm link to livelihood strategies in the watershed. However, considering the decentralisations processes some countries are going through, arguments are now raised for including more local governments as well.

A risk of some participatory watershed management programmes/ projects is that they aim at incorporating every aspect of life in its activities, and in the end become a participatory rural development project in a territory that happens to be a watershed. The question is what is the added value of this kind of work in a watershed?, and, Should watershed management really involve all these aspects? A new approach to watershed management is that it does not so much involve a central command, or unit of planning, but more the coordination and articulation of activities and initiatives of different stakeholders. Sustainability in participatory watershed management is then the emerging property (more than the sum of all parts) of all activities and initiatives. How activities should be articulated, how conflicts should be resolved, what kind of rules and arrangements will work in the watershed, is considered a learning process that involves all stakeholders. Probably change is needed in the perceptions, role and contributions of each stakeholder, in order to achieve such kind of synergy.

In Ecuador there are several cases of municipalities that are coordinating actions of watershed management with local stakeholders. The management is done on municipal level, after an analysis on watershed level. So, the hydrological planning is done on base of information on watershed level, and the implementation of the plan is worked out on political-administrative level, by municipalities who work together and coordinate actions in a manner of "mancomunidad". Examples of these initiatives are: "mancomunidad de 3 municipios para el manejo de micro-cuencas de la cuenca Alamor en Bosque Seco, sur del Ecuador; Mancomunidad de 4 municipios de la cuenca Chanchan; consorcio de Rio Blanco, liderado por el municipio de Riobamba.

Finally, it should be noted that though quite some papers have been written about participatory watershed management, quite some databases with information about a particular watershed have been constructed and quite some effort is put into

³⁶ SNV joined efforts towards participatory watershed management in a number of cases:

- Nepal
- Perú, cuenca of Chancay-Lambayeque (1992- 2000)
- Perú, micro-watersheds in the Andes (1997-2003)
- Ecuador, cuenca of Chanchan (2000- 2004)
- Ecuador, Bosque Seco, Cuenca of Alamor (2003-2006)

A detailed methodology for micro-watershed planning starting at community level was developed by SNV in Peru (see Vogel and Rojas, 2004). In Bosque Seco and Cuenca Chanchan, Ecuador, the experiences are developed at the municipal level.

promotion of participatory management in watersheds over the world, but most efforts are still in an initial phase and very few examples are known of full participatory watershed management over time.

2.5. Institutionalising participation

As participation has become a key element in the debate on water management and natural resource management in general, more attempts are made to institutionalise a participatory approach in government programmes and even to mainstream a participatory approach throughout a sector or organisation. This is a major challenge as most experiences with participatory approaches are at local level and/or in pilot projects with relatively high investment in terms of financial and human resources (in number and qualifications). Pimbert [2004] calls this process of **scaling-up** of participatory approaches "institutionalisation", and distinguishes several interrelated areas of change necessary for institutionalisation of participation in natural resource management:

- Spreading and scaling up change from the micro (e.g. project/local) to the macro (e.g. policy/national) level.
- Scaling out from a single line department or sector or initiative, to catalyse wider changes in both organisations (e.g. government and donor agencies, nongovernmental organisations (NGOs), civil society groups and federations, private corporations) and policy processes.
- Changes in attitudes, behaviour, norms, skills, procedures, management systems, organisational culture and structure as well as policy change.
- The inclusion of more people and places through lateral spread, from village to village, municipality to municipality, district to district and so on.

Efforts of institutionalising participation are almost **like a game of poker**: stakes are high and one has to decide in spite of with a lot of uncertainty. If institutionalisation is successful, impact on livelihoods may be enormous. If institutionalisation fails, -that is to say if participation is poorly implemented, if deadlines dictate the process in stead of communities, if communities are not really allowed to say no to new proposals for example- the experience will be a negative reference for people as well as agencies for a long time, and close opportunities for future institutionalisation of participation. An example of such a phenomena (of creating a negative precedent) is the experience with agriculture cooperatives in Latin America that created a prejudice towards that persists until today³⁷.

The collaborative research group [Institutionalising Participation and People-centred Processes in Natural Resource Management](#) of IIED and IDS (under the leadership of Michael Pimbert), produced some very relevant questions and case studies about the subject (see Box 14).

Large-scale participatory policy processes and programmes for natural resource management often include national governments, large NGOs, civil society organisations and donor agencies as major actors/stakeholders. A participatory dynamic that includes more people and places constantly challenges these large organisations to become flexible, innovative and transparent. More specifically, the emphasis on diversity, decentralisation and devolution of decision-making powers in the policy process and the management of natural resources implies procedures and organisational cultures which do not impose 'participation' from above through standardised practices.

How can bureaucracies facilitate and support the participation of local actors throughout an inclusive whole – from deliberations, appraisals and preparing for partnerships, through planning and developing co-management agreements, policymaking, negotiating resource allocation, implementation, monitoring and evaluation, to reviewing and revising the means and ends of the participatory process? What policies enable – or constrain – the spread and mainstreaming of participatory and people-centered approaches in environment and development? Under what conditions can bureaucracies and other organisations be refashioned or transformed to ensure that their outcomes (policies, programmes, resource allocation and

³⁷ Obviously the experience with agriculture cooperatives in Latin America was a very complex process, that also involved land reform politics and internal conflicts within cooperatives.

*projects) actually facilitate, rather than inhibit, participation and the adaptive management of natural resources? How do roles, rights, responsibilities and the distribution of costs and benefits need to change among actors in civil society, government, and the private sector? What kind of training, capacity strengthening and follow up is necessary to create the right 'skills mix' for staff of public agencies to employ participatory approaches effectively on a large scale? What incentives (e.g. economic, professional, social, etc.) act as catalysts for the spread and mainstreaming of participation? How do the attitudes and behaviour of officials and professionals change when they become involved in the use of participatory approaches, and what are the factors that encourage or bring about these changes? What is the impact of institutionalising participatory approaches on the social dynamics, livelihoods and well-being of low-income rural and urban groups and local organisations? And on the status of natural resources, environmental conditions and knowledge on people-environment interactions?
Pimbert, 2004, Research and Publications Highlights*

Box 14. Questions in relation to institutionalising participation (Pimbert, 2004)

A mayor concern for scaling-up is: **how to avoid loss of quality?** Application of participatory processes at a large scale in a government organisation generally implies a certain degree of methodological standardisation. Though in itself it is not a bad thing that work processes are written down, in large organisations there is always a risk that such manuals are either implemented according to the letter with little regard for local context, or hardly implemented at all because they are deemed not applicable to a local situation. Even though methodological training is mostly part of a scaling-up process, such trainings do not always include the capacity to adjust and recreate the methodology for local circumstances. Moreover, correct adjustment by newly trained field workers supposes quite some follow-up and feedback from more people with more experience in this particular methodology. Finally, participatory processes require a part from methodological skills, facilitation skills and attitudes, which are not acquired overnight. All such capacities are generally short in supply. For example when the rope-pump, very successful in Nicaragua, was promoted by a large-scale project in Western Africa, it did not have the same impact due to a lack of follow-up on the O&M of the pumps. [H. Holstag, pers. com. 2005]

The first set of **questions** when proposing a particular participatory way of working in a large government organisation is: Can't this be simpler? Quicker? Cheaper? The second question is: How may this be adjusted in order to fit into our operational and financial planning system? It takes quite some time before staff realizes that institutionalising is not just about changing a few things in work processes at field level, but actually a whole process of institutional change. This is particularly difficult because higher level staff tend to think that field workers are the ones who should be trained, so they themselves hardly participate in trainings nor pilots. Typically a process of institutionalisation can go back and forth for a long time, unless sufficient political will (and political convenience) and knowledge is found at all levels. However, the possibility that the whole idea finally is abandoned, always remains one of the possibilities. Probably a parallel SWAp process, multiple stakeholder platforms for learning etc. can do a lot to help achieve change in large government organisations.

Although the emphasis of institutionalising participation is on enhancing institutional and organisational change, locally tested participatory work processes will always require some adjustment as well. The question is, how much and in which aspects? Pressure from large government organisations, as mentioned before, is to make it simpler, quicker and cheaper. The dilemma for the group of people (insiders and outsiders) who are trying to facilitate institutionalisation, is where to draw a line, say no, while avoiding that the proposal as a whole is rejected by the organisation (see Box 15). Often locally developed participatory processes are too costly to replicate at a large scale, but the doubt remains how to achieve quality at a lower cost. In most cases this would actually require more field testing.

In 2001 a large national programme of the Peruvian government for watershed management, PRONAMACHCS, became interested in institutionalising the participatory methodology for micro-watershed planning, called Pcubo, throughout the institution. This methodology had been developed and extensively field tested by GOPA-GTZ, SNV in cooperation with a local office of PRONAMACHCS itself. After an evaluation mission by the WB of the work of PRONAMACHCS financed by them, one of the recommendations was to institutionalise the methodology Pcubo.

At that point in time, a large part of the methodology that includes delimitation of micro-watersheds, prioritization of communities, participatory inventory of water resources, general participatory appraisal and specific appraisals for interest groups with specific demands, participatory planning, participatory technology development, monitoring etc., already was written down in one way or another. However, the whole methodology (all parts) consisted of no less than 10 manuals. The first proposal of PRONAMACHCS was to bring it all back to one manual of 50 pages. For this an external consultant was hired, who had no experience with the methodology at all. The product was of appalling quality and was never used.

In the meanwhile a multiplication process was started from within the institution, involving some of the most experienced own staff. Initial proposals for training of trainers, replicas of training and follow-up would take about a year, taking into account that some methodologies could only be applied during the dry season. In total about 400 people would be trained in some or all components of the methodology. This initial proposal was considered too costly and too slow. Finally a timeframe of three months was agreed upon, but this was heavily delayed in implementation, due to a sudden lack of funds. The training of trainers and replicas were carried out, but finally the institutionalisation was abandoned, because of changes in the higher management of the organisation and other (political) organisational problems. By that time, almost all staff with experience in the methodology had left the organisation. Many had found work in similar fields outside the government.

Box 15. Experience of institutionalising participation in watershed management promotion

An alternative view to approach the difficulties encountered in institutionalising new ways of working, is the **learning alliances approach** promoted by initiatives such as "[Streams of Knowledge](#)". The learning alliances approach searches for a balance between the content of innovation and the process of learning itself. This learning process should include active involvement of different stakeholders (at key institutional levels) as well as monitoring of the process of innovation itself.

The learning alliances approach arises from action research, and has strong links with methodologies such as [RAAKS](#) (Rapid Appraisal of Agricultural Knowledge Systems) developed by Paul Engel. It draws upon the concepts from Soft Systems Thinking and AKIS (Agricultural Knowledge and Information Systems) promoted by Røling and others.

In 2005, IRC organised an electronic conference on Knowledge Management applied to the Water and Sanitation Sector, as well as a Symposium on that same topic. The [background paper](#)³⁸ they wrote for that Symposium gives the following description of the concept of learning alliances:

"At its simplest a Learning Alliances is a series of linked platforms, existing at different institutional levels (national, district, community, etc.) and created with the aim of bringing together a range of stakeholders interested in innovation and the creation of new knowledge in an area of common interest. The stakeholders involved should have complementary capabilities which, when combined, will allow the new knowledge created in the innovation process to be brought to scale. Some of the key capabilities required are in: implementation, regulation, policy and legislation, research and learning, and documentation and dissemination."

Some of the lessons learned mentioned in that same background document are:

- There are no technological or methodological silver bullets: Developmental processes are highly complex. There are no simple or single technological or methodological answers. Innovations often fail to be scaled up because they are

³⁸ Moriarty, P. et al, 2005.

“alien objects” with no roots in local contexts; they are not integrated into the enabling environment necessary to support and sustain them. It is the process of creating the enabling environment through learning among different stakeholders which will lead to impact and sustainability.

- Learning Alliances take time and resources: The process of making a few stakeholders interested in the concept, then inviting several other stakeholders to initiate the process and then keeping the process going takes time and resources.

- Learning Alliances need an engine: Champions are needed to sell the idea, organise the initial meetings and keep the process going after these first steps have been taken.

- Learning, not planning, is the main focus of Learning Alliances: In conventional approaches most meetings tend to be about planning and negotiation, not learning. Central to the learning alliance approach is the importance of creating the space to enable learning through negotiation. Failures must be allowed and must be discussed openly. Making the learning component the focus of the process requires good facilitators and committed stakeholders.

- Documentation, reporting and dissemination need a specific budget and time allocation throughout the process: In a Learning Alliance the learning is done throughout the process, not at the end. For this to happen, documentation, reporting and dissemination should be properly planned for.

It is worth mentioning that Learning Alliances are not the same as Communities of Practice. Though both approaches strive for innovation, learning and knowledge sharing, Communities of Practice typically aim at knowledge exchange between peers mostly with similar but separate responsibilities. Successful examples of the application of Communities of Practice are found in large companies, for example Philips and Shell. The essence of the Learning Alliances Approach is to facilitate exchange between different complementary stakeholders sharing a common problem. It involves overcoming of institutional and sector boundaries.

PRIVATISATION

Privatisation is probably the most politicised and misused word in the debate on water management. There are so many uses and interpretations of the word privatisation that it is imperative to start with an overview of terminology. Also some arguments and positions in the debate will be presented.

In the privatisation debate, a distinction should be made between:

- privatisation of water delivery services
- privatisation of hydraulic infrastructure
- privatisation of water as a resource

2.6. "Privatisation" of water as a resource: water right titles

The discussion about water rights titles is generally held about **concessions**. The term "concession" reflects that ownership of water remains in hands of either the State or the Nation, while the right to use a certain amount of water is conceded to a natural or legal person. Concessions are given out the form of concessions for a number of years or even indefinitely. It is expected that increased security of rights provides incentives for people to investment in profitable and sustainable exploitation of water.

The term concession, though almost as highly politicised as the term privatisation itself, does not say a lot, unless its **characteristics** are known. In the **most liberal proposals**, concession is seen as a real right, generally with the following three characteristics:

- The water right title not linked to having a land title
- The water right enables the holder of the water title to transfer his/her right permanently (selling) or temporary (lease) to others without approval of the state (thus as a free market transaction)
- To employ the water for whatever use he or she considers convenient, without possibility of the State to revoke the right (take it back)

Jan Hendriks describes the implications of such a water right as follows:

"In this case the State loses control over the resource and in situations of scarcity in a sector; it could only intervene to reassign water rights by expropriation for public interest. Re-allocation between sectors, in this interpretation of privatisation, would be done by means of market mechanisms, without State influences except by buying and selling water rights. This definition of privatisation comes the closest to the situation of water rights created under the Water Code of Chile³⁹.

The above mentioned three characteristics of a water concession are **not supported** by the majority of people, who fear that, just as in Chile (see Box 16), this will result in accumulation of water rights in the hands of few, speculation and exclusion of other users. They expect that water markets will not develop because high imperfection, especially with regard to the availability of information to all users.

The most far reaching privatisation of water rights was implemented under the Water Code of Chile of 1981. This law considered a prominent role for market forces for the reallocation of water between users, that is, it enabled transfer both temporarily (leasing) and permanently (selling) of water rights. Although water remained part of the national patrimony, water rights would approach property rights, enabling transfer to others without any restriction. Also, initial rights were given out by the State for free without preferences for any sector, for an indefinite time and without limits to quantity to those who demanded them. Moreover, those who demanded waterrights were not obliged to justify the amount,

³⁹ The Water Code of Chile gives "derechos reales" (real rights) to users for an indefned period of time and with possibility to transfer their water rights to others even outside its sector of use.

due to which the State had to define whether or not the requested amount would affect rights of others. When there would be two or more demands for the same water source, water had to be allocated through auctioning. In addition to this there were no users' obligations for water right holders other from paying water fees.

Interestingly recently the Water Code of Chile was modified because the principle of auction rarely occurred in practice and the way water rights were given out (no restrictions, nor obligations) prejudiced the country resulting in the accumulation of water rights for speculation and amassing. Those who needed water for productive use, for example, were hindered by this. The modification resulted in greater faculties for the state to declare water for populational or environmental use, a special charge for water that is not used in order to limit accumulation of rights for speculation, requests should justify the amount of water in relation to requirements for specific uses, as well as other restrictions in the name of the common interest. It did not, however, changed the possibility of water title holders to transfer their rights to others no-users.

Box 16. Modifications of the water code in Chile (source [CEPAL- DRNI newsletter 22, 2005](#)]

On the other end of the scale from privatisation to "statism", is the **state-dominated model**, a model which is currently in legislation in many countries in Latin America. In that model, the state assigns water rights for a particular use. The amount of water depends upon the type of use and generally is a historically acquired right⁴⁰. The problem of this model is not only the bureaucracy of state agencies in implementation, but also the current lack of funding to implement the model according to how it was conceived to work, and the general dependency of water users' on the goodwill of state officials for every little thing. In many countries the lack of capacity to enforce basic regulation and the issue of corruption and political opportunism add to the problems of state agencies in water management. All this does not contribute to security of water rights. Moreover, this kind of rules for access to water does not provide incentives users to make better use of the resource. There are some authors that promote a kind of middle way between a liberal water rights regime and state-dominated model, a **so-called mixed model**. For example, they propose **concessions but with strict regulation and different characteristics** than those mentioned above, for example:

- The right to use a certain amount of water, for a given use. If the water is used for other uses, permission must be asked for a change of use otherwise the user right will be revoked.
- No possibilities to transfer the right of use permanently to another person, not even for the same use. (in that case the use right returns to the state).
- Possibilities for leasing the use right, under strict conditions.
- Clear environmental obligations for users, with the possibility to loose the right of use in case of violations of these obligations.

Obviously the exact characteristics of a concession, as well as obligations should be the central part of debate about water legislation.

A part from the above mentioned criteria, the **norms for eligibility of right holders** should be a central part of the discussion, as is explained below.

Generally legislative proposal include some kind of central registration of water use rights. **Holders of water rights** are considered either natural persons or judicial persons. Researchers and other professionals related to [WALIR](#) (Water Law and Indigenous Rights) have rightly pointed out that in the mountainous areas of the Andes, presence of the state is very weak and not even all irrigation channels nor

⁴⁰ For example, rice farmers in Chancay Lambayeque scheme have a right of 14000 m³ water per hectare per cropping season, simply because they are rice farmers. Farmers in the same irrigation system that historically cultivate maize, only have right to 7100 m³ per hectare per cropping season.

drinking water supply systems have been registered. Registering all as individual users will be costly, time consuming and difficult for people. In the meanwhile their rights will not be recognised in the system, nor outside the system making them vulnerable to losing their (acquired) water rights to new users (mining e.g.). Therefore they advocate for the option of collective water use rights for such systems. For example in the water law proposals of 2005 in Peru, the assignment "en bloque" of water rights is considered. This implies reinforcement of internal regulations within water users organizations or "bloques" to avoid loss of protection of (weaker) individuals within the system.

Another implication of the fact that most legislative proposals consider individual rights is that **families or couples** are unable to register rights as a group. In land titling such issues reinforced the tendency is therefore to register rights in the name of the "head of household", affecting negatively other household member, mostly women.

The debate on water rights and concessions also point to the **practical complications** of implementing a system of registration and titling in countries where not even land titles are fully registered. Drawbacks of titling programmes for water are similar to those for land titling programmes, see below, but water titling has additional complications due to the specific nature of the resource: it flows, it fluctuates over the seasons and practices of some generally affect availability to others.

Complications of land titling programmes have been:

- the heavy cost of mapping and registering title to many small plots, and the need to maintain and update the register on a regular basis
- the process of titling tends to enable literate and wealthier groups to benefit far more than poorer and illiterate people, and converts land from being a social asset into a commodity that is potentially marketable. Though also the contrary has been found: that wealthier groups accumulate land rights because of the lack of land titles.
- The titling process also tends to register primary rights' holders while excluding those with secondary, or derived rights, such as women who gain access to land through marriage. It also excludes tenants.

2.7. "Privatisation" of water services

Another part of the debate on privatisation, perhaps the larger part, is about the privatisation of water (delivery) services. More exactly, this is about **private sector participation in water services**, either for drinking water or irrigation water. The argument for private sector involvement is generally that state operated delivery services are inefficient and financially not sustainable, whereas end-users are considered not capable of assuming the service. An exception to the last argument is Irrigation Management Transfer (IMT) where the management of the delivery of irrigation water is passed on to users. Therefore the case of irrigation will be dealt with in that (IMT) section. In the following, the different options for private sector participation in the drinking water and/ or sanitation sector will be presented.

Private sector participation in drinking water and/ or sanitation services may theoretically occur in any single one or a combination of the **sub-activities** required for the service (according to Lamothe, 2004):

- In **drinking water supply**, this may be:
 - Water capture and source protection
 - Production of drinking water (treatment)
 - Supply to consumers
- In **waste water treatment**:
 - Collection and treatment of wastewater

- Reuse of treated water
- Sludge disposal

Lamothe further distinguishes the following forms of private sector participation for the WATSAN sector:

- **Outsourcing:** contacting of private companies for specific activities of service delivery, for example maintenance of certain infrastructure, fee recovery etc. Generally these are short term contracts, with permanent competition.
- **Public-private partnerships (PPP):** these may take the form of joint stock companies where the public sector and private sector divide shares, and delegation contracts where companies are either responsible for running the service, or for a combination of construction, and running of the service. Such contracts are usually for a relatively large period of time (20 years).
- **Privatisation**⁴¹: full ownership of infrastructure and the right to service delivery by a private company.

By far most discussion related to private sector participation is about the **Public Private Partnerships (PPP)**. This is undeniably a very general term for many different management options. As mentioned above this could either have the form of a joint venture, or a delegation contract.

In order to compare the **different options of delegation** to the private sector in drinking water sector, [Budds and Graham](#) [2003] distinguish asset ownership, capital investment, commercial risk, O&M and contract duration. Table 1 is based on their comparison. See Box 17 for a detailed explanation of the different management options in this table.

	Service contract <i>(outsourcing)</i>	Management contract	Lease	Concession	BOT-type ⁴²
Asset ownership	Public	Public	Public	Public	Private / public
Capital investment	Public	Public	Public	Private	Private
Commercial risk	Public	Public	Shared	Private	Private
Operations/ maintenance	Private / public	Private	Private	Private	Private
Contract duration	1–2 years	3–5 years	8–15 years	25–30 years	20–30 years

Table 1. Comparison of different options for delegation of responsibilities to the private sector [adjusted from Budds and Graham 2003]

⁴¹ It is noteworthy that the study done by Lamothe and others on private sector participation in Europe revealed that privatisation as defined above, only occurs in England and Wales, whereas in the Netherlands it is forbidden by law. In Scandinavian countries and the Netherlands private sector participation consists mainly of outsourcing, whereas of the other countries only France and Spain have some tradition of public private partnerships. [[Aquilibrum, European Water Management between regulation and competition](#), 2004]

⁴² BOT: build, operate and transfer. There are many variations to this type of contract, that may include training etc.

Service contracts, called outsourcing in the former explanation, are usually short-term agreements whereby a private contractor takes responsibility for a specific task. A management contract involves the transference of certain O&M responsibility to a private company. Lease and affermage contracts are similar to management contracts, but the private operator takes responsibility for all operation and maintenance functions, including billing and revenue collection. In both cases, the operator collects the tariff revenue but, under an affermage, the contractor is paid an agreed-upon affermage fee for each unit of water produced and distributed; whereas under a lease, the operator pays a lease fee to the public sector and retains the remainder. Under concession contracts, the private contractor manages the entire utility and is required to invest in the maintenance and expansion of the system at its own commercial risk. Concessions have longer terms, to allow the operator to recoup its investment and, at the end of the contract, the assets either are transferred back to the state or a further concession is granted. The role of the government is predominantly regulatory. BOT (Build-Own-Transfer) type contracts are similar to concession contracts, with the difference that the private contractor is responsible for constructing the infrastructure from scratch.(6) They are usually used for "greenfield" projects, such as water purification and sewage treatment plants. The private partner then manages the infrastructure, with the government purchasing the supply. At the end of the contract, the assets either remain indefinitely with the private company or are transferred back to the government. 6. Variations include: Build-Own-Operate,(BOO), Build-Own-Operate-Train (BOOT) and Build-Own-Train-Transfer (BOTT). Under the divestiture model, the government transfers the water business, including the infrastructure, to the private company on a permanent basis through the sale of some or all of the shares in the company. This model has only been adopted in a small number of cases, such as England and Wales (full divestiture) and Chile (partial divestiture).(7) In England, privatized water companies are run under strict commercial rules with tight regulation. Budds and Graham (2003)

Box 17. Explanation of different management options as explained by [Budds and Graham](#), 2003

For illustrative purposes, I added a municipal water company, joint stock company and privatisation to the comparison (see Table 1).

	Municipal water company	Joint stock company (joint venture)	Privatisation (divestiture)
Asset ownership	Public	Private / public	Private
Capital investment	Public	Private / public	Private
Commercial risk	Public	Private / public	Private
Operations/ maintenance	Public	Private / public	Private
Contract duration	Indefinite	Indefinite	Indefinite

Table 2. Different management options for water and sanitation services, continued

In addition to the above mentioned management options, end-users can also form a company or a cooperative that assumes part of the water services. As these are private persons as well, sometimes this is also called private sector participation. Also private sector participation is the service delivered by micro enterprises. These examples show that a discussion about private sector participation should specify the model that is discussed and the kind of private sector companies that are involved.

Alternatives to private sector participation in the drinking water and sanitation sector are municipal water services (either as part of the municipality or as an autonomous company under the municipality) or a national public water company.

2.8. Debate on private sector participation in water services in WATSAN sector

The debate on private sector participation in water services generates high emotions. In many countries the privatisation of publicly owned companies, electricity, telecommunications etc. has resulted in a rise of user fees, that has not always been accompanied by better services. Users are therefore suspicious of anything called privatisation and reject the idea that someone would be making profit from providing a basic service to (poor) people. These emotions rose even higher when water activists started to shed light on the profits and practices of **large international water companies** as well as their ties with some of the international consultative bodies on water and sanitation. Especially in relation to the three largest international water companies:

- Veolia (formerly Vivendi Environment, formerly Générale des Eaux) owned by Vivendi
- ONDEO (formerly Lyonnaise Des Eaux) owned by Suez
- Thames Water owned by RWE, a German electricity company

Activists also argue that it is very difficult to control these companies because they operate under different names. See Table 3.

Major International Water Companies & Their Foreign Subsidiaries					
<i>Only subsidiaries in which company has greater than a 50% share shown (Name followed by country)</i>					
Parent Company	Vivendi(France)	Suez(France)	RWE(Germany)	Bouyges(France)	Kelda(UK)
Water Division	Vivendi Environment	ONDEO	Thames Water	SAUR	Yorkshire Water
Subsidiaries	US Filter (USA)	AGBAR (Spain)	American Water (USA)	Aquatech (Canada)	Alcontrol BV (NLD)
	Aqua Alliance (USA)	Northumbrian Water (UK)	Azurix (USA)	Dynamco (UK)	Aquarion (USA)
	PSG (USA)	United Water (USA)	Wessex Water (UK)	Emalsa (Spain)	Canadian Clean Water (Canada)
	Aguas de Aconquija (Argentina)	Aguas de Limeira (Brazil)	Bovis Thames (CHN)	Guestagua (Spain)	Henrici Melieulaboratoriu (NLD)
	Aguas de Jaen (Spain)	Aguas Decima (CHL)	FB Leopold (USA)	Rossa (Russia)	Alcontrol GmbH (Germany)
	Aguas del Sauce (Uruguay)	Aguas Provinciales de Santa Fe (Argentina)	Hydro-Aerobics (USA)	Sigesa (Italy)	.
	Folkestone & Dover Water (UK)	Aqua Toscana (Italy)	Kelantan (Malaysia)	Senegalaise de Eaux (Senegal)	.
	Ibersade (Spain)	Aquasystems (Slovenia)	.	Sodeci (Ivory Coast)	.
	MSG (Gambia)	Calgon (USA)	.	.	.
	Oewa (Germany)	Essex & Suffolk (UK)	.	.	.
	OK Wasser (Germany)	Eurawasser (Germany)	.	.	.
	OMSA (Mexico)	GGA (Spain)	.	.	.
	SEEG (GAB)	JMM-OSI (USA)	.	.	.
	Servitec (Hungary)	LdE (Israel)	.	.	.
	United Water (AUS)	Lydec (Morocco)	.	.	.
.	Palya (IDN)	.	.	.	
.	Sino-French Water (CHN)	.	.	.	

Table 3. Major international watercompanies and their subsidiaries in different countries" [www.thewaterpage.com], 2000, (some names have changed now.)

To give an indication of the magnitude of international water companies: the three largest companies provide services to 263 million people, employ about 300.000 people together and have a combined turnover of about 50 billion US\$ dollars (according to figures of 2000 published at [TheWaterPage](#) collected by the Water Policy International). It is, however, not (just) the fact that these companies are making profit that is criticised, but that they are making profit on selling a vital human need.

Several different arguments are put forward to reject and promote private sector participation in water supply and/or sanitation services. Budds and Graham made an interesting classification of arguments, and also [TheWaterPage](#) gives a good overview. In Table 4 a summary of both are presented. Both sources also point to a fact that nearly all are rather abstract arguments (both in favour and against), that do not touch the most interesting question: How to succeed in providing sustainable services to the poorest people? The answer to this question probably will come from detailed analysis of local options and not so much from one ideological standpoint or another. However, the different arguments do point out the concerns and risks that have to be taken into account in such choices.

In their [article](#) "**Are the debates on water privatization missing the point?**", Budds and Graham argue that neither publicly nor private utilities are well suited to serve the majority of low-income households with adequate water and sanitation because they encounter the similar barriers to water and sanitation provision. For example the fact that peri-urban and rural areas are least attractive for service provision because they are scarcely populated, have low quality infrastructure and litter capacity to increase water fees. So they do not exclude the possibility that involvement of a private company may in a well-governed locality may improve services, but they do point out that there is no justification for international agencies and agreements to actively promote greater private sector participation for improving water and sanitation services in the South.

It is this **promotion** of private sector involvement in water and sanitation services in developing countries **through aid and loan conditions** that last year led to an intensive campaign of WaterAid against DFID. The grievance was that private sector involvement was one of the finance conditions of DFID and also that participating (UK) companies would receive subsidies by DFID as part of entering a deal. This resulted in DFID reviewing its strategy on WWS, redefining its practices of conditionality and calling on the World Bank and the IMF to do the same.⁴³

⁴³ "[Partnerships for Poverty Reduction: Rethinking conditionality](#)", UK Policy Paper, DFID, march 2005

Table 4. Arguments against and in favour of private sector involvement in water and/or sanitation services

ARGUMENTS AGAINST	ARGUMENTS IN FAVOR
<p>1. Public Goods</p> <p>In this argument, drinking water and sanitation are considered public goods in the sense that it is necessary for human survival and lack of good quality services has an impact on personal and public health. It is therefore not convenient both from an ethical and a utilitarian standpoint that people should be excluded from these goods. This and the human rights argument were the central arguments at the Alternative World Water Forum in Geneva 2005 [see also www.FAME2005.org, and Reclaiming Public Water]. However, it is questionable whether the argument actually excludes private sector participation, or primarily implies carefully designed tariff structures and good regulation.</p>	<p>A. Economic Goods</p> <p>The fourth Dublin principle (see box 1) states that water has an economic value in all its competing uses and should be recognised as an economic good. This is not to say that water is not a social or environmental good, but simply that water use should be as efficient and effectively as possible. This is not a point of discussion. The debate is about idea that this efficiency and effectiveness of allocation can be achieved by market forces through competitive service providers and paying users.</p> <p>Opposition to this argument, point out that there is often very little competition and that households that use the most water generally do not change their consumption patterns when water fees rise. (Whereas poorer households that already consume little water, sometimes return to unsafe water sources if water fees rise.)</p>
<p>2. Natural Monopolies</p> <p>As the costs of service infrastructure are high, and the duration of (some) contracts are long term, water companies will have almost a monopoly in service provision opening the way for overpricing and bad quality service (including accountability for environmental sustainability). A study on private sector involvement in WWS among countries in Europe, shows that in the three countries of Europe where with private involvement, competition for bidding works fairly well in England where a tradition of strict regulation exists, but not so well in Spain where contracts are defined at decentralised levels. In France a compulsory national legislation exists with regard to bidding, prices, quality etc.</p>	<p>B. State Failure</p> <p>By far the strongest (apparent) argument for private sector involvement is the fact that – in overall terms- the public sector has been unable to provide sustainable good quality services to the majority of poor people. It is argued that public operators are generally bureaucratic, inefficient and overstuffed. Moreover, public operators are accused of corruption and political use of investment funds. It is said that national and local governments lack the funds required for investment in – mostly severely deteriorated- infrastructure and in most cases are not eligible for credit. It is expected that private involvement will help to overcome such deficiencies. It is assumed that private sector involvement will increase technical capacities.</p>
<p>3. Human Rights</p> <p>This is the idea that water is a basic human right, which cannot be denied to anyone having paid or not their water bill. The human right to water has recently been reinforced</p>	<p>C. Poor people already pay higher water fees than rich people</p> <p>This argument states that it is wrong to assume that poor people are unwilling or unable to pay water fees, because they pay already high fees to small scale private providers in many</p>

by the declaration of the UN Committee on Economic, Cultural and Social Rights (see chapter on water rights), by explicitly declaring water as a human right.

The argument arising from this is that governments have the obligation to provide quality water and sanitation services to their citizens. If they are unable to pay, some kind of subsidies should be arranged. The idea that somebody obtains profit from the sector is contradictory to this view, because there are still unserved people, so the profits should be used for investing in services.

4. Wrong management incentives...

In the face of freshwater scarcity, a sole focus on efficiency and profitability of water and/or sanitation services may not be convenient. A public service will pay more attention to social justice and sustainability of the services, and moreover is expected to take into account off-side effects of water management, investing in different kind of technologies⁴⁴.

areas. For example in the outskirts of Lima where no piped water from the municipal water company arrives, private truck owners charge about 20 times as much for water. A similar phenomenon is found in many places. So these people would be better off by a privatised piped water services that charges, for example, twice the current price of water of the municipal water company.

Moreover, as one comment on TheWaterPage says: *Free services in fact disempower communities and destroy their leverage. It is fundamentally a "top down", centralist approach. It is inherently dependent on a remote bureaucracy. A call for free services is in practice a condemnation to no services, particularly in rural settings. It is not only naive but dangerous and fundamentally unfair.*

In relation to this argument, Budds and Graham(2003) point out that care should be taken to overweigh the argument that poor already pay. They give three arguments: people buy usually small amounts of water, or water when it is particularly scarce, the informal water providers are usually extremely efficient considering the circumstances in which they operate and also, the fact that these prices are paid does not imply that there is no negative impact on household economies.

⁴⁴ [Más allá del Mercado, el futuro de los servicios públicos](#)

Limitations of the proclaimed benefits of private sector involvement in less “profitable” situations, resulted in an alternative model: **private-public-civil partnership (tripartite)**, generally promoted by [Public Private Infrastructure Advisory Facility of the World Bank](#) (PPIAF) of the World Bank. Water activists promote the public-public partnerships, that is: between national and local governments, to overcome deficiencies in service provision.

As stated before, the privatisation discussion is very general about private sector involvement, whereas benefits and risks can only be defined on the basis of a assessment a specific model and the characteristics of the parties (private, public) involved. A specific long-lasting experience of public-private partnerships in low-income areas is the **experience of Aguas Argentinas** in the poor barrios in Buenos Aires. This has been written down⁴⁵, and some interesting lessons learned. For example that private involvement does not eliminate political manipulation of water and sanitation services as is sometimes assumed. Other noteworthy lessons are that involvement of community organisations and NGO’s was crucial for the project and that not all aspects of pro-poor service provision could be negotiated in advance, so that negotiations both by government and communities after the concession was given remained important.

A very specific case of private sector involvement is **participation of micro-enterprises**. One of the most famous examples is the project in Bangladesh, where groups of landless farmers (mostly women) own a well and sell water to others. In Latin America water sector reform has advanced most of all regions in the world. However there is a lot of variation among countries, some see more changes in regulation and others introducing private sector involvement in service provision as well. For detailed information see the overview made by the Water Supply and Sanitation board of the World Bank [V. Foster: [“Ten Years of Water Service Reform in Latin America: towards an Anglo-French model”](#)] Table 5, from that same paper, gives an overview of reform in Latin America.

country	regulation ⁴⁶	Private sector participation ⁴⁷
Chile	100%	86%
Argentina	88%	62%
Bolivia	100%	28%
Colombia	100%	13%
Ecuador	25%	25%
Mexico	19%	19%
Uruguay	17%	17%
Honduras	16%	16%
Brazil	24%	1%
Peru	100%	0%
Nicaragua	100%	0%
Panama	100%	0%
Costa Rica	100%	0%
Venezuela	3%	3%
El Salvador	0%	0%

⁴⁵ Schusterman, R. et. al. (2002), “Public Private Partnerships and the Poor: Experiences with water provision in four low-income barrios in Buenos Aires”, WEDC, Loughborough University, UK., Series Editor: M. Sohail. See www.lboro.ac.uk/wedc/projects/ppp-poor/

⁴⁶ Percentage of urban population that enjoys regulation

⁴⁷ Percentage of urban population that receives its service directly from a private sector operator (excluding BOT projects)

Guatemala	0%	0%
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Table 5. Overview of reform in Latin America (Foster, 2005)

2.9. **Irrigation management Transfer (IMT)**

Irrigation management transfer is the term used for the transfer of all or certain responsibilities of irrigation systems management to users' organisations. It is also called "privatisation" of irrigation systems, as such users' organisations are generally private organisations⁴⁸. In stead of transfer, turnover and self-management are also used.

Theoretically, irrigation management transfer implies a withdraw of the government agencies from irrigation management: operation, maintenance, administration, fee collection, conflict management. However, in practice is also used in cases where only a part of system management is transferred to users, and in most cases users' organisations operate under detailed regulation. This implies that irrigation management transfer is, in many cases, de facto participatory irrigation management.

As mentioned in the part on participatory irrigation management, the discussion on irrigation management transfer motivated by two different **assumptions**:

1. System management will improve through the mobilisation of farmers' knowledge and improved communication between farmers and agencies
2. Costs of operation and maintenance will be reduced because users' organisations assume part of the responsibilities that before were assumed by government agencies.

These two assumptions combine in the **basic idea** of irrigation management transfer, which is that principal stakeholders of a good functioning irrigation systems are the users themselves. Therefore they will be motivated to pay user fees in order to operate and maintain their system, and this in turn will improve their productions and ultimately livelihoods and wellbeing of farm families.

Irrigation management transfer has been **implemented**, in many cases as part of structural adjustment programmes, in almost all countries with large scale irrigation in Asia and Latin America. Often, however, it was not accompanied by an appropriate process of training and transfer, a supportive legal framework, acceptable state of irrigation infrastructure, and, related to this, a clear view of government agencies role after transfer. In many cases, users' organisations were hastily formed, and after sometime participation only existed on paper. So after management transfer, systems continued to provide poor service, show high rates of non-payment of water fees, poor maintenance etc, or sometimes they would deteriorate more. There are, nevertheless, exceptions of schemes known in Philippines, Sri Lanka, Pakistan, Mexico and Peru that did reach a good level of technical, financial and democratic performance.

By far most of the research on irrigation management transfer has been done by IWMI. A **comparative framework** was developed for assessing irrigation management transfer, see www.iwmi.cgiar.org.

One of the **criticisms** of irrigation management transfer is that users' organisations are considered not capable of operating and maintaining major infrastructure and/or water fees. Yet, there are no rules written in stone on this subject. For example, the Chancay-Lambayeque irrigation system in the North of Peru (aprox. 100.000 hectares, 20.000 user families, 70% landholders have less than 10 hectares), users formed an

⁴⁸ There are exceptions where water legislations considers the waterusers' organisation to be an extension of the aparatus of the state, as therefore "semi-public".

independent company for operation and maintenance of the hydraulic infrastructure. Delegates of all water committees had a seat in the board of the company.

Another important criticism on IMT is that in most cases it is exclusively motivated by cost-reduction, so that capacity development of users' organisations and the facilitating role of agencies remains underdeveloped. Therefore in many systems the only effect is a deterioration of system's management, sustainability and increased vulnerability of farmers' livelihoods.

At the conference on irrigation management transfer held in Wuhan, the following points are some **lessons** that arose from that event⁴⁹:

1. Management transfer which is partial or involves incomplete control by farmers leads to unstable management characterized by limited cost efficiency and staff accountability. Turnover is often partial, with agency staff continuing to exercise partial control over water distribution or budgets after turnover. This can create a false impression of failure which can reinforce resistance to turnover policies.
2. Turnover should be treated as an evolving program rather than as a short term project with rigid quotas for turning over set numbers of systems per year.
3. There is a frequent lack of strategic planning to reorient agencies and plan pro actively for staff disposition prior to the implementation of turnover. This compounds agency resistance to turnover programs.
4. Establishing motivating conditions for farmer organizations to take over irrigation management is more important than investing in efforts to motivate and train farmers.
5. Abuse of authority by factions after turnover is seen by less powerful farmers as a risk which is associated with management turnover. They may therefore seek continued agency involvement in auditing, regulating and helping to mediate conflicts.
6. Rehabilitation is often done before turnover without meaningful farmer participation and investment. This can discourage farmers from taking over responsibility for the irrigation system after turnover. In contrast, farmer participation and investment in system improvements prior to turnover can be an effective means of preparing farmers to take over long term responsibility for irrigation systems.
7. Irrigation systems which were originally designed to be managed by trained engineers or technicians so as to maximize water user efficiency and flexibility of operation is often incompatible with the management capacities of farmers.
8. Farmer organizations seem to rarely raise capital replacement funds after turnover. This can be a cause for concern about the long term physical sustainability of irrigation systems after management is turned over to farmers, especially if it is questionable that governments will be able to afford to finance rehabilitation in the future.
9. Management transfer commonly involves increased cost to farmers for irrigated agriculture, especially where farmers were not paying for the full cost of irrigation before turnover. This can be a disincentive for farmers to take over management of irrigation systems.
10. Strong high level political support and support among farmers for management turnover is essential if agency resistance to turnover is to be overcome. It may not be advisable for policy makers to have resistant irrigation agencies implement turnover programs. Consideration should be given to having neutral organizations, such as NGOs or companies, implement turnover programs.

From the experience of SNV, the issue of IMT is not so much about exclusive and absolute control by users' organisations about system management, as mentioned in

⁴⁹See website of International Network on Participatory Irrigation Management: www.inpim.org

the first point of the lessons of the Wuhan Conference, but more about finding the right checks and balances. Most large irrigation infrastructure has been build by the government, many with external loans. Such investments where justified because their national and social interests for the country. From that point of view, it is understandable that governments will always want to have a supervising role in system maintenance. Problems arise when a government does not clearly define its roles over system management and/or makes opportunistic use of its power to issues decrees.

3. WATER FINANCING

Water is a scarce good and thus should be allocated where best use is given, balancing the social, economic and ecological functions of water. There are costs related to the use of water: for its conservation, for conveyance of water to users, for regulating institutions, as well as social costs such as compensation to non-user groups for forgone benefits. Obviously someone should pay these costs. The most straightforward idea is that whoever uses the water pays such costs. Still, it is not so easy and there are a whole lot of **issues** to raise about this topic, for example:

- Should poor people pay as much as richer people for drinking water and sanitation? If the answer is no, how to distinguish between users?
- Should the m³ necessary for basic drinking water consumption cost the same price as m³ of excessive consumption? What's the level of basic consumption?
- Should all users contribute equally to covering costs? How to measure consumption among sectors? What about non-consumptive water use?
- What should users fee cover? Only O&M and capital costs, or also future investment, environmental costs, social costs, costs of the functioning of national water authorities etc?
- Should water fees be uniform across a country or depend on the cost of each individual system (thus depending on the level of services and natural circumstances)?
- Is payment on the basis of volumes used? Can this be put in practice considering measuring and controlling capacities?
- Who should collect and administer fees? When should fees be collected (before, after or for each consumption)?

On these and a lot more issues related to water financing, debates are held, and mechanisms and instruments are being developed.

In this paper, a distinction is made between **financial institutional arrangements** and **finance instruments**. Financial institutional arrangements refer to the organisation, roles and responsibilities in the channelling of funds to different levels, whereas instruments are the actual proposal for credit provision, fee collection and so on. Generally the objective of instruments is two fold:

1. obtain a certain level of cost-recovery (covering the costs of water use)
2. give users an incentive for correct management and use of the water

Finding **adequate water finance arrangements and instruments** is urgent because there are hardly any financially sustainable water supply systems (a part from some locally managed and constructed systems). Most large scale irrigation systems have been constructed with external funding to governments, continue to depend on government funds and have low levels of fee collection that provide little prospect for financial sustainability.

Also drinking water and sanitation systems are usually subsidized, while a lot of additional investment for rehabilitation, construction and upgrading is still needed. Considering the targets set by the MDG's for drinking water and sanitation, investments in this sector should double according to the Camdesus Report "Financing Water For All"⁵⁰.

⁵⁰ The "Camdesus Report" was prepared by a panel of 14 international "water experts" from public and private organisations in preparation for the Third World Water Forum in Kyoto. The precise title is: "Financing Water for All, Report of the World Panel on Financing Water Infrastructure".

So water financing is **not straightforward** and solutions are needed urgently. In the following text, first some general definitions and reflections on the kind of costs involved and the available sources of finance are given⁵¹. Then some funding mechanisms and instruments are presented. And in the final part will be talked about incentives across sectors, such as environmental services.

3.1. **Costs and sources of finance**

A very interesting view of costs and cost-recovery is put forward by IRC in its Thematic Overview Paper (TOP) on Financing and Cost Recovery⁵². The following figure (Figure 6) is an attempt to capture their idea on costs, applying it not only to drinking water sector but also to the irrigation sector with an IWRM view. It considers **four different groups of cost**, clustered according to degree of vinculation with the water supply system:

1. Costs related directly to the functioning of the system
2. Costs related to the provision of services to the system
3. Costs related to the sectoral institutional framework
4. Costs related to the multi-sectoral institutional framework and integrated water resource management.

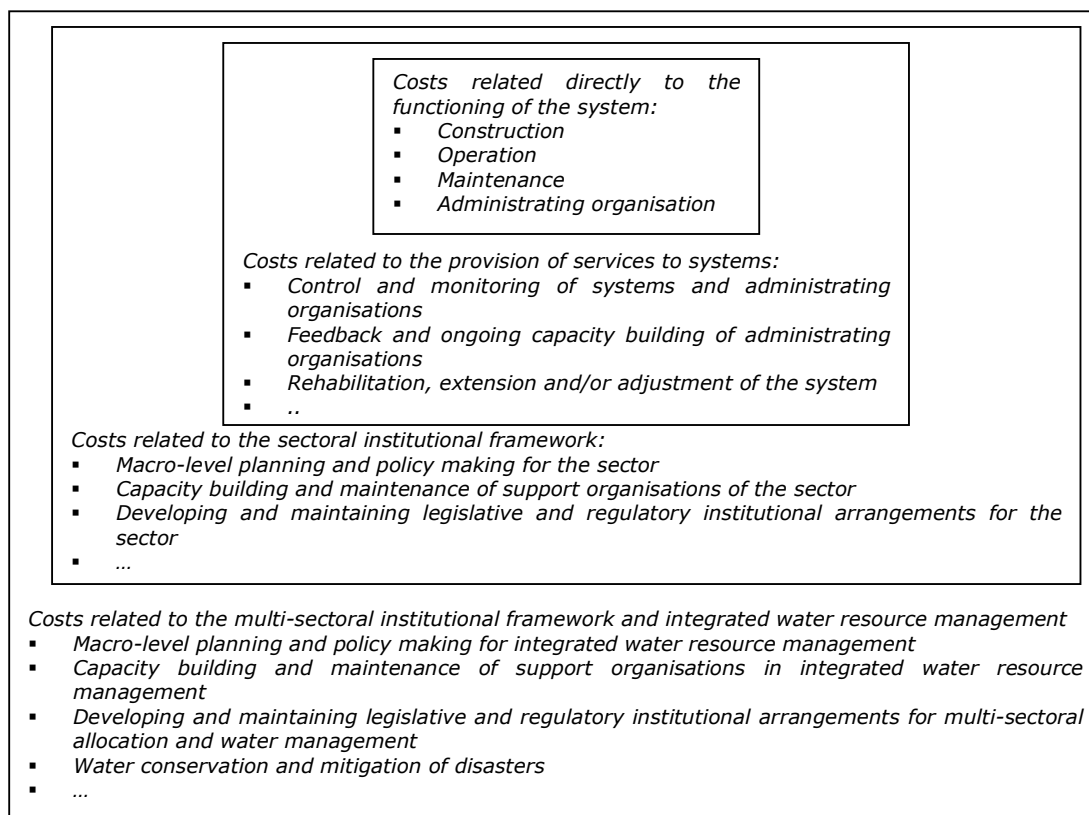


Figure 6. Costs involved in water supply systems (adjusted from Fonseca, 2003)

The contribution of this idea of Fonseca is to consider not only costs directly related to the system (capital costs, O&M, infrastructure and local organisation), but also wider

⁵¹ It is noteworthy that financing discussions in the irrigation and the drinking water sector, although seemingly isolated from one another, have many parallels.

⁵² Cardone and Fonseca, 2003, see http://www.irc.nl/redir/content/download/8160/126955/file/Cost_Recovery.pdf

costs related to service provision after construction (institutional support to systems, upgrading of systems) and institutional costs (policy making, planning, legislation, regulation). This is not an entirely new idea, because it can be found in for example legislation on water fee structures (see Box 18), however, cost recovery debates tended to focus only on the direct systems costs and occasionally the costs of service provision.

Under the legislation in force in 2004, water fees in Peru were as follows. Users of irrigation water paid a fees consisting of a system component, a national component (canon de agua) and in some cases a capital component. The canon de agua was paid to the national government and from there, the money was channelled either to the local water authority or to the local watershed authority. Also 1% of the waterfee was paid to the national federation of irrigation waterusers' organisations. The system component was used to operate and maintain the irrigation system, both major and minor infrastructural works.

Drinking water operators only paid the canon de agua to the national government. This money was distributed between local and national water authorities, and in addition to that 25% used to go to the National Programme for Watershed management and Soil conservation, reflecting the importance of conservation. The value of the waterfee for non-agricultural use was dependent on waterscarcity, dividing the country into three scarcity zones.

Both, drinking water operators and irrigation organisations would be charged less than one third of the canon charged to other uses in the same zone. However, drinking water operators would not contribute to operation and maintenance costs of major infrastructure, that they generally shared with irrigation users and hydropower plants. Even though in times of scarcity they would have priority use over the water from those structures.

Kome, Documento Temático, Consulta Regionalización y manejo de conflictos en el agua, 2004

Box 18. Formal waterfees in Peru under the legislation of 2004

Having presented costs, theoretically enables a discussion about **which costs in what percentages should be assumed by whom and how**. This is subject of a heated debate centred on the question whether poor people should pay for water and the fact that water is a human right⁵³. Many people feel that it is unfair that the level of service for water supply and sanitation should depend upon people's capacity to pay, or that non-paying users would be excluded from the service. However, it should be born in mind that the complexities involving exclusively publicly financed services have proved to be a major obstacle in providing safe and sustainable water supply and sanitation services to poor people.

IRC as well as some organisations that work close to the field, propose a **non-ideological starting point**: consider all costs and all possible sources of funding that could lead to an increase in sustainable service provision. Such sources may be:

- Water fees and other contributions from users (for example in mountain irrigation generally no water fees are paid, but all is done by labour contributions from users)
- Municipal funds
- Funding from NGOs or other non-profit organisations
- Private sector
- National authorities
- International agencies and donors

This is illustrated in Figure 7.

⁵³ See the section on "rights based approaches to water" and also the arguments mentioned in the section on "the debate about private sector participacion in water services" for more details.

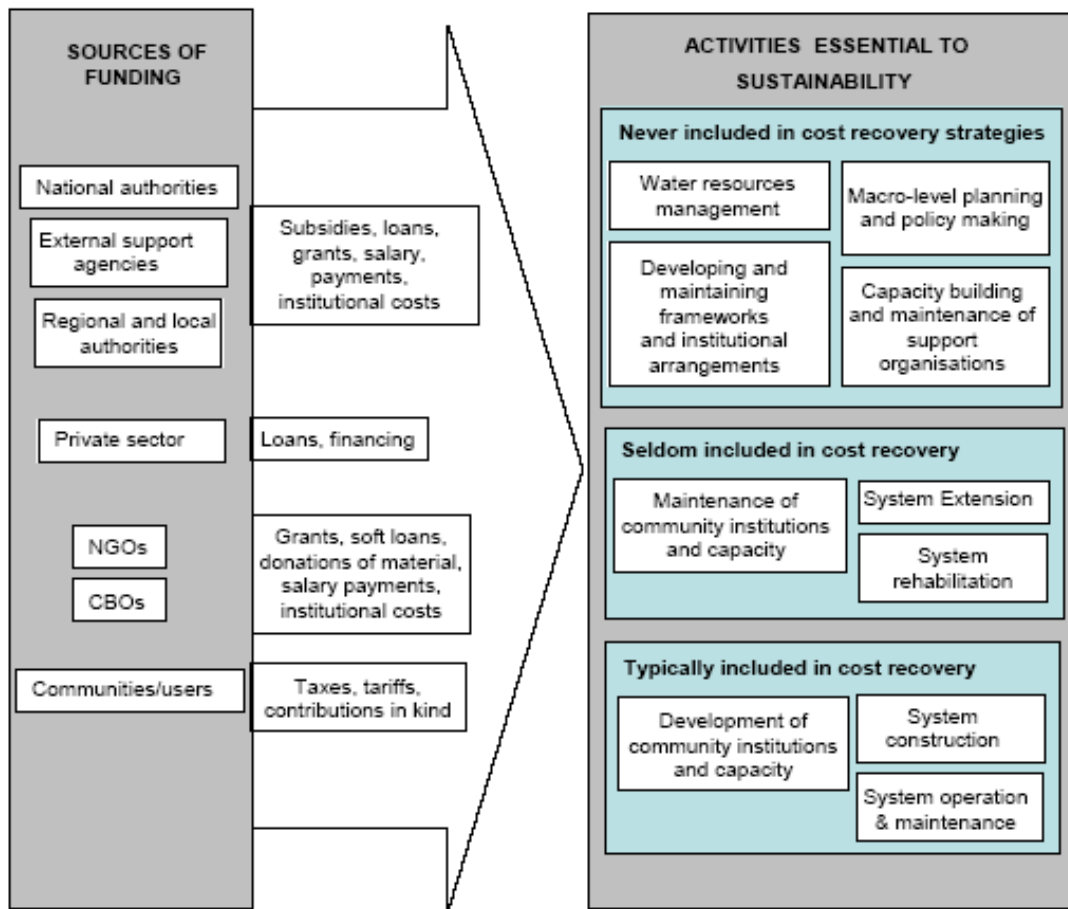


Figure 7. Framework of IRC about Cost-Recovery: Matching all costs with all available sources [[TOP Financing and Cost-recovery, IRC](#)]

The **Camdessus Panel**⁵⁴ followed a similar approach, mentioning a need for increase in funding from all sources: national governments, municipalities local community organisations and local business, local NGO's, international NGO's, banks and private companies, bi-lateral and multi-lateral donors, export credit agencies.

Notwithstanding the fact that such pragmatic non-ideological approaches are very useful, the **position of water activists** that all should be public funding is also important⁵⁵, in the sense that it draws attention to the fact that (some) governments might not have been giving sufficient priority nor resources to their water sector, in particularly drinking water for peri-urban and rural sectors. Interestingly this lack of priority of governments is also mentioned by the Camdessus Report. Obviously turning attention to a whole range of other sources, apparently alleviates pressure on governments to increase their budget for (rural and peri-urban) water and sanitation.

Water activists propose eight measures of financing for drinking water and sanitation (see Box 19) and vigorously oppose the recommendations of the Camdessus Report, in particular the one that proposes that development aid money should be used to

⁵⁴ Financing Water for All, Michael Camdessus, J. Winpenny, 2003. [full report](#), [summary](#)

⁵⁵ Water as a public good, public funding, [FAME2005](#)

subsidize or share risks with private operators in service provision⁵⁶. The general critic on their counter-proposal, a part from the exclusive public focus, is that most sources are currently non-existent, and that it will take time and effort to create them.

Eight actions to ensure public funding for water, as proposed at the Alternative World Water Forum in 2005:

- *Global taxation*
- *General (national) taxation*
- *Specific taxation*
- *A public fee structure for water services*
- *Ad hoc, multi-year, interregional programmes*
- *Co-operative financial instruments (to be reinvented)*
- *Intermediation by international financial institutions*
- *The "wholly public" PPP: public/public partnership*

Box 19. Proposals for water financing at the Alternative World Water Forum in Geneva, See www.fame2005.org, and www.tni.org section on water.

3.2. Financial institutional arrangements and instruments

In this text a distinction is made between financial institutional arrangements and finance instruments⁵⁷. Financial institutional arrangements refer to the organisation, roles and responsibilities in the channelling of funds to different levels, such as municipalities, water supply and sanitation committees, small providers etc.

Finance instruments are the tariff structures, subsidies, credit schemes, taxation, environmental payment etc. Though analysis and selection of appropriate instruments is very important, it cannot be viewed in isolation from the provision of financial services and the institutions (either public or private) that provide such services. For example, a major challenge is how to make funds for water and sanitation available to communities and local governments, without depending on whether there is a project in the area.

With decentralisation, the importance of sustainable financial institutional arrangements for sub-national and local governments increases, obviously also accompanied by the transfer of decision making powers and human resources. Some of the suggestions for **institutional arrangements** to make funds available for water financing at this level are:

- Trust fund
- Municipal credit pools
- National development banks, agrarian banks
- Local micro-credit schemes
- Water cooperatives (experience from Santa Cruz, Bolivia for drinking water- see Box 20-, also experience of some successful waterusers' organisations in irrigation)
- Community funds
- ...

SAGUAPAC/Bolivia: A water co-operative for a large city. Does it work? (Andrew Nickson)

⁵⁶ This proposal includes the idea that money of Overseas Development Aid should be used for the creation of a Revolving Fund to finance the public costs of preparation and structuring of complex projects, including private sector participation and other innovative structures. The fund would be used to assist in the preparation and structuring of project bids (including legal, financial and technical advisory costs) at both the tendering and negotiation phases, to be paid back by the authorities once bids were accepted. In addition to that the Camdessus Report includes the idea that aid money and MFI lending should be available to facilitate water projects managed by private operators under public control, for example to finance infrastructure investment, guarantees for devaluation risks or fund revenue shortfalls for a short time.

⁵⁷ Thanks to Teun Bastemeijer for this idea.

Large cities in many low-income countries face a water supply crisis. ... The study examined the only major urban water supply and sewerage co-operative in the world. Known as SAGUAPAC, the Cooperativa de Servicios Publicos 'Santa Cruz' Ltda has provided water since 1979 to the people of Santa Cruz, the largest city in Bolivia, with a population of 1m. All 96,000 of its domestic customers are automatically members of the co-operative. The city is divided into nine water districts, where customers elect members to the administrative board of SAGUAPAC. This board appoints the general manager and approves tariffs. Customers also elect a separate supervisory board that monitors the performance of the administrative board. The Birmingham study found that SAGUAPAC is one of the best-run water companies in Latin America, measured by criteria of efficiency, equity and effectiveness. It has:

- *a low level of unaccounted-for water*
- *a low number of employees per 1000 water connections*
- *efficient accounting: 100 percent of all connections are metered*
- *a 96% bill collection efficiency rate*
- *80% water coverage, despite rapid population growth*
- *a 24 hour supply of clean water.*

The study report identifies two key reasons for SAGUAPAC's superior performance:

** Its co-operative structure shields management from undue political interference, especially with regard to hiring, firing, and the awarding of contracts. The general manager has been in post since 1986, in sharp contrast to the norm in Latin America where managers of state or municipal water companies are regularly removed when a new political leadership takes office.*

** The co-operative structure also means that SAGUAPAC is not bogged down with legal delays in tendering procedures and the administration of external loan finance that bedevil water companies belonging to the public sector. This means that it can implement investment projects much faster and more efficiently than other companies.*

Other lessons for policy-makers are that:

** private sector lease and concession contracts are not the only way to improve the performance of water companies in low-income countries*

** the co-operative model is sustainable and capable of high performance. It is catching on elsewhere in Bolivia, with new water co-operatives established in the towns of Tarija (1988) and Trinidad (1991).*

.... SAGUAPAC is highly regarded by the World Bank and internal Bank documents have praised it for its utilisation of two major Bank credits. ...

[source: TheWaterPage, www.thewaterpage.com]

Box 20. Case of a water cooperative in a large city in Bolivia (TheWaterPage)

Moreover, the Camdesus Panel recommends that governments and water authorities should provide a legal framework to encourage long-term investment from the local private sector, investors as well as local private operators. To enhance larger private investments the panel suggested that a revolving fund should be created to finance the public costs of the preparation and structuring of projects (particularly in the tendering and negotiation phases).

General consensus is that subsidies should be oriented towards achieving sustainability and be complementary to water fee from the system itself. The basic idea is that costs related directly to the functioning of the system should not be subsidised on a continuing basis.

Some suggestions for water financing instruments are:

- Tariff structures
- Subsidies (also seed capital to small local providers)
- Risk sharing (initial reserves, guarantees)

Below some details are given on different tariff structures and subsidies.

Tariffs in water and sanitation

Most commonly used **tariffing options in drinking water** provision are⁵⁸:

- Fixed or flat tariff: users are charged a fixed monthly amount, there is micro-measurement and usually there are restrictions on use (no garden irrigation, limited number of water points.) This kind of tariff is very common in small rural

⁵⁸ See IRC Thematic Overview Paper on Financing and cost recovery for a detailed discussion of tariffs and other instruments in water and sanitation services.

systems, when no pumps are used (so changes in consumption do not directly lead to changes in operation costs). Conflicts may arise when households start to install more water points. In that case an alternative is to charge a fixed price per water point.

- Constant volumetric tariff: users are charged a fixed amount per m³ of consumption. In small systems, this scheme is generally introduced when there is a motor pump. It is also very common in urban systems. A prerequisite for introduction is the installation of water meters and personnel for reading them.
- Increasing Block Tariff: users pay more per m³ when they consume more water as a total. The purpose of this payment scheme is to provide an incentive for users to economize water, while not inhibiting basic access to water for those who consume little. Also in this case, meters are a prerequisite.
- Two Part Increasing Block Tariff: this is a tariff where a fixed amount is charged for water below a certain threshold and above that threshold tariffs may be increasing with consumption or fixed. This enables to provide basic access to water for all, some propose even that is first block should be free, while the higher fees charged to users with more excessive consumption rates also covers the costs of this basic amount of water. (This is also a form of cross-subsidies within the system.)

Although the most precise relation between consumption rates and water fees seems desirable from the perspective of social justice and water economization, this assumes the existence of water measurement tools and administration tools that most small systems do not have. In such cases a fixed tariff may be the best (pragmatic) option. In very small water systems, fees are usually not applied, but ad-hoc contributions are asked from households when there is a need for funds.

Tariffs in irrigation

Irrigation fees may be determined according to:

- the amount of land that is under irrigation (sometimes in combination with the crop assuming a fixed amount of water per hectare for each crop, especially in continuous flow systems)
- the number of hours or water turn that is received (this is called water shares, the amount depends upon the total water availability)
- the volume of water that is delivered to the field

In recent years, **volume based** water distribution – as opposed to distribution of **water shares** – has gained attention as a way for improving efficiency and as an incentive to economize water, because farmers only receive the amount of water they demand and are only charged for that amount⁵⁹. However, especially in large schemes it is very difficult to measure, register and charge for all water distributed to many small plots. In a response to this several computer supported water administration systems have been developed, and have been introduced successfully(!) in irrigation schemes operated by poor farmers⁶⁰.

However, not all schemes operate with monetary tariffs. A lot of small scale schemes, mountainous schemes and farmer constructed schemes operate only through contributions in labour. Especially in those schemes constructed by farmers, the idea that a percentage of their water fee should go to the central government is fiercely

⁵⁹ See the PhD study of J.Vos, "Metric Matters" (2002, Wageningen University) on the performance and organisation of volumetric water control.

⁶⁰ Well-known examples of such computerised wateradministration software are those used by the Licto system in Ecuador, as well as the Rio Mashcón system and the Tinajones system in Peru. Such type of administration was introduced on a large scale by the Strengthening of Irrigation Organisations Project in the Peruvian Coast. The University of Cuenca, in Cuenca, Ecuador also has developed appropriate packages for water fee administration.

rejected, pointing to the fact (in most cases) that the schemes never received any services or assistance from the government agencies.

In **monetary tariff systems**, a further distinction is made according to the time of payment. There may be:

- payment in advance (before the cropping season)
- payment for each water turn (“pago contra entrega”)
- Payment at the end of the cropping season, mostly after harvesting

It is generally thought that payment for each water turn is the most secure form of fee collection, but users are reluctant to accept this form of payment arguing that they have no money before the harvest.

Subsidies

Most people think that **subsidies** from outside the water sector should not become a basic component of cost-recovery. It is thought that such subsidies should be used for improving access, and that in design the kind of system should be selected that future users will be able to pay.

In order to determine the economic feasibility of infrastructure, studies are done. In drinking water and sanitation, willingness to pay studies are conducted for this purpose. In irrigation, cost-benefit analysis of the proposed production is conducted. It is, however, a fact that not in all areas, basic drinking water services will be cost-effective, and a lot of irrigated farming has to face lowering food prices.

Due to the fact that drinking water supply and sanitation is a basic human need and a human right, there is more acceptance of the idea of on-going subsidies in that kind of systems. Nonetheless, in large scale irrigation there are cases of on-going subsidies especially large numbers of small-holder families are dependent on the system, because of the political costs cost-recovery might pose.

Cross-subsidies could be considered a sustainable way of financing water in less profitable areas. Cross-subsidies could be categorised in three groups:

- Subsidies from one user to another in the same system: some users pay more than others, either by differentiated tariffs or by some kind of block tariff
- Subsidies between systems in a region or country within the same sector: services in remote and/or poor areas are undercharged and the deficit is covered with excess water fees from other areas.
- Subsidies from one sector of use to another sector of use: some sectors, mining, industry and/or agriculture pay higher water fees and thereby finance major infrastructure from which other uses also benefit.

3.3. Finance flows and administration of funds

This part deals with the issue of who should administer finance and how funds should flow. One of the major complaints of users of all kind is that water fees are centrally administered by government agencies and then, apparently only a fraction is reinvested in the area⁶¹. To a certain extent this is true, as discussions about accountability to users have mostly focussed on system level and system administration, and there are very few mechanisms of accountability at other levels (service provision, legislation, functioning of national institutions).

⁶¹ This was one of the most commonly heard complaints about tariffs during the nationwide consultation on regionalisation and management of water conflicts held in Perú in 2004. See www.iproga.org.pe

Both irrigation waterusers' organisations and drinking waterusers' organisations face **difficulty in administrating** their own funds (directly related to system operation & maintenance). Often such organisations lack experience and are few opportunities to acquire the necessary skills. Also in many countries, such organisations are not legally recognised as autonomous organisations⁶², or water legislation prohibits explicitly funds administration by users' organisations. A part from credibility issues, this entails practical problems, such as difficulties to open a bank account in the organisation's name.

Within the context of irrigation systems quite some research has been done on cash flows and accountability, for example whether water distributors should be paid directly by users or by the waterusers' organisation. Another issue is for example whether secondary channel organisations in large systems should be **financially autonomous** or not from the main system waterusers' organisation.

A special case in terms of self-financing of integrated water management and waste water treatment, are the Dutch Water Boards. These function as local governments dedicated exclusively to the management of water. They exist parallel to the municipal governments. The Dutch Water Boards are authorities elected directly by the population in the area, they have the right to raise taxes (water board charge and water pollution levy) and their functioning is integrated in the public system and public legislation. Also the Water Board have their own operational staff that assume all tasks related to water management in the area. They coordinate with local municipalities on construction and maintenance of sewerage, as well as with drinking water companies (owned by the municipalities and provincial governments). The Water Boards have the authority to carry out inspections as well as sanctions⁶³.

Interestingly, the water fees of the Water Boards are considered taxes, not a financial contribution to obtain an individual service. Therefore the construction and maintenance of physical infrastructure is not based upon the expected returns, but on the balance of interest made by the elected board. This is called the solidarity principle in the functioning of the Dutch Water Boards. (See "Success factors in self financing local water managed", published by NWP for the third world water forum in Kyoto, 2003). [Success factors in self financing local water management \(pdf, 513kb\) 2003](#)

Box 21. Challenges for cost-recovery according to IRC TOP Financing and Cost recovery

See also the extensive suggestions of IRC and INPIM on water financing in drinking water and irrigation sector respectively (Box 22 and Box 23).

Suggestions of IRC for waterfinancing in drinking water supply and sanitation

General challenges – creating an enabling environment

To get the best results in terms of the equity and sustainability of water services, there are some important 'musts' and some other 'desirables':

- 1. Decision makers have to be made aware of the need for and benefits of cost recovery approaches that consider not only the construction, but the lifetime, rehabilitation and extension of water supply systems and all the elements that are necessary to providing longer-term support. That support has to be provided not just for the systems themselves, but also to make the systems affordable for the poorest consumers (Review the IRC approach).*
- 2. In a decentralization framework, the transfer of operational and financial responsibilities from central government to regional and local authorities must be accompanied by sufficient training or funding to support the new activities and skills needed.*
- 3. Typical time horizons and priority setting for programmes (and associated funding) need to be adjusted to meet the broader, sectoral development goals – this challenge is very much directed to development agencies and development banks.*
- 4. Responsible agencies need to develop comprehensive national and regional budgets for the water sector that include human and technical resources as part of long-term programme design, and clarify the nature and sources of original and on-going financing.*

⁶² The lack of legal status of the rural water committees in Nicaragua, is a problem acknowledged by both the organisations themselves, donors and governments.

⁶³ Water Boards apply gradual but strict sanctions, that ultimately leads to the employment of a process-server and the confiscation of goods for non-paying inhabitants.

5. Lack of information about water consumers is often a handicap to sector planning. Gathering detailed information about a customer base can be both technically difficult and expensive in relation to the potential size and scope of water services.
6. Specific water supply and sanitation programmes need to be part of an agreed longterm plan for water resources management within any community or set of communities sharing a watershed.
7. Partnerships for service provision need to be developed among local NGOs, donors, governments, and the private sector, which means that there has to be a framework for fostering and coordinating such partnerships.
8. Maintaining a focus on the poorest is vital in the context of sustainable financing and cost recovery policies.
9. Engaging women in the decision-making process for system design and service management has been acknowledged as a challenge for some time, and continues to pose challenges in many rural and peri-urban areas.
10. Monitoring the performance of service provision over time, to help guide strategy at the sectoral level is often a challenge, due to insufficient funding and capacity.

System-related challenges

1. High levels of unaccounted-for, or unbilled, water make cost recovery much more difficult. They can have a variety of causes, such as illegal taps, leakage, or fee waivers for larger government, industrial, or military consumers.
2. Often existing tariff structures are ineffective in capturing a system's recurring costs and promoting water conservation. They may also exclude the poorest of the poor from service provision.
3. Meters or other gauges of consumption are a critical component of cost recovery, although it should be noted that in areas with abundant supply, the cost of installing and maintaining meters may be less cost-effective. Meters must be read on a regular basis and fixed promptly when they break down. This poses technical, institutional, and financial challenges.
4. Effectively designed subsidies are targeted at the poor, to improve access to networked services in peri-urban areas, and provide access to safe quantities in rural areas.
5. Output-based tariffs and subsidies can be a challenge in a political environment that is resistant to reform and accountability of service-provider finances and accounting processes.
6. Designing a flexible billing cycle that accommodates the needs of the poor (with regards to seasonal income, non-regular income, etc.) while allowing for the service provider to maintain steady income to meet expenses can be a challenge.
7. High administrative costs can arise in billing for water, and providing information to consumers about the system.
8. Problems can also arise where there is limited training and follow up with partners to expand expertise and encourage autonomy.
9. Monitoring and evaluation for effectiveness at the system level is often inadequate, which means that problems are not corrected in a timely way.

Box 22. Challenges for cost-recovery according to IRC TOP Financing and Cost recovery

Suggestions INPIM on waterfinancing in irrigation

Changing the way in which irrigation is financed can help make participatory irrigation management more effective and sustainable. Conventional approaches to irrigation finance through large government implemented projects can build infrastructure, but often create incentives and constraints that fail to promote local resource mobilization for operation, maintenance and improvement of irrigation systems, displacing and discouraging local efforts. Instead there is a need for financing mechanisms that encourage and strengthen local capacity. Developing financing mechanisms suitable for PIM requires overcoming several challenges:

Large investments. Construction and repair of irrigation systems sometimes requires large-scale, lumpy investments, demanding financial and technical resources in excess of those available locally. Unless the financial capacity of WUA can be strengthened they are likely to remain dependent on external aid to finance major construction works.

Incremental investment. In practice, many of the works involved in repairing, replacing and upgrading infrastructure are relatively small, scattered throughout irrigation canal networks, and can feasibly be done piecemeal over a period of many years. An incremental approach to infrastructure improvement is more affordable, and more within the financial and managerial capacity of local irrigator's organizations.

Gaps in governance and finance. Water user organizations often lack the legal status and authority needed to carry out repairs and improvements to irrigation systems. Banks, bond markets and other financial intermediaries are often unaccustomed and unprepared to lend money to water user organizations. Institutional changes and learning may be needed to strengthen local financial capacity.

Finding ways to sustainably finance irrigation investments requires financing arrangements that fit with local conditions and needs to follow feasible pathways for developing the financial capacity of irrigators organizations. Simply increasing participation in conventional large-scale construction and rehabilitation projects may not lead to sustainable changes. However, strategies are available can help make financing for PIM more effective and sustainable.

Making WUA creditworthy. If WUA have to rely only on the cash, labor and materials they can collect in a single season, then their capacity is quite limited. If there are ways to borrow larger chunks of money and repay in installments over a period of months or years, this can greatly increase WUA financial capacity. Strengthening the capacity of WUA to borrow may require legal changes to strengthen the formal legal status of WUA and their authority to collect fees. However the most important need is to build creditworthiness with banks and other financial institutions. In some cases bond markets may be available, but often a more feasible option may be to work with banks and other local financial institutions. If WUA have bank accounts and demonstrate their capacity to mobilize and manage money, then that cash flow constitutes the most important basis for making financial institutions confident that loan will be repaid. Cash flow, not collateral, is the key requirement to establishing and increasing the creditworthiness of WUA.

Externalities Many of the benefits from investment in irrigation go not to farmers but to urban consumers. Profits in irrigated agriculture are often low and uncertain. The aggregate effect of irrigation investment often pushes down crop prices, as do other trends, so that farmers receive only a portion of the benefits of increased productivity, while the gains may primarily go to those who purchase irrigated crops, (including poor rural households). Irrigation investments that increase demand for goods and services, such as farm inputs and agricultural labor, yield multiplier effects beyond the benefits received directly by farmers. The distribution of benefits, and more general government policies to assist farmers, underlie the reality that almost all governments around world continue to assist agriculture and water resources. Rather than focusing only on reducing or eliminating subsidies there is a need to ensure that any continuing government assistance for irrigation will be used as productively as possible.

Rechanneling financing for irrigation. Rather than channeling irrigation fees into the government treasury or government agency budgets, the funds can be retained by or returned to WUA. Experience with participatory irrigation management has shown that when irrigator's organizations have a greater say in how money is spent, they find ways to spend money more effectively, with less waste and solutions better attuned to local priorities. This can range from greater consultation during planning and implementation to putting WUA fully in charge of hiring contractors and disbursing funds.

Smart subsidies. Too often, government assistance is provided in ways that tend to displace and discourage local efforts. Any government subsidies that are provided can be linked to local resource mobilization, through eligibility criteria, matching formulas and other mechanisms. Grants can be offered on a competitive basis, subject to eligibility criteria for local contributions and WUA performance in maintaining irrigation infrastructure. One way to structure such financing is in the form of an irrigation investment fund.

Reserve Funds and replacement cost budgeting. Discussion of reform in irrigation finance is often framed in terms of "cost recovery," tending to look backward at the large capital outlays that government has sunk into irrigation systems. A more constructive approach is to look forward toward ways of enabling WUA to pay for repair, replacement and further development of shared irrigation infrastructure in the future. WUA should be able to accumulate money in a reserve fund to cover future needs. Initially irrigators may prefer to contribute directly to specific works, but over time if a WUA performs well then members may grow more confident that fees will be used wisely and efficiently, and so more willing to pay higher fees that can be used to build up reserve funds for replacing and improving infrastructure.

Box 23. INPIM on Participatory irrigation management and financing
(www.inpim.org)

3.4. Water financing and cross-sectoral incentives

Though the larger part of water financing is about cost-recovery and finding sources of finance, there is also the expectation that economic instruments may improve water management **inducing changes in user behaviour**. For example the common belief that water fees may increase users efficiency of water use, and that fines may prevent users from stealing water. Of course, many people also warn for too simplistic ideas about **incentives**, especially in developing countries, where some only exist in legislation due to a lack operational capacity of juridical and/or administrative institutions. Also examples of perverse incentives, those that obtain negative impacts and unforeseen undesirable change of behaviour, are plenty. However, incentives remain an interesting complement to planning and control in the bid for achieving change.

One of the incentive schemes that has attracted most attention recently is related to **environmental services**⁶⁴. This in fact refers to a whole package of incentives

⁶⁴ Most of this text is based upon an overview document prepared by SNV Ecuador:, Javier Rojas, SNV Ecuador Portafolio Sur, Loja – Ecuador, 2005

oriented towards the protection and/or conservation of resources that provide such services. Most known is payment for environmental services, nevertheless, this is does not, as sometimes is assumed, the only possible instrument. Possible instruments that may be used to provide incentives for conservation of resources that provide environmental services are a.o.:

- Payment for environmental services
- Exemption from taxes
- Payment of transfers (?)
- Ecological or other forms of certification of products with added environmental value
- Subsidies to ecologically sustainable communal production strategies
- Subsidies to environmentally friendly technology
- Direct support from beneficiaries of water to providers of water

Some consider environmental education, and demand management (inducing users of drinking water to be more efficient) as part of incentives. Regulation and territorial planning are also instruments to induce changes in user behaviour.

The **strength** of incentives related to environmental services is that it brings environmental services to the forefront and makes evident its intimate relation with economic and social life. It should be viewed as a means for achieving greater sustainability of vital ecosystems, not as a goal in itself. In that sense it is not surprising that the concept and instruments are being developed mainly in relation to forest conservation, watershed protection, protection of biodiversity and international carbon oxide exchange.

It should be born in mind that there is no explicit demand for environmental services itself, people generally have more specific tangible demands, such as a sustainable drinking water source, that may be related to environmental services. Incentives for the protection of resources that provide environmental services should come from clear felt needs of demanding groups, and protection should potentially fit in existing production systems of "providers". A further issue is to define precisely the object of the service and ways to quantify "products" generated by providers. For that purpose clear indicators are needed, which are not always easy to find. Transparency on this point is also essential.

The topic incentives for environmental services is emerging, and several organisations are experimenting with the idea (see www.millenniumassessment.org, www.catie.ar.cr, www.oecd.org). And the results of the workshop: [Developing markets for watershed protection services and improved livelihoods](#): Findings discussion workshop by IIED in 2005.

See "Documento de Discusión sobre Incentivos por Servicios Ambientales" from SNV Ecuador for more details on the conceptual aspects of environmental services. [Rob, Hay dos documentos conceptuales sobre servicios ambientales escritos por Javier Rojas en el D-group, deberían ponerlo en el portal para poder hacer un link hacia esto (ahora no es accesible para personas de fuera del D-group)] Also the [Latin American network on watersheds](#) (supported by FAO) has some interesting information and cases. (See [Information on the forum on environmental servicios of 2003](#))

4. EQUITY, WATER RIGHTS AND THE RIGHT TO WATER

Besides efficiency and efficacy concerns, issues of equity and justice are increasingly recognised as part of the job of water professionals. This is understandable because problems of (distributive) justice arise whenever scarcity and competition exists, and these are plenty in water management. Frequent equity concerns are for example:

- Only people with land titles are benefited by the construction of water supply systems
- Generally holders of land titles and/or "heads of households" become water right holders.
- Head enders receive more water than tail-enders, in piped systems, higher household have less access to water
- Poor people, women, children contribute labour, but rarely end up in management committees
- User preferences and requirements of older, richer male users are reference for decision making on the system. This fails to take into account needs of poorer people, younger people, women, who may have different life-styles and livelihood strategies, and therefore different needs.

In water supply systems, ideas about what is just are incorporated in system design, operation & maintenance practices, water rights, organisation membership, and decision-making to name a few things. So conceptions of equity and justice are translated in concrete rights and obligations: water rights, participation rights, obligations of use, payment etc. For example, in system design, first it is defined who will benefit, and who will not benefit from the system, then it is defined how much water, at what time etc. each receives, and so on. Different solutions may arise like:

- Traditional users have more water or more water security (preferences in times of scarcity) than new users.
- Those who pay more receive more water
- Those who contributed more labour during construction receive more water
- Water rights are assigned individually, on household basis, or to collectivities
- Amounts of water are proportionate to the amount of land (in irrigation)

What is fair and just is not so clear-cut, nor culturally neutral. To understand this more fully, **some basic considerations** in relation to equity and justice are discussed⁶⁵.

Justice is about what people are entitled to, what they deserve⁶⁶. These entitlements may be expressed in rules or laws, but underneath such rules lay general moral principles, for example the principle that all people are equal. Obviously such moral principles may be very different from one society to another. Equity is social justice.

Nevertheless, it would be naive to assume that what is defined in rules and obligations will therefore definition happen in practice. For the purpose of this chapter, this complexity is summarised in the following layers of questions about equity and justice:

1. What is equity and justice in water management?
2. Who defines it?
3. How is it achieved (or what is achieved at all)?

The first two questions will be discussed in the part on justice and equity in water management, the third question will be discussed in the parts on water rights (theory) and methodological ways to deal with equity issues. In addition to that, a specific part

⁶⁵ A very interesting compilation of work on this issue is the book "Searching for Equity, conceptions of justice and equity in peasant irrigation", edited by Boelens and Dávila, 1998, Van Gorcum.

⁶⁶ Beauchamp, T.L., *Philosophical Ethics*, 1991.

is dedicated to gender equity in water management and a final part to rights based approaches in water management.

4.1. Justice and equity in water management

As mentioned before the word justice refers to both general **moral principals**, as well as the rules derived from those principles. In western society, two of the most dominant approaches of justice are⁶⁷:

- Justice is to ensure equal access of all to the goods that every person needs/ desires (egalitarian theories of justice)
- Justice is to ensure equal opportunities for all people through fair procedures and systems (libertarian theories of justice)

To some people these principles are so fundamental, that they hardly conceive different interpretations of justice. However, there is a lot of discussion about their **supposed universality**, and criticism on development projects, legislation, education etc. based on either of these assumptions without taking into account local perceptions, norms for justice. Commonly heard criticisms are:

- Ethnocentric: Not universal but ethnocentric, starting from a western model of human behaviour, human preferences and lifestyle.
- Individualistic: Focus on individual rights, not taking into account collective rights crucial in societies with high inequality.
- Reductive: Aiming at general rules that may be applied to all, not taking sufficiently into account the specificity of individual situations and cases.

As several people now think that the moral principles underlying justice in water management are not so universal, it becomes very important **who defines what justice is**. This has various implications:

1. If justice is about equality for all, then the question is, as says clearly Boelens, **"Who must be equal to whom?"**. For example in relation to equal access: Who decides what basic needs are? Ideas about what people need are based on assumptions about the way of life and priorities of people, often with a certain "stereotype model of life" in mind. This point has often been brought forward by gender specialists, demonstrating that certain policies or technology had been chosen with the implicit idea that all future users are male heads of households.

Moreover, How to ensure equal opportunities e.g. of participation if people are fundamentally unequal? In order for people to obtain their rights, they must equalise themselves to the "model citizen" on which the procedures are based. Several authors point to the fact that many development projects and legislative processes come with conceptions of equity and justice that ignore local moral principles and rules, thereby not only jeopardizing the effectiveness and sustainability of the investment, but also violating the basic right of people to shape their own lives.

2. Another implication of the diversity of perceptions about social justice is that reaching a common understanding about it is not so evident. Rather than one set of principles and rules, various normative systems may co-exist in a particular area. This is called **legal pluralism**. It is important to note that legal pluralism is not just about the contradictions between national and customary law (though that may be the most visible), but also about interactions with other local norms such as those imposed by projects ("project-law" according to Boelens, 1998) or the church. Some of these norms and rules may be reinforcing each other, others may be contradictory.

⁶⁷ Beauchamp, T.L., Philosophical Ethics, 1991.

All such conceptions provide frameworks for justice and equity in water management, resulting sometimes in different proposals for the division of water rights, obligations, tariff structures, infrastructure design etc.

It is a point of discussion **whether legal pluralism is problematic**. From the point of view of many legislators and engineers, not in the last those who work in water management; co-existence of several sources of justice is chaotic and has to be put in order. Boelens (1998) mentions that it is sometimes of source of conflict and struggle, but also an opportunity for change. Bruns and Meinzen-Dick⁶⁸ (2003) talk about 3 positive effects:

- It creates room for manoeuvre for individuals
- The interaction of different kinds of rights and existence of multiple legitimizing frameworks allows for rights to evolve in response to changing pressures on the resource and on society.
- Neglecting customary rights can cause serious opposition from those whose rights are ignored.

In the field of work of SNV, legal pluralism is a daily reality, and the capacity to promote dialogue between different stakeholders is central to its advisory practice. Many advisors are confronted with the strength of local organizations, especially in relation to ever changing political and institutional support to water management. For example, Jan Hendriks (2004) made the following comment about the situation of water governance in the Andes: "In this context of discomposure of the institutionality of the state, local waterusers' organisations are one of the few effective entities that managed to maintain problems and conflicts within more or less acceptable margins."

3. **On a micro-scale**, the question "Who defines what is justice?" cannot be seen in isolation from power⁶⁹ relations in a community. Experience (and a lot of research) shows that there may be substantial inconsistency between moral principles, the rules derived from them and practice. However, this does not make them, a priori, more just or unjust than other sources of justice. It is not the moral judgement (superiority or inferiority) of community rules that defines its importance, but the fact that most of the direct water management decisions, allocation, and conflict management are handled at local level. For sustainable social justice, the micro-scale of water management is of great significance, whereas projects, government agencies and so on generally have only temporarily presence. Strengthening local management capacity and facilitating is thus very important for equity in water management. Participatory approaches such as demand oriented approach, participatory irrigation management etc. recognize this.

4.2. Equity and water rights

Globally, three kind of discussions about water rights take place. First there is the advocacy, at global level, for the international recognition of the **human right to water** (see rights based approach). One of the questions is what the human right to water should include and how it could be binding for countries. Secondly, partly related to the first, there are debates about **water rights in national legislation** of countries, based upon the expectation that correct framing of such rights may improve water management and water allocation efficiency (see debate on water right titles). And finally there is a continuous field of inquiry and preoccupation with how local

⁶⁸ [Understanding legal pluralism in water rights: lessons from Africa and Asia](#)

⁶⁹ In this case, power refers to all kinds of power: power over, power to and disciplining power that emerges from dominant norms and values.

access and control to water is constructed, in other words the **materialization of water rights**. It is this last discussion about water rights that will be presented in this part.

How rights are materialised, how do those who have a right actually get water is a mayor issue both in irrigation as in drinking water supply. Allusion is made to corruption, power relations etc. (for example how access to a borehole is monopolised by the landowner after the project has gone). It is clearly understood that not only by designing local regulation of the water system after construction, users will have access to water in the quantity, quality and opportunity they are entitled to. Much emphasis is given to understanding local water rights and local water use practice before construction or rehabilitation of water use systems. Also it is now recognised that much of what engineers used to consider "open access resources", in fact were resources with a detailed regulation of rights and obligations (but not written down), interwoven with access to other resources or spheres of life.

The different dimensions of rights and how these are materialised are described by Boelens and Zwarteveen [2001]. This **framework**, though developed in the context of irrigation, may be relevant for access to drinking water as well. It describes in details the dimensions and categories (levels) of how a water right is materialized. Boelens and Zwarteveen also explain that analyzing the materialization of water rights is particularly complex, because of the nature for the resource water:

1. unlike land, almost all water exists in a transitory state: it has a high predisposition to flow, to seep vertically and horizontally through soils, to evaporate and to be transpired.
2. There is great variation in stream flow and water quality from year to year, from season to season and even from day to day.
3. Water-use practices of other users greatly influence water availability. (For example in continuous flow systems, illegal subtraction influences water tables of down stream intakes).
4. Common-pool resource nature of irrigation systems, individual use does reduce water availability but exclusion is difficult.

The following table (Table 6) summarises Boelens and Zwarteveen's framework for analyzing water rights.

Level of concretisation	Elements (dimensions) of a water right		
	Technical	Organisational	Socio-legal
Reference rights			
Activated rights			
Materialised rights			

Table 6. Framework for analysing water rights (Boelens and Zwarteveen, 2001)

More than simply distinguishing between "de facto" and "de jure" water rights, they distinguish three levels of concretization of a water right:

1. **Reference rights** that could be described as the formal entitlements to water.
2. **Activated rights**, or rights in action, refer to the process of transforming reference rights into operational rules and procedures for water distribution. Water distribution schedules are one outcome of this process, but also who is allowed to participate in users' organisations.
3. **Materialised rights** refer to the actual water use and distribution practices and to the actual decision-making processes about these practices. ... Materialised rights are often not written down, nor even made very explicit. They can be seen as a routinised way of doing things.

The contents of each right and the way one right is transformed into the next right are subject to social processes and power relations in the community, the water supply system and external agencies.

Theoretically, rights include a definition of:

- The subject of the right (right holder)
- The content of the right (what the subject has a claim to)
- The grounding of the right (justification of the right)
- The responsible party (the obligation holder)

Boelens and Zwarteveen, from an irrigation perspective, distinguish the following three dimensions of water rights:

- The **socio-legal dimension** refers to the legitimation of the right, in other words the moral principles underlying the right.
- The **technical dimension** refers to the physical means required to bring water to users (infrastructure, technology, skilled operators).
- The **organisational dimension** refers to the organisation of means to operate and maintain technology, organize users and workers, make decisions.

Analysis of water rights and the way they are (socially) constructed, should thus take into account the different levels of concretisation and dimensions. Recognition of this kind of desegregation on the construction of water rights implies that the strengthening of local water management capacities should take into account a whole range of actors and interactions, not just the directorate of the users' organisation.

4.3. Methodological answers to equity issues in water management

As mentioned above, mostly the methodological response to equity considerations are sought in participatory approaches of various kind. However, as mentioned in the general part on participation, such participatory approaches sometimes fail to address equity issue and reinforce status quo. **Critics** are:

- Access to participatory processes is often unequal because user rights, invitation & motivation practices, logistic arrangements, communication in general tend to exclude explicitly and implicitly the younger, poorer and/or female potential participants.
- Capacities to participate and influence opinion in participatory processes depend upon social status, education and personal factors, which are unequally distributed
- Internal dependencies among participants may prevent them from expressing themselves freely in all issues.

Obviously, facilitators can often influence or even dictate the **rules of a participatory process**, in order to provide more possibilities to less powerful groups (for example by influencing logistics, providing separate training, influencing invitation & motivation practices). Some people, however, reject this practice calling it: "facipulation". They state that truly participatory processes should not have any pre-defined rules.

In spite of efforts to influence the participatory process, there is no guarantees for overcoming inequalities, nor for preventing unequal outcomes. In reaction to these limitations to enhance change, some people propose **affirmative measures**, such as participation quota for poor households or for female users. Others, however, consider such conditions to be anti-participatory.

These points of view can be considered extremes on a gliding scale between respecting status quo in a community and seeking to press for change. In between are many combinations of improved participatory approaches and conditions set by outsiders (see Figure 8).

Examples of conditions set by outsiders (projects and/or governments) are:

- Definition of formal water rights⁷⁰
- Fixed percentages of representation at waterusers' boards, for example fixed percentages of small, middle and large landholders, fixed percentages of female board members.
- Definition of internal procedures and regulation, for example defining the organizational model, functions of members of the board, number of general assemblies a year, election procedures.
- Definition of general rules for distribution, for example the amount of water per capita/ hectare.
- Definition of tariffs and tariffs structures
- Definition of sanctions

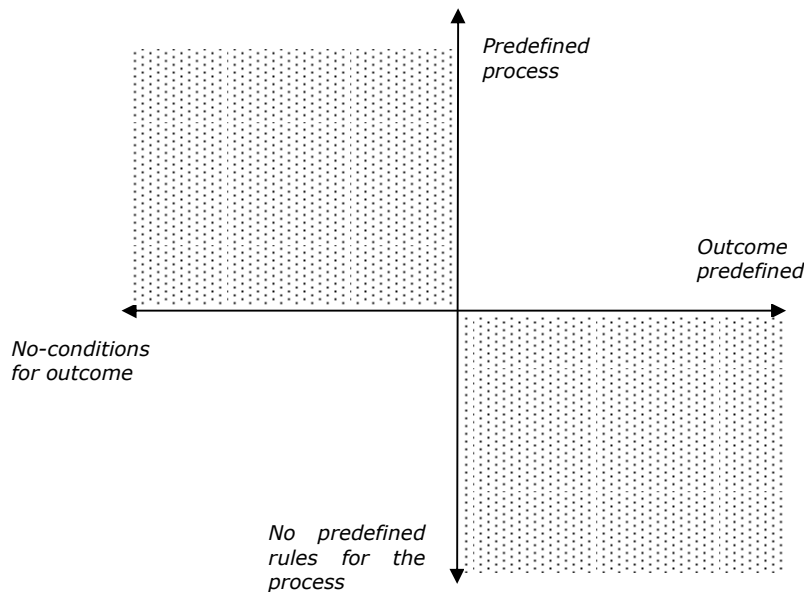


Figure 8. Extremes of conditionality (of outcome) and participatory process control, marked areas define the range of options generally available to practitioners.

Most of the above mentioned conditions have been criticised for being **cultural imposition** (see part on justice and equity in water management) and for providing perverse incentives. Especially the definition of quota for female participation in waterusers' boards has been criticised because it would oblige women to participate, create virtual participation and does not really change female exclusion from decision making. Moreover, it is pointed out that such external conditions generally are not sustained over time (only exist on paper) and do not strengthen local water management capacity.

Practitioners generally say that conditions only help if its implementation is accompanied by information, training and adequate facilitation. Impact of setting external conditions should be well monitored, in order to detect perverse effects. In project settings, conditions should be clearly explained and negotiated from the start, with no hidden agendas. The line between negotiation of conditions, and using conditions for manipulation/ abuse is easily crossed.

⁷⁰ Reference rights, see previous section on equity and water rights.

There are in fact, many aspects in which facilitators may improve quality of participatory processes, in order to promote more equitable outcomes (see Box 24 for recommendations for equity by IRC). Crucial for such improvements is the facilitators' knowledge of the community, of livelihood strategies of different socio-economic groups, the amount of time that he or she may dedicate to that area and the pace of the process as a whole. Up-scaling and economic reforms put stress on such requirements.

Equity and Demand-Responsive Programming Approaches

Demand Responsive Programming - Equity - The demand- and equity equation: a checklist

The concept of equity refers to sharing of benefits and responsibilities for water and sanitation facilities in a balanced way among different groups and different communities. However, in the context of the water and sanitation sector, the fact that water has an economic value can come into conflict with the need to ensure everyone gets at least a minimum level of access. This conflict lies at the heart of an important debate in the sector over the relation of the newer programme approaches? specifically demand-based approaches? to fundamental considerations of equity and the distribution of benefits in water and sanitation programmes. Put simply, the question at issue is: For water and sanitation programmes, what are the implications for equity of demand-driven approaches?

[...]

The demand-and-equity equation: a checklist

Examples of pertinent issues relevant to equity in water and sanitation are listed in the following paragraphs. In order to relate them to demand-based approaches, they are clustered under the four design and implementation headings.

Eligibility criteria:

Initial communication:

Do all communities have equal knowledge about the programme? Can at least one person in all households describe some requirements of the programme?

Is it understood equally well by different groups (men and women? different ethnic groups? rich and poor?)

Do methods of application (for example, the type of written formats, the timing and method of payments) favour one group over another, unrelated to their real demand?

Area and village selection:

Is the programme clear about the difference between eligibility criteria based on need and which are based on demand? What does it do about this?

Does negative political interference jeopardise fair and transparent area/village selection?

Management groups:

Who is the community that is involved in water and sanitation projects and how are these community members identified? The demand-driven approach requires considerable initiative within the group of potential users. However, faced with the challenges of logistics and capacity in communities, at least some projects seem to contact and work through a few individuals who may form a barrier, rather than a bridge, to those who demand and will pay for services of their own choice.

Location and coverage:

Who selects locations of sanitary facilities and water points, and how are they selected? Does the selection process favour some groups unfairly?

Does the current or proposed location of the facility provide fair access (taking into account technical feasibility of different locations) to women? to the poor?

Check: Why do some groups not use the service or facility?

Technology choice and service levels:

Selection:

Is the technology selection biased in favour of richer or more powerful groups?

Did some groups (women, for example) want less expensive technologies in terms of cash, operation and maintenance, labour? Why? What was done about this?

Timing:

When is the service available? Is this timing equally convenient to all groups (for example for richer and poorer women)?

Who makes rules about the timing and who is consulted?

Service level:

Is the service provided to those in greatest need when they want it? What is the desired level of use for domestic purposes?

Does the least-cost latrine technology provide a hygiene advantage over current practice?

Cost-sharing for implementation and construction

Subsidy:

Did the users of more expensive technologies receive a higher subsidy than groups with less expensive technologies?

Is the implementation delayed a long time after the prospective users have completed their payments in cash and kind?

Ownership

Are the standposts, water points or latrines perceived to be owned by one or a very few persons? Why? Who uses the facility? For water, mapping is also a useful check for this.

Community payment for sustained operation

As was noted at a meeting on Demand Responsive Approaches (Mangochi, Malawi, June 1997), "In order to ensure that disadvantaged and isolated communities are not left out in the application of the DRA, the financing and technology strategies should be appropriate for them to sustain the water services. Community participation should be committed up front and coping mechanisms should be enhanced to ensure community capacity to fully pay for O&M. A major effort should be undertaken to raise awareness of the various sources of funds and mechanisms to reach the remote and isolated areas."

(Piped water): Are there graduated or flat water tariffs?

(Point sources): Do water charges limit the amount of water taken by some families or drive them to less safe sources?

Has the project taken a decision about replacement of equipment? Are books available and up do date?

Where are the payments?

What happens to the money that is paid by consumers? Where is it kept? How is it used in reality?

A few questions, preferably fewer than these, could serve as a basic checklist for examining the demand-and-equity equation. Answers to most of these questions can be gathered, on a small sample, with relatively little effort. In many projects, the answers to some of these questions are already known. These answers should be communicated and, where needed, acted upon? a process that may sometimes require both will and special management capacity. It should go without saying that, as part of the 'learning culture' approach, it is necessary to answer such questions and act on this information. The suggestion is that the debate begin at the policy-making level, but then go beyond it, attending to the realities of the communities in which projects and programmes are implemented. Thus, the point is to involve the practitioner?the manager, supervisor, field worker, water committee, women's group, user, politician?in investigating and acting on this important issue.

For professionals, this checklist is meant to stimulate some basic discussion. Have key issues been addressed in this checklist? Is this approach of developing and applying tools at the programming level feasible and worth the effort? Are there other strategies - possibly better strategies - that will address the relation of demand-sensitive approaches and needs for equity in our programming?

Box 24. Part of the demand and equity equation checklist developed by IRC, for complete checklist (see: www.irc.nl)

So ideally in every situation, a **balance** should be found somewhere between conditioning and participatory process quality. Monitoring and learning is essential for finding such a balance, especially if it is participatory monitoring and learning. In that case equity concerns should be put explicitly on the agenda. Particularly important for good participatory monitoring is that views of non-users and non-members of the water committee are heard as well.

4.4. Gender equity and water management⁷¹

In most countries, men and women have different roles and responsibilities in the household, and often also with regard to water management. With regard to **drinking water and sanitation**, for example, women are often the ones who collect water and bring it to the house, the use water for cooking, cleaning, washing. Moreover, often women are considered to have relatively more responsibility for family hygiene and health. If water supply and sanitation services are of low quality, women bear most of the consequences, because they take care of ill children. If drinking water is found at large distances, those who bring the water, women and children, see their time for other activities (education, economic activities) considerably reduced. Absence of

⁷¹ For general information about gender see the portal dedicated to that topic.

sanitary services, affects privacy and personal safety, which is more delicate for women and girls.

This is not to say that men are not concerned or affected by low quality services. Obviously they also use water for drinking, personal hygiene etc, they are also worried if their children become ill. The fact that roles and responsibilities are different, simply implies that preferences and detailed knowledge about use, may differ along gender lines.

While the roles and responsibilities of women in domestic use of water are easily recognised because they are part of female responsibilities in the household sphere, **productive use of water** (irrigation, livestock) is usually considered a male domain. However, with regard to productive use of water no generalisations can be made about gender labour divisions. Detailed field research on female participation in irrigation, show that labour division changes according to region, production system and socio-economic and household situation. In addition to that it is important to remember that a lack of or limited physical labour contribution to productive water use, does not exclude knowledgability, involvement in decision making or economic dependency on such activities⁷². Too often and too easily it is assumed that the role of women in productive water use is limited or insignificant. Also, more than domestic use of water, roles and responsibilities in productive water use are subject to changes related to shifting livelihood strategies, resource degradation and not in the last: migration.

For a long time, the importance of female participation in water projects was argued on the basis of female labour and/ or **gender differentiated needs** to design, distribution, organisation etc. Research tried to identify such needs, in order to show how water systems design, distribution schedules, organisational models etc could be made less gender biased. Such gendered needs are more easily found in domestic water use, but, even though some needs are mentioned more frequently by women than men (see Box 25 for examples), diversity of livelihood systems is such that no universal gendered needs to water management can be identified. Moreover, within systems, labour division and responsibilities are affected by socio-economic situation, household composition etc., creating significant diversity of needs among men and women.

Apparent gendered needs to water management

- Both irrigation engineers and drinking water engineers find that women are relatively more interested in multiple water use of supply systems. For example use for washing or drinking (human or livestock) of irrigation canals, use for homegardens and livestock of drinking water supply systems. This puts additional requirements e.g. on the negotiation phase and system design.

- With regard to sanitation, women are relatively more interested in sanitary facilities close to the home, for defecation, for personal hygiene (also washing children) and some provisions, not necessarily household based, for washing.

- It has been found that the absence of private sanitary facilities at schools, negatively affects girls' attendance, especially in adolescence.

- Most women prefer not to irrigate (receive irrigation turns) at night, though in one some case it was found that most night turns go to women because of their lack to influence scheduling decisions.

- In many places, men assume main productive activities and cash crops, whereas women assume complementary productive activities and consumption crops (unless they are de facto or de jure female heads of households). Investment in irrigation tends to favour main productive activities, sometimes affecting land or water available to complementary activities. This might negatively affect female income and family nutrition.

Box 25. Apparent gendered needs to water management

⁷² Often it is suggested that women do not need to be involved in irrigation water management because often they do not contribute labour to physically demanding activities such as land preparation. This same argument is not applied to rich farmers that use hired labour for such activities.

The point is that men and women both will have needs and opinions about water management (design, operation and maintenance, organisation) that are not necessarily the same. Gender biases in design, O&M, organisation etc. may **affect both sustainability and effectiveness of service delivery**. Therefore all water management interventions should at least part from some basic knowledge of local gender relations (in relation to water) and strategies for involvement of both sexes, because:

- Intrahousehold interest are not always homogeneous
- Heads of households are not always fully informed of all details and preferences of water use.
- Even if communication in a household is fluid, training and information about the O&M of water systems is generally not passed on to other members.
- One of the most critical factors for system sustainability is its capacity to deal with internal and external conflicts.

A part from effectiveness and sustainability of water systems, involvement of both men and women, as well as the relevance to analyse gender relations are also sustained on the basis of men and women's **equal rights** to benefit from natural resources, investments, and other opportunities related to water management interventions (training, generation of leadership skills, social recognition). In addition to that for some water projects or management interventions, contributing to gender equity is one of its objectives.

Appropriate strategies for gender balanced water projects and management interventions, should always part from an applied gender analysis and open dialogue with men and women (separately). Opinions about and proposals for a particular situation should always part from a joint analysis with women (and men to a lesser extent) and not impose far-going measures without such consultation. For example female participation in water users' organisations is sometimes no priority for women, not because of their lack of interest in the topic, but because the organisations are ineffective or because they have other ways of influencing decision making. Obviously, logistics of a participatory process (place, time, date, duration, methodology, spatial arrangements of activities) should be adapted to preferences of both men and women.

In spite of the need for dialogue, slow paces and so on, a lack of female involvement should not too easily be accepted as a natural status quo, because the confidence required to discuss such things develops slowly. Sometimes external requirements of female involvement by projects may provide an additional argument for a woman to justify her participation to other members in the household. In other cases, such participation quota become a burden to people who already have a heavy workload and do not expect much from meetings. In many cases, both the system and the people will benefit, if a diversity of views are taken into account. In most cases, explicit recognition of (reference) rights for men and women individually or explicit registration in the name of both spouses will be evaluated positively by women. Even though this may not result immediately in more female participation in committees, it does provide them with (a feeling of) additional backing when conflicts arise or when for other reasons they have to deal with the committee or officials about water issues.

Just as for equity issues in water management in general, time availability, presence (frequency of contact) and knowledge of facilitators about the community and its different livelihoods strategies influence positively. Also the presence of both male and female facilitators is helpful.

A part from the many organisations that are dedicated to promote gender equity in general, there are several **organisations** working on the topic of gender in relation to water management:

- The [Gender and Water Alliance](#) is a network of individuals and organisations interested in the topic, they validated a list of golden rules initially developed by IRC. (see Box 26)
- IRC with PAS have published the METGUIDE, a methodological guide for participatory monitoring in water and sanitation where gender is incorporated. http://www.wsp.org/pdfs/global_metguide.pdf
- IWMI does research on the topic in relation to poverty, gender and water. It has a resource page on this: www.iwmi.cgiar.org/respages/PGW/index.htm
- UNDP made a resource guide for mainstreaming gender in water management, a practical guide to sustainability in cooperation with the Gender and Water Alliance (www.undp.org/water/genderguide)
- INPIM dedicated a section to the issue.

Ten "Golden Rules" for a Gender Approach in Drinking Water and Sanitation Programmes

Thanks to the experience gained by training courses, IRC developed ten golden rules of strengthening a gender approach in water and sanitation programmes. These rules were validated by the Gender and Water Alliance in 2003. Full version of the text may be consulted at www.irc.nl/page/4395.

Information: Make sure that information reaches all women and men. Different groups use different channels and they also differ in literacy and areas of interest;

Mini-gender analysis: Discuss with women and men how work and decisions in water supply and sanitation are divided. Asked about who decides, both men and women usually say the men. Discussing the process often reveals that both sexes play a role. Both groups also often come to their (own) conclusion that women do much of the work, but are not much involved in decisions. This provides a good basis for discussing implications and change;

Facilitation of meetings: Ensure women and men can equally well take part in meetings by taking specific measures: times and locations are suitable for both sexes, men understand and support the value of women's participation, women are informed and encouraged to attend, seating and language are arranged so that all can hear and understand, speaking out by women is facilitated (women sit together, breaks for internal discussion, choose spokeswomen, etc.), women's views are included in the minutes and reflected in decisions, if needed a separate meeting is held with (poor) women, e.g. at their places of work;

Planning decisions: Ensure -and collect evidence- that (poor) women and men have had a say in, and all groups achieved mutually agreed decisions on, at least the following decisions: types, design and location of facilities and decisions on local maintenance, management and financing systems;

Organizations: Determine [by law] that a minimal proportion of members of planning and management organizations is female. Enable women and men of the different groups to choose their own representatives on the basis of suitability and trust for the various tasks. Encourage that women are chosen in financial positions as they tend to be more trustworthy. Help establish locally agreed rules and procedures for representatives to regularly account for their work to those who have chosen them;

Hygiene education: Involve women and girls as planners, change agents and managers, not as passive audiences. Have separate hygiene programmes for men which address their own responsibilities and practices as well as gender relations that affect health/hygiene. Gender-blind hygiene promotion often gives women and girls more work, do not address the male control of resources and overlook that young women can often not change behaviour of male relatives and go against hygiene views of older female relatives;

Training and employment: Make sure that both sexes are trained for technical, managerial and hygiene tasks. Adapt training to the requirements of women (place, methods, duration). Achieve an equitable division in paid and unpaid jobs and jobs with a higher and lower prestige;

Means for improvements: Ensure that credit, materials and skills for making own water/sanitation/hygiene improvements are available to women and men. Link water and sanitation projects with livelihood approaches;

Gender-sensitiveness and skills: Achieve, on the basis of a participatory analysis of their own experiences and interests, that agency staff and management, and staff of training institutions, are aware why gender is important and practice gender approaches;

Staffing: Employ female staff and equip them, as well as male staff, for dealing with gender issues. Work in cases of shortage of female staff with gender-sensitive male staff who in their turn work with local female intermediaries (local women of whom the communities accept that they work directly with male outsiders).

Box 26. Ten Golden Rules for a Gender Approach in Drinking Water and Sanitation Programmes

Over the years, a lot of interesting field work has been done in the related to gender and water management, although a lot was never written down:

- Combining strengthening of irrigation water users' organizations and female participation with alphabetization for users. (Licto, Ecuador)

- Working both capacity building for female waterusers, strengthening and sensibilization of irrigation management organisation and support to female board members in the organization. (Chancay- Lambayeque irrigation organisation , Chiclayo, Peru)
- Gender training to men and women, and working with schoolchildren (colouring for health) in the water and sanitation project PASOC in Nicaragua
- Work on impact of wells on female workload in Benin
- Work on community management of funds for a drinking water project in the highlands of Cusco, Peru.

In the past, attention to **gender** often resulted in a **separate** project component, a separate specialist and/or office responsible for incorporation gender issues into the project or line of work. Though a certain amount of specialist knowledge and skills is indispensable, and a lot of hard work has been done as well, this segregation was seen as one of the major obstacles for obtaining more impact. Limitations were for example:

- The fact that a special unit, office, component or specialist would exist, resulted in other not paying attention to gender anymore
- A great deal of the time and effort of the people responsible for gender was dedicated to convincing and involving other members of the team, which sometimes even created irritation and resistance against the issue.
- Sometimes such units, offices, specialists would work exclusively with women groups, who therefore would not participate in other activities.

In reaction to these shortcomings came calls for **mainstreaming gender** in drinking water and sanitation, in irrigation, and in integrated water resource management. This is a major challenge, because mainstreaming requires fundamental changes in organisations that work with waterusers' organisations. (see part on institutionalising participation). A lot has been written about the subject, but no magic formula is found. Nanzeen Kanji in her paper about [Mind the Gap](#)⁷³, suggests the following lessons on mainstreaming:

- The importance of developing practical strategies on the 'how to' of gender mainstreaming – within specific policies, programmes and projects – and to provide follow up support to people working to mainstream gender in a variety of settings.
- Gender champions – working with external allies – can change institutional environments, even when they are inhospitable. Prospects for change are greatest when a) internal structures allow for the open expression of dissent and make it possible to bring conflicts out into the open, converting them into opportunities to deepen levels of mutual trust and understanding in the organisational environment, and b) there is external pressure from strong national and international women's constituencies as well as strategic alliances to promote change.
- Beliefs and values of facilitators and change agents cannot be underestimated – they are of fundamental importance. Experience shows that positive gains are usually made in different organisational contexts when individuals with strong values of equity and social justice are in positions that allow them to promote actions in support of these values.
- Training is no magic bullet (as it was sometimes viewed by agencies) and changing attitudes and norms is a long slow process. One of the key issues is how dependent mainstreaming is on individual change agents – as they move on, organisations and programmes can revert to 'business as usual' and processes of change that may have been set in motion may not be strong enough to maintain

⁷³ Nanzeen kanji, [Mind the Gap, Mainstreaming Gender and Participation in Development](#), International Institute for Environment and Development (IIED) and Institute for Development Studies (IDS), 2003.

independent momentum. Feed back, follow-up and organisational change is indispensable complement of training.

- Even the most comprehensive approaches to institutionalising gender do not emphasise enough the importance of organisational change, particularly organisational norms and culture. But changing organisations – their structure and practice as well as their incentive and accountability systems – is particularly difficult in the mood of neo-liberalism that seems to permeate most conventional organisations today. This is because cost and ‘efficiency’ considerations over-ride concerns for more gender-aware, participatory practice, which is also more time-consuming and demands more courage and innovation.
- While a greater number of development organisations now use the terms ‘gender’ and ‘governance’, the extent to which shifts in terms and concepts have been reflected in policymaking, practice and in organisational structures is debatable. Change can all too easily become reduced to inventing new language and discourse, without any positive effects on the lived experience of marginalised groups.
- Too much a focus on the “technical aspects” of gender mainstreaming, such as development of tools, planning methods etc, can lead to little attention to differences in power and social processes. As one gender advocate working for government puts it: “We have struggled to develop sophisticated tools, plans, and indicators to gain legitimacy and support from powerful ministries of planning and finance. They have become so complex, they are difficult to implement and take a long time to “trickle down”.

Also in the case of gender mainstreaming, **monitoring and learning** at appropriate levels is crucial for achieving change (changing attitudes, developing adapted methodologies). Therefore several sets of gender indicators have been developed. A specific indicator is the so-called gender budget, which is not - as the name might suggest-, the budget allocated to a gender component, but a gender disaggregated revision of the all budget expenditure.

4.5. Rights based approaches to water

As mentioned in the part on equity and water rights, reference water rights in itself do not guarantee that people have access to water, but they do provide a starting point for struggle to gain access. This is the central motivation for promoting rights based approaches.

In general terms a ‘rights-based approach’ is one that promotes a recognition that people are entitled to their rights, and that governments have an obligation to direct action and resources to respect, protect and fulfil human rights. In a rights approach, all people, including poor and marginalised people, are recognised as claimants with entitlements and the right to make choices about how scarce resources are allocated in the process of realising their rights [Oxfam, www.oxfam.com]. Analyzing and enhancing the capacity of citizens to claim their rights and make authorities accountable is central to this approach. For example, this is done by strengthening political participation and direct representation of poor people in decision making.

Recognition of water as a human right would thus –theoretically- enable people to demand water (with quality, quantity and opportunity⁷⁴) to their authorities and/or the international community. It can be a starting point to question inequity (see Box 27).

Anne Platt of Worldwatch Institute reports that a family in the top fifth income groups in Peru, the Dominican Republic, or Ghana is, respectively, three, six, or twelve times more likely to have water connected by pipe

⁷⁴ Obviously characteristics would depend upon how the right is defined.

to the home than a family in the bottom fifth in those countries. Because they lack access to publicly subsidized utilities, says Platt, the poor often end up paying more for their water than do the rich because they must obtain it from illegal sources or private vendors. In Lima, Peru, for instance, poor people may pay a private vendor as much as \$3 for a cubic metre of water, which they must then collect by bucket and which is often contaminated. The more affluent, on the other hand, pay 30 cents per cubic metre for treated water provided through the taps in their houses. Hillside slum dwellers in Tegucigalpa, the capital of Honduras, pay substantially more for water supplied by private tankers than they would even if they paid for the government to install a water pipe. In Dhaka, Bangladesh, squatters pay water rates that are twelve times higher than what the local utility charges. In Lusaka, Zambia, low-income families pay, on average, half their household income on water.
From [B. Marlow, Blue Gold, 2002

Box 27. Differences in payment for water (in: Marlow, 2002)

The fact that the human right to water is such an important starting point for struggle had the consequence that there is a lot of **debate** (globally) about the content of such a right⁷⁵. This started with the fourth Dublin principle that introduces the notion of water as an economic good (though it also says that all humans have a basic right to water at an affordable price). Then, at the third World Water Forum in Kyoto (2003) there was an unsuccessful but significant lobby for the recognition of a fundamental human right to water. Moreover, in 2002, the General Comment N° 15 of the UN Committee on Economic, Social and Cultural Rights was approved⁷⁶. Wedgwood (2005) says that the General Comment does not entail a large modification compared to the Fourth Dublin Principle, because as she says:

"After eleven years of debate, the General Comment does not differ markedly from the Dublin Principle – except that the Dublin Principle was a fudged definition of water as a commodity to be bought and sold but it had to be affordable to individuals because it's a basic right and the recent General Comment cleverly swapped the argument round and said that water is a basic right but must be affordable, therefore, assuming implicitly that there is a price, which means that it's a commodity."

The right to water was also one of the key principles of the Alternative World Water Forum (Geneva, 2005), including not only drinking water but also a minimum amount of water for productive uses. In this forum an attempt was made to find ways for practical implementation of that right, through the proposal of legal, financial and democratic instruments.

Compare those three texts on water rights in the following boxes (Box 28, Box 29 and Box 30):

Fourth Dublin Principle

Principle No. 4 - Water has an economic value in all its competing uses and should be recognized as an economic good

Within this principle, it is vital to recognize first the basic right of all human beings to have access to clean water and sanitation at an affordable price. Past failure to recognize the economic value of water has led to wasteful and environmentally damaging uses of the resource. Managing water as an economic good is an important way of achieving efficient and equitable use, and of encouraging conservation and protection of water resources.

Dublin principles, source: <http://www.wmo.ch/web/homs/documents/english/icwedece.html>

Box 28. Fourth Dublin Principle

⁷⁵ That means, there is a lot of debate about who should be the right holder, what is the justification, what is the entitlement and who should be the obligation holder to provide the right to water.

⁷⁶ See: Substantive Issues Arising in the Implementation of the International Covenant on Economic, Social and Cultural Rights, General Comment No. 15 (2002), The right to water (arts. 11 and 12 of the International Covenant on Economic, Social and Cultural Rights), <http://www.unhcr.ch/html/menu2/6/gc15.doc>

*The human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses. An adequate amount of safe water is necessary to prevent death from dehydration, to reduce the risk of water-related disease and to provide for consumption, cooking, personal and domestic hygienic requirements.
See the United Nations Human Rights Website, International Covenant on Economic, Social and Cultural Rights, [general comment No. 15](#)*

Box 29. General Comment No. 15, The right to Water

*"... the fundamental principle that:
Water for drinking, cooking/nutrition, for hygiene (potable water, basic "household" water needed to live, of which the WHO has estimated that each person needs 50 litres per day)
And Water for agricultural and industrial production and those tertiary activities that are indispensable to the life of a human community (water for the security of collective existence, of which the WHO and FAO have estimated that each person needs 1,700m³ per year for all uses)
Are an integral part of the basic human right to water, at both the individual and collected level. This right is based on the need for access to water for vital human uses, and no one may be deprived of this access for any reason whatsoever.
The right to water should not be decided by a series of choices. It is no negotiable or reversible. It is universal and indivisible, ... Thus, it is the responsibility of the community, meaning its institutions and public authorities, to ensure the conditions (legal, administrative, economic, financial, social...) needed to ensure that this right is truly available to everyone and that all humans are guaranteed the quantity and quality of water sufficient for human life and the security of collective existence,, This does not mean that this right can or should be satisfied in any manner, particularly by "non-sustainable" practices at the social, economic levels."
Discussion paper theme 3, Alternative World Water Forum Geneva, 2005*

Box 30. The right to water as defined at the Alternative World Water Forum, 2005

Two main **questions** remain:

- 1 Is it really contradictory to see water both as a human right and as a commodity?
- 2 What implications does the right to water have in practice?

In relation to these questions, many people say that there is no contradiction, but that in practice finding a balance between social, economic and environmental interests needs constant monitoring and efforts. Furthermore, some point to the limitations of regulatory capacities in developing countries and international power asymmetries that affect the autonomy of countries in protecting the interest of their poor people⁷⁷.

Locally the right to water implies priority of domestic use over other uses, and sometimes even the faculty of the government to expropriate private land where water sources are located. Without questioning the principle itself, it is worth mentioning some critics:

- The principle tends to favour urban interests over rural interests
- Domestic water use is not always strictly domestic, in larger urban centres gardens are watered, cars are washed etc., and in smaller towns drinking water is used for livestock, irrigation of home gardens.
- The principle does not provide an incentive for improving efficiently of water conduction and use.

⁷⁷ [The General Agreement on Trade and Services \(Gats\) and the Basic Right to Water](#), Lyla Mehta and Birgit La Cour Madsen, Institute of Development Studies, University of Sussex, August 2003, Paper Prepared for the Research Project on 'Linking the WTO to the Poverty-Reduction Agenda' (Part of the DFID-funded Globalisation and Poverty Research Programme)

Finally, most people think that governments are considered to be the **obligation holders** of providing the right to water to all their citizens. However, what does that mean in the case of resource poor governments? For example, should and can governments really be responsible for the sustainability of services in rural areas in poor countries? The question is where governments' obligations end and users' obligations begin...

5. REFERENCES

- BALLESTERO, M., BROWN, E., JOURAVLEV, A., KÜFFNER, U., ZEGARRA, E., "Administración del agua en America Latina: situación actual y perspectivas", serie Recursos Naturales e Infraestructura N°90, división de Recursos Naturales e Infraestructura, CEPAL, Santiago, Chile, 2005, 76p.
- BEAUCHAMP, T.L., "Philosophical Ethics, an introduction to Moral Philosophy", second edition, Georgetown University, McGraw-Hill Inc., U.S.A., 1991, 431p.
- BLOK, K., "Capacitándonos, SNV, IPROGA, IMAR, CEDEPAS, Lima, Peru, 2000,
- BOELENS, R., "Equity and rule-making", in: BOELENS, R. and G. DAVILA (Eds.), "Searching for Equity, conceptions of justice and equity in peasant irrigation, Van Gorcum, Assen, The Netherlands, 1998, pp. 16-34
- BOELENS, R. and ZWARTEVEEN, M., "Las dimensiones de género de los derechos de agua en los sistemas de riego andino", in: BOELENS, R. and HOOGENDAM, P. (Eds.), "Derechos de Agua y Acción Colectiva", IEP Ediciones, Lima, Peru, 2001, pp. 112-152
- BRUNS, B., MEINZEN-DICK, R. (eds),"Negotiating water rights", IT publications, London, U.K. 2000, 326 pages
- BRUIJN, K. de, "Análisis del Pronóstico Hídrico y su Relación con la Planificación de la Campaña Agrícola", Libro de Trabajo 10, IMAR Costa Norte and Wageningen University, 1999, 96p.
- BRUIJNZEEL, L., "Hydrological functions of tropical forests: not seeing the soil for the trees?", in: Agriculture, Ecosystems and Environment 104, Faculty of Earth and Life Sciences, Vrije Universiteit, Amsterdam, The Netherlands, 2004, pp 185-228
- CAIRNCROSS, S. "Sanitation and water supply: Practical lessons from the decade, Water and Sanitation", Discussion Paper No 9, Water and Sanitation Programme, Washington DC, 1992
- CARDONE, R. FONSECA, C., "Financing and Cost-recovery", IRC Thematic Overview Paper (TOP), IRC, Delft, The Netherlands, 2003, 117p. (download from www.irc.nl)
- DEGREGORI, C., "Peru: identidad, nación y diversidad cultural", in: HEISE, M., "Interculturalidad: Creación de un concepto y desarrollo de una actitud", Programa FORTE-PE, Lima, Peru, 2001, pp87-96.
- DEL CASTILLO, L. et al., " La Legislación de Aguas en el Perú", Informativo legal agrario N°20, CEPES, Lima, Peru, 2004,60p.
- DEVERILL, P; BIBBY, S; WEDGWOOD, A; SMOUT, I, "Designing water and sanitation projects to meet demand in rural and peri-urban communities, book 1 concepts, principles and practice". Water Engineering and Development Centre (WEDC), Loughborough University, Leicestershire, U.K. 2002, 184 p. www.wedc.lboro.ac.uk/projects/new_projects3.php?id=36:%20book%201
- DOUROJEANNI, A., "Gestión Integrada de Recursos Hídricos: ¿Otra meta teórica?", Cuarto Dialogo Interamericano sobre Administración de Aguas, Foz de Iguazu, Paraná, Brasil, 2001, 30 p.

FAO Participation Website, <http://www.fao.org/participation/>

FAO and INPIM, Electronic conference June 2001 , Overview Paper: Irrigation Management Transfer, Sharing Lessons from Global Experience, June 2001

FOSTER, V. "Ten years of Water Service Reform in Latin America: towards an Anglo-French model", Water Supply and Sanitation Sector Board Discussion Paper Series, Paper No. 3, The World Bank, 2003, 24p.

Halsema, W. van, SNV Reference CD on land and water management, SNV the Hague, 2004.

HENDRIKS, J., "Legislación de Aguas y Gestión de Sistemas Hídricos en Países de la Región Andina", documento de trabajo elaborado en el marco del Proyecto Water Law and Indigenous Rights (WALIR), september 2004, 53p.

Hoekstra, A.Y. and Hung, P.Q. (2002) Virtual water trade: a quantification of virtual water flows between nations in relation to international crop trade, Value of Water Research Report Series No.11, IHE, the Netherlands.

HOPE, A. and S. Timmel, "Training for Transformation, a handbook for community workers", revised edition, Mambo Press, Gweru, Zimbabwe, 1996, Volume I, 175p., Volume II, 131 p., Volume III, 200p.

IRC, Demand Responsive Programming - Equity - The demand-and equity equation: a checklist, at IRC website: <http://www.irc.nl/page/3563>

Decentralized wastewater management in peri-urban areas in low-income countries Jonathan Parkinson and Kevin Tayler, Environment&Urbanization Vol 15 No 1 April 2003, page 75-90

Kar, K., "Subsidy or self-respect? Participatory total community sanitation in Bangladesh", IDS Working Paper 184, IDS, Sussex, U.K., 2003, 50p.

KLARENBECK, M. and R. MEZA, "Intercultural Equity, a track, its steps and techniques, methodological guideline to incorporate the intercultural equity value in development work", SNV, Lima, Peru, 2003, 67p.

MOHAJERI, S., KNOTHE, B., LAMOTHE, D., FABY, J., "Aqualibrium, European Water Management between Regulation and Competition", Directorate-General for Research Global change and ecosystems, European Commission, Office for Official Publications of the European Communities, Luxembourg, 2003, 352p.

MOLLINGA, P., "On the Waterfront, waterdistribution, technology and agrarian change in a South Indian Canal irrigation system", Proefschrift, Wageningen, The Netherlands, 1998, 307 p.

MORIARTY, P., VISSCHER, J.T., SAADE, L., BLOKLAND, M. , "Sector wide approaches for water and sanitation development", Netherlands Ministry of Foreign Affairs, The Hague, 2002. 110 p.

MORIARTY, P., BUTTERWORTH, J., "The productive use of domestic water supplies How water supplies can play a wider role in livelihood improvement and poverty reduction", IRC Thematic Overview Paper, IRC, Delft, The Netherlands, 2003, 57 p.

MORIARTY, P., BUTTERWORTH, J., BATCHELOR, C., "Integrated Water Resources Management, And the domestic water and sanitation sub-sector", IRC Thematic Overview Paper, IRC, Delft, The Netherlands, 2004, 48 p.

MORIARTY, P, FONSECA, C., SMITS, S., SCHOUTEN, T., "Background Paper for the Symposium: Learning Alliances for scaling up innovative approaches in the Water and Sanitation sector", IRC, June 2005, Delft, Netherlands, 52 p.

MUHUMUZA, F., TONER, A., Goodbye To Projects? The Institutional Impacts Of A Livelihood Approach On Development Interventions Research Project No. R7908 Department For International Development Working Paper Series Paper No 4 A Review Of Development Interventions And Livelihood Approaches In Uganda, Bradford Centre for International Development, University of Bradford, 2002, (www.brad.ac.uk/acad/bcid)

ONU/WWAP, " Informe de las Naciones Unidas sobre el Desarrollo de los Recursos Hídricos en el Mundo : Agua para todos, agua para la vida.", París, Nueva York y Oxford, UNESCO (Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura) y Berghahn Books, 2003

OSTROM, E., "Crafting Institutions for Self-governing Irrigation Systems", Institute for Contemporary Studies, California, U.S.A., 1992.

PAULET, M., "PROYECTO DE LEY DE AGUAS – ABRIL DE 2003, Parecer Técnico de Manuel Paulet Iturri", Lima, Peru, 2003, 8 p. [unpublished]

PETRELLA, R., "Water as a public good, public funding", Working document for workshop 3 at the Alternative World Water Forum in Geneva, 2005, Brussel, Belgium, 2005, 17p.

PIMBERT, M., "Institutionalising participation and people-centered processes in natural resource management, Research and publications highlights", International Institute for Environment and Development (IIED) and Institute for Development Studies (IDS), London, U.K., 2004, 43p.

ROCKSTRÖM, J., L. GORDON, C. FOLKE, M. FALKENMARK, and M. ENGWALL, "Linkages among water vapor flows, food production, and terrestrial ecosystem services", Conservation Ecology, SIWI, Swedish Natural Science Research Council, Stockholm, Sweden, 1999, <http://www.consecol.org/vol3/iss2/art5/>

ROJAS, J., VEGA, G., VOGEL, A., "Gestión Participativa de los Recursos Naturales para el Desarrollo Rural Sostenible, Experiencias en tres Microcuencas Altoandinas del Perú", Gerencia de Organización y Gestión de Microcuencas, Subproyecto Manejo Intensivo de Microcuencas Altoandinas (MIMA), PRONAMACHCS y SNV, Lima, Peru, 2004, 348 p.

SAMTAC/GWP, Integrated Water Resources Management, TAC BACKGROUND PAPERS NO. 4, <http://www.gwpforum.org/gwp/library/Tacno4.pdf>

SAVENIJE, H. G., "The Role of Green Water in Food Production in Sub-Saharan Africa", Article prepared for FAO at the 8th Stockholm Water Symposium, entitled: How do we feed a growing world population in a situation of water scarcity?, IHE, Delft, The Netherlands, 1998, 5p.

SOLANES, M., GONZALEZ-VILLAREAL, F., "Los Principios de Dublin Reflejados en una Evaluación Comparativa de Ordenamientos Institucionales y Legales para una Gestión

Integral del Agua”, TAC Background papers No. 3, TAC and GWP, Stockholm, Sweden, 2001, 44 p. (1998 English version)

Third World Centre for Water Management, Mexico, “Report on the impacts of mega-conferences on global water development and management”, support of Sasakawa Peace Foundation USA and Japan, Mexico, 2005, 15 p.

VOS, J., “ Metric Matters, the performance and organisations of volumetric water control in large-scale irrigation in the North Coast of Peru”, Proefschrift, Wageningen, The Netherlands, 2002, 237p.

WEDGWOOD, 2005,

WHO, Meeting on Small Community Water Supply Management Reykjavik, Iceland, 24-26 January 2005, WHO, Geneva, Switzerland, www.who.int/entity/water_sanitation_health/dwg/smallcomws.pdf

WINIPENNY, J. “Financing Water for All, Report of the World Panel on Financing Water Infrastructure”, Executive Summary, (panel chaired by M. Camdessus), World Water Council, 2003, 14 p.

WORLD BANK, “World Bank Participation Source Book”, www.worldbank.org/wbi/sourcebook/sbhome.htm

YODER, R., “Locally Managed Irrigation Systems, essential tasks and implications for assistance, management transfer and turnover programs”, IIMI, Colombo, Sri Lanka, 1994, 97p.