

Literature Review on Right to Water for Livelihoods

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1. Introduction

This literature Review has been carried out to come with an understanding of the principles and mechanisms in terms of quantities and norms for allocation of water across different sectors and livelihoods. It seeks to basically understand how allocations are made for irrigation and other allied agriculture or non- agricultural livelihoods like livestock rearing, horticulture, tanneries and brick making etc. It seeks to first give some understanding of the concept of livelihood, which will help us understand how water is allocated differently for different livelihoods. It then goes on to explain the principles and mechanisms of water allocation, by Dinar et al, which is by far most comprehensive understanding of mechanisms of allocation of water for agriculture. This is followed by a brief review of a few case studies and experiments by organizations working on water. Non-agricultural livelihoods have been examined in the context of multiple uses of irrigation water and intersectoral water allocation.

1.1 Defining Livelihood

The definition of 'livelihood' has been extensively discussed among academicians and development practitioners (see for instance Ellis, 1998, Batterbury, 2001; Chambers and Conway, 1992; Carney, 1998; Bernstein, 1992; Francis, 2000, 2002; Radoki, 2002). There is a consensus that livelihood is about the ways and means of 'making a living'. The most widely accepted definition of livelihood stems from the work of Robert Chambers and Gordon Conway: 'a livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living' (Carney, 1998:4). Ellis (2000) suggests a definition of livelihood as 'the activities, the assets, and the access that jointly determine the living gained by an individual or household'. Wallman (1984) who did research on livelihoods in London in the early 1980s approached livelihoods as always more than just a matter of finding or making shelter, transacting money, and preparing food to put on the table or exchange in the market place. It is equally a matter of the ownership and circulation of information, the management of social relationships, the affirmation of personal significance and group identity, and the inter relation of each of these tasks to the other. All these productive tasks together constitute a livelihood. For an anthropologist such as Wallman livelihood is an umbrella concept, which suggests that social life is layered and that these layers overlap (both in the way people talk about them and the way they should be analyzed). This is an important analytical feature of the notion of livelihoods.¹ One feature that these definitions and interpretations share in common is that they eloquently underline the generally accepted idea that 'livelihood' deals with people, their resources and what they do with these. Livelihoods essentially revolve around resources (such as land, crops, seed, labour, knowledge, cattle, money, social relationships, and so

¹ See <http://www.livelihood.wur.nl/?s=A1-Livelihood> .This section has been freely quoted for an understanding of livelihoods.

on), but these resources cannot be disconnected from the issues and problems of access and changing political, economic and socio-cultural circumstances.

Livelihoods are also about creating and embracing new opportunities. While gaining a livelihood, or attempting to do so, people may, at the same time, have to cope with risks and uncertainties, such as erratic rainfall, diminishing resources, pressure on the land, changing life cycles and kinship networks, epidemics such as HIV/AIDS, chaotic markets, increasing food prices, inflation, and national and international competition. These uncertainties, together with new emerging opportunities, influence how material and social resources are managed and used, and the choices people make.

An understanding of livelihood is important in this context as this determines our understanding of why and how water is allocated differently for different livelihoods. It is basically allocated depending on the way it is looked at, as a public good or an economic good. Water can be viewed as a basic human need, or a basic human right, a merit good, or an ordinary private good. In fact it is the very quantities that water is allocated in can be said to determine its allocation and the way it is regarded (Perry et al, 1997). It is this complexity of water that makes its allocation mechanisms difficult.

2. Understanding Water Allocation

Water allocation is influenced by the existing institutional and legal frameworks as well as the water resources infrastructure. The National Water Policy sees water as a basic human need and “in planning and operation of systems, water allocation priorities according to it should be broadly as follows: Drinking water, Irrigation, Hydro-power, Ecology, Agro-industries and non-agricultural industries, Navigation and other uses. However, the priorities could be modified or added if warranted by the area / region specific”². Irrigation being the biggest user of water, understanding water allocations for agriculture based livelihood are important. According to Dinar et al (1997) in *Water Allocation Mechanisms :Principles and Examples*, the objectives of water resources policy and the criteria for the allocation of water can be targeted via numerous forms of allocation, ranging from complete control by the government to a mixture of market and government allocation, to predominantly market allocation which may also require government intervention. The following section seeks to recap this analysis of water allocation. The authors identify the two principles of efficiency and equity as the principles to manage all scarce resources. Economic efficiency is the amount of wealth generated by a resource base. In an economically efficient resource allocation, the marginal benefit from the use of the resource should be equal across sectors (that is, uses) in order to maximize social welfare. In other words, the benefit from using one additional unit of the resource in one sector should be the same as it is in any other sector. If not, society would benefit by allocating more water to the sector where the benefits, or returns, will be highest and equity is the distribution of total wealth among different sectors. Resource allocation may also be based on equity. Equity objectives are particularly concerned with fairness of allocation across economically disparate groups, and may or may not be consistent with efficiency objectives. In the case of household water, for example, an equitable allocation of water resources suggests that all households, regardless of their ability to purchase water, still have a basic right to water services. Meeting this objective may entail providing government subsidies or free service, or perhaps adopting a differential pricing structure based on income.

² <http://www.nih.ernet.in/belgaum/NWP.html>

2.1 Criteria for Allocation

The authors also identify eight basic criteria for allocation.

Appropriate means of resource allocation are necessary to achieve optimal allocation of the resource.

- * **Flexibility** in the allocation of supplies, so that the resource can be shifted from use to use, place to place, as demand changes, making it possible to equate marginal values over many uses with least cost.

- * **Security** of tenure for established users, so that they will take necessary measures to use the resource efficiently; security does not conflict with flexibility as long as there is a reserve of the resource available to meet unexpected demands.

- * **Real opportunity cost** of providing the resource is paid by the users, so that other demand or externality effects are internalized. This allows the allocation to account for environmental uses with a non-market value (such as providing a habitat for wildlife). This also directs the employment of the resource to activities with the highest alternative values.

- * **Predictability** of the outcome of the allocation process, so that the best allocation can be materialized and uncertainty (especially for transaction costs) is minimized.

- * **Equity** of the allocation process should be perceived by the prospective users, providing equal opportunity gains from utilizing the resource to every potential user.

- * **Political and public acceptability**, so that the allocation serves values and objectives, and is therefore, accepted by various segments in society.

These criteria, frequently invoked in many water policy debates on the need for equity or fairness in water allocation, and whether or not these criteria are relevant in the case of water.

An additional set of criteria should include: (Winpenny 1994 as cited in Dinar et al 1997)

- * **Efficacy**, so that the form of allocation changes existing undesirable situation such as depletion of ground water, and water pollution, and drives towards achieving desired policy goals.

- * **Administrative feasibility and sustainability**, to be able to implement the allocation mechanism, and to allow a continuing and growing effect of the policy.

2.2 Water Allocation Mechanisms

According to Dinar et al 1997 in *Water Allocation Mechanisms: Principles and Examples*, there are **four water allocation mechanisms namely marginal cost pricing, public allocation, water markets and user-based allocation**. Traditionally, the dominant role of the state in the management of water resources has been rationalized based on the public good characteristic of water. However, inefficient use of the water, low recovery of the operation and maintenance expenses, mounting costs of developing new sources of water, and problems with quality of service in agency managed systems has led to a search for alternatives to increase the efficiency of water allocation and management. Marginal cost pricing, public, user-based, and market allocation are all found in a wide variety of contexts. No single type of allocation is best for all contexts. The requirements and outcomes of each need have to be carefully examined. There is an essential role for the state (public allocation) in the development and management of water resources, particularly under circumstances involving large scale systems. The state's interest in many water resource investments relates to their strategic importance, e.g. because of its role in increasing food security or public health. In addition to such positive effects that may not fully be captured by the private users, negative externalities associated with much water use (e.g., downstream pollution) call for a strong regulatory

role for the state. However, the resulting public allocation depends on the relative political influence of various stake holders. User-based allocation is generally more flexible than state allocation, but the high transactions costs for organizing users to develop systems and allocate water over large areas means that this type of allocation is more often found for small-scale systems and the tertiary level of major systems. However, the user organizations needed to provide these services are unlikely to be sustainable unless they also offer their members greater control over water. This means they must have decision-making authority for water allocation, as well as distribution. Such collective action is not likely to be equally effective in all locations. It is most likely to emerge where there is a strong demand for water, and a history of cooperation. Just as political power of different sectors affects the outcome of public allocation, the local influence of different groups (e.g. women, farmers, pastoralists) will influence user-based allocation patterns. Local social norms also have a major influence. Most societies have some norms giving priority to drinking water as a basic need that should not be denied to anyone inside or outside the group. However, some of these norms are subject to restrictions on users that would ritually or physically pollute the source. In India and in many places in the sub continent, caste purity and pollution restricts the access of low-caste households to water from many sources. They may be precluded from bathing or washing clothes or dishes, and even have to depend on high-caste members to draw drinking water for them.”(Ibid)

2.3 Understanding User Based Allocations:

Case Studies have been enumerated to give us a better understanding of water allocation in agriculture. Water as a common property is managed by user groups and these user based allocations are important in the understanding of water allocations for livelihoods. These user based systems are examples of common property systems owned and managed by a defined community and have certain critical roles in local communities. Berkes and Farvar (Berkes, 1989:11-13) summarized these functions under five headings:

Livelihood security:

Common property resource system ensures livelihood security. All members of the group are ensured equal access to the resource. Thus the basic needs of all members are met. All common property systems are characterized by the presence of arrangements for allocation of the resources among co-users (Bromley, 1985; Ostrom, 1986; as cited in Berkes, 1989:11)

Access equity and conflict resolution:

Common property systems normally provide mechanisms for the equitable use of resources within a minimum of internal strife or conflict. Rules mutually agreed upon by all members of the group provide an efficient means of conflict resolution and reduce “transaction costs” in the enforcement of these rules.

Mode of Production:

Common Property systems often form the basis for the systems of production. These systems tends to be set up at the sub villages or sub tribal levels and consist of work teams that include a number of households. Common property systems serve as interface, not only between society and resource, but also between the individual and society at

large. Social roles and obligations are often defined in terms of one's participation in work teams. Common property systems are an integral part of the local culture. Hunting, fishing and fruit gathering are a way of life rather than merely a means of earning a living.

Resource Conservation:

Common Property Resource Systems help in conservation of the resource utilized. This is mainly because there is an emphasis on taking what is needed. Any individual trying to appropriate more than his share is duly penalized according to the rules governing resources usage.

Ecological sustainability:

It has been argued that common property systems help in maintaining ecological sustainability. It is these systems that ensure that resources are not wasted and are used sustainably because resource conservation is very important for the users group depends upon the resources which ensures that it is conserved. The user group evolves mechanism, through trial an error process, to use the resource sustainably.

2.4 Common Property Resources (CPRs) and the Rural Poor

A large number of people particularly the rural poor, all over the world depend to a large extent on natural resources of land, water, forests, and fisheries for the supply of many basic necessities of life, e.g. food, fuel wood, small wood, shelter etc. (Gibbs and Bromley, 1989:22). The rural poor having little or no private property depend on CPRs. Distribution of private property today is the outcome of a process of interaction of various historical, cultural, social, legal political and economic factors (K. Singh, 1994:18). Common property resources were deliberately or accidentally set aside for communal use. These resources became, through convention and tradition, accessible to all the people, living in a community located closest to the resource. However, the poor, who had no private property resources, depended to a great extent on the CPRs that others who owned private property resources (Ibid: 19)

Large numbers of people in the rural areas depend to a large extent on CPRs for their livelihood. They collect, free of charge, firewood, crop wastes (gleaning), cow dung, weeds fodder, building materials (poles, thatch and silt), fruits and vegetables, herbs, fibre etc. from CPRs, Water which is essential for survival is also collected from community ponds, lakes, rivers etc. Besides, CPRs also provide raw materials for traditional occupations, including art and craft, and thus indirectly support employment in these occupations (Ibid).

According to Jodha (1990:A65) CPRs play a very significant role in rural communities, more so in the relatively high risk, low productivity areas, such as arid and semi-arid and tropical regions in India. He says that, "in villages in the dry regions of India, CPRs performs several functions. Their contribution to people's employment, income generation and asset accumulation (directly or through complementing the private resource based activities) are numerous. However being a part of routines, they are seldom recognized and recorded. This sort of invisibility of CPR contributions is more pronounced in the case of long term social and ecological processes characterizing dry areas. CPR contributions range from direct and more visible contributions in terms of physical supplies to the less visible gains implied by sustainability of agro- ecological systems."

Jodhas' study examines the dependence of the household economy of the rural poor their access to common lands. The study covered eighty-two villages from twenty districts scattered in seven major states in the dry tropical zone of India. The study defined the CPRs as including community forest, pasture/waste land, pond/tanks, rivers, rivulet, watershed drainage, river banks and river/tanks beds. The study found that the rural poor (i.e. agricultural labourers and small farm having less than 2 hectares of fairyland equivalent land households") derived the major part of their fuel and fodder supplies- from two thirds of four- fifths of the total from common lands. The common lands also made a significant contribution to their employment (128 to 196 days a year per household) and income (CPR income accounting 14 percent to 23 percent of income from other sources). Most importantly, Jodha concludes that the inclusion of CPR income brings about substantial reduction in the inequality in income distribution. Thus, clearly, the support provided by the CPRs is important in sustaining the household economies of the rural poor.

3. How are water allocations made in user groups?

The following case studies elaborate how water is allocated in user groups where water is a common property natural resource.

CASE STUDY: Pani Panchayats:

The Pani Panchayats in Maharashtra has been one such experiment. Water from the tanks has been used for agricultural purposes virtually revolutionizing the lives of several farmers in a predominantly drought prone area like western Maharashtra. Here, since the vast majority of farmers' livelihood depends on rainfall, water becomes the most important input in agricultural production and consequently the management of this natural resource assumes utmost importance. In a drought prone region, Western Maharashtra, early experiments in watershed management lead to increase in the water levels in the aquifer, motivating farmers to think on the issue of water conservation. This water conservation movement which eventually became institutionalized as the Pani Panchayats developed through an external catalyst, the Gram Gaurav Pratisthan set up by Vilasrao Salunkhe. The basic principles of this farmer managed irrigation system are as follows:

- Every family member is allocated water for cultivation at the rate of half an acre per head subject to a maximum of 2.5 acres per family. In other words 1000 m³ of water per head per year subject to maximum 5000m³ per family per year.
- Water lifted be shared by members is based on family size and not land holding.
- No water intensive crops can be grown. Thus leading to a strict ban on water intensive cash cropping such as sugarcane which is predominant in the region.
- Cropping patterns be decided by mutual consultation in the group.
- Water rights are not attached to land rights. This clear separation of water and land rights entitles those having a share in the group to be able to sell their water.
- Land for which the water is obtained under this project cannot be sold without the permission of the Pani Panchayat.
- Small lift irrigation schemes are built by joint efforts of farmers for common benefit.
- Water taxes to be paid by all members in 2 installments each year by the dates fixed by consensus failing which water supply will be cut off.

- All equipment connected with the project is kept with the Pani Panchayat. Money obtained from the taxes is deposited in an account in the project's name and all claims on the project are paid by the Pani Panchayat".
- The "Pani Panchayat" has the right to appoint workers/staff for the maintenance of the project and to decide on an honorarium to be paid to them.
- A meeting of all the members is held twice a month. At these meetings problems faced by members in getting water is resolved by all the members in accordance with the rules.
- Any action by a member contrary to the rules is severely punished.
- The allocation and membership is withdrawn in any case of rule violation by a member.
- The construction and management of the project and distribution of water and monitoring of crops is the joint responsibility of the members.
- The "Pani Panchayat" has the right to make new rules and to change existing rule.

CASE STUDY: Sukhomajri:

Equitable distribution in terms of water allocation can be seen in another case study in the village of Sukhomajri. This was also a drought prone poverty stricken village. The transformation of Sukhomajri from a barren land into a green belt was due to a model of sustainable development called the Chakriya Vikas Pranali (CVP) that was developed by P R Mishra.³ Sukhomajri is a village 20km from Chandigarh where traditional livelihoods practiced included rainfed agriculture, livestock grazing, and some employment in a cement plant located locally. Experiments by the Indian Council for Agricultural Research in the area in soil conservation and watershed activities slowly culminated in today's success story of Sukhomajri. Controlling of grazing and woodcutting, and several other conservation measures has led to increase of supply of fodder from crop residue and reduced the grazing pressure on agricultural lands. A self sustaining process of production has emerged wherein a one-time investment of cash, plants and technology guarantees year-round employment for all members of the village society. The increased water tables, the increased access to irrigation has transformed the village. The rights to water created from the benefits under this complex system of activities like cropping patterns according to the water available, soil conservation activities, are assigned to all village members, including landless households, based on labor investment in creating the system (Joshi and Seckler 1982). Rather than simply assigning rights in accordance with landholding, replicating existing patterns of unequal resource tenure, rights are proactively allocated in a way intended to increase the assets of the poor. A landless person has the right to water, and can even sell his water rights if he wants to. At a minimum, this shows the scope for creative alternatives in allocating rights, particularly to newly developed water supplies.

CASE STUDY: Watershed Support Services and Activities Network (WASSAN):

Watershed Support Services and Activities Network (WASSAN) started in 1995 as an informal network of NGOs to influence the Watershed Development Program of Government being implemented in the drought prone areas for economic improvement of

³ http://www.rainwaterharvesting.org/People/RuralJY_english.htm

the poor, women and marginalized sections of the rural India. Carving out a creative space for NGOs within the government program, capacity building of various stakeholders, influencing policy and capacitating and empowering the rural community are the main agenda of WASSAN.⁴ WASSAN is based in Hyderabad in Andhra Pradesh, has been working with communities in the area of watershed development and livelihoods. The organization has several programmes. Revitalising Rainfed Agriculture programme is an Action and Advocacy program to locate the prime movers for revitalizing rainfed agriculture. At one end it tries to generate field experiences at a reasonable scale on diversifying farming systems of the small and marginal farmers, and at other end, it evolves a relevant policy framework for rainfed agriculture in dry regions from the experiences. The core objective is to identify required public support systems, institutional mechanisms and technology options to provide a basis for a sustainable rainfed agriculture policy. This initiative is supported by Ford Foundation.⁵ The drought in Andhra Pradesh and WASSAN's intervention in this context is what is commendable. The organization has laid an emphasis on institutional arrangements, and has redefined resource use patterns. Andhra Pradesh Drought Adaptation Initiative is a Pilot Initiative on Drought Adaptation aims at promoting appropriate farming systems and land use changes, and common natural resource management for better adaptation of the communities to the changing climatic conditions, particularly long-term rainfall deficits.⁶ A collectivization of groundwater access, diversification of crops, intervention in terms of technology, diversification of livelihoods and a complete decentralized, participatory planning in the watershed activities have resulted in great accomplishments.⁷ These programs are designed to have a convergence with mainstream programs like NREGA in particular which would ultimately result in an upscaling of the programs.⁸

CASE STUDY: MYRADA

Mysore Resettlement and Development Agency (MYRADA) was founded in 1968 to assist the Government in resettling Tibetan Refugees. Mysore State has since become Karnataka. The Tibetan program ended in the early 80s. By 1982 Myrada moved out of resettlement and began to focus entirely on the poor and marginalized in the rural areas.⁹ It works primarily in three states in South India namely Karnataka, Tamil Nadu and Andhra Pradesh. Participative Integrated Development Watersheds (PIDOW) is one of the key focus of the organization.¹⁰ The basic mission that guides the organization is building poor people's institutions. The emphasis is on creating livelihoods for the poor through institution building and capacity building. The organization works through self

⁴ http://www.wassan.org/about_wassan/emergence.htm

⁵ http://www.wassan.org/Revitalizing_Rainfed_Agriculture/default.htm

⁶ <http://www.wassan.org/apdai/apdai.htm>

⁷ http://www.wassan.org/apdai/documents/APDAI_Final_Report_%20%20Stage_1.pdf

⁸ <http://www.natcomindia.org/natcom-new%20data/Presentations/Ravindra%20A,%20WASSAN-%20Inception%20workshop.pdf>

⁹ <http://www.myrada.org/MyradaProfile%202010.pdf>

¹⁰ <http://www.myrada.org/index.html>

help groups. Watershed management is looked at in holistic manner, where watersheds are developed in the local context with the local people to enhance livelihoods of the people. The concentration is on minor basins and tanks which are administered by the village or panchayat. The organization stresses the need to work to strengthen local institutions if they exist, such as milk cooperatives. The emphasis is basically on local people managed institutions. The PIDOW designed are about 600 to 800 acres with 80 to 100 farming families as a possible start. The watershed programmes is planned and managed by local groups and coordinated at the watershed level. There is decentralized planning with conscious efforts to work with especially groups of people below the poverty line who are to benefit from the programme. A functional group with rules and regulations where the group ascertains the choice of beneficiaries and the disbursement and utilisation of funds is established. Similar to the watershed created in Sukhomajri, there is an emphasis on an integrated planning that is locally designed according to relevant conditions. The trees in the water shed are chosen according to the need for soil stabilisation, for fuel and for fodder. Astra Oles (smokeless, fuel-efficient ovens) are installed in the homes in the watershed as this controls the cutting of trees along the watershed for fuel wood. An integration and decentralized local planning of the watersheds is the key reason for the success of the programmes implemented by Myrada. Myrada has tried to promote non land based livelihoods to address issues of equity in the watershed programmes.¹¹ The organization argues that there should actually be no separation of the terms watershed development and livelihood intervention because the watersheds as the biophysical environment are the basis of livelihoods for all villagers. A livelihood perspective does not mean watershed development has to start something new but rather encourages a closer look at people's coping strategies, decision making and the connection to the outside world. This change of perception may help to reflect how watershed development affects people's lives. The most natural would be if livelihood promotion were integrated into watershed development, and not perceived as something additional, new and different and economic. It is in this context that it is important to analyze Myrada's intervention strategies of watershed development and water allocation.

CASE STUDY: Watersheds Organization Trust (WOTR):

This is an organization working in Ahmednagar and Aurangabad districts of Maharashtra. Fr. Hermann Bacher, a Jesuit priest, and Crispino Lobo established the Watershed Organisation Trust (WOTR) in 1993. Fr. Bacher had committed himself to change the lives of the rural people handicapped by the shortfall of opportunities and resources in their villages. Under them, WOTR organised and capacitated villagers to regenerate their watersheds so as to trap whatever little rain that fell in their area and use it for farming and personal use. With its head office at Ahmednagar, WOTR has, over the years, turned barren landscapes into forests. And this magic has happened not just because of the technical guidance and funding that it has provided to several villages across Maharashtra but for the fact that it works with a holistic picture in mind. WOTR gets villagers committed to watershed development. It convinces them about the need for collective participation and voluntary labour. WOTR gets the women population involved too in the process of decision-making and governance. The activities of the organization concentrate on poverty alleviation through water allocation for not only agriculture but also other allied livelihoods like, livestock, poultry etc.¹²

¹¹ <http://www.ispwdk.org/ispwdk/Livelihood/fstudy.pdf>

¹² http://www.wotr.org/about_wotr.html

Water allocation in terms of equity is the biggest challenge and watershed management is mistakenly understood as an activity that will only help farmers in their livelihood. In order therefore to have effective mobilisation along watershed lines, it is necessary to have the full participation of the watershed community as well as the local milieu in which the watershed community dwells. This means the evolving and establishment of enabling and positive relationships resulting in enduring partnerships. Watershed activities can and should involve the entire community, as it benefits the entire community not only because of the increase in water levels but also because watersheds can provide opportunities for livelihoods other than farming.

Watershed development and implementation is one way of ensuring that regions that receive less rainfall than required for farming are not deprived of water resources. This community-based watershed development approach adopted by WOTR to tackle drought mitigation, environmental degradation, water scarcity, deteriorating livelihood sources and poverty alleviation has had a significant impact not only on those living in the watersheds but also on the policy and national level.

Since watershed development in India is viewed as a strategic input to stabilizing rain-fed farming systems, the need for capacity building of various participants has increased significantly. The learning, insight and methodologies developed by WOTR and its partners have contributed significantly to shaping the way resources at the national level are allocated and spent for watershed development.¹³

CASE STUDY: Aga Khan Rural Support Programme (India)

The Aga Khan Rural Support Programme (India), the rural development partner of the Aga Khan Foundation (AKF), is an internationally recognised, community-based, non-denominational, non-government development organisation, based in Gujarat. Since the early 1980s, it has focused on enhancing rural livelihoods through sustainable management and use of natural resources in degraded and resource poor regions of western and central India, often characterised by limited economic opportunities as well.¹⁴ AKRSP (I) goes beyond merely addressing problems of food self-sufficiency and looks at the wider issue of poverty alleviation and improvements in the quality of life. Its programmes aim for broader, long-term economic and social development. The underlying philosophy is that rural economic development is best catalysed and sustained through village-level institutions that are autonomous and transparent, contributing to democratic norms of behaviour and to the growth of civil society.

Their work to organise and empower rural communities and marginalized groups, particularly women, through natural resource management interventions in three districts of Gujarat has been commended immensely. Central to these capacity building efforts is the organisation of a variety of formal and informal village level institutions where AKRSP facilitates participatory planning and mechanisms for conflict resolution as well as mainstreaming gender concerns. In addition, since the early 1990s AKRSP has been systematically involved in both policy advocacy on Participatory Irrigation Management (PIM) as well as in organizing farmers to manage their own canal irrigation systems through water user associations and irrigation cooperatives. Involving women in such efforts is a more recent development, partly arising from AKRSP's own re-thinking about

¹³ http://www.wotr.org/water_food_security.html

¹⁴ http://www.akdn.org/india_rural.asp

the need to address gender equity concerns in PIM right from the beginning, and partly from ongoing efforts at gender-sensitive organisational transformation. Significantly, these engendering processes were facilitated by AKRSP's second director, a man committed to addressing gender inequalities. In the process, AKRSP has been consistently trying to demystify commonly held perceptions which view farming and irrigation as primarily male occupations, by illustrating rural women's predominant role in the larger agriculture system, which includes irrigation.¹⁵

It is difficult to find equity in terms of water allocation in class, caste and gender dimensions. Mostly it is gender which comes last. Several staff members, though acknowledging the principles of gender equity, found it difficult to integrate such concerns as an 'add on' in already existing projects. Not only was the task of organizing (male) farmers itself massive, the reluctance from the state government to any sort of power sharing, let alone addressing gender, was considerable. It was not till 1997-98 that opportunities emerged for AKRSP to look at gender in new canal projects, making efforts to involve women right from the project inception stage.

Support for AKRSP's efforts at enhancing women's membership in PIM societies came, not surprisingly, from adivasi men. Interviews with adivasi men in a cross section of PIM societies revealed that they felt strongly about women's inherent capabilities in handling conflicts better than men and in exhibiting more self-discipline when it comes to framing and enforcing rules (Vasavada, 2000 as cited in website)¹⁶. Men claimed that women are more sincere both in terms of collecting irrigation dues and saving money at the household level. In cases where women have been trained as canal supervisors, they have also been more effective than men in ensuring that water is not wasted and that irrigators do not take water out of turn.

In addition to these direct impacts of involving women in irrigation decision-making, the AKRSP case illustrates that canal water has multiple uses for women, such as bathing and washing clothes and utensils, as well as for livestock. It is increasingly being recognized that these gendered needs ought to be addressed in the design of irrigation systems and the adoption of rules governing access to water by PIM societies. However, such efforts will not be sustainable unless gender concerns in PIM are placed in the larger context of equity where water needs of the landless and other stakeholders also need to be addressed.

To summarise some of the key findings of AKRSP's strategy:

- As an important starting point, AKRSP has been systematically undertaking gender sensitization training of its staff at all levels to challenge perceptions and attitudes on women's roles and capabilities in natural resource management.
- Building on the success of similar endeavours is essential – for example, women in other project villages had been managing group-well irrigation schemes successfully before AKRSP thought of involving women in PIM.
- Capacity building is important. This includes exposure to other development organisations where women are managing irrigation interventions effectively.
- Women need to be involved from the beginning so that they can also be exposed to the negotiation process with the irrigation bureaucracy, rather than waiting for irrigation societies to start functioning efficiently before addressing equity.

¹⁵ <http://www.genderandwater.org/page/5785>

¹⁶ <http://www.genderandwater.org/page/5785>

- To facilitate and encourage women's participation in PIM, it is necessary not only to convince women, but also to involve them in other development interventions which address their practical gender needs, such as savings and credit groups. Strong group formation both mixed and women only, are integral to AKRSP's success in its efforts to involve women in PIM.

AKRSP's success shows that NGOs can and should demonstrate models that challenge legal criteria for membership which link water rights to landownership. Such models must illustrate that involving women is not only a question of empowering them, but also of managing community irrigation more efficiently, effectively and equitably, in order to have a strong role in influencing policy and legislation.

4. Inter sectoral water allocation and principles and mechanisms for allocation of water

The agricultural sector demands and uses eighty percent of the country's water and the steady agricultural intensification across peninsular India has resulted in an increase in the demand for irrigation water leading to unsustainable extraction of surface and groundwater resources. Due to the changes in agricultural practices, drastic changes are happening in the hydrological regimes across catchments of rivers, including reduced flow and groundwater depletion. At the same time urban expansion and urbanization process which also provides opportunities for socio-economic progress is ever increasing. Relative contribution from the urban sector to national economic growth is very high. The demand for water from this sector is no less either. The ever growing population and this process of urbanization simply add to the demands from the nations water resources. Moving water away from agriculture to uses with higher economic value is one of the main measures widely seen as desirable. According to Molle and Berkoff sectoral "allocation stress" is often identified as resulting from four different observations: a) agriculture gets the "lion's share" of all diverted water resources; b) agriculture is not only the main water user but also an activity that incurs by far the largest wastage; c) cities are "thirsty"; and d) water productivity in nonagricultural sectors is far higher than in agriculture. This apparent misallocation is often attributed to the failure of the government to allocate water rationally. (Molle and Berkoff 2006)

The major conflict that is emerging in India and in many other developing countries is the emergence of urban water demands and the conflicts with the incongruence of these two systems of water usage. The authors highlight the fact that while urban conurbations have been highly successful in increasing their per capita water availability at the cost of other sectors like agriculture and nature based sectors. The authors also argue that while conventionally the question of agriculture being the inefficient user of water has enabled the urban and industrial sectors to argue for greater allocations though in reality there is very little proof to show that these sectors conversely use water very efficiently. The real issue is not only of usage but also of availability. It appears that urban planners have not really accepted that availability has a ring of finality to it. Data in this paper shows that almost all cities have increased their availability at the cost of supplies to their hinterland and other sectors. The paper argues that we need to look at these issues not only through the prism of efficiency but also address the question in the context of longer term realities. The authors also highlight the political nature of this conflict as more powerful urban constituencies manage to get a lion share of scarce water resources and this is one reality that we should not forget when we are planning for the future. The paper concludes that the only way we can ensure sustainable water usage and allocation across

all these sectors is to address the question of efficiency and re-using and re-cycling, only then will it be possible to plan for the future. Though as many of the examples put forth in the paper show we have so far shown no such inclination to do so and it is probably what we hope to do in future. The article actually puts forth all these issues in very clear and clinical terms and in its approach has provided a real defense towards agricultural water usage against the hegemony of urban water usage.

Studies have shown that the increasing competition between the agricultural and industrial sector for the use of water may even threaten food security (Pinar Keskin 2008). This scholar examines the links between industry and agriculture, and the mechanisms through which the effects of industrial and trade policies extend from one sector to the other. Keskin studies the role of natural resources in determining these spillover effects. In particular, he shows, both theoretically and empirically, that water is a major channel through which industrial policies affect agricultural production decisions. Indeed, industrialization may hurt agricultural productivity when farmers compete with industry for water.

Keskin argues that the Food and Agriculture Organization (FAO) describes food security as a condition when all people, at all times, have access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. Nations' ability to achieve food security via agricultural production has long been a policy concern. Will agricultural production keep up with the increasing global food demand and avoid more people to struggle with hunger? One of the targets of the United Nations Millennium Development Goals is to decrease the number of people who suffer from hunger by half between 1990 and 2015. It is clear that to reach this goal, vigorous and sustainable agriculture is the first requirement. The Green Revolution starting 1960s has been an engine to fulfill this requirement and to boost agricultural productivity in many developing countries. Rainfall is subject to shocks and variability, and so irrigation such as groundwater systems has played a central role in the success of the Green Revolution. Diffusion of irrigation methods and high yielding variety seeds widely contributed to the reduction of the number of people facing risk of hunger in these countries. However, increasing competition for water resources seems to be a major threat for future advances in agricultural productivity. Indeed, food-crop production has been negatively affected by the depletion of water resources. World Development Indicators (2006) suggest that approximately 10% of the world's annual freshwater is still used for agriculture. More than 50% of irrigation water in Asia is used for rice production. Increasing competition between different uses and users of water and water depletion is, thus, important from a food security perspective in these countries. (Ibid)

A solution must be found for the competing intersectoral demands. Mechanisms must be developed for allocating scarce water resources between competing uses like irrigation, rapidly expanding domestic and industrial needs, hydropower environmental needs etc. As examined earlier in this review, Dinar et al study, the principles of efficiency and equity and others that govern the allocation of water when it is treated as an economic resource. The basic mechanisms they analyse are marginal cost pricing, public allocation, water markets and user-based allocation.

Traditionally the state has played a dominant role in managing water resources, but inefficient use of water, poor cost recovery for operating and maintenance expenses, the mounting cost of developing new water sources, and problems with the quality of service agency-managed systems has led to a search for alternatives that make water allocation and management more efficient.

Dinar, Rosegrant, and Meinzen-Dick address some of the basic principles of treating water as an economic good and of allocating it among sectors. After outlining the

economic principles behind allocating scarce water resources, they review the actual means of various mechanisms used for allocating water, including marginal cost pricing, social planning, user-based allocation and water markets. Giving examples from experience in several countries, they weigh the pros and cons of different approaches to water allocation showing that no single approach is suitable for all situations. Clearly the state must play an important regulatory role, for example, but how effectively it does so depends on the relative political influence of various stakeholders and segments of society. User-based allocation is generally more flexible than state allocation but collective action is not equally effective everywhere; it is most likely to emerge where there is strong demand and a history of cooperation. The outcome of market allocation depends on the economic value of water for various uses, but moving toward tradable property rights in water may ease the process of intersectoral reallocation by compensating the losers and creating incentives for efficient water use in all sectors according to these scholars.

5. Conclusion

All the case studies discussed above basically illustrate how livelihoods which are dependent on water, are not just important in the context of water allocations but should also be seen in the light of the understanding of livelihoods that this paper has earlier pointed out to. These case studies help us to understand that livelihoods is basically about making a living with ones accessible and available resources and much more. Water allocations in all the case studies carried out for enabling and ensuring these livelihoods, AKRSP, MYRADA WASSAN an WOTR, may not have clearly designed principles of allocation like in the Pani Panchayats and Sukhomajri, however what needs to be noted is that water allocations in all these case studies is carried out in a manner where basically the livelihoods of the poor communities are being protected and enhanced , the emphasis is on tackling the larger question of poverty, and therefore allocations of water are decided on this main ground. The watershed activities or soil conservation activities or other activities should be understood in this light. Water is viewed here as a basic human right and as a public good, it is this view that has made it possible for the case studies to allocate water according “needs” of the particular community. It is precisely the “publicness” nature of the good which has been recognised and in all the case studies all activities regarding the conservation of water has been carried out by the entire community. Watershed activities can and should involve the entire community, as it benefits the entire community not only because of the increase in water levels but also because watersheds can provide opportunities for livelihoods other than farming. Single-use approaches to water development and management do not reflect the realities of poor people’s water use. People use domestic water supplies for activities such as irrigating backyard gardens, keeping livestock, fishing, processing crops and running small-scale enterprises. In areas without adequate domestic water supply, they use irrigation water to meet household needs, such as drinking and bathing, as well as to support a range of income generating activities in addition to crop production. A more integrated, multiple-use approach can maximize the health benefits and productive potential of available water supplies—leading to increased incomes, improved health and reduced workloads for women and children. This is what is primarily seen in all the activities of the case studies discussed above. Systems that cater to multiple uses are also more likely to be sustainable, because users benefit more from them, have a greater stake in them, and are more willing and better able to pay for them. Policy-makers, planners, and project designers need to enable and support a multiple-use approach by developing

the necessary policies, capacities, and institutions. Incorporating provision for multiple uses into plans for meeting the Millennium Development Goals, Poverty Reduction Strategy, and IWRM (where IWRM does not mean simply “developing” water resources and only supply enhancement) and water efficiency plans and strategies is a start.

The current single-use perspective which dominates thinking on water development and service provision has led to domestic water-supply schemes that ban the use of water for production or that supply too little water for any but the most basic domestic needs, and to irrigation schemes that ignore the need for domestic or household level production activities. By failing to address people’s real needs, this top-down, technocratic approach disempowers them and leaves them responsible for systems that only partially meet their requirements. When communities design their own water systems, they invariably plan for multiple uses. And, when single use, public supply schemes are provided, they are almost always used for multiple purposes. However, because these uses are unplanned and only rarely acknowledged, they often lead to health risks for water users, water shortages at the tail ends of supply systems, damage to infrastructure, and conflicts between users. Brick making, fisheries, plantations Kitchen Gardens, Tanneries, several such small scale livelihoods operate using irrigation supplies. This is hardly ever acknowledged, and is considered “illegal”. Such water use is not institutionalized and the poor who practice these livelihoods have no formal rights.

In essence, a multiple use approach involves (1) assessing the range of water needs in collaboration with end users, (2) examining the water sources available—from rainwater to wastewater to piped systems, and (3) matching water supplies to needs based on the quantity, quality and reliability required for various purposes. Multiple Stakeholders platforms should be created to bring about such planning and use of water. Three crucial aspects of a multiple-use approach that are neglected in traditional approaches to water supply are: participation of local communities, identification of all water needs, and consideration of the different water sources available. While this may require more time and effort than rolling out a blanket program, the end result is more economically efficient, social equitable and environmentally sustainable.

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