

The Forum and its Work

The Forum (Forum for Policy Dialogue on Water Conflicts in India) is an effort to bring together all those interested in working on issues related to water conflicts in India into a loose network for action and interaction. The Forum began its work towards the end of 2004 as a collaborative effort of a few organisations and independent researchers and was supported by World Wide Fund for Nature (WWF). Presently the Forum has about 100 organisations and individuals and the present phase of Forum's work is primarily supported by Arghyam Trust, Bangalore. The Forum's work covers the four broad areas of conflict documentation, conflict resolution, conflict prevention and network and outreach.

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Entitlement and Allocations of Water for Competing Uses

K. J. Joy, Priya Sangameswaran, A. Latha,
Shripad Dharmadhikary, M. K. Prasad, K. P. Soma

Forum for Policy Dialogue on Water Conflicts in India

Life, Livelihoods, Ecosystems, Culture:
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March 2011

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K. J. Joy and Suhas Paranjape
Forum for Policy Dialogue on Water Conflicts in India

Summary

The introductory chapter sets out the context of the report. The immediate context is the work of the *Forum for Policy Dialogue on Water Conflicts in India* (Forum henceforth) over the last 4-5 years, and the learning that the issue of entitlements and allocations for livelihood needs and ecosystem needs is an important reason for many water conflicts in India. To address this issue, the Forum set up a working group. The broader context is the water sector 'crisis', and problems such as declining water availability and unsustainable and inequitable use of water, along with ongoing changes that are taking place in the water sector. These changes include, among other things, institutional changes (such as the setting up of regulatory authorities), the introduction of water entitlements and tradable rights, an emphasis on the pricing of water, and a continuing clamour for large-scale infrastructure projects. The kind of implications that these changes would have for different aspects of a right to water are then briefly indicated.

The rest of the report discusses in greater detail each of the four sets of needs - basic, livelihood, environmental, and socio-cultural - that should, ideally, be part of any conceptualisation of a right to water. The effort in each case is towards bringing out the complexities involved, rather than coming up with a single, 'technical' definition of the need in question, or suggesting a one size fits all solution.

Chapter 2 talks about the right to water for basic needs in terms of different dimensions such as quantity, quality, affordability, accessibility, the unit at which provision is made and also the conditions for such provision, institutional mechanisms for delivery, and pricing. In terms of the controversial questions of delivery and pricing, it is argued that whatever be the mode of delivery, certain non-negotiables must be clearly laid down, even if these preclude many kinds of private sector participation. Care must also be taken to avoid using the instrument of pricing to meet goals that it is not best suited to meet.

In the Indian context, though the right to water is not explicitly mentioned in the constitution, there is judicial support for it. However, the implications of judicial judgements for different dimensions of the right to water are not clear, and many aspects of water policies and legislations (especially in the ongoing reforms) are also explicitly incompatible with the right to water for basic needs. Some examples include the way in which participation is conceptualized and implemented in the new decentralized projects, the equity implications of the condition for recovery of capital and O&M costs, and concerns with regard to processes of privatisation and regulation.

A tentative model of provision of water for basic needs is then outlined. This calls for a formalisation of the right to water for basic needs, possibly via a constitutional amendment, as well as its incorporation in national and state-level water policies. Basic water should be guaranteed to all residents of a locality at any given time irrespective of the legality or otherwise of their domicile status. In addition, lifeline water should be provided free of cost. Perhaps, more importantly,

a clear mechanism for redress in case of lack of access or violations of any of the non-negotiables should be laid down, and lack of availability of finance or similar constraints should not be accepted as reasons for non-provision.

Chapter 3 discusses the importance of taking ecosystem needs into account in the planning for development and management of water resources, pointing out how inter-basin diversion, indiscriminate sand mining, and other interventions adversely affect ecosystems. However, interpreting environmental flows or ecosystem needs is not easy, especially given the fact that it is not only the amount, but also the timing, quantity, quality, and duration of flows that are important from an ecosystem perspective. Nor is it obvious that 'apportioning' or 'allowing' water to be left in the ecosystem is the correct approach; in addition, there is a view that environmental water requirements should include both terrestrial and aquatic ecosystems. Hence, methodologies appropriate to the Indian context need to be carefully chosen. Some of the national principles adopted by the Australian Government for ensuring ecosystem needs provide useful pointers in this regard. Also, classifying rivers according to their sensitivity or ecological importance (on the basis of certain indicators) might be a more pragmatic approach.

Providing water for ecosystem needs is particularly challenging because of the perception that this would leave less water for present needs, which in turn is likely to trigger conflicts. Further, our understanding of how different ecosystem components in different bio-geographical settings react to changes of flow caused by water use or land use changes is highly inadequate. Decision-making with regard to water for ecosystem needs is also complicated by factors such as the management of water as a separate entity from the river basin, the highly sectoral and fragmented approach to river basin management, the lack of coordination between different agencies using the same resource, and the uniqueness of each river basin. Hence creating a suitable policy and legal framework for ensuring water for the ecosystem is not easy. Among other things, it would involve addressing issues such as the principle of subsidiarity with respect to scale of management, rights framework, the need for compensation, genuine involvement of communities, and practically implementable flows. The basic unit of planning and decision making could start from the micro watershed level and be scaled upwards and integrated into the entire river basin.

Chapter 4 brings out some key questions related to water for livelihood needs and explores areas where there could be convergence across different uses. The importance of thinking of livelihoods not just in terms of food security or meeting of basic needs, but in terms of a life with dignity for the family is stressed. However, determining the basic requirements of a person/family to ensure a reasonable living and a life with dignity, as well as the level of various livelihoods that would ensure that these requirements are met, is not an easy task. Certain guiding principles are then offered in the case of both agricultural and non-agricultural occupations. In the case of agriculture, for instance, the meeting of livelihood needs should be based on a cropping pattern that is suitable to the eco-climatic characteristics of the region, and the landless should also be entitled to water for irrigation if their livelihood is related to agriculture. The case of industries and services is more complicated and would involve, among other things, the question

of the unit of allocation of water (the industrial unit or the people working in the industry), and distinguishing between livelihood and economic or commercial activity.

Further, in case of all allocations, it is not just the quantity that is important, but also quality, timing, pattern, location, etc. Similarly, the question of whether allocations should be based on the production potential of water for a particular activity, or for the actual production achieved, needs to be carefully thought through. Allocations of water also need to retain some flexibility and provisions for new developments, increased efficiency of water use, new entrants /population changes, new opportunities, exigencies, year to year variation in water availability, and long term events like climate change. Finally, it is important to keep in mind that the process of deciding and allocating water for livelihood needs cannot be separated from the process of overall resource use and development planning, and the decision-making associated with it, since livelihoods can be ensured only by a combination of different natural and human resources.

The chapter also discusses certain broader issues that have a direct bearing on water allocations for livelihoods such as water for livelihood as a human right; equity and sustainability as basic principles; de-linking of land rights from water rights; import, export and transfer of water; limits to extraction; and balancing of various rights and needs.

Chapter 5 briefly discusses the right to water for socio-cultural needs. Broadly, these can be defined as water required to maintain a certain way of life that is inclusive of the cultural traditions, social values, and practices of particular communities. Recognising socio-cultural needs as a separate category is important because they draw attention to the multi-faceted nature of water; play a role in the preservation of cultural identity; and often involve knowledge systems with very different kinds of epistemological bases than that of the dominant development paradigms. Although socio-cultural needs are difficult to quantify, some general principles could be laid down. For instance, in case the fulfilment of a particular socio-cultural need has the risk of adversely affecting sustainability of a water source, attempts must be made to develop alternative modes of fulfilling these needs. But perhaps the most important point to keep in mind is that adequate attention must be paid to the social, economic, and political contexts in which socio-cultural needs are embedded, and that the needs are conceived in dynamic terms instead of in static terms that attempt to recreate a mythical past. Finally, one must be careful that the right to fulfilment of socio-cultural needs is not co-opted into a conservative agenda that puts in place or re-enforces discriminatory practices.

Chapter 6, the concluding chapter, drawing from the previous chapters brings out the critical issues that cut across all the different uses. The issues this chapter discusses include prioritisation of different water uses, right to water and equity, mode of service delivery, water pricing, environmental flows and water for industries. The attempt here is to detail out the issues with certain initial propositions emerging from the different chapters in the report as starting points, for a long term engagement with these issues to develop a social consensus around them. For example, in the case of water use prioritisation, the chapter

proposes a different conceptualisation of prioritisation and argues for a sequential prioritisation for water for basic needs, livelihood needs and ecosystem needs. This means that water for other uses would be allocated only after these three needs are met. In the case of water for industries, a highly contested area, it proposes that industries should not be allowed to externalise costs, and that they should invest in water saving, and only the saved water should be allocated to industries. Water for industries should not be at the expense of the existing livelihoods of the peasantry.

The Forum would make use of this report, along with the forthcoming companion report on institutional and legal issues related to water conflict resolution, to build consensus at different levels as well as influence and change mind-sets and create social acceptance about water allocations across different uses based on equity, sustainability and democratisation. The Forum would also make efforts at policy advocacy so that necessary changes can be made in the existing policy, institutional and legal framework governing water. The report argues for a framework law which sets out the principles that are binding on both the policy and legal processes. Such a framework law needs to take into account: 1) the bio-physical and social characteristics of water, 2) a right based discourse (the right to water should include on the minimum a) potable water of adequate quantity for all, water for livelihoods, minimum environmental flows, and b) only after meeting these needs can water be made available for commercial use), 3) the legal framework must take as its starting point an articulated hierarchy of these rights; and 4) an institutional mechanism to ground it. We are confident that the working group on framework law set up by the Planning Commission would address some of these issues and concerns.



Introduction

1

The first part of this introductory chapter lays out the overall context and purpose of bringing out a position paper of the Forum on the crucial issue of "entitlements and allocations for livelihoods and ecosystem needs". The second part discusses the structure of the position paper and the processes involved in developing this paper.

The context

There are two contexts: the first, the immediate context lies within the Forum and its concerns and what it wants to do in the future with the position paper; and the second, more global context is the crisis in the water sector and the broader changes taking place within it. Both these contexts are interrelated, as the Forum's concerns and what it wants to do are located in the broader context of the water crisis and the changing water sector discourse.

The immediate context

The work of the Forum during the last three to four years, especially the extensive documentation of different types of water conflicts it undertook, has very clearly brought forward that entitlements and allocation of water for livelihoods or "development" and for the ecosystem (the water required to keep the ecosystem's integrity and functions) have been at the centre of most water conflicts. Though they get expressed in many different forms as the local contexts in which they take place vary, they are all broadly related to contending water uses or equity and access.¹

When the same unit of water is demanded for - or has to be allocated to - different kinds of uses and sectors, we have a contestation and a potential conflict. For example, the conflict around the Keoladeo National Park involves contestation between the irrigation needs of the local farmers and the needs of the Bharatpur wetland bird sanctuary, a World Heritage and Ramsar site. In Kuttanadu, Kerala, rice farmers and fishermen are in conflict because of the Thanneermukkom bund over Vembanadu Lake to block sea water intrusion. In Loktak, Manipur, the Ithai barrage constructed at the confluence of the Khuga and Manipur rivers as part of the Loktak Multipurpose Project (LMP) as a solution to the shrinking lake has created unintended effects as a large agricultural area along the river became flood prone, and also farmers started encroaching upon Loktak Lake for capture fishing. In the case of Chilika, Orissa, another Ramsar site, the conflict is many-sided and involves fishermen and settlers, while the Gagans basin in the Himalayas is a microcosm in which urban demands, state policy and increasing pressure endanger the source itself. In watershed development in Vadali in Chotila Taluk, Gujarat, the absence of social regulation has led to an accentuation of drinking water problems, as more water was diverted towards irrigation by relatively rich

¹ The cases that are cited are detailed in Joy et al, 2008 in Joy et al (ed.), 2008. They are also referred to in Joy and Paranjape, 2009 in Iyer (ed.), 2009.

farmers. In peri-urban areas, there is a growing conflict between farmers who wish to mine groundwater to supply it to the city, and those who want to use it for irrigation, a problem that extends from metropolitan Chennai to the Sangolda village in Goa. The Ganga canal for Delhi is another case of a conflict between urban needs and rural livelihoods.

Within the same kind of use, if the same unit is demanded by - or allocated to - different users, it also gives rise to a wide variety of conflicts. In the Bhavani River, a tributary to the Kavery in Tamil Nadu, competing demands between old and new settlers have been further aggravated by growing demands of industry and irrigation, especially in the context of growing drought conditions. The 'Phad' systems in the Tapi Basin in Maharashtra, which had inbuilt equitable access and a sustainable cropping system management, have all but collapsed mainly because of the new irrigation projects that have been constructed on the same river system in recent times. In the Palkhed Project in Maharashtra, those at the tail-end suffer twice the discrimination, both in terms of the norm of allocation as well as the actual allocation. Recently, in a drought year, centuries of deep rooted caste-based cultures and traditions of oppression and prejudice reared their heads to deny water to the Dalits in and around Mangaon². The Tembu Lift Irrigation Scheme (TLIS) in south Maharashtra, meant to serve a severely drought-prone region, has become a source of conflict and contestation on the issue of restructuring the scheme on more equitable lines. The proposed Nar-Par diversion in Maharashtra, which diverts the water of west flowing rivers into other basins, is facing opposition from both ends, especially from adivasis (tribals) who would have to face submergence and displacement. The Indira Gandhi Canal case illustrates how so-called inter-linking and diversions may actually widen and sharpen a conflict rather than resolve it.

With the rapid industrialization taking place in the country, especially in the form of mining, setting up special economic zones (SEZs) and so on, there has been also large scale diversion of water from agriculture to industrial use. The Hirakud dam, primarily built for flood cushioning and irrigation, has been a site of conflict and contestation because of diversion of water for industrial use (Panda, 2009). The Government of Maharashtra (GoM) has taken a pro-industry policy right from 2003 and this is also reflected in the Maharashtra State Water Policy of 2003 where the second priority has been given to industrial use and agriculture has been pushed to the third place. In 2003 the GoM, through a Government Order, limited the powers of the Irrigation Department to reserve water for non-agricultural use to 25% of the storage in the dams. Through the same Government Order the GoM set up a High Power Committee headed by the Water Resources Minister with the powers to sanction demands for reservations for more than 25% for non-agricultural uses. Though the Maharashtra Water Regulatory Authority was created in 2005 which has the mandate to issue bulk entitlements, this Government Order is still in force. This issue has not been brought before the Maharashtra Legislature or made a legislative act on this and the GoM has been coming out with a fresh Government Order every time the previous one lapses and the latest one was promulgated in January 2011. The recent study by Prayas, Pune on the Maharashtra Government's policy of diverting irrigation water to industries and cities and its implementation, shows that 2885 TMC (thousand million cubic feet) of water from 43 dams have been diverted over a period of 2003

²Mangaon is very close to Mahad where, almost 80 years ago, Dr. Ambedkar launched a Water Satyagraha by marching to the Chavadar Tank to open all public watering places to the Dalits.

to 2010 -- bulk of this diversion took place between 2007 and 2009 - affecting 357621 ha of irrigated area (Prayas, 2010).

The core issue that all these cases bring forth is the absence of clear-cut norms of equitable water allocation and distribution that also take into account ecosystem needs. Allocation norms have evolved according to local situations, the size and nature of the project, and historical socio-political relations. To tackle the conflicts over allocations and access, we need a better concept of a right or an entitlement to water. How much water should a person or a household be entitled to as a right? Here we need a livelihood based framework that sees the assurance of minimum livelihood needs and the corresponding water requirement as an associated right. Coupled with this is the need to share shortages and surpluses in a principled manner. It also entails doing away with the obstacles that deny the disadvantaged sections of our society their rights.

To this we should add another concern, the ecosystem. Ecosystems have no voice, no votes, and some important ecosystem issues have never entered the agenda for water conflicts. For example, concepts of ecological flows, minimum ecosystem requirements and preservation of ecosystem services are only recently being explored. Yet, our long term futures will finally be decided by whether we tackle these issues, before we poison the well springs of life on this planet. In fact under threat are the poorest of the poor as well as the very sources of our water - our rivers, wetlands and aquifers.

Need for an integrated perspective: Constitution of a working group

Today there is a polarised discourse around issues of allocation for livelihood needs and ecosystem needs: positions being taken as per one's location. Thus the critical issue is: can we tie them together in an integrated perspective/approach? This was the question that was posed in the national workshop held in March 2009 on the same theme.³ The broad consensus in the meeting was to explore ways to go beyond this polarisation and find ways to integrate them. The Forum constituted a small working group to go into these issues and come up with a "position" paper for the Forum.⁴

The broader context

There are two sets of issues that constitute the broader context: one is the water sector crisis in India and the second is the type of changes that are sweeping the water sector discourse since the 90s.⁵

Water sector crisis

There seems to be a near consensus amongst all concerned with water in India - practitioners and civil society organisations (CSOs), academics, policy makers, lending institutions and so on - that the water sector in India is going through a serious crisis, though the characterisation and detailing of this crisis do differ. The wider context in which this crisis is located has also been changing since the 1990s and especially since the beginning of the 21st century. One of the important collective concerns of different national and international forums has been how to address the challenge of meeting the growing demand for fresh water while

³ *The two day national workshop on Water Entitlements and Allocations for Livelihoods and Ecosystem Needs and the Legal-Institutional Framework for Conflict Resolution held on 30-31 March 2009 in Pune.*

⁴ *The Forum also set up another working group to look into the institutional and legal issues to water conflict resolution.*

⁵ *This section on the broader context - water sector crisis and the changing water sector discourse - heavily draws from the introductory chapter of the report of the study, Social Movements around Water, carried out by Society for Promoting Participative Ecosystem Management (SOPPECOM) in 2009-10. The report is presently unpublished and is available with SOPPECOM, Pune.*

⁶ For a recent discussion on the water sector issues in India, see *Water Resources Division, Planning Commission, Government of India, 2009*.

maintaining ecosystem sustainability.

In the post independence period, India witnessed unprecedented investments in setting up water infrastructure to meet its domestic water, irrigation, industrial and hydro-power needs with an emphasis mostly on large dams, storage structures and canal networks. These investments in water infrastructure, along with private investments in developing groundwater, helped in meeting the growing food needs of an expanding population in the country by providing assured irrigation to some areas, which was one of the important factors contributing to the Green Revolution.⁶

However, in spite of the massive public investment estimated at more than Rs. 120,000 crores, only about 55 million hectares (mha) of cropped land has been brought under irrigation so far, accounting for little more than 30% of the cropped land in the country. Of this, more than 50% is under well irrigation, and most of this investment has been private (by individual farmers). The number of bore/tube wells and dug wells has grown manifold since the 1960s, as has the extraction of groundwater for irrigation and domestic water needs, and as a result the number of "dark zones" has been increasing.

The Parthasarathy Committee, which reviewed watershed programmes under the Ministry of Rural Development (MoRD), succinctly highlights some of the critical issues and problems in irrigation in India: 1) irrigation facilities have been concentrated and restricted, and vast areas have remained outside the purview of irrigation; 2) in 170 most backward districts in the country - the poverty geography of India - rainfed agriculture is practiced; 3) for the first time since the mid-60s, foodgrain production has grown at a slower rate than the population in the 90s; 4) growing unemployment in the rural areas and farmers' suicides are symptomatic of the growing agrarian crisis in the country; and 5) irrigated agriculture seems to have hit a plateau (Government of India, 2008).

Irrigation development, in other words, has been both unsustainable and inequitable. The over emphasis on large storages has led to problems of displacement and environmental sustainability. Overdraft of groundwater has led to depletion of groundwater (and the increasing number of "dark" watersheds is a sign of this) and problems of salinisation, arsenic poisoning and increase in fluoride levels in water have emerged. The lack of effective governance in the groundwater sector has deepened the drinking water crisis in rural areas, the impact of which is largely borne by the rural poor and women. There is a growing urban-rural divide in terms of access to safe drinking water. More and more villages are running out of water, and for women, water scarcity means travelling longer distances in search of water (Joy and Paranjape, 2005) leading to serious health problems (Kerr (ed.), 1990; Swaminathan, 1997; Seaforth, 2001 cited in Joy and Paranjape, 2005). With growing industrialisation in the country, the demand by industries for water has also steadily been growing, having possibly serious implications for the agriculture sector and especially for food security. Apart from the regional disparities in the development of irrigation - in Punjab the cropped area irrigated is about 80% whereas in states like Maharashtra and Orissa it is only 15 to 17% - the access to irrigation has been inequitable. The expansion of the irrigated area has been much faster on larger sized farms compared to small and marginal farms (Vaidyanathan, 2005). There is, however, very little

⁷ Two caveats are in place here: 1) these figures only show potential availability and not actual access. Actual access is much less as it is mediated by many constraining factors; 2) these are average figures, and average figures often hide extremes. There are many areas where availability would be even lesser.

disaggregated data to show how this inequitable access to water maps on to caste and gender.

The estimated annual per capita availability of water has also been decreasing quite steeply in India - in 1951 it was 5,137 m³/capita/year, but by 2000 it had reduced to 1,865 m³ and by 2005 further reduced to 1,342 m³, much lower than the global per capita average availability of about 2000 m³ (Paranjape and Joy, 2004).⁷ There are also studies that show that a sizable population in India could face "absolute water scarcity" by 2025 (Seckler et al, 1998).⁸

Coupled with the issues of scarcity and inequitable access to water, are questions of low efficiency of irrigation water use, decreasing productivity of irrigated agriculture, the vicious circle of 'low quality service - low cost recovery - low maintenance of the system', increasing levels of pollution, decreasing groundwater levels and unregulated extractions, increase in the frequency and intensity of droughts and growing number of villages not having access to safe drinking water.

Water scarcity has tremendous implications for agricultural production. Farming in India is a means of livelihood for the majority of the population and not just a sector that produces food. Thousands of farmers have committed suicide the last few years in India in response to low crop production, low prices and heavy debts. Though hard figures, especially at the national level, are hard to come by, studies show that between 2002 and 2006 over 17,500 farmers have committed suicide every year (Patel, 2007), and statewise reports indicate that the trend still continues. While the reasons for these deaths are still debated, scientists and social science researchers have noted that suicides might well be linked, at least, partially to a drop in agricultural productivity which, in turn, is related partially to changes in state agricultural policy and to water shortages, particularly for small farmers.

The severity and diversity of this "crisis" is also reflected in the increasing number of water conflicts in India of varying intensity, types and scales. Water conflicts now divide every segment of our society - nations, states, regions and sub-regions within states, districts, village communities, political parties, castes and farmers. Though the doomsday predictions of 'water wars' may not have taken place - at least not at the scale of a world war - water is radically altering and affecting political boundaries all over the world, between as well as within countries and communities. In India, water conflicts are likely to get worse before they begin to be resolved. Till then they pose a significant threat to economic growth, social stability, security and ecosystem health.⁹

Water sector reforms and the changing discourse in India

As mentioned earlier, since the early 1990s, and more significantly over the last 10 years, the water sector discourse has been drastically changing in India, and for that matter, the world over. Many new concepts, terminologies and governance structures have come into the discourse. Integrated Water Resource Management (IWRM) has become the buzzword. Participatory Irrigation Management (PIM) and co-management are being promoted as new institutional solutions. The National Water Policy (2002) and the various state water policies talk about river basin

⁸ Of course the issue of scarcity is further confounded by inequitable distribution. Those who talk about scarcity do not often talk about distributional inequity. The issue of water scarcity is a contested terrain. Water scarcity is often seen as a social and cultural construct (Mehta, 2000; Jairath, 2009).

⁹ For a synthesized understanding of water conflicts in India see Joy et al, 2008, "A Million Revolts in the Making: Understanding Water Conflicts: A Compendium of Indian Experience" in Joy et al (ed.), 2008. This edited volume has tried to capture different types of water conflicts in India. The World Commission on Dams talks about conflict between rural and urban populations, upstream and downstream interests, agricultural, industrial and domestic sectors, human needs and the requirements of a healthy environment (World Commission on Dams, 2000).

organisations. Multi stakeholder platforms and processes are being projected as institutional solutions to address different types of water conflicts. From 2005 onwards, starting with Maharashtra, different states have either established or are in the process of establishing independent water regulatory authorities. The World Water Forums organised once every three years primarily by the World Water Council (WWC) and the Global Water Partnership (GWP) - two supra-national bodies (and the GWP has national and area partnerships spread all over the world) - seem to be directing the policy discourse on water the world over.

As for the state, it has moved from the earlier largely techno-centric model to approaching the crisis from an economic and institutional perspective. After the Dublin Principles of 1992, the discourse around water changed, and water is increasingly seen as an economic good (The Dublin Statement on Water and Sustainable Development, 1992). Clearly, the thrust, for a certain period, moved away from investing in infrastructure, to managing the resource through smart governance. Institutions and pricing thereby became the key words, with the state showing eagerness to move out of provisioning of water. The state has proactively focused on taking steps, mostly at the instance of multilateral donors, to put forth policies, laws and rules, and for supposedly better management of 'scarce' water. Formulation of new laws and policies, institutional reforms, creation of water entitlements and building partnerships between users, private interests and the state have been some of the important aspects of the water sector reform package of the state.

We also hear increasingly about public-private partnerships, about making water rights tradable, and the role of private service providers in irrigation management. In the wake of the Dublin Principles there has been a raging polarised debate about the social vs. economic goods character of water. Different types of privatisation - source privatisation to service delivery - are being attempted in various states coupled with a policy push towards economic pricing of water. There is also talk about virtual water transfers across national boundaries, and water has already been brought under the purview of global trade by including it in the General Agreement on Trade and Services (GATS). All these and many other developments within and outside the water sector seem to indicate that the sector is being impacted significantly by the Liberalisation, Privatisation and Globalisation (LPG) regime unleashed in the country since the early 1990s. There are also many who see these reforms in the water sector as part of the process of "accumulation through dispossession", a concept first used by David Harvey to describe the process of capital accumulation that is taking place in the present phase of capitalism. There is also an increasing feeling that global lending organisations such as the World Bank and Asian Development Bank (ADB) are dictating the water policy of the country and of the different states.¹⁰

Within India, Maharashtra seems to be leading the pack in ushering in most of these reforms. The recent policy initiatives in Maharashtra - the Maharashtra State Water Policy (2003), Maharashtra Management of Irrigation System by Farmers Act (2005), and Maharashtra Water Resources Regulatory Authority Act (2005) - all reflect this. In fact the timing of these reforms makes the motivation of these policy initiatives suspect. The reforms have coincided with the huge loan that the government of Maharashtra has taken from the World Bank as part of its irrigation

¹⁰ *The World Bank has decided to play a much larger role in the water sector in India. The World Bank's outlay itself is going to rise from US\$ 700 million over the previous four years to US\$ 3200 million in the next four years. World Bank lending is tied to its recipe for water sector reforms in the country (see Briscoe and Malik, 2006).*

sector reforms - a loan of US\$ 325 million to assist in the implementation of the Maharashtra Water Sector Improvement Project. No wonder the World Bank has hailed the reforms that have been unleashed in Maharashtra, especially fixing entitlements, appointing independent water regulatory authorities and so on (Briscoe and Malik, 2006).¹¹

Over the last 20-30 years, efforts have emerged from within civil society, challenging the dominant paradigm of development in the water sector and creatively engaging with and responding to the challenges posed by both the crisis, and the changes that are taking place. Alternative strategies are being put forward that focus more on sustainable, equitable and democratic management. The innumerable struggles against dams (against displacement and submergence), mass mobilisations around equitable water distribution, innovative experiences in participatory irrigation management (PIM) that go beyond efficiency and address concerns of equity, sustainability and democratisation, struggles against water privatisation of various types, multi-stakeholder platforms and processes to resolve conflicts around water pollution, innovative watershed development experiences throughout the country, struggles by the farmers against water being increasingly taken over by industries, and many such positive experiences are all part of the efforts by non-state actors to find answers to the multi faceted and multi tiered water crisis. It is our belief that engaging with these experiences creatively will help find a pathway for re-structuring the water sector along more equitable, sustainable and democratic lines.

In this changing discourse on water and the reforms that are underway there are two issues that need further discussion as they have a direct bearing on the theme of this report. The issues are 1) water entitlements and tradable rights, and 2) the issue of pricing. In fact, one should also add the issue of climate change and the uncertainties that come with it, as it can either exacerbate existing conflicts or give rise to new ones. Also the uncertainties associated with climate change are being used by some powerful lobbies to argue for larger storages (read large dams), and this can have serious repercussions on environmental flows. The dominant thinking on these issues is reflected in Briscoe and Malik's book, *India's Water Economy: Bracing for a Turbulent Future*, considered as the World Bank's recipe for water sector reforms in India (Briscoe and Malik, 2006).

Water entitlements and tradable rights

In the book, Briscoe and Malik forcefully argue for "empowering users by giving them clear, enforceable water entitlements" (p. 46). They are also for separating water rights from land rights with the same legal certainty as land and other property rights (p. 47), which essentially ensures the tradability of water rights. In this context the authors hold the Maharashtra Water Resources Regulatory Authority Act (MWRRA) 2005 to be a model legislation that needs to be emulated by other states (p. 50).

Of course, enforceable water entitlement is a step forward; without a definite entitlement, there is no accountability. However, if we go by MWRRA, the criteria to work out entitlements are very clearly linked to landholding in the command areas. This implies that present access to water will be treated as entitlement,

¹¹ For a detailed critique of water sector reforms in Maharashtra, see Joy and Kulkarni, 2010.

thereby converting present access to water, which is clearly inequitable, into a right in perpetuity. Under the Maharashtra Farmers Management of Irrigation Systems Act, which is closely linked to MWRRA, the Water Users' Associations can make water available to companies for contract farming. All these can lead to further concentration of water rights. For the World Bank, the rationale for de-linking the water rights from land rights is to make it a commodity. For social movements and grassroots initiatives committed to the equity agenda, the rationale for de-linking of water and land rights was to create wider access to the resource poor sections including the landless. Thus, the very same demand of de-linking land and water rights is being pushed forward to serve two opposing interests.

Financial sustainability and the issue of pricing

Here, Briscoe and Malik put forward two major arguments: one, remove the disconnect between prices and costs as it induces very large economic costs, and two, the costs should increasingly be met from user charges as there is no free lunch (p. 56). The contention of the authors that the users would be willing to pay a higher price for an efficient, reliable and accountable service is, by and large, in line with the experience on the ground. It is also true that presently the resource rich sections pocket most of the "subsidy" in irrigation. However, the authors have not outlined a pricing strategy which would take care of the interests of the resource poor sections by making water available to them at an affordable cost, and at the same time charge others for the economic costs.

The issue at stake here is whether water is a social or an economic good. The "privatisers", who believe that water should be allowed to become a full commodity and that restrictions placed on this process are the cause of all the ills related to water, argue that water is an economic good; the anti-privatisation currents have insisted that water is a social good, should not become a commodity and should be dispensed by the state.

Both these positions seem to be problematic. There is a third strand of thinking, though a minority trend presently, which treats water as both a social and an economic good and argues not for a withdrawal of the state but for a change in its role.¹² For example, access to clean water is fundamental to survival and critical in reducing the prevalence of many water-related diseases. Other dimensions of water supply also have a social good character that therefore requires governmental action, overseeing or regulation. At the same time, the supporters of this approach advocate the use of sound economics in water management. Water is also a means of production, whether in agriculture or in industry, whether in artisanal production or large scale industrial production. Take the case of irrigation. Water for irrigation is important in order to stabilise a minimum production on small and medium farmers' lands. It is also important to farmers who produce for profit rather than for subsistence needs. The provision of water is a service that serves both functions, a basic service aimed at basic livelihood needs, and also an economic service for conspicuous consumption or surplus generation. Both of these functions also place contradictory demands on how the service should be provided and at what charge. A basic service aimed at basic needs to be provided to all equitably at an affordable price, including the poorest

¹² Peter Gleick is an important advocate of such an approach. For detailed discussion of how to combine the social and economic good character of water see Gleick, 2002.

sections, has to be subsidised if need be, through cross subsidy within the sector or across sectors. On the contrary, an economic service provided for surplus generation needs to be charged the full economic cost at premium rates to provide for cross subsidy for basic service. It is difficult to see how free markets can even begin to meet these complex and contradictory demands. The differential or graded tariff system advocated by the Irrigation Pricing Committee headed by Prof. A. Vaidyanathan (Government of India, 1992) can go a long way to resolve this tension between the social and economic good character of water.

Large water infrastructure and storage

Briscoe and Malik's book clearly takes a position in favour of creating larger water infrastructure, especially larger storages. It treats per capita (surface) water storage as an indicator of development. Quoting from the book, "Arid rich countries (like the United States and Australia) have built over 5000 m³ of water storage per capita, middle income countries like China has 2500 m³, ... and India can store only about 200 m³". Correlating per capita surface water storage with "development" itself is problematic as it can have negative impacts on ecosystems and people (who are displaced because of large water projects). With the forced withdrawal of the World Bank from the Sardar Sarovar Project in 1993 following the Morse Report and the setting up of the World Commission on Dams (WCD), there was an expectation that the World Bank would rethink both its strategy and role in water projects the world over. However, within six years¹³ of the publication of *Dams and Development: A New Framework for Decision Making* by the World Commission on Dams in 2000, the World Bank seems to have come a full circle with this book in terms of its love for large dams. Also, with the climate change debate, the clamour for larger water infrastructure and surface storages seem to have got further currency. Larger water infrastructure and storages are posited as the only way to cope with these uncertainties.

This emphasis on a large dam centred strategy ignores the gains and experience of the extensive implementation of watershed development in the country. Though the outcomes may not have always matched expectations, watershed-based development strategy has amply demonstrated its potential to be the lynchpin of rural development in dryland areas - one that integrates sectors and provides the foundation for subsequent development (Joy et al, 2004).

One of the important learnings of the water sector discourse and practice in India has been the need to go beyond the sterile debate on large vs. small and aim at integration of sources - integration of water from large, exogenous sources and water harvested locally through watershed development programmes. Integration has the potential to overcome the limitations of both kinds of sources. For the local system, the exogenous water supplement can provide critical support needed for livelihood assurance that is sufficiently dependable. Also, the local water system plays multiple roles - as a system for harvesting and utilising local water, as a buffer or holding system for the larger system creating greater control over the timing and quantum of water application for the individual user, and as a semi-autonomous management unit much more compatible with user participation. It implies that the local water source is developed to its fullest potential, the local system is built around it and the exogenous water provides supplements to the

¹³ *Brisco and Malik book came out in 2006 and hence six years.*

system as a whole.¹⁴ Through such integration one can also reduce the need for large scale diversions and allow most of the post-monsoon flows to remain unbound, which is very critical for ecosystem functions and the livelihoods of the downstream communities.

Thus the four chapters that follow this introductory chapter, the issues they bring forth and the positions they take need to be read keeping in mind the context, both in terms of the immediate as well as the larger contexts outlined above.

Review of the National Water Policy

The Ministry of Water Resources has initiated a process to review and revise the National Water Policy, 2002. Though this is a timely and welcome initiative, we in the Forum feel that what is needed, and needed urgently, is not just some tinkering or revision of the policy but its complete and radical restructuring. Among other reasons, this is because the basis of the current water policy is outdated and unscientific. For example, the existing policy and practice fails to take cognizance of the unified nature of the ground and surface waters. Planning and management of water resources continues to be along the lines of administrative boundaries, whereas modern ecological understanding emphasizes that the river basin needs to be the unit of planning. Thirdly, there are no clear norms of allocation across different uses especially across livelihood needs and the ecosystem needs. Fourthly, the planning of water resources continues to be top down and non-participatory. These are only some of the important issues. There are many such issues of fundamental importance that necessitate nothing less than a radical restructuring of the policy. The current process of revision of the water policy offers a unique opportunity - and also puts an obligation - to bring to bear upon the policy a more evolved and updated, holistic, ecological, equitable and democratic understanding of water resources and this report could contribute to this process.

¹⁴ *Integration is one of the core ideas in Paranjape and Joy's alternative to the Sardar Sarovar Project (SSP) on the Narmada. Through such integration they have shown that the height of the dam, submergence and displacement can be brought down significantly without compromising the irrigation benefits to Gujarat. In fact the alternative has the potential to increase the service area from the present 1.8 million ha to 4 million ha. For details see Paranjape and Joy, 1995.*

The process

Following the two day workshop in March 2009, as mentioned earlier, the Forum constituted a working group to work on the various aspects of this theme - entitlements and allocations for livelihoods and ecosystems - and prepare a draft position paper that could be further discussed and finalised. The group consists of K. J. Joy, Priya Sangameswaran, Shripad Dharmadhikari, Prof. M. K. Prasad, A. Latha, and Soma K. P. The group met in Kerala in June 2009 to discuss the substantive issues related to this theme, explore the common grounds around these issues within the group, and then prepare a chapter plan and allocate responsibilities of writing the various chapters.

It was decided to have the following six chapters (the names of the persons who took the responsibility of writing the chapters are given in brackets): 1) Introduction (K. J. Joy and K. P. Soma), 2) Water for basic needs (Priya Sangameswaran), 3) Water for ecosystem needs (A. Latha and M. K. Prasad), 4) Water for livelihood needs (Shripad Dharmadhikary), 5) Water for socio-cultural needs (Priya Sangameswaran), and 6) Critical issues and way forward (K.J. Joy). The group was supported by Shruti Vispute of the Forum and Amita Kaushik who was brought in to do a quick literature review.

Once the first draft was ready, it was circulated internally within the group for comments and suggestions. Later the Forum organized a meeting of the two sub-groups¹⁵ in November in Delhi to present and discuss both draft reports (and outlines) and see how they match and overlap with each other. The drafts were also circulated to the Steering Committee members of the Forum for their comments and suggestions. The revised draft was again presented and discussed in the two-day national workshop held on 25-26 February 2010 at Pune. The draft report has been finalised taking into account the feedback received in this workshop.

Purpose of this document

This document is not meant to be purely academic; of course it is academic, but it is not prepared primarily with the objective of solely contributing to the existing academic literature. We are also aware that there may be more comprehensive academic treatises on these issues. This position paper has been prepared with the idea that the Forum, and all those who have been connected with the Forum and its work, would own this document and use it in many different ways - in their work with the communities, and also use it for campaigns and advocacies especially with the policy makers - to usher in a change, first in the many ways that we think about water, and second, in the many ways that we manage it. It is meant to provide us a set of benchmarks in our work as a forum for conflict resolution and conflict prevention.

We also know that the document has to be broad enough - and not too rigid and narrow - to accommodate the concerns and viewpoints of different groups and individuals within the Forum. It also needs to be flexible enough to adapt itself to different situations and contexts within the normative concerns or foundational principles of sustainability, equity and democratisation that guide the work of the Forum, the concerns that bind us all together. Thus, this document should not be treated like a rigid "party manifesto". Instead, the document aims to set certain minimum benchmarks or principles with regard to the issue of entitlements and allocations for livelihoods and ecosystem needs.

The Forum would use this document for wider dissemination and advocacy work within both the practitioner community as well policy makers. One of the immediate tasks of the Forum would be to use this report to intervene in the process of the review of the National Water Policy that is currently underway.

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Water for Basic Needs¹

Introduction

Of all the needs that water fulfils, most people would include water for basic needs in any understanding of a 'right to water'. Yet, the various dimensions involved in its provision - quantity, quality, affordability, accessibility, the unit at which provision is made, conditions for such provision, institutional mechanisms for delivery, and pricing - are not straightforward. This chapter conceptually discusses these different dimensions as well as some of the areas of debate and controversy, and brings out their working in the Indian context, followed by a tentative model of the provision of water for basic.

Dimensions of water for basic needs

In terms of water, basic needs include drinking, bathing, cleaning, cooking and other domestic uses. Additionally, basic needs may also include the needs of livestock. However, other than drinking water needs, what exactly constitutes basic needs is not obvious. This is one of the factors that makes it difficult to arrive at a consensus about the exact amount of water required to satisfy basic needs. Basic water requirements suggested by various donor agencies such as the World Health Organisation, US Agency for International Development, and the World Bank range from 20 to 50 litres per capita per day. However, greater amounts of water are also likely to significantly increase health and quality of life (CESR, 2003). There is also the fear that suggesting a particular level of water provision can provide an excuse for governments to 'lock' the water provision at that level (UNESCO-WWAP, 2003). Further, any discussion of the quantity of water required for basic needs is complicated by the question of whether one should have a universal standard as well as whether and how differences in requirement due to culture, climate, and technology (such as those that exist between societies living off flowing rivers and societies dependent on abstracted water, or those between rural and urban households) should be taken into account.

Other dimensions such as quality, accessibility, and affordability of water - each of which would also vary depending on a number of contextual factors - also need to be taken into account, along with quantity. The question of affordability, in particular, has become very controversial in recent times, following changes in water policies that emphasise cost recovery, and that have also led to an emphasis away from public modes of provision of water such as public standposts, to private modes such as piped water schemes. A useful conceptualisation of 'affordability' is provided by WHO (2003). Firstly, affordability could be conceived in terms of a relation between income and expenditure on water. More specifically, no more than three to five percent of an individual's income is to be spent on water. While WHO does not discuss the possibility of the percentage differing across income groups, this might be a way to deal with inequities in income distribution. However, caution must be exercised while using such percentage figures. For instance, very often, only the tariff on volumetric water is included in the expenditure, while the connection charges are not

¹ This chapter draws heavily on Sangameswaran, Priya, 2007, 'Review of right to water: Human rights, state legislation, and civil society initiatives in India', Technical Report, Centre for Interdisciplinary Studies in Environment and Development, Bangalore.

included, even though these can be quite high, especially when a new water supply system is being put in place. Secondly, WHO emphasises the fact that what people can pay does not depend only on absolute income, but also on the expected income stream. People who earn money on an irregular basis may not be able to enter into long-term arrangements which might be cheaper in the long run, but which would entail regular financial commitments. Thirdly, different affordability criteria may also be applied to different slabs of water, such as lifeline water and lifeline plus water, which are discussed later in this chapter. Fourthly, discussions of affordability often take particular modes of provision of water and/or technology as a given. Instead, low cost options should be given first preference, as long as other desirable criteria such as sustainability are also met (and in special circumstances, even at the expense of such other criteria). Finally, it is important to note that income-based criteria for affordability may not always be deemed to be relevant, for instance, if it is believed that some minimum quantity of water should be provided free of charge to all, irrespective of their income levels.

Requirements of accessibility and quality have typically been discussed less than the question of quantity of water or pricing (Bluemel, 2004). This is so in spite of the fact that the quality of water is related to health. For instance, drinking water could be contaminated by a range of chemicals (lead, arsenic, benzene), microbes (bacteria, viruses, parasites), and physical hazards (glass chips, metal fragments) that could pose risks to health. In general, water quality is affected by both point and non-point sources of pollution such as sewage discharge, discharge from industries, run-off from agricultural fields, and urban run-off.² In the light of increasing groundwater pollution as well as contamination of surface water bodies, the question of water quality is slowly becoming important. Cases such as the contamination of groundwater due to arsenic in Bangladesh and West Bengal in the South Asian region have also helped to bring this issue into focus. Further, given the magnitude of the problem of quality, it might make more sense to prioritise (at least in the short-run) the elimination of pollutants with the most significant impacts on health in a particular context, rather than set high thresholds for all parameters of water quality, even when these cannot be attained immediately within the available resources (UNESCO, 2005: Clause 7.2). Finally, the dimension of water quality also offers an important means of linking water and sanitation issues, as one of the primary causes of contamination of water is the inadequate or improper disposal of human and animal excreta.

In order for water to be secure and useable, everyone must also have safe and easy access to water facilities. For instance, in households using only a remote and unprotected source, health can be jeopardised by water contamination. Further, collecting water from distant sources entails a lot of time, so that women and children who often bear the burden of collecting water in many cultures, are unable to undertake other activities (economically remunerative work, domestic chores, leisure, and so on in the case of women, and going to school or playing in the case of children).³ In addition, there is also the risk of injury while carrying heavy loads. Interestingly, the General Comment 15 of the United Nations defines accessibility not just in terms of the physical dimension, but also includes economic accessibility (which is equivalent to the affordability dimension discussed earlier), as well as non-discrimination against marginalised areas or groups, along with access to information on water issues (UNESCO, 2002: Clause 12).

² *Khurana and Sen (2007) cited in the literature review by Amita Kaushik on water for basic needs.*

³ *Note, however, that care must be taken to ensure that this argument for easier access does not end up further stereotyping women's association with certain tasks.*

It is important to note that questions of quality, access, and affordability differ for different uses of water, as well as across class and gender. For instance, the quality of water would depend on the particular need in question: water for drinking would have to be of a higher quality than water for cleaning purposes, since health-related problems could arise not only due to insufficient water, but also due to problems in water quality such as fluoride contamination and arsenic poisoning. Questions of quantity, quality, access, and affordability are also inter-related. For instance, not being able to afford official sources of safe water might result in households having to use water from polluted streams and rivers (Mehta, 2004).

Further, there is also the question of the unit at which provision of water for basic needs is made - the individual or the household. An important point to keep in mind in this regard is that there may be a difference between the unit to which a right is assigned, and the unit of implementation, which in turn has implications for equity. In South Africa, for instance, the Free Basic Water Policy that guarantees 6000 litres per capita per month without cost has been calculated using a household size of eight and a per capita per day provision of twenty-five litres of free water. This, in turn, tends to disadvantage larger and poorer black families (Langford, 2005). In general, whenever the unit of implementation is the household, the amount of water per household ends up being calculated on the basis of the average size, which in turn means that larger families are implicitly penalised.

A related consideration is that in most countries, the minimal criteria for any human right to be accorded, whether to an individual or to a household, seems to be citizenship. However, 'citizens' constitute a political community defined by the state, and at any given time, there may be groups of people (such as slum-dwellers and migrants) who are 'non-citizens' (Mamdani, 1998). Further, slum-dwellers are also increasingly being denied the rights of citizens, as a result of judicial judgements such as the one in the 2000 Almitra Patel versus Union of India case, which treat the urban poor as encroachers and equate the provision of resettlement as tantamount to rewarding pickpockets (Ramanathan, 2006). How such 'non-citizens' can also be ensured access to water for basic needs then becomes an important question. In fact, given that the domain of citizenship is increasingly becoming contested, one might even want to delink access to water from citizenship criteria.

Another important dimension (which would apply not just to basic needs, but is particularly critical in this context) is the question of who would actually be in charge of the various functions involved in the provision of water, or in other words, the institutional mechanisms put in place to undertake delivery⁴ of various water services. If water for basic needs is to be guaranteed to all, does it necessarily imply that the state must undertake this function, and that none of the specific tasks involved in providing water to people can be delegated to any private body (which is the stand taken by some campaigns against water privatisation)? Or does it mean that only critical tasks such as tariff-making should be retained by public bodies, and/or that private bodies should be subject to regulation by the state with a view to ensuring access to water for basic needs to all? The peculiar characteristics of water, such as a high degree of natural

⁴ Delivery would broadly include building the necessary infrastructure as well as operations and maintenance. Note that this dimension would not be applicable only to basic needs, although it is particularly critical in this context.

monopoly, high capital intensity and the presence of sunk costs, the multipurpose and hydrologically interconnected nature of the water resource itself, as well as the perception that public provision is the best way to guarantee universal access, have traditionally lent support to the delivery of water services by state or state-owned enterprises. But the currently dominant view is that the private sector (including foreign private bodies such as MNCs) should be permitted to undertake this function either on its own or in partnership with the state or state-owned enterprises, given the limited effectiveness of national or state governments in this respect.

It is not possible to delve here into the vast literature on the subject, or to discuss the pros and cons of different modes of provision of water. Instead, we argue that whatever the mode of provision, there should be certain non-negotiables. Among other things, there could be provision of a certain amount of water to meet basic needs and precise details of the conditions of such supply can be included in the legal instruments governing the working of the concerned public or private body such as contracts and acts of parliament. In addition, in order to actually ensure the right to water, there should be clear mechanisms for redress in case of violation of the non-negotiables. Hence guidelines are needed on which body would be responsible for judging violations, who would be penalised in case of violations and how, as well as whether a system of compensation for those without water for basic needs can or should be put in place.

Note that a position of flexibility in terms of who actually undertakes delivery of water is consistent with a number of international discussions about the right to water. The latter gives states the freedom to choose their system of water delivery, while at the same time emphasising that non-state actors should take necessary steps to realise the right to water, (or at least not thwart it); in addition, the need for regulation by the state is also emphasised (see, for instance, UNESCO, 2002 and UNESCO, 2005). At the same time, we would like to highlight that the non-negotiables mentioned above would effectively preclude many kinds of privatisation currently being undertaken, and underscore the ultimate responsibility of the state.

Finally, perhaps the most important dimension of the right to water is pricing. In terms of pricing, some argue that the right to water should be interpreted not to mean the provision of 'free' water, but water that is affordable to all, including socially disadvantaged groups. Others argue in favour of providing at least a certain minimum amount of water free of charge to all, and charging only for water supplied beyond this minimum (as in the case of the South African water policy). Although the question of pricing is related to the affordability dimension discussed earlier (in that any pricing strategy must meet certain affordability criteria), it is somewhat more complicated as there are a number of other goals that pricing is often supposed to attain. Goals could include recovering costs, capturing the 'true' value of water as a resource that has multiple uses, and providing an incentive for judicious use of water. Any discussion of pricing would therefore have to consider whether or not pricing is the most suitable instrument to attain these goals, as well as the various pricing options available. However, much of this discussion would pertain to non-basic needs. The goal of capturing the true value of water or curtailing consumption would not be relevant in the case of water for basic needs

(although over a longer time frame, one might want to consider ways of reducing the requirement of water even for basic needs, such as alternative technological options for sanitation which would use lesser water). Further, while meeting costs is relevant even in the case of basic water, these costs do not necessarily have to be met from the users themselves, or even from the water arena itself, as we discuss later. Similarly, the pricing choices are also relatively simpler in case of water for basic needs. One could either have water supplied free of charge, or one could charge a low tariff: either a fixed rate, or a volumetric rate.

We would like to conclude this section by mentioning a number of points which are not, strictly speaking, dimensions of the right to water, but which are nevertheless critical to its working. The first is the question of the appropriate mode of provision of water and the various concerns that need to be kept in mind while determining it. For instance, typically, provision of water has involved undertaking new schemes, instead of considering ways to use existing schemes more efficiently, or to use alternative non-traditional modes of water provision that may be both more cost-effective as well as more sustainable. Similarly, particular kinds of water delivery systems - piped water systems in rural areas and 24/7 water in urban areas - are increasingly being privileged by ongoing water reforms, even though their implications in terms of cost, sustainability and equity are often problematic. The question of the appropriate mode of provision of water would also need to include appropriate mechanisms to deal with water after it is used, i.e., wastewater management. The second point relates to the question of duties and responsibilities of the right-holder, and in particular, the need to limit both the quantity of water consumed as well as to restrict the manner in which it is used. Also, the question of what specific measures - regulation, moral injunctions, and so on - one would use for this purpose is critical. The third point relates to the fact that there can be conflicts between different users as well as different uses, even in the context of water for basic needs alone (for instance, drinking water for urban versus rural users). When water for livelihoods and ecosystem needs are also included, the number and complexity of conflicts increase. Hence suitable mechanisms to resolve such conflicts in a just manner need to be put in place, along with the introduction of policy safeguards that would minimise such conflicts. Fourthly, many international policy negotiations, such as those about sharing of transboundary waters and bilateral and multilateral trade agreements, would need to be evaluated against the framework of a right to water.

⁵ *General Comments issued by the United Nations Economic and Social Council are non-binding interpretations of the rights and obligations included in the International Covenant on Economic, Social and Cultural Rights (ICESCR), but may be relied upon by various international bodies when deciding whether a state has met its obligations under the Covenant (Blumel, 2004).*

Provision of water for basic needs in India

At the international level, the two most explicit instruments for provision of a right to water are the General Comment ⁵ 15 adopted in November 2002 by the United Nations Committee on Economic, Social and Cultural Rights (CESCR) and the 2005 draft guidelines for the realisation of the right put forth in the Report of the Special Rapporteur of the United Nations Commission on Human Rights (UNCHR), both of which focus on water for personal and domestic uses.

In the Indian context, though the right to water is not explicitly mentioned in the constitution, there is judicial support for it under Article 21, the right to life (a fundamental right), which has been reiterated in a number of court judgements. For instance, in December 2000, in the course of a case involving the Government of Andhra Pradesh's permission to an oil company to set up a potentially polluting

industry in the catchment area of two rivers which are the main sources of drinking water for Hyderabad and Secunderabad, the Supreme Court ruled that access to clean water is a fundamental human right of all citizens under Article 21 of the Indian constitution, and that the state is duty bound to provide it (Ramachandraiah, 2001). However, the implications of judicial judgements for different dimensions of the right to water are not clear, and have to be derived from rules and norms of specific programmes of different departments working on water (at the central, state and sub-state level). What is really problematic, though, is that many aspects of water policies and legislation (especially in the ongoing reforms) are also explicitly incompatible with the right to water for basic needs. Given differences across states as well as the large number of programmes/schemes in place to deal with drinking water, it would not be possible to discuss all of these aspects. Instead, in this section, we briefly lay out some of the norms laid out by the centre, and consider certain features of the reform process that are relevant to the discussion of water for basic needs.

Two important aspects of the scope of the right to water are affected by the centre, viz., quality and quantity. Firstly, at least some forms of water come under the purview of central legislation dealing with the quality of water and water pollution (Pant, 2003). Quality of drinking water supplied by public agencies is governed by Bureau of Indian Standard (BIS) IS: 10500. Packaged water was included in 2000 in the Prevention of Food Adulteration Act, 1954. Similarly, the Water (Prevention and Control of Pollution) Act, 1974 (amended in 1988) provides for a comprehensive scheme of administrative regulation through a permit system. The provisions of the Environmental (Protection) Act, 1986, also relate to water quality and access to water, through its notifications on permissible quality standards, environmental impact assessments, and public hearings. Its most relevant provision from the point of view of water is probably the Coastal Regulation Zone (CRZ) Notification, which prohibits certain activities such as the discharge of untreated wastes and effluents in coastal areas declared as CRZ. However, the quality norms are far from adequate. For instance, the bottled water and soft drink industry, which depends on extracting groundwater, and has a huge impact on the surrounding groundwater (in terms of both quality and quantity), is outside the purview of the 1994 Environmental Impact Assessment (Anonymous, 2005).

Secondly, the drinking water programmes of the central government have standardised quantity norms for meeting basic water needs, which influence the way in which these programmes work on the field. According to official guidelines issued by the central government, rural water requirements in India are set at 40 litres per capita per day (lpcd) while urban water requirements are set at 140 lpcd for sewered areas, and 100 lpcd for unsewered areas. There are a number of problems with these quantity norms. The rural water requirement does not take into account the needs of livestock (except in desert areas where another 30 litres is allocated on that count). There is also little space for flexibility in the norms to deal with differences in requirements, say, across different agro-climatic zones. Usually, in designing rural water systems, total demand is determined by fixing the norm at 40 litres per capita per day as a minimum requirement for all rural areas, and then multiplying this by the population. One result of this lack of flexibility in quantity norms is that in regions where per capita use is lower, population coverage is reduced (Reddy, 1999). Finally, there is the concern that the urban

norms perpetuate technology and water and sanitation systems that make excessive use of water and lead to further inequities between rural and urban areas. It is partly in response to concerns such as these that, in recent times, the need to shift from the conventional norms of litres per capita per day (lpcd), to ensure drinking water security for all in the community, has been mooted (see, for instance, Gol, 2009). The implications of this move need to be thought through, but there seem to be at least some calls to exercise caution in extending a security discourse to water.⁶

There are also many aspects of a right to water for basic needs that are either not clearly defined by central-level policies and guidelines, or are defined in such a way that makes the satisfaction of basic needs difficult. For instance, the National Water Policy accords top priority to drinking water (Gol, 2002: Clause 5), and holds that the drinking water needs of human beings and animals should be the first charge on any available water (Gol, 2002: Clause 8). However, there is no discussion of how this is to be operationalised, either at the central level, or at the state level. In other words, there is no clear discussion of conflicts between drinking water and other uses of water, and how these are to be resolved, or of the relation between the right to water and other rights. As a result, water for industry or agriculture is often prioritised over drinking water.

What is perhaps of greatest concern in terms of the fulfilment of basic water needs for all, is the set of processes slowly being put in place in the rural and urban drinking water sector that are euphemistically called 'sector reforms'. Provision of domestic water supply has, for a long time, been supply-driven, that is, based on centralised modes of funding and decision-making, focused on exploiting additional water resources, with emphasis on norms and targets and on construction and creation of assets. Consequently, management and maintenance of the facilities built, equitable distribution of the available water, the question of water quality, or the sustainability of the source, has not received much attention. The resulting problems have led to a number of changes in the domestic water sector in recent years of which, perhaps, the most important one is the shift from supply-side projects to demand-side projects based on the principles of demand responsiveness, decentralised mode of management, and cost recovery (usually 10% of the capital costs and 100% of the Operations and Maintenance (O&M henceforth) costs). Other reform measures that have been encouraged include commercialising or corporatising of institutions, unbundling/rebundling of functions, and appropriate forms of private sector participation as well as public-private partnerships, especially in urban areas. In the rural drinking water arena, sector reforms began formally with the Sector Reform Programme of 1999, which was upscaled to Swajaldhara in 2002. Similar programmes have also been undertaken by individual states using a variety of funding sources. In the urban context, reforms have typically formed the conditionalities for receipt of funds from the central-level Jawaharlal Nehru National Urban Renewal Mission (JNNURM) and the Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT). There are also guidelines on specific issues (such as the 2004 Guidelines for Sector Reform and Successful Public-Private Partnerships of the Ministry of Urban Development and Poverty Alleviation) which have fed into the reform process.

⁶ For a brief summary of some critical views on the security discourse, see Sangameswaran (2009).

Many critiques have emerged about the reform process, centred around the cost-contribution clause, the discourse of depoliticisation that has often accompanied the setting up of new institutions such as Village Water and Sanitation Committees, the presence of a large number of private players, the lack of attention to local inequalities and power dynamics, the (perceived) withdrawal of the state, and the speed (and often non-transparent manner) in which far-reaching legal changes are being made.⁷ Though it is not possible to review all these issues here, we would like to highlight a number of considerations that are critical for the fulfilment of basic water needs.

Consider the question of decentralisation and participation. Firstly, even in drinking water schemes such as Swajaldhara, which purportedly rested on principles of social inclusion and governance, there were no mechanisms to actually ensure that the schemes were designed by including all sections of society (Ahmed, 2005). Secondly, no instruments were explicitly included to enable marginalised sections of the population to participate in the decision-making processes at the micro-level; this is true even when quotas came to be formally earmarked for such groups in local committees. Hence the possibility that this approach would help in overcoming existing inequities is very remote. Thirdly, the goal of participation in these projects is itself very limited, viz., to get local people to contribute labour as well as costs, and there is no emphasis on understanding what their priorities are at any given time. Ideally, according to the logic of demand-based projects, if people are uninterested in house connections or modern systems of supply, there should be an openness towards providing low-cost water through stand post supplies and/or improving the water sources within the village (Reddy, 1999), but in practice this is often not the case.

A second issue of concern from the point of view of fulfilment of basic water needs is the condition about recovery of capital and O&M costs. This condition often results in the exclusion of those without adequate resources, unless local-level measures such as an explicit provision of waiver for poorer households are taken. Sampat (2007)'s study of the working of the Swajaldhara scheme in Rajasthan brings out, for instance, that people either had to take loans in order to make the payment, or else that a new contractor class emerged that bore these costs on behalf of villagers, putting in place new kinds of patron-client relationships (a finding that is also corroborated by studies in other locales). In general, a blanket implementation of the cost-contribution clause is likely to violate the affordability criteria that any right to water for basic needs would need to meet.

The third concern that we would like to highlight relates to the processes of privatisation and regulation.⁸ We have mentioned in the previous section that whatever the mode of provision, the key is to have certain non-negotiables along with mechanisms of redress. But in general, there has been no explicit consideration of a right to water (whether for basic needs or otherwise), and of its implications for the conceptualisation of different aspects of the reform process, and particularly for the process of privatisation. In fact, even the nature of the kind of privatisation currently under way is not adequately understood. Although the involvement of private players in the water sector is not a new phenomenon, be it in drinking water or irrigation, the current forms of privatisation are different on a number of counts. Earlier, private operators were mainly individuals, such as

⁷ See, for instance, Sampat (2007) for a discussion of some of these critiques of demand-driven approaches, particularly in the context of the Swajaldhara scheme in Rajasthan, Cullet (2006) for a discussion of the legal aspects of the changes, and Sangameswaran and Madhav (2009) for a discussion of three sets of institutional changes - regulation, privatisation and decentralisation - that are part of the reforms.

⁸ The discussion in this paragraph draws on Sangameswaran and Madhav (2009).

individual farmers in the case of tubewell-based water markets and contractors in the case of tanker water supply, with the latter often operating under contracts from civic or government authorities (Sridhar, 2003). In the new forms of privatisation in the urban drinking water and irrigation sectors, players are mostly corporations (including MNCs), although in the rural drinking water sector, private players are typically individual actors and small local companies. Also, there is now an increasing push to have consolidated contracts, as against the single-function contracts of the past. These differences need to be kept in mind while drawing out the implications of private sector involvement for the fulfilment of the right to water for basic needs. For instance, lines of accountability become increasingly blurred with the various levels of contracting and sub-contracting that are often found in the new forms of private sector involvement.

Further, one institutional mechanism that has been mooted in the reform process, namely independent regulatory authorities (IRAs), has, at least in theory, the potential to subject private providers to certain performance requirements, including the provision of water for basic needs. Actualising this is not an easy process, but the problem in the Indian context is even more fundamental; the IRAs or variants thereof that have been put in place in a number of states in the country do not even have such an undertaking in their mandate. The question of regulation is also complicated by the fact that large populations depend on informal water providers, often paying excessive prices, and being subject to uncertainties. While one could at least conceive of some forms of regulation and monitoring of such informal providers, ensuring water for basic needs may require the current users of informal water supply systems to gain access to formal water supply systems.

A tentative 'model' of provision of water for basic needs

At the level of conceptualisation, a rights-based approach offers the most useful conceptual apparatus to think about basic needs. However, given the complexities in the different dimensions of water for basic needs as outlined earlier in this chapter, instead of posing the discussion of the scope of the right to water in terms of a fixed allocation of water (along with particular standards of quality, accessibility, and affordability), it might be more useful to focus on the principle of equality and capability to do and to be (à la the capabilities approach of Sen and Nussbaum).⁹ This would translate into the idea that people all over the world should have access to safe, adequate, and affordable water in a manner that ensures a basic level of healthy functioning and well-being (Mehta, 2003).¹⁰ But while this would automatically allow scope for inclusion of cultural and other kinds of differences in the ambit of the right to water, it also means that more context-specific interventions become critical.

How then, would such an approach be operationalised? A tentative 'model' of one possible approach is outlined below, drawing on the experience of other countries - such as South Africa - which have tried to implement the right to water.

One of the first questions to grapple with in terms of ensuring the provision of basic water needs for all is the question of whether such a right needs to be formalised as an independent right (and the form that such formalisation should take), or whether the current interpretation under the right to life is sufficient. An

⁹ See, for instance, Nussbaum (2000). *Even if all people reach such a basic level of functioning and well-being, there would still be high levels of inequalities in society.*

¹⁰ Addressing these, by means of a right to water in conjunction with other rights, could be the next step.

important consideration here is the fact that water is a state subject in India, so that it would be difficult to enact central-level legislation and guarantee its implementation across the country. But if the option of greater formalisation is chosen, one approach might be to undertake a constitutional amendment that explicitly incorporates a right to water. Such a constitutional provision can also be accompanied by an explicit provision for a right to water (at least in order to meet basic needs) either in the national water policy, or in a separate basic water policy adopted for this purpose. This last option has been adopted in South Africa, where an explicit right to water in the constitution is supported by a Free Basic Water policy that aims to provide a supply of 6000 litres of safe water per month to all households free of charge. The constitutional provision as well as the policy document could then form the basis for holding the states accountable for the provision of water for basic needs. Note that the current water policy, that is, the 2002 National Water Policy, continues to call water a 'basic human need' as against a 'basic human right', in spite of many attempts by civil society agents to get the nomenclature changed from 'need' to 'right' (Anonymous, 2002).

Secondly, what the right implies for the different dimensions mentioned earlier would need to be clarified. Given the fact that water is a state subject, and given the importance of decentralisation and the need to allow space for context-specific variations, the power to delineate the precise content of each dimension would need to rest with the state and/or with local bodies. However, the need for some kind of broad guidelines at the central level remains. Here, we attempt to provide a tentative outline of these broad guidelines. It is also crucial that the process of making guidelines about various dimensions of basic needs at a more centralised level, as well as the process of deciding more precise rules and norms at lower levels, be democratic and transparent. In fact, explicit provisions for this purpose must be included in the institutional structures of decision-making, although the precise modalities of this process are not discussed here.

In order to lay down guidelines for basic needs, it might be useful to think of three different categories of water for households - lifeline water (which could cover just minimum water required for drinking and cooking); water over and above lifeline water or lifeline plus water (which would cover uses of water that are necessary for maintaining a decent life such as washing, hygiene, sanitation, etc); and luxury water (water used by households for purposes which are not strictly essential e.g., water for washing cars). *Only lifeline and lifeline plus categories of water would be included in basic needs.*

Minimum quantity, quality, and physical accessibility norms for both lifeline water and lifeline plus water should be laid down at the central level. State governments and local bodies would be free to adopt higher quantity or quality norms in order to deal with varying requirements in different contexts. Water for basic needs (both lifeline and lifeline-plus) should be defined on a per capita basis rather than on a household basis, even though actual supply may happen at the unit of the household. For administrative expediency, it might be necessary to use an average figure for the number of members per household. However, the average figure could vary across different areas (districts or states) in order to ensure that this average is a reflection of the actual situation in a given area, and to prevent the implicit penalisation of larger households. There should also be explicit clauses

(in the constitutional amendment if undertaken, the national water policy, as well as state and sub-state norms) *that guarantee provision of basic water to all residents (temporary or permanent) of a locality at any given time irrespective of the legality or otherwise of their domicile status as well as of possession of relevant documents thereof; this would include (but not be restricted to) new migrants and refugees from other regions whether within or outside the state/ country in question as well as those whose older source of water for basic needs has been alienated from them or has been rendered unusable due to reasons such as displacement, pollution, and so on.* No one should be denied basic water on the grounds that they have not paid for a legal water connection, or are yet to be allocated such a connection, or have defaulted on payment of their water dues or other dues.

Any individual who does not have access to basic water should have the right to approach the body in charge of providing water in that area to demand that arrangements for providing basic water - whether temporary or permanent - be made within a fixed time period. If such provision is not made within the stipulated period, then recourse could be made either to an existing body or a new body created explicitly for this purpose. Similar provision for redress should also be available in case of actual or potential violation of any of the non-negotiables specified in terms of provision of water for basic needs (such as norms about quantity, quality, accessibility, pricing and so on).

Lifeline water should be provided free of cost. Lifeline plus water could be charged a low tariff (a fixed charge for the whole slab, or a volumetric tariff). These two provisions - free lifeline water and low-tariff lifeline plus water - could be uniform across all classes, or could be restricted to lower-income groups; however, the administrative costs of having a policy that differs across income groups would be quite high.

Whatever the method of provisioning adopted, local bodies must have adequate finances to provide water for basic needs. Here again the South African experience has useful lessons. One of the major problems that local bodies in South Africa (especially smaller ones) have faced in implementing the right to water is the lack of adequate finances, especially given that fiscal conservation measures put in place in the same period as the adoption of the right to water resulted in reduction in grants and subsidies to local municipalities and city councils. Apart from limiting the amount of funds available, this also meant that the kind of institutional arrangements that resulted, that is, partnerships between public bodies and the private sector in the realm of water, had a mixed impact, especially in terms of equity. One can anticipate similar issues arising in the Indian context, given the thrust on self-sufficiency and balancing of budgets in the course of both the rural and urban reforms being implemented in recent times (in demand-oriented schemes such as Swajaldhara in the rural sector and JNNURM and UIDSSMT in the urban sector). This in turn means that there should simultaneously be an emphasis on strengthening the financial resources available to rural and urban local bodies, both by state and central governments. Similarly, there could also be earmarking of some proportion of funds available to local government authorities (whether raised by them or given/lent to them by central or state governments or other private or bilateral/multilateral organisations) to meet

the right to water for basic needs. This is important because very often, the inadequacy of finances is often 'created' by a wrong choice of investment priorities.

One more factor is worth emphasising in the context of availability of finances. In contrast to the current trend of making each sector and sub-sector self-sufficient in terms of finances, the possibility of financing a particular use of water (in this case, water for basic needs) from other water or non-water arenas, that is, the instrument of cross-subsidy, must be kept open. Finally, it might be worth having an explicit legal provision to the effect that no government authority can cite lack of availability of finances and/or other constraints as reasons for non-provision of water. This would mean that the provision of lifeline and lifeline plus water is non-negotiable. In fact, there is already judicial support for such a provision in the Indian context; for instance, some judicial judgements (such as the 1980 Municipal Council Ratlam vs. Vardhichand and others) hold that the state cannot claim insufficient funds as a reason to not carry out its duties (Upadhyay and Upadhyay, 2002). However, such a legal provision could be laid down more explicitly.

Conclusion

The right to water for basic needs, while less controversial than the right to water for livelihood or ecosystem needs, nevertheless involves a number of dimensions, not all of which are straightforward or involve an easy consensus. The current context of reforms in the water sector, which has implications for many of these dimensions, is a further complicating factor. The propositions put forward in the tentative model of water provision for basic needs can be used as a starting point to come up with more specific norms in particular concrete settings. But in general, a basic rule of thumb seems to be that guidelines or norms of water provision and/or policy changes in the realm of water (be it about pricing, reducing leakages, participation, or others) need to be evaluated against the framework of a right to water, or more specifically, with respect to the question: would putting in place the particular policy in question ensure that access to water for basic needs improves for at least some (if not all), and in particular for marginalised groups in society?

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Water for Ecosystem Needs

'We can fill the taps without emptying the rivers'. (*Fred Pearce, New Scientist, 07 June 2003*)

Water for environmental needs

Global estimates reveal that over 1.4 billion people live in river basins where high levels of water use threaten freshwater ecosystems. (Smakthin, Revenga, and Döll: 2004) Expanding cities and changing lifestyles will necessarily lead to an increase in the demand for water. According to the 3rd United Nations World Water Development Report (WWDR3), a steadily increasing demand for agriculture, followed by a rising demand for industry and energy, continue to be the main drivers behind increasing water use. The World Commission on Dams (WCD) has predicted that environmental sustainability will rise as a predominant factor influencing decisions in water development in the future. The highest cost of expanding water use has indeed been borne by ecosystems, as well as by poor communities which directly depend on these ecosystems, including fisherfolk, tribals, artisans etc. who remain unaccounted for. It is now accepted without dispute that ecosystems in their natural state are capable of ensuring long term availability of fresh water for sustenance of human beings, and that the value of water goes far beyond its productive uses. Unfortunately, most countries including India are not yet aware of how much water is in use and for what purposes, the quantity and quality of water that is available and can be withdrawn without serious environmental consequences, and how to plan for a sustainable future. However, many countries across the world are increasingly recognising the importance of integrating ecosystem needs into development planning, taking suitable policy and legal decisions to ensure water for ecosystems, and safeguarding livelihoods and profits for the future.

This chapter makes a case for highlighting the need to ensure water for the environment, while planning for the development of water resources and the management of water within the Indian context. It also tries to indicate the different challenges in ensuring water for ecosystems, as well as the different methodologies to assess the water needs of the environment, while affirming that we all lose if water is not left for the needs of the environment. The chapter also outlines the role the Forum for Policy Dialogue on Water Conflicts in India should take towards policy and legal instruments in ensuring water for the environment.

Increasing significance of environmental flows or water for ecosystem needs

World over, approximately 263 international river basins covering almost half the earth's land surface support 40 per cent of the world population, while carrying 60 per cent of the global river flow. There is no dispute to the fact that while the

demand for freshwater is increasing all over the world, the competition and conflicts over scarce water resources are also escalating. The problem is more pronounced in developing countries with both economic and physical water scarcity, where growing human populations depend on limited water resources. Until recently, a supply and demand based approach to providing water for agriculture, power, domestic and industrial uses has been prioritised by policy makers and planners. Also, research has focused on technologies to provide good quality water for drinking and sanitation, and adequate water for irrigation. However, degradation of rivers, wetlands and lakes and their aquatic ecosystems, disappearing flood plains and deltas, and plunging water tables and deterioration of water quality, have prompted policy makers and researchers to start thinking differently from the supply and demand oriented approach followed over the years.

Studies reveal that in many parts of the world, rivers are not reaching the seas due to massive diversions and over extraction. Mighty rivers like the Nile, the Colorado, the Indus, the Amur Darya and the Syr Darya are rivers no more. They resemble drains or channels rather than beautiful waterscapes. Not enough water is left in rivers for performing the valuable and immeasurable environmental services that they used to provide for society and for the ecosystem. The livelihoods of tribal, farmer and fishing communities, downstream water users as well as ecosystem dependent communities, has been put at risk due to the degradation of their primary livelihood resources. Estimates shows that river basins where current water use is already in conflict with water resources needed to maintain ecosystems, cover over 15 per cent of the world's land surface, and are populated by over 1.4 billion people. (IWMI: 2005)

The proposed National River Linking Project (NRLP), based on the assumption that water is flowing waste to the sea and that every drop has to be utilised for the benefit of mankind, has prompted wider discussions on ecosystem needs in the Indian context. Many Indian rivers have been subjected to large scale diversion of water outside the natural systems. Kerala, for instance, has a long history of interbasin transfers: a classic example is the Periyar Project (also known as the Mullaperiyar Project), by way of which water has been diverted from the Periyar River to meet the irrigation needs of the Vaigai basin in Tamil Nadu for more than a hundred years. The Mullaperiyar tributary of the Periyar River has ceased to flow for at least 36 km downstream of the dam. The case of the Krishna, the fifth largest river system in India, highlights the significance of ecosystem needs. Estimates show that the Krishna river's discharge into the ocean has decreased gradually. Before 1960, the river discharge into the ocean equaled 57 BCM a year. Since 1965, it steadily decreased, falling to 10.8 BCM in 2000, and falling further, close to nil in 2004 thus impacting the coastal ecosystems.

Overcommitment to human uses without accounting for environmental flows (EF) is the main reason for the reduced outfalls. Although the impacts of reduced flows on ecosystems are not quantified properly, there is well documented evidence of downstream environmental degradation in the lower Krishna basin, manifesting in soil and groundwater salinisation, increasing pollution, disappearing mangroves and wetland desiccation (Venot:2008).

Water for the environment - Interpretations

Over the years, it has been widely recognised that a river is much more than water flowing waste to the sea. It is an ecosystem in itself, and a critical link in the environment. The guiding principle in water management in the Netherlands has changed from 'controlling floods and rivers' to 'living with floods and giving room to water', given the increasing uncertainty created by climate change as well as fast changing socio-economic boundary conditions (Pahl: 2006). A river needs to flow in order to perform its various evolutionary and ecological functions.

There is no universally agreed definition or interpretation of environmental flows. The terms 'minimum flows', 'in stream flows', 'water for ecosystem needs' etc. are generally used with slightly differing conceptual understanding to represent environmental flows. The International Union for Conservation of Nature (IUCN) defines environmental flows as the water regime provided within a river, wetland or coastal zone to maintain ecosystems and their benefits, where there are competing water uses and where flows are regulated (Pahl: 2006). The International Water Management Institute (IWMI) describes environmental flow regimes as discharges of a particular magnitude, frequency and timing, which are necessary to ensure that a river system remains environmentally, economically and socially healthy (IWMI: 2005).

From an ecosystem perspective, it is not only the amount of flows that are important, but also their timing, quantity, quality and duration. The appropriate flow regime through different seasons of the year for enabling the various ecosystem functions like migration, feeding and breeding of fish and other aquatic life is of prime importance. Equally critical aspects include sediment and nutrient transport, deposit of sand, flushing out of pollutants, enriching and safeguarding riparian, flood plain, mangrove, backwater and delta ecosystems, replenishing ground water and protecting water quality.

There has been considerable debate on what is the right perspective with regard to water for environmental needs. Is 'apportioning', 'ensuring', or 'allowing' the water for ecosystems the correct perspective? Who are we to decide how much water should be allocated for environmental needs, or the evolutionary and ecological needs of rivers? This may be seen as inappropriate in principle because "water itself is part of nature and one cannot presume to allocate water to nature". This question has been raised by some authors (Iyer: 2005).

Another view suggests that 'environmental water requirements' should include both terrestrial and aquatic ecosystems. This perspective acknowledges that water is needed for direct evapo-transpiration through forests, wetlands and other lands, all supporting distinct ecologies and other functions of terrestrial ecosystems, apart from aquatic ecosystems. The latter would then be understood as 'environmental flows', and both together would constitute 'water to be left for ecosystem needs'. This is an interesting view, given that first, the requirements of terrestrial ecosystems are currently not explicitly considered, and second, that at present the 'environmental flow requirements (EFR)' and 'environmental water requirements (EWR)' are normally taken as synonyms (except rare cases when EWR is used to denote the total volume of EF) (Mohile, Gupta: 2005 and Smakhtin, Revenga and Döll: 2004).

In the Indian context, water to be left in the river for cultural and religious needs also assumes significance. "Flows are needed for maintaining the river regime, making it possible for the river to purify itself, sustaining aquatic life and vegetation, recharging groundwater, supporting livelihoods, facilitating navigation, preserving estuarine conditions, preventing the incursion of salinity, and enabling the river to play its role in the cultural and spiritual lives of the people (Iyer:2005).

In this chapter, based on the understanding that all land broadly falls within some watershed boundary, the flow regime to be left for the environment, right from the first order stream watersheds to the main river basin, denotes the water for environmental needs at a river basin level. Herein lies the significance of a watershed based approach to river basin restoration and management, which would automatically ensure that water is left for fulfilling its various evolutionary and ecological needs, which in turn would ensure the healthy status of river systems for society.

Environmental flows in South Australia are interpreted as environmental water requirements which are the hydrological regimes needed to sustain the ecological values of aquatic ecosystems, including their processes and biological diversity, at a low level of risk. Environmental water provisions are those parts of the environmental water requirements that can be met at any given time, after considering existing users' rights, and social and economic impacts. These provisions are sought for watercourses, riparian zones, wetlands, flood plains, estuaries, caves and aquifer ecosystems. In cases where current environmental water provisions are not sufficient to meet the requirements of water dependent ecosystems, the aim of the policy is to progressively increase environmental water allocations until they do so (Australian Bureau of Statistics: 2004). Australia is one of the few countries which has initiated steps to restore flows in river basins consequent to drought and increasing water scarcity. The country has adopted twelve national principles for allocation of water to ecosystems. Many of the principles have relevance to the Indian context, given how important rivers are for Indians.

Principle 1: River regulation and/or consumptive use should be recognised as potentially impacting on ecological values.

Principle 2: Provision of water for ecosystems need to be based on the best scientific information available on the water regimes necessary to sustain the ecological values of water dependent ecosystems.

Principle 3: Environmental water provisions should be legally recognised

Principle 4: In systems where there are existing users, provision of water for ecosystems should go as far as possible to meet the water regime necessary to sustain the ecological values of aquatic ecosystems whilst recognising the existing rights of other water users.

Principle 5: Where environmental water requirements cannot be met due to existing uses, action (including reallocation) should be taken to meet environmental needs.

Principle 6: Further allocation of water for any use should only be on the basis that natural ecological processes and biodiversity are sustained (that is, ecological values are sustained).

Principle 7: Accountabilities in all aspects of management of environmental water should be transparent and clearly defined.

Principle 8: Environmental water provisions should be responsive to monitoring and improvements in understanding of environmental water requirements.

Principle 9: All water uses should be managed in a manner, which recognises ecological values.

Principle 10: Appropriate demand management and water pricing strategies should be used to assist in sustaining ecological values of water resources.

Principle 11: Strategic and applied research to improve understanding of environmental water requirements is essential.

Principle 12: All relevant environmental, social and economic stakeholders will be involved in water allocation planning and decision-making on environmental water provisions (<http://www.ncc.gov.au/ast6/Vol2-AllocWaterCoAGobligation.html>).

Risks and Challenges

It has been widely recognised that allowing water for ecosystem needs is bound to trigger new conflicts since it will leave less water for present needs. However, failure to provide water for ecosystem needs will necessarily cause further deterioration of the ecosystems, leading to an irreversible loss. Less water in the river basin means less available drinking water, more concentrated pollution, more infectious diseases, loss of food security, reduced fish stock and diversity, less wild life, more competition between water for agriculture and drinking needs, and loss of biodiversity, even leading to extinction of species.

There are complex and competing social and political interests that must be assessed and determined in addressing relevant questions, including what environmental flows are required, and how they can be provided. Focusing on environmental flows out of context is unlikely to yield good results, and may even alienate communities.(Dyson, Bergkamp and Scanlon: 2003).

There are very few rivers in the world where a proper assessment of the water required for ecosystem sustenance has been carried out, leave alone implemented. In countries such as India, issues of environmental water demand have not even received the necessary attention they deserve. International Water Management Institute has developed a map of Water Stress Indicators (WSI) which takes into account environmental water needs. These environmental needs - the amount of water required to keep freshwater ecosystems in 'fair' condition -

were calculated using global models of hydrology and water use (IWMI, 2005). In countries like India most of the areas are marked where too much water is already being drawn for other uses leaving very little for ecosystem needs.

One of the major problems in designing environmental flows in the Indian context is that even the significant knowledge and database on ecological components like fish species, for instance, has rarely been interpreted in the context of environmental flow assessments. In other words, how different ecosystem components in different bio-geographical settings react to changes of flow caused by water resources or land development or land use changes in the river basin, is yet to be assessed. For example, the impacts of reducing or increasing high or low flows on fish, invertebrates, riparian vegetation, or sediment regime (which is one determinant of aquatic habitat), are not quantified. *We have limited understanding of the wisdom of tribal and fishing communities who have been living with and off the natural highs and lows in rivers, wetlands and coastal zones for centuries.*

India is handicapped by a poor hydrological database and insufficient correlations between alterations in hydrological regimes and impacts on ecosystems. Little is known about what happens when river basin developments modify river flow patterns significantly, especially in heavily dammed and diverted rivers. The priorities of a developing economy focusing on increasingly resource intensive water management approaches are bound to create conflicts. Moreover, assessing environmental water needs is an evolving field of action research in today's world.

Implications

Across the world, most fresh water for human use comes from inland wetland ecosystems like lakes, rivers and swamps. The livelihoods of people living in or on the borders of wetlands often depend partially or entirely on wetland ecosystem services. Loss or degradation harms them directly. In Cambodia, for example, fish from the freshwater Tonle Sap wetland ecosystem provides 60-80 per cent of the country's animal protein. In Malawi, local people use the fruits, seeds, tubers, roots and leaves of around 200 plants from the wetlands surrounding Lake Chilwa. In Malaysia, rural households earn up to US\$ 80 a month selling medicinal plants gathered from wetlands. Climate regulation, water purification, gene stock for food, and insulation from floods are a few of the innumerable services offered to humankind by rivers, lakes and other forms of inland wetlands. Modification, destruction and alteration of wetlands have affected these ecosystems, in turn affecting the livelihoods that depend on them (IWMI:2006).

Human interventions that infringe upon the environment and their implications for livelihood needs

Most river basins in India are either highly regulated by dams and diversions, or polluted right from the upstream. The situation of ground water is also no different. Since ground water is mostly individually owned and operated, there is no control over extraction, and over extraction contributes to lowering of water tables. Many

floodplains have been cut out from rivers by embankments, and riparian lands which remain are under intensive agriculture and grazing pressures. Human settlements, deforestation, mining and other activities have degraded the river catchments, and increased the sediment loads of all rivers. Also, during the past few decades, rivers have received increasingly large discharges of industrial effluents, fertilisers and pesticides from agricultural practices and domestic wastes (IWMI:2006)

An estimated 47,000 dams of more than 15 m height have been built all over the world by the year 2000. About half of the world's large dams were built solely or primarily for irrigation. Large dams are estimated to contribute directly to 12-16 per cent of global food production and 19 per cent of electricity requirements. However, of all the human interventions on river systems, dams have also been the most significant, often irreversible and direct modifiers of river flows, at the cost of the ecological health and ecosystem services of such river systems. Globally, over half of the 292 large river systems are affected by dams(Nilsson, Reidy, Dynesius, and Revenga: 2005; and World Commission on Dams: 2000).

Among all the environmental changes wrought by dam construction and operation, the alteration of natural water flow regimes has had the most pervasive and damaging effects on river ecosystems. Dams can heavily modify the magnitude of water flowing downstream, change the timing, frequency, and duration of high and low flows, and alter the natural rates at which rivers rise and fall during runoff events. Dams and diversion of water are capable of affecting several kilometres of downstream ecosystems, depending on the size and design of the structure, and the dynamism of the river, thus fragmenting rivers into static reservoirs and channels.

The important ecological impacts associated with flow alteration are summarised below:

- (1) Altering flows can lead to severely modified channel and floodplain habitats, because river flow shapes physical habitats such as riffles, pools, and bars in rivers and floodplains, and thereby determines biotic composition;
- (2) Aquatic species have evolved life history strategies such as their timing of reproduction in direct response to natural flow regimes, which can be desynchronised through flow alteration;
- (3) Many species are highly dependent upon hydraulic connectivity, both lateral and longitudinal, which can be broken through flow alteration; and
- (4) The invasion of exotic and introduced species in river systems can be facilitated by flow alteration(Richter and Thomas: 2007).

There is a widespread notion that irrigation and hydropower releases can be considered as environmental flows. However, water released for hydropower generation creates wide fluctuations in downstream river flow, flooding and drying out on a daily basis in tune with the tail race discharges. Irrigation releases can increase flows in the dry season compared to the wet season. As a result, aquatic organisms which have been tuned to the natural flow dynamics of a river are severely impacted.

The case of the transboundary Indus River Basin is a classic example. Several storage dams and barrages have been built on the Indus River. A complex network of canals transfers this water to about 30 million acres of agricultural land. The amount of water in the Indus River has decreased dramatically from around 1,85,000 MCM per annum in 1892 to 12,300 MCM per annum in the 1990s. As a result of the reduced flow into the fertile Indus delta, the extent of mangrove forest and biodiversity has declined, shrimp and fisheries reproduction has been reduced due to change in seasonal water availability and modified water quality, and agricultural chemicals have accumulated in the soil. Increased salinisation of the lower Indus has resulted in a decline of fish species which are sensitive to changes in temperature and salinity. Also, saline water has intruded 64 km inland, because of which 1.2 million acres of farmland has been lost.

Consequently, each such environmental impact has a related social impact as well. Fisherfolk, who form 84 per cent of the population in the delta, used to catch an estimated 2,47,000 tonnes of fish per annum. The loss of delta has led to a decline in the potential of fisheries by 70 per cent.(IUCN)

Some indigenous ichthyofauna (e.g., the anadromous fish, *Tenulosa ilisha*, or *Puntius* species., which used to constitute 28 per cent of the landings in 1943-1944) have completely disappeared from the Kaveri River after the construction of the Mettur Dam. A major negative trend in the Western Ghats Rivers, as pointed out by studies, is the construction of dams(Smakthin: 2007). The existing hydroelectric projects (e.g., Idukki and Mullaperiyar on the Periyar River, and the Parambikulam group of dams on the Chalakudy River) have already significantly fragmented the main river.

Indiscriminate sand mining is another human intervention which causes major impacts on ecosystems. Sand mining has led to an erosion of riverbanks, thus affecting their stability. It has also deepened river channels, thus promoting saline intrusion at deeper levels in the rivers. Breeding and feeding of fish and other aquatic species, which depend on the nutrients deposited on riverbeds, has been severely affected. Inland fishing communities, and clam and lime shell collectors, are forced to shift to other occupations consequent to sand mining. Lowering of water table in water bodies along riverbanks is another direct consequence.

Pollution from agricultural chemicals, industrial pollutants, waste and sewerage discharge are affecting both surface and ground water ecosystems. Take the case of the Periyar River in Kerala. Physico-chemical analyses, and reviews of the Periyar River water quality analyses, show a consistent decline in pH and oxygen levels, and an increase in water temperature, radioactivity, pesticide pollution, and levels of heavy metals. Crabs and prawns that were found downstream have now become almost extinct due to water pollution. Greenpeace describes the Eloor industrial area, which is located in the downstream of the Periyar River, as one of the most vulnerable hotspots of industrial pollution in the world. A parallel reduction in the flow of water will further increase algal blooms, resulting in occasional fish kills, as has already been experienced in the past(Smakthin: 2007).

Implications in the context of inter basin water diversions

Interbasin water diversions involve diverting waters from one river basin to another, either interstate or within the state for different uses. This in turn is based on the concept that the river from which water is diverted has a 'surplus', and that which receives water has a 'deficit'. The National River Linking Project (NRLP) is considered to be the biggest ever interbasin transfer of water in India. The Project seeks to end the flood problems of the Ganga and the Brahmaputra, and solve the problem of drought in Southern India, by diverting 'surplus' waters from these snow fed Himalayan rivers to the 'water deficient' monsoon fed Peninsular rivers like the Kavery. Kerala, projected as a water 'surplus' state, has one of the highest numbers of interbasin water diversions. The Periyar Project, the Parambikulam Aliyar interstate water diversion, and the Siruvani Drinking Water Project, are all examples of diversion of water into another basin or state.

The Parambikulam Aliyar Project (PAP) is a multi basin interstate diversion project. Water from the tributaries of three west flowing rivers - Periyar, Chalakudy River and Bharathapuzha - finally reaches the Aliyar reservoir in Tamil Nadu in the eastern side of the Western Ghats, through a series of canals, tunnels and power houses, from where a major portion is used for irrigation in Tamil Nadu. Apportioned water also reaches the Chittur basin in Kerala. The PAP is an interstate water apportioning treaty between Kerala and Tamil Nadu which has been prevalent since 1958. The Mullaperiyar Project is perhaps the earliest formal agreement on water sharing in India. In this case, a tributary of the West flowing Periyar river - the Mullaperiyar - was diverted to the neighbouring Madurai district of Tamil Nadu, for providing irrigation water and power generation. The lease deed signed in 1886 between the erstwhile Travancore state and Madras Presidency allowed control over 8000 acres of land and water in Kerala, to the recipient state for a period of 999 years! These two projects are considered as successful cases of interlinking of rivers in the document prepared by the Task Force on Interlinking of Rivers (TF-ILR) constituted by the Ministry of Water Resources, Government of India in 2002.

Globally, there has been rethinking about the basic concept of interbasin water transfers, owing to the strong opposition in the donor basins from where water is transferred, the economic feasibility of such large transfers which has not been established in a convincing manner, and most importantly, the cumulative impact on the downstream environment. As pointed out by an author, "Both Mullaperiyar and Parambikulam Aliyar Projects were major and shocking interventions in nature which really treated rivers cavalierly as pipelines to be cut, turned around and welded, but it was not the practice in those years to do any Environmental Impact Assessments."(Iyer:2006)

Perhaps the most disastrous impact of any river diversion project is the complete diversion of water leading to a denial of even 'minimum flows' below the diversion structures. Total diversion of waters has led to degradation of riparian forests and river channels all along the tributaries of the diverted rivers, apart from direct submergence of forests or fertile valleys and swamps under the reservoirs. Wild life movement paths are cut off due to the diversion canals running through the forested areas as well as drying up of rivers below the diversions. The urgent

need to carry out a post facto assessment of the ecosystem impacts of diversion projects in India has been reiterated in several platforms by environmental experts. There is no assessment of what has happened to the livelihoods of people who were living downstream of the diversions either.

Water to be left for the environment - who decides and how?

'There is no single best method, approach or framework to determine environmental flows' (*Flow - The Essentials of Environmental Flows. IUCN , 2003*)

As the demand for developing scarce water resources grows at an unprecedented rate, policy makers and planners are faced with the tough challenge of ensuring enough water for maintaining the health of the ecosystem, which alone can guarantee the sustained availability of freshwater for fulfilling livelihood needs.

Presently, we are faced with a techno-bureaucratic system that fails to see the link between continued availability of good quality water, and ecosystem health and integrity. Water is presently managed in a fragmented and sectoral way, even by dividing rivers between different concerned departments and agencies, thus prioritising short-term needs and gains. There is no coordination between agencies which share the same water resources. There is a total lack of responsibility towards the upkeep of the source by the users. This is causing many freshwater ecosystems to degrade to the point that they can no longer support biodiversity or food production. Hence, the toughest challenge would be to overcome this barrier of departmentalism. Each user should relate to their contribution towards degradation of the ecosystem, based on which an inbuilt mechanism to ensure water for the ecosystem needs to be evolved.

Freshwater ecosystems are highly complex and are influenced by various factors like climate, latitude, topography, the extent of human intervention and water extraction, etc. so that no uniform norms can be applied to all river basins. Another important aspect for consideration is the extent of development of the river basin. The norms for heavily utilised and degraded river basins would have to be different from those for the relatively undisturbed basins.

IWMI has made some estimations of water for ecosystem needs based on global assessments. Because ecological information is almost completely lacking for most of the world's river basins, IWMI's global assessment only used hydrological data. Generally, the amount of water required by each river to keep it relatively healthy - its 'environmental water requirement'- ranged from 20 per cent to 50 per cent of its total mean annual flow. It should be emphasised, however, that these volumes of water are enough only to maintain those ecosystems in a 'fair' or 'moderately modified' condition. Though the global estimates obtained are not precise, they do provide useful measures for countries like India which have never assessed their environmental flow requirements (IWMI: 2005).

Prescriptive methods like desktop methods (hydrological index method) rely on historical records to make flow requirements for the future. Hydraulic rating methods use the relationship between the flow of the river or the discharge and simple hydraulic characteristics such as water depth, velocity, etc. to calculate an

acceptable flow. These methods are an improvement on hydrological index methods, since they require measurements of the river channel, and so are more sensitive than the desktop approaches to differences between rivers. However both these methods are based more on the physical features of the river than on ecology.

The expert panel method relies on the judgement of experts on the different flow needs of a river for different seasons and important aquatic species. The composition of the expert committee would be river specific, but would include a hydrologist, a fisheries expert, a geomorphologist, an aquatic biologist and one or more river basin community representatives. Through discussions with different users, use of hydrological records and ecological data or records, the panel produces a draft report of the responses of river biota to different flow regimes. The report is finalised based on inputs from all the different types of dependents (tribals, fishing communities, industries, power boards, irrigation departments, etc.). These methods have been tried in countries like Australia and South Africa (Davis and Hirji: 2003).

Classifying rivers according to their sensitivity or ecological importance appears to be a more pragmatic approach towards making decisions about water for ecosystem needs in the Indian context. Rather than a highly technical approach, a combination of desktop, expert and ecosystem sensitivity indicator methods has been tried out by IWMI in selected river basins in India: the Krishna, Kaveri, Narmada, Periyar and part of the Ganga (IWMI: 2007).

The indicators used by IWMI include presence of rare and unique aquatic biota, diversity of aquatic habitats, presence of protected areas in the river basin, sensitivity of aquatic ecosystems to flow reduction, percentage of the watershed and floodplain remaining under natural vegetation cover types, percentage of exotic aquatic biota, overall richness of aquatic species, degree of flow regulation and fragmentation, human population density in the river basin, and overall quality of water.

If human systems are viewed as being embedded within natural systems, human water use can expand to a 'sustainability boundary', beyond which a substantial degradation of ecosystem services occurs. Determining the location of the sustainability boundary is critical to successful management, and rests on clearly defining what constitutes a degraded ecosystem. Environmental flows should consider both the quantity and timing of flows to maintain 'naturally variable flow regimes', whereby seasonal flow patterns are maintained with the aim of retaining the benefits provided by low and high flows. Naturally low flows, especially floods, shape channels and allow the delivery of nutrients, sediments, seeds, and aquatic animals to seasonally inundated floodplains. High flows may also provide suitable migration and spawning cues for fish (Millennium Ecosystem Assessment: 2005).

There is an urgent need to evolve suitable assessment methods of ecosystem water requirements in the Indian context, drawing lessons from international experiences. However given the extremely high diversity of culture and ecosystems and livelihood dependencies in India compared to other countries, there is a need to gain clarity on whether a 'rights based approach' or an 'allocation based approach' or a combination of both would be workable and

feasible in the long term. There is also a need to involve the river basin communities and the users (power boards, irrigation departments, industries, etc.) in different stages of planning in order to ensure decision making on the flows. The governments in turn should ensure that people dependent on the river have timely access to all the information on hydrological and ecosystem parameters, the interrelationship between flow fluctuations and ecosystem changes, and consequent impacts on livelihoods so that they can effectively participate in the assessment process.

Actualisation of water for the environment

There is an urgent need for a shift to a system that gives equal if not more importance to an ecosystem approach to water management within the limits and potentials of the ecosystem. The disappearance of rivers, wetlands, deltas and flood plains is an indication. Consequently, livelihoods that have depended on these ecosystems for centuries are also disappearing. However, recognising this reality is different from taking necessary corrective steps. Implementation of ecosystem flows or meeting environmental water demands, which in turn would sustain the basic needs of drinking water and food, is the challenge of the day.

Creating a Policy Framework

The concept of environmental flows is part of a broader notion of taking an ecosystem approach to integrated water resources management. There is a need to revisit the various international agreements and conventions to which India is a party, like the Convention on Biodiversity, the Ramsar Convention etc., which encourage parties to introduce measures to manage environmental flows. The most relevant ones are the guidelines for reviewing laws and institutions to promote the conservation and wise use of wetlands. The guidelines for integrating wetland conservation and wise use into river basin management, as well as those for the allocation and management of water for maintaining the ecological functions of wetlands, can also be of use. Wetlands are described as the 'kidneys' of the landscape because of the functions they perform in hydrologic cycles, and because they are the downstream receivers of wastes. They have been found to clean polluted waters, prevent floods, protect shorelines, and recharge groundwater aquifers. They are also the main source of livelihood for millions of farmers and fisherfolk all over the world.

During the Eighth Conference of Parties to the Ramsar Convention, parties adopted guidelines for the allocation and management of water for maintaining the ecological functions of wetlands. The resolution recognises the variety of services that wetlands can provide, and the necessity to allocate water for the maintenance of their natural ecological character. The resolution also contains five groups of guidelines aimed at operationalising the principles. These guidelines relate to policy and legislation on water allocations for wetland ecosystems, the valuation of wetland ecosystems, environmental flow assessments downstream of dams, determining water allocations for a particular wetland ecosystem, and implementing water allocations to wetlands (Dyson, Bergkamp and Scanlon: 2003).

At a global level, very few countries have evolved any suitable legislation or policy framework for ensuring environmental water requirements. The National Water Policy in India, while acknowledging that water is part of the larger ecosystem and realising the importance and scarcity attached to fresh water has not made any mention that water needs to be left for ecosystems. The policy also mentions that water resources development and management will have to be planned for a hydrological unit such as a drainage basin as a whole, or for a sub-basin, multi-sectorally. It needs to take into account surface and ground water for sustainable use, and incorporate quantity and quality aspects as well as environmental considerations into the framework. However, ecology stands fourth in the water allocation priority, preceded by drinking water, irrigation and hydropower, while all three requirements can be ensured in the long term only through meeting the need for water for ecosystem needs. Perhaps Orissa is the only state that give second priority to ecology after drinking water. Kerala does not even mention ecology in its water policy. However, the necessity for conservation and development of water resources based on the concept of watershed, is cited as inevitable for maintaining the ecosystem integrity of rivers and river basins of Kerala. There appears to be an urgent need to incorporate water for ecosystems as well as the appropriate requisite institutional framework at the national and state levels by bringing about necessary amendments to policies.

Some of the important issues that need to be addressed while working towards a policy framework include:

- a. The scale of management of environmental flows: The appropriate level at which the water needs of the environment have to be actualised within the policy framework is very relevant since these needs would ultimately decide the scale of planning and implementation. Subbasin to basin level upscaling would be the best ecological unit for deciding on water for ecosystem needs.
- b. The principle of subsidiarity: The principle of subsidiarity, which is about dealing with issues at the lowest appropriate level capable of handling them, should be applied to the management of water resources. Implementing processes to allow water for ecosystem needs would involve difficult political choices of the level at which the decisions are to be taken and enforced, and how to raise the financial resources. While the decision to implement should be taken at the highest level i.e. the state and the centre, the day to day decisions about 'on the ground' implementation need to be made at the lowest appropriate level, depending on the type of water use.
- c. Define and recognise the rights over water: We have a range of river dependent stakeholders from tribals who depend upon flowing waters to industries who abstract millions of litres of water and give back pollutants into the river system and ground water. There is hence a need to define the rights to water use and access, including property rights over water. Though controversial in nature, this aspect will have to be addressed sooner or later to avoid mismanagement of water.
- d. The need for compensation: Water used by farmers, tribals and fishing communities for their livelihood needs may get polluted by industries or mining companies. The case of Plachimada Coca Cola Company polluting the open wells

and ground water in Perumatty grama panchayath, and the case of mining companies polluting the rivers in Goa, are classic examples. Systems of payment of compensation to communities either through less water extraction (in turn leaving more water in stream), or through cleaning up of water resources, may have to be incorporated in the policy framework which is legally binding as well.

e. Genuine involvement of the communities at all stages: Incorporating community values and traditional knowledge into the development of policy, regulations and management plans must not be left to chance. It must be built into the framework legislation. This 'community' includes the user community, and all others with an interest in the sustainable management of the system, or an interest in a particular part of the system.

f. An implementable flow regime needs to be evolved: The flows to be left in the system need to be based on a mechanism of strong legislation, enforcement and compliance, with a regular monitoring mechanism inbuilt into it. It must take into account the local conditions.

The role of the Forum in implementation

Implementation of processes to ensure environmental water needs is a process of negotiation backed by suitable policy, as well as institutional and regulatory support. In this negotiation, some users are bound to lose their existing water quota, while some may gain. Ultimately, everybody will gain equally from a healthier ecosystem.

The shift towards management for natural flow regimes is also reflected by parallel shifts in public policy, from laws favouring private interests and prior appropriations to protecting water rights and environmental flows as part of the 'public trust'. In 1988, South Africa passed landmark legislation to aid decision making on all or part of any significant water resource (National Water Act, 1988). One of the most progressive aspects of this act was the establishment of a reserve to support both essential human needs (water for drinking, food preparation, personal hygiene) and aquatic ecosystem integrity. Notably, this two-part reserve - with human and environmental components - takes priority over other uses such as irrigation and industrial withdrawal.

For many highly regulated river systems in North America, recent changes in dam operations and adaptive management plans are now fostering conditions that improve fish habitat, river-floodplain connectivity, and estuarine ecosystems, often at the cost of hydroelectric generation or navigability to barges. In addition, the decommissioning and removal of some dams has begun in the United States.

The Forum's prime focus is on water conflicts. In the process of taking up, understanding and intervening in some active conflicts at the river basin level, the often unseen linkages between not allowing for water needs of the ecosystem or environment and the eruption of conflicts are becoming evident. In fact the Action Research on synchronising reservoir operations upstream with the downstream irrigation and drinking water needs going on in the Chalakudy river in Kerala is a living case wherein water needs for the downstream environment are being worked out as a conflict resolution strategy.

Below are outlined some of the important roles the Forum for Policy Dialogue on Water Conflicts in India can take up towards actualising water for the environment

A. Explore the possibility of taking up sample river basins in India: one in the Western Ghats, one in the Himalayas and one in the North East. Form a team of experts and community representatives. Through a mutually agreeable process, develop criteria and indicators for assessing water for the environment. Rather than a techno centric approach, a dialogue based process supported by historical data on hydrology, available ecological information, cultural and social needs etc. can be worked out.

B. River conservation is the mandate of the National River Conservation Directorate under the Ministry of Environment and Forests, GoI. Presently it is overfocused on pollution control oriented River Basin Management Plans. Given the deteriorating status of rivers all over the country, a policy instrument for River Conservation under Ministry of Environment and Forests separate from National Water Policy, is needed. The Forum should prepare a policy brief on river conservation, which will also include the subject of water for environmental needs. Once the policy brief is ready, organise dialogues across the country, get opinions and comments from river protection groups and communities, fine tune the policy brief and submit it to the MoEF.

C. Publish a simple booklet on the basics of water for the environment, the linkages with livelihood needs, ecosystem services, and economic and political decisions regarding water, drawing appropriate cases from across the country. The booklet shall also touch upon how communities can play a role in assessing and arriving at appropriate flow regimes. This booklet can be used for campaigning and advocacy.

D. The largest amount of water is extracted for irrigation. Evolve operational strategies for reducing the physical loss of water during transit, improving efficiency of delivery and irrigation, strategies for 'more crop and livelihoods per drop' of water used, and gradual transition to organic farming. These strategies in turn would improve the flows and increase groundwater.

E. Based on the outcomes of the Action Research going on for resolving upstream - downstream conflicts in Kerala, a Reservoir Operations Management (ROM) strategy for dammed and regulated rivers is being worked out in tune with the downstream needs of communities and other downstream users. However, investigating opportunities for modifying dam operations will require a thorough assessment of not only the operating rules that govern the day-to-day operations of any specific dam, but also the physical mechanisms by which the benefits (i.e., water, energy) from the dam are distributed, the end uses of those benefits, and the socio-political and economic drivers that ultimately dictate dam operations(Richter and Thomas: 2007).

F. Since river basin is the macro unit at which the flows for the environment are to be implemented, River Basin Organisations (RBOs), as mentioned in many state and national policies, constitute the appropriate institutional framework within which to implement e-flows. Hence, the Forum should take a proactive role in spelling out the modalities and the bottom up institutional framework of RBOs.

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Water for Livelihood Needs

Introduction

Many conflicts centre around issues of right to water, entitlements, equity, and allocations for livelihoods needs. Assurance of water in terms of quantity and quality for livelihoods is a pivotal issue in conflict resolution. Given the complexity of the issue of water allocations for livelihood needs, it is neither possible nor desirable to present a blueprint for determining livelihood allocations. Further, given that the discourse on the issue is also fairly recent, and the views diverse, this chapter will necessarily have more questions than answers.

This chapter primarily aims to:

- Lay out key questions and issues regarding water allocations and flows for livelihoods
- Bring out the common understanding as it evolves within the subgroup and the larger Forum
- Identify key areas of convergence (and divergence) within them
- Determine a position that can serve to emphasise the importance of allocations for livelihoods and form the basis for evolving a consensus on this issue

This chapter has drawn extensively from the rich discussions and the vast collective experience of the members of the Forum, as well as some discussions outside the Forum.

The chapter is divided into the following sections:

- A. Highlighting the right to water for livelihoods
- B. Understanding and defining 'livelihoods'
- C. Understanding and defining 'water allocations for livelihoods'
- D. Determining allocations and flows for livelihood needs: criteria and methodology
- E. Processes, structures, and forums for balancing interests, environmental, livelihood, economic and other needs, and decision-making
- F. Physical and institutional mechanisms for actual allotments, extraction and withdrawals of entitlements
- G. Key issues in water allocations for livelihoods
- H. The Transition

A. Highlighting the right to water for livelihoods

The history of popular struggles and movements related to water in the country shows that our development process has been highly iniquitous, further accentuating the wide gap between the haves and have-nots. A large number of conflicts about water studied by the Forum also point to this fact. One of the primary reasons for this iniquitous development is the absence of a right to livelihood, in particular, a right to water for livelihoods.

As the presentation by K. J. Joy and Suhas Paranjape and at the national workshop in Pune¹ states:

"Many conflicts centre around the issue of right to water, entitlements, equity and allocations for livelihoods and for ecosystem (environmental) needs."

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). Ellis (2000) suggests that livelihood is defined as 'the activities, the assets, and the access that jointly determine the living gained by an individual or household' (Kaushik, 2010²). Thus, the determinants of livelihoods includes 'assets', in our case water, and also 'access', that is, the need for a right to water and the assurance of allocation.

An unequivocal assertion that the right to water for livelihoods is very much a part of the basic rights framework is critical to address these conflicts. This right can be asserted separately as the right to water for livelihoods, or as an integral part of the basic right to water, so that there is a continuum from the right to drinking water all the way up to the right to water for livelihoods. Alternately, the right to water for livelihoods can be included in the right to livelihoods, or even in the right to life with dignity. In any case, there is little doubt that some form of the right to water for livelihoods is indispensable for addressing the inequities in water resources development.

¹The two day national workshop on Water Entitlements and Allocations for Livelihoods and Ecosystem Needs and the Legal-Institutional Framework for Conflict Resolution held on 30-31 March 2009 in Pune.

²This definition is from "Literature Review on Right to Water for Livelihoods" by Amita Kaushik. For the discussion on livelihoods she primarily used <http://www.livelihood.wur.nl/?s=A1-Livelihood>

B. Understanding and defining 'livelihoods'

The first issue is to understand and clearly define what is meant by a livelihood.

An activist friend relates the following story. At a public hearing of a major tourist project in northern India, there were attempts to hinder the local people from voicing their strong opposition to it. The result was a kind of chaos often seen at public hearings, due to which the event was postponed. As it happened, a person representing the promoters of the project happened to be a friend of one of the activists. Livid at what was happening, she told the activist, "*Hamare pet per kyun lath marte ho?*" (Why are you snatching away our livelihood?)

It is obvious that one does not think of a project from which a promoter is likely to earn crores of rupees as their 'livelihood'. Yet, dictionary definitions have a connotation of bare sustenance, which are limiting definitions for our purpose as well. Where livelihood should be placed between these extremes, and how, are challenging questions indeed.

In this context, some defining characteristics of a livelihood could be as follows:

1. A livelihood is a means of providing for all the basic needs.
2. A livelihood goes beyond mere food security, and should ensure needs other than food, including shelter, clothing, education, health, etc. To elaborate, a livelihood does not translate to merely eking out an income irrespective of the circumstances. The individual should be able to do so in conditions that allow him or her the space and dignity to fulfil the requirements for a decent means of living, while desisting from deliberate harm being caused to others such that these conditions are not met.
3. However, a livelihood cannot be limited to the above, that is, it cannot be a means to barely escape poverty.
4. A livelihood should allow not only for comfortable living, but a life with dignity.
5. A livelihood should be sufficient to provide for the entire family, not only for the working individual.
6. A livelihood should include monetary as well as non-monetary accruals.
7. Livelihoods do not include only agricultural related activities, but must also include industrial and service sector activities.
8. Livelihoods are often intrinsically related to a way of life. They also imply a symbiotic relationship with the natural heritage, such that this relationship as well as the ecology of production allows communities to manage a way of living that is in harmony with the fulfilment of human needs and environmental preservation. While this may sound romanticised, it is a principle that continues to inform the way of life for many societies across the world. It is premised on a direct relationship with these elements, and implicit in it is the understanding that when we move away from this direct relationship to a more complex one where the chains may not be so evidently linked, distortions emerge and lead to conflicts.

It is also important to understand where the line between a livelihood and a commercial activity is crossed, for the same activity can be a livelihood for one and a commercial activity for another. For example, fishing can be a livelihood activity, while trawler fishing is a commercial activity. As we are discussing the right to water for ensuring livelihoods, this distinction becomes important. However, the situation is not always straightforward. For instance, a trawler may be supporting many fisher people.

The following aspects can assist in distinguishing between livelihood and commercial activities, particularly in case of livelihoods based on a primary sector activity.

1. The activity is being undertaken by an individual or a family, or involves a small number of employed people as labourers.
2. The concerned person or family is working on the activity directly or 'hands on'.
3. The level of integration with the market, and the amount of production that is

used or consumed by the person or family

4. Level of monetisation of the activity

5. Whether the activity represents a 'traditional' occupation for the individual or family

For livelihoods in the secondary and tertiary sectors, the situation can be more complex. There is no doubt that many industrial and service activities provide jobs and livelihoods to millions of people. But can all work provided by such activities be classified as livelihood? Consider a thermal power plant that requires a considerable amount of water to run (apart from coal). Would every person employed by it be considered to get a livelihood - from plant worker to general manager to owner? And is it therefore justified that the plant would have a right to get the necessary water?

This raises the question of whether there can be an upper bound for the income from an activity for it to be considered a livelihood? For example, for a senior officer in the thermal power plant who earns several lakhs of rupees annually, would his job be his livelihood? If not, then what would be his livelihood? Or can we say that an upper bound for income should be put in place for the purpose of guaranteeing an entitlement to water? That is, a person should have a right to water to enable him or her to earn up to a certain limit, but not beyond that? Should any water beyond this limit need to be procured through a commercial transaction? How would this be actualised when water is not required by individual actors, but as a whole by the entire plant, and various people draw different incomes from the same plant?

In other words, there is a debate about whether a normative principle of allocation has to be used for different ranges of livelihoods.

These questions need further discussion and debate. Meanwhile, some points to consider could be as follows:

1. What is the size or scale of the endeavour?
2. What is being produced by the industry, or what service is being rendered?
3. Is the industry producing anything that can be classified as a basic need?
4. What are the implications of the activity for the sustainability of elements in the natural heritage?
5. What are the levels of pollution caused by the industry, and the extent of water reuse and recycling?

C. Understanding and defining 'water allocations for livelihoods'

Once we arrive at an understanding of what is meant by 'livelihood', the next issue to be dealt with is the water required to be allocated for enabling and ensuring these livelihoods.

Water for livelihoods can include

In flow use without degradation of the resource (e.g. fisheries)

In flow non-consumptive use with degradation of the quality of the resource (e.g. washing clothes by a *dhobi*)

Withdrawal from flow for consumptive use without a return flow (e.g. cooling water for power)

Withdrawal for non-consumptive use with return flows of the same quality

Withdrawal for non-consumptive use with return flows with degradation of the quality of the resource (e.g. industrial use)

Withdrawal for part consumptive use and part return flows (e.g. irrigation)

In short, there can be eight combinations of

Withdrawal	Consumptive Use	No degradation of quality
In flow use	Non-consumptive use	Degradation of quality

We use the term quality here to include physical quality, timing, duration, flow pattern, etc. Also, withdrawals can be ground water, or from a river/surface water, and can go back into groundwater and/or river/surface water.

Thus, allocations need to account for these various types of uses.

Another aspect to consider is that there can be overlaps between water allocated for various needs: water allocated (or allowed) for environmental needs, livelihood needs, basic needs, cultural needs, and economic needs. For example, water serving environmental requirements could also partly serve livelihood requirements (e.g. the flow in a river, and fishing.) This is illustrated by Figure 1. The circles represent different water needs, and the overlapping areas are where water can serve multiple needs.

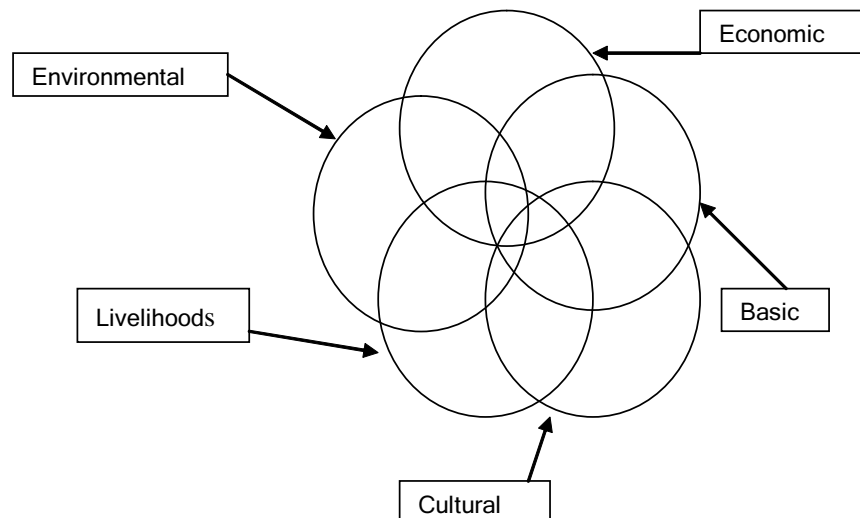


Figure 1

On the other hand, there can also be conflicts between various needs. In other words, some of the requirements can be mutually exclusive. This will happen when one need results in the consumptive use or degradation in quality, leaving less or inferior quality water for another need. Figure 1 illustrates this.

Note that mutual exclusion is not only between two needs, but can be:

- an internal conflict within specific needs, e.g. between two sets of livelihoods (agriculture and industrial use)
- between geographical areas (e.g. downstream and upstream)
- between various needs (e.g. livelihood and environmental needs)

To help address issues of mutual exclusion or conflict in usage, a scheme of prioritisation is necessary.

There is a clear consensus that the requirements of basic needs, which are the easiest to quantify and possibly the only ones that can be, should get top priority. Beyond this, we cannot state a-priori and in a hard and fast way that livelihood needs should always be prioritised over environmental needs.

Ideally, livelihood, environmental and cultural needs should get the same priority. This seems to be the general consensus in the Forum when we say that livelihood and environmental needs should be seen in an integrated manner. This is also reflected in the quote of Prof. M. K. Ramesh included in the presentation by Joy and Paranjape:

"With meeting basic needs and livelihood requirements besides providing safeguards for protection of the right of the environment ('environmental integrity') as irreducible minimum & non-negotiable ones....³"

The need to place livelihood, environmental, and cultural needs at the same level of priority also requires evolving livelihood options that are compatible with the environment and ecology of the region. Defining rules of engagement and use that disallow and/or penalise the use of water in ways that are incompatible is also essential. For example, pesticides in water which cause skin and other allergies and damage the water for other uses should be disallowed, and the responsible parties penalised.

However, there could be occasions when livelihood needs conflict with and have to override environmental needs, and even occasions when environmental needs have to be prioritised. The example of Bharatpur (Chauhan, 2008) shows that the need to protect critical ecosystems could even override the need of water for livelihoods. Thus, there would have to be flexibility in the prioritisation, with some methods in place to make decisions depending on the specific situation.

Given this, we can say that the prioritisation of needs should be:

1. Basic needs
2. Livelihood, environmental, and cultural needs
3. Economic or commercial needs

³ Joy and Paranjape used this quote from the notes sent in by Prof. M. K. Ramesh for the two day national workshop on Water Entitlements and Allocations for Livelihoods and Ecosystem Needs and the Legal-Institutional Framework for Conflict Resolution held on 30-31 March 2009 in Pune

There is another set of prioritisation that would need to be put in place, in case of conflicts between geographical areas.

One principle would be that the rights of the riparian community (for meeting livelihood, environmental and cultural needs) should take priority over the rights of non-riparian communities. However, in case of upstream/downstream conflicts, with both communities being riparian, this prioritisation would not help. Such conflicts would need to be addressed through participatory decision-making processes or negotiations.

There are two other aspects here that can be controversial. If we say that the riparian community has a right to the river water, can we accept that a land-owner would have a right to the groundwater below his/her land? One proposition would be that both communities should have the first right, but not the right to all the water in the river or below the ground. However, this leaves the landless without access to groundwater.

Another issue is whether a land-holder, by the very virtue of holding land, should get higher priority for water for irrigation. This issue, which is already the subject of significant discussion, needs to be further discussed and addressed, since it involves the issue of trading or bartering of water rights. In principle, the Forum should accept that the landless should also be entitled to water for irrigation if their livelihood is related to agriculture, or to water to support fodder or other natural produce that their livelihoods require. This right should be accompanied by suitable restrictions and a framework on barter or trade. (In case of other occupations, they should be entitled to water in any case. For example, a potter or a brick maker should be entitled to water in order to sustain his or her livelihood).

D. Determining allocations and flows for livelihood needs: criteria and methodology

To determine the allocations and flows for livelihood needs, one should first ascertain the various means of livelihood prevalent in the region, and the extent of each of these. Next, one needs to work out the water required for these livelihoods to ensure a life with dignity. This necessarily involves a degree of quantification, though the right to water for livelihoods cannot be reduced to just a specific quantity of water.

Such quantification should consist of the following steps:

1. What are the basic requirements of a person/family to ensure a reasonable living and a life with dignity? This will generally be a combination of money, in-kind goods, and services.
2. What level of various livelihoods will ensure that these requirements are met? (For e.g. a farmer may need to have a minimum acreage, an industrial worker may require a certain wage, and a brick maker may need to sell a certain amount of bricks.)
3. What are the water requirements to ensure these levels of livelihood? These requirements need to be worked out for the range of livelihood options.

The process deployed to work out these steps, especially step 1, can draw from the vast discourse on poverty indicators, the poverty line, standard of living etc.

The following points need to be kept in mind:

Water needs for the same set of livelihoods may vary from basin to basin.

Urban areas need a different treatment.

Quantification and actualization of the right will differ depending upon the context and situation. (e.g. Rajasthan has low rainfall, whereas Bihar has ample water, even floods.)

There are several options for determining allocations for livelihoods. One way is to translate livelihood needs into a 'cash equivalent', and this in turn into a right to a quantity of water that can earn this amount. Though this kind of quantification has its merits, it can also lead to many problems that accompany the complete monetisation of any right or responsibility. If there are strict checks on the prevention of the right to water for livelihoods being interpreted as just the right to a specific sum of money, then this method, in combination with some others, can be a useful guide to estimate water allocations needed for livelihood needs. This is especially the case for non-agricultural occupations where even food, apart from other needs, has to be purchased.

In the case of agricultural occupations, food needs are often (but not always) met through self-production, but even people in these categories will need to pay for other services and goods. The use of biomass as a measure to quantify livelihood requirements as proposed by late Shri K. R. Datye and others (Datye, 1997; Paranjape and Joy, 1995) is also another method, but suitable mainly for agricultural livelihood options. Once we have an idea of how much biomass is required to meet livelihood needs, we can work out the quantity of water required to produce this biomass.

Another method would be to allot to each person/family the right to a certain quantity of water for livelihood needs, and leave it to them to choose a livelihood they prefer, the needs of which would be met by the quantity of water allotted (for example, a volumetric allocation of water in an irrigation system which can be used by the farmer for any crop, as against a cropping pattern laid down by the irrigation system for the whole command). This is problematic because different livelihood options require different amounts of water. However, such an approach could be used to define allotments for agricultural occupations.

In general, the approach will have to be vary for different livelihoods.

One important issue in this context is whether the totality of water resources in an area define the maximum possible entitlements? Or do other considerations like basic needs and human rights define entitlements? And if resources fall short, does water have to be imported? These considerations also depend on how one sets the boundaries for defining the 'area'.

Another issue is the disaggregation of allocation at the community and household levels, and along gender lines. At what level should the right to water for livelihoods be recognised: community, household, individual, or other entities?

Should the allocations be made to the community, the household, or the individual? Should the allocations in certain cases be in the name of women, instead of households? The answers may vary depending on the kind of livelihood and the situation in question, but it is important to note that allocations can be made to these various groups or individuals, as also others. Also, the rights and allocations may operate at different levels. For example, one possibility is that for non-agricultural livelihoods that derive from a manufacturing unit, the right to water can belong to the individual, but the allocation will be made to the unit.

Occupational Categories

The data enumerating various occupational categories from the 2001 census is as follows ⁴.

Total Population	1,028,737,436
Total Workers	402,234,724
Main Workers	313,004,983
Marginal Workers	89,229,741

Workers Engaged in Various Occupations in India, Census 2001

	Persons	Percentage of Total Workers
Agricultural Workers		
Cultivators	127,312,851	32%
Rural	124,719,747	
Urban	2,593,104	
Agricultural Labourers	106,775,330	27%
Rural	102,431,218	
Urban	4,344,112	
Industrial Category Workers		
Agricultural and Allied Activities	13,245,693	3%
Mining and Quarrying	2,097,826	1%
Manufacturing		0%
Household Industries	16,786,835	4%
Non-household Industries	34,427,855	9%
Electricity, Gas and Water Supply	1,602,902	0%
Construction	14,165,044	4%
Wholesale and Retail Trade	29,342,807	7%
Hotels and Restaurants	2,572,133	1%
Transport, Storage and Communications	13,421,181	3%
Financial Intermediation and Real Estate, Renting and Business Activities	6,481,789	2%
Other Services	33,957,155	8%
Total Workers (Industrial)	168,101,220	42%
Total Agricultural Workers	234,088,181	58%
Grand Total (All Workers)	402,189,401	100%

The most important means of livelihood in India remains agriculture and related activities, with 58% of the workforce engaged directly in agricultural activities as cultivators or labourers.

⁴http://www.censusindia.gov.in, and in particular, http://www.censusindia.gov.in/Census_Data_2001/Census_data_finder/B_Series/Industrial_Category_of_worker.htm

Moreover, water resources will continue to be used the most for agriculture in general and irrigated agriculture in particular. The water demand in 1997 and projections for 2010, 2025 and 2050 for various sectors prepared by the National Commission on Integrated Water Resources Development (NCIWRD) are as follows ⁵.

Sr. No.	Uses	Year 1997	Year 2010		Year 2025		Year 2050	
			Low	High	Low	High	Low	High
1	Irrigation	524	543	557	561	611	628	807
2	Domestic	30	42	43	55	62	90	111
3	Industries	30	37	37	67	67	81	81
4	Power	9	18	19	31	33	63	70
5	Inland Navigation	0	7	7	10	10	15	15
6	Flood Control	0	0	0	0	0	0	0
7	Environment (1) Afforestation	0	0	0	0	0	0	0
8	Environment (2) Ecology	0	5	5	10	10	20	20
9	Evaporation Losses	36	42	42	50	50	76	76
	TOTAL	629	694	710	784	843	973	1180

Thus, irrigation was responsible for 83% of all water use in the country in 1997, and even by 2050, this usage will only reduce to 65 - 68%. There are several critiques of the NCIWRD projections. However, that the biggest demand for water resources will be due to irrigation is generally accepted. Note that the NCIWRD estimates for water use for irrigation do not include the rainwater that is used directly by crops, so it does not present estimates of water used for agriculture as such, but only for irrigation. For our purpose, the key message is that maximum water resources will continue to be used for irrigation (and agriculture).

Thus, assessing water allocations for agriculture based livelihoods is important for the total number of people involved as well as for the total water used.

Water for Agricultural Occupations

At one level, assessing water needs for agriculture is fairly straightforward - the evapo-transpiration (ET) needs of various crops are well known. However, assessing water needs for agriculture based livelihoods has several other complexities. Some of these are presented below.

1

The irrigation required, as against the evapo-transpiration, depends on the rainfall. Hence the water demand for crops will depend on where they are grown. This raises the issue of an 'acceptable' cropping pattern to determine livelihood needs. For example, rice can be grown in Kerala without irrigation, but needs irrigation in Punjab. This will raise the issue of local water falling short of meeting these needs, and hence the question of importing water.

However, another principle is that the farmer should be able to choose what crops

⁵Source: MoWR, 1999

to grow. (More generally, the choice of livelihoods should be with the individual.)

Even if the crops selected conform to the eco-climatic zone, there is the question of growing two or more crops in a year. This will increase the water requirement.

In general, the Forum should take a stand that the cropping pattern should conform to the eco-climatic characteristics of the region, and that livelihood needs should be understood as water for one main crop. Water for additional crops should not be part of livelihood rights. Note that the fulfilment of livelihood needs depends not only on the crop but on the area of land available to the farmer. Hence, the water requirement needs to be determined should ensure a main crop on a certain minimum acreage of land. In this context, the biomass based water requirement developed by late Shri K. R. Datye and others can be a useful guideline.

The main crop need not be only a food crop, for there are other crops that are equally important for basic human needs, for example, cotton. The issue of water intensive crops which are considered necessary - for example sugarcane, banana, etc. - needs to be discussed. Perhaps these crops should not be part of livelihood needs.

However, another issue must be kept in mind here. Often, the choice of crop is driven by the external policy regime, and prices and other market factors. Monetary returns on the crop will be determined by prices and the market. So it may be difficult to expect the farmer to choose an eco-climatically appropriate crop instead of a more lucrative crop, even though the latter may be water intensive (e.g., sugarcane and jowar).

Thus, there is a need to shift the policy framework to (a) encourage cropping choices as per eco-climatic regime, and (b) offer similar monetary returns for most crops. Only such an approach will make certain that the need to ensure a particular cropping pattern does not lead to policing.

An exercise should be carried out to systematically work out the crops suitable for various eco-climatic zones, and the amount of land needed per family or person, in order to ensure that the production of these crops guarantees reasonable livelihoods, as well as to ensure the amount of water required for this purpose.

2

The irrigation needs are determined by the evapo-transpiration and rainfall. However, the actual water to be withdrawn for irrigation will also depend on whether it comes from surface flows, groundwater, long distance canals or local sources. The allocation at the field will translate into a higher requirement at the canal head. In general, for surface water and water from longer distances, the losses are likely to be higher. These will need to be factored in to determine the allocations or withdrawals.

3

The third issue is that of water allocation for the landless. As mentioned above, in

principle, the Forum should accept that the landless should also be entitled to water for irrigation if their livelihood is related to agriculture. This right should be accompanied by suitable restrictions and a framework on barter or trade.

One relevant aspect is that if all landholders have a right to water to irrigate a minimum quantity of land for one crop, then what will a landless person do with his share of water? One option is to allow a landholder with more than the minimum land (for which water has been allotted to the landholder) to use it for some consideration. Another option is to allow a landholder to use the water for a consideration for a second crop. This also means that the time or season when the allocation is available are of crucial importance. It is just one illustration which shows that the period for which water is allocated is also an important consideration. There is also the possibility that the landless will lease land from the landholder and cultivate it using their share of water. The time or season when the water is available could also be important for this scenario.

4

Water needs should be estimated with the understanding that the water will be provided from the nearest source. Indeed, ensuring water rights for livelihoods should be based on decentralised water development and management plans with priority being given to the full development of local resources for meeting local needs, with import of water not ruled out, but to be undertaken only under exceptional circumstances.

One of the most important experiences in this context is that of the Pani Panchayats in Maharashtra which incorporates many of these features, including equity (item 1, 5 below), sustainability and ensuring cropping patterns appropriate for the eco-climatic zone (item 3 below), and democratic functioning (items 4, 11 below). The Literature Review summarises the key elements:

*Pani Panchayats:*⁶

The Pani Panchayats in Maharashtra constitute 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, the vast majority of farmers' livelihoods depend on rainfall, and hence, water becomes the most important input in agricultural production. Consequently the management of this natural resource assumes utmost importance. In a drought prone region in Western Maharashtra, early experiments in watershed management led to an increase in the water levels in the aquifer, motivating farmers to think about 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:

1. 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 is allocated annually, subject to maximum annual allocation of 5000m³ per family.

⁶The discussion on Pani Panchayats is based on Kaushik, 2010.

2. Water lifted is to be shared by members based on family size, and not land holding. This is one of the most important features that brings in equity.
3. 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. This brings in the element of sustainability.
4. Cropping patterns are to be decided by mutual consultation in the group.
5. 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 sell their water.
6. Land for which the water is obtained under this project cannot be sold without the permission of the Pani Panchayat.
7. Small lift irrigation schemes are built by joint efforts of farmers for common benefit.
8. Water taxes are to be paid by all members in two installments each year by the dates fixed by consensus, failing which water supply will be cut off.
9. 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.
10. 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.
11. A meeting of all the members is held twice a month. At these meetings, problems relating to water supply faced by members are resolved by all members in accordance with the rules.
12. Any action by a member contrary to the rules is severely punished.
13. The allocation and membership is withdrawn in case of rule violation by a member.
14. The construction and management of the project, as well as the distribution of water and monitoring of crops, are joint responsibilities of the members.
15. The Pani Panchayat has the right to make new rules and change existing ones.

Water for Non-Agricultural Occupations

Some of the principles outlined for the agricultural section remain valid for non-agricultural occupations as well.

The individual / family should be able to choose their livelihood.

The livelihoods for which water is to be allocated should confirm to the ecology and climate of the area.

The case of industries where a number of people work is more complicated. Here, while livelihood may be provided to several individuals, the water required is not divisible into individual shares. Some of the questions in this case are:

1. Should all the people working in the industry be entitled to water? Or should the industrial unit as an entity be allocated water based on the number of people employed or other criteria?
2. Should every person employed, from worker to manager, be considered for an allocation of water entitlement?
3. If the industry is functioning as a commercial unit, should it be required to purchase the water needed rather than be allotted water for livelihoods?

The nature of the industrial entity including its size and ownership structure, its product, its pollution impact, and whether and to what extent it reuses and recycles water, should also be considered in deciding allocations. These are questions which we should consider.

However, one suggestion is that non-agricultural occupations which are being undertaken at the level of the individual or family should be considered for allocation of water for livelihood needs. The rest are most likely operating as commercial entities and should purchase water. The census data above lists 4% of the total workforce as being engaged in household manufacturing industries. Also, there are likely to be household level operations among other occupations as well.

The allocations should be in terms of not only quantity but also quality, timing, pattern, location, etc. For example, tourism is becoming a significant source of livelihoods. A lot of tourism takes place near water bodies. Ensuring that such water bodies remain clean and unpolluted is critical to the continuation of tourism. Thus, ensuring quality can become as important as allocation in terms of quantity.

Another issue of importance that is common to both agricultural and non-agricultural livelihoods is whether allocations should be based on the production potential of the water for a particular activity, or for the actual production achieved per unit of water. The former is more appropriate as it would encourage efficiency of water use and production. But caution regarding the capacities of various people to achieve these efficiencies must be kept in mind (e.g. the capacity of small and marginal farmers to install drip irrigation).

E. Processes, structures, and forums for balancing interests, environmental, livelihood, economic and other needs, and decision-making

The process of deciding and allocating water for livelihood needs cannot be separate from that of deciding overall resource use and development planning and the decision-making associated with it. This cannot be overemphasised as water is never the only resource that can ensure livelihoods. Indeed, it is only a combination of natural resources like land, water, forests, and grasslands, and human resources like knowledge, communities, and institutions, that can ensure sustainable and equitable livelihoods.

Moreover, activities undertaken to develop water resources will also enhance other natural resources that can provide livelihoods, and vice versa. For example, watershed management, water harvesting and related activities which are meant for agricultural use can also provide non-agricultural livelihoods. As the experience of the Watershed Support Services and Activities Network (WASSAN) in Hyderabad shows, watershed activities can and should involve the entire community. These activities benefit the entire community, not only because of increase in water levels, but also because watersheds can provide opportunities for livelihoods other than farming ⁷.

Planning for water allocations should be based on a principle of subsidiarity. It is at the lowest level that basic development planning should start. The need for water is embedded firmly in development planning, and hence decisions about determination and allocation of water for livelihood needs will also be taken beginning at the lowest levels. In case of water, a watershed is the natural boundary, but for several reasons, a somewhat bigger unit or a small basin may be more appropriate to define the boundary. The fact that administrative boundaries are different from watershed/basin boundaries poses a big problem. This is not a new issue, but something that has been debated and discussed for years if not decades. In this context, the emergence of river-basin based planning is an important development.

River-basin level planning is possibly the most appropriate structure for making decisions not just about allocations for livelihoods, but also about the fundamental balancing needed between various requirements, and the irreducible allocations for basic needs, environmental needs, cultural needs and livelihood needs. Decisions about how to actualise these allocations, and how to handle any water surplus after satisfaction of these needs, can also be decided at the basin level. Decisions to import water in case of a deficit can also be decided at this level, and could be realised through negotiated settlements with other river basin bodies. Here, the level could also be a sub-basin, especially in case of massively large river basins. Adopting the basin level for deciding on the allocations will allow for proper micro-to-macro integration and matching.

This planning process will need to integrate all water sources like ground and surface water for entitlements. There is also a need to integrate geographically over a basin - upstream and downstream - including the groundwater, if the planning is being done at the sub-basin level.

Caste and gender considerations being very important, the planning and decision-making structures must include women and all castes in the decision-making, as well as respond to their specific needs with sensitivity.

The process of allocation of water entitlements should include fixing the responsibilities of those who secure entitlements. The responsibility of the communities (from a personal to a social to an industrial sector level) to safeguard and upkeep the sources from exhaustion and pollution must go hand in hand with the entitlement to water. In particular, rights and entitlements could be subject to conditions on the quality of return flows (e.g. effluents from industrial units), recycling and reuse of water and its extent, etc.

⁷The discussion on WASSAN is based on Kaushik, 2010

Since we are not starting with a blank slate, the (substantially) regulated river basins and (mostly) non-regulated river basins will have to be treated differently. However, this does not mean that the established use and practices must be taken as a given, even if they are iniquitous and unsustainable. In the case of regulated rivers, changes in the operations of reservoirs will be a key issue. For non-regulated rivers, ecosystem, cultural and livelihood needs can be built into water resources development.

The allocations of water also need to retain some flexibility and provisions for:

- New developments
- Increased efficiency of water use
- New entrants / Population changes
- Changing of livelihood options by individuals and communities
- New opportunities
- Exigencies
- Year to year variation in water availability
- Long term events like climate change

To allow for the incorporation of medium to longer term changes, the allocations should be reviewed periodically, say every 7-10 years.

To ensure proper functioning and equity, and prevent such basin level decision-making bodies from corruption and abuse of power (e.g., selling off water to an industry though farmers don't get water for even one crop), such a system would need to incorporate the following attributes:

1. Clearly articulated principles for balancing various needs
2. Clearly articulated principles for the allocation of water for various needs
3. Irreducible, non-tradable, non-dispensable, non-monetisable entitlements of water for several needs (basic, environmental, livelihood), and for certain sections of society (poor, vulnerable, etc.)
4. A policy and legal regime that includes the above
5. Appropriately empowered decision-making structure(s) that allow opportunities for all to participate. This would mean a democratic and nested institutional framework starting from the micro watershed level up to the basin level.
6. Transparency in decision-making
7. Accountability of the decision-making structures, especially reverse accountability of the supra local bodies to the local bodies
8. Mechanisms for checks and balances
9. Sufficient financial resources to be able to make and implement decisions

10. Technical support (for various issues like assessing flows through holistic methods, creating physical and institutional infrastructure, etc.)

It is important to note that no river basin, howsoever large or small, is a blank slate. Since centuries, human civilisation has used water (and other resources). Much of this water use has developed in a way as to create inequity, pollution and destruction of resources. Reversing this process, especially by curtailing and/or reallocating existing water use, is likely to be the biggest challenge. Given this, social acceptance (apart from legal and policy level acceptance) of the right to water for livelihoods, environmental and cultural needs is probably the single most critical issue in this context. Creating such an acceptance is among the most significant tasks for the Forum.

F. Physical and institutional mechanisms for actual allotments, extraction and withdrawals of entitlements

The physical mechanisms for allocating water for livelihood needs are especially important when the needs require withdrawal of water as against in-flow or in-situ use. Proper design of physical mechanisms is also important to ensure equity considerations.

Certain basic principles that we can adopt in this context are:

1. The mechanisms to harvest, store, withdraw and deliver water should start with the smallest area. The full development of local resources should be the first priority.
2. Mechanisms that violate other rights should not be used (e.g., building a large dam to supply water for irrigation).

Another important issue to be considered is that of financial implications for such mechanisms. All the issues raised in the recent debates on public finance and privatisation are crucial in this context, including the need for least cost approaches and financial sustainability, while ensuring that the cost element does not deprive anyone of the right to water for livelihoods. This will ensure a judicious use of subsidies and public spending.

When developing institutional mechanisms, integration with the existing schemes and programmes should be considered. For example, can these mechanisms be combined with NREGA?

G. Key issues in water allocations for livelihoods

Water for Livelihood as a Human Right

There is differing opinion about whether water for livelihood should be a human right by itself, or part of the human right to water. Part of the problem is also that the right is extremely difficult to quantify, and inclusion as a part of human rights will require some form of quantification to ensure that the State meets its responsibility.

An alternative is to posit that the right to livelihood is an integral part of the Right to Life with dignity, and hence it remains the responsibility of the State to provide a certain basic minimum quantum of water to secure people's livelihood needs. Such a formulation will require a suitable policy and legal regime to ensure water for livelihoods.

Equity and Sustainability as the Basic Principles

The fundamental principles that govern the allocation of water for livelihood needs would have to be equity and sustainability. Reversing the entrenched inequity would be an important part of the agenda, and possibly the most difficult.

De-linking Land Rights from Water Rights

This is a major issue that is larger than the issue of water allocation for livelihoods, though it has a direct bearing on the livelihood rights also. The two issues related to de-linking water rights from the ownership of land are:

- (1) the right to groundwater below it, and
- (2) the right to receive irrigation water.

An associated issue is also that of trading of water entitlements. If trading is permitted, there is a danger of commercialisation and accumulation of large chunks of the resource in the hands of a few. On the other hand, without some form of trading, water entitlements to the landless may remain meaningless. This issue is already discussed earlier in this chapter.

Import, Export and Transfer of Water

Are the maximum possible entitlements defined by the totality of water resources in an area, or by basic needs and human rights? Should water be imported if there is a shortage? The boundaries for defining the 'area' will affect these considerations.

If the local water resources are not sufficient to meet the minimum irreducible basic, environmental and livelihood needs, then should water be imported from external sources? How would this import be governed? Or should we take a stand that livelihood and other needs have to be strictly within the eco-climatic limits of the region? That is, should certain livelihood options, for example water intensive crops like sugarcane, not be permitted?

There is a need to be flexible in terms of importing water from an external source, though broadly speaking, the principle should be that developmental activities in a region should be suited to the eco-climatic zone. In other words, we need to develop production and livelihood systems that do not disturb the ecology. However, if minimum needs are not being met with local resources, then the transfer of waters from other sources should be considered.

However, such transfer should be conditional. These conditions can include the following:

- (1) The decision-making related to the transfer should involve participatory

processes on both sides, and should be the outcome of mutually acceptably negotiations.

- (2) No export should be permitted if the exports are detrimental to meeting the basic, environmental, cultural and livelihood needs of the exporting basin.
- (3) Full development of local water resources of the importing basin should be subject to environmental considerations before importing water.
- (4) Equity and equitable distribution of the local as well as the imported water should be ensured.
- (5) Some area in the importing basin should be moved under a permanent tree cover.
- (6) Some water bodies must to be protected.
- (7) Other impacts should be within acceptable limits.

A related issue is whether local communities (or riparian communities) have a right to the entire water in the area, or whether the larger society also has some rights to this resource. This is a question of inter-watershed equity. In general, the Forum should take a position that while the first right to the resource should lie with the local community, they cannot have the right to the entire resource (unless it is only enough to satisfy their minimum needs). However, this cannot mean a right to equal quantity of water for everyone, in which case low rainfall watersheds may ask for a transfer of water from high rainfall watersheds as a right. The right to water is a right to water to meet specific ends like livelihoods, and these need to conform to the eco-climatic regime.

There is also a need to discuss and refine the meaning of 'local', and the boundaries that would determine the smallest area for planning and deciding water allocations.

Limits to Extraction

It should be recognised that there will be limits to extraction. These limits will be determined not only by the limits to the physical availability of the resource, but also by the requirements of the environment and ecology. It is important for these overall limits to be kept in mind, as they will define the boundaries of developmental activities including livelihood options in any region.

Balancing of Various Rights and Needs

The right to water for livelihoods should not infringe upon or hinder the livelihood needs of others. Moreover, the allocation for livelihood needs should be integrated with ecological and cultural needs (i.e. these requirements should not be compromised). Further, these needs / rights should not infringe upon other rights, and should also not conflict with larger socio-economic-political criteria like sustainable development (hence, no big dams). A responsibility to maintain, conserve and enrich water resources, and not impinge on the rights of others

should be an integral part of these rights. In particular, the quality of return flows, reuse and recycling and its extent, etc. would be important considerations.

H. The Transition

The transition from the current situation to a situation where the rights are well defined and realised is a long and arduous journey. Overall, the path would cover the stages of awareness building, debate and discussion, development of concepts, policies and mechanism, struggles, acceptance, legal and regulatory changes and a just, sustainable and equitable implementation. These stages will not necessarily occur in this order, and several of these stages could be occurring concurrently. The Forum can play important roles in each of these stages. In fact, it would be important to develop an understanding about the transition process, apart from the detailed conceptualisation of the rights themselves, so that strategic intervention can be facilitated.

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Socio-Cultural Needs

Apart from water for basic, livelihood, and ecosystem needs, a right to water should also include socio-cultural needs. This set of needs is perhaps the least tangible, and therefore, the most difficult to pin down. In this chapter, we attempt to briefly lay down what socio-cultural needs include, and the implications that they would have for different dimensions of a right to water (both in terms of conceptualisation and actualisation), even as we caution against the co-optation of socio-cultural needs into a conservative agenda.

Broadly speaking, socio-cultural needs for water could be defined as water required to maintain a certain way of life that is inclusive of the cultural traditions, social values, and practices of particular communities. Socio-cultural needs could cover a wide range of needs such as water required for certain religious or cultural functions (e.g., worship of springs in Uttarakhand) as well as certain customary practices (e.g., bathing in rivers or ghats); for meeting certain values (e.g., the emphasis on a flowing river in many cultures); and to carry on certain socio-economic functions (e.g., indigenous water harvesting systems). As the examples indicate, it is often impossible to have a clear demarcation between basic, livelihood, ecosystem, and socio-cultural needs. For instance, water for bathing would technically be a component of water for basic needs, but if there is a customary practice of bathing in a particular place (say a river or a ghat), then in addition to the quantity requirement, socio-cultural needs would include water being present in a particular form or locale (e.g., flowing water in a river or ghat). Similarly, water for an indigenous water harvesting system would technically be a component of water for livelihood needs, but if the particular system is also related to the social and political organisation in the society in question, then it is difficult to separate out the socio-cultural needs from the economic needs (as in the case of system tanks in Tamil Nadu until the 17th century described in Mosse, 2003). However, even while recognising the difficulty of separating out socio-cultural needs from other kinds of needs, we argue that it is, nevertheless, important to explicitly recognise them as a distinct category for a number of reasons that we discuss below.

Firstly, socio-cultural needs draw attention to the multi-faceted nature of water and the diverse meanings embodied in it, a point that needs to be particularly reiterated at a time when the discourse of water as an economic good has acquired prominence. As embodiment, water in all its manifestations - be it a pond, a river, or an ocean - is perceived in numerous cultures as a living entity with its own emotions and moods and with the ability to experience trauma and healing, pain and calm. This is evident, for instance, in the representation of water as springing from the head of gods, flowing from the mouth of beasts and taking live forms in its journey, representations which are symbolised in numerous practices and rituals to celebrate its advent or presence, or which result in its association with other cultural practices. This, in turn, influences the kind of relationship that people living close to the source of water have with it. For instance, fisherfolk often speak of the

turbulence or calm in the 'moods' of water while setting out on their daily round of catching fish. Mallahs, the traditional fisherfolk of Bihar, perform rituals to 'please the goddesses that reside in the lakes and ponds' prior to initiating the season. Similarly¹ many local knowledge systems in the Narmada valley considered the Narmada river as 'mother' and as life giving and the origin of creation (Baviskar, 1995).

There are also qualities of water that have been prominent historically, but which are quite problematic in terms of their implications for equity and justice. In many religions, water is seen as the embodiment of purity and/or is associated with properties of cleansing and healing; these same notions of purity and pollution (in relation to water, and more generally) also form the basis of discriminatory caste practices. The challenge then is to take cognisance of certain properties of water without letting the religious significance overwhelm the socio-cultural significance. The importance of doing this is brought out by a counter-example, that of the Tehri dam in Uttarakhand state, where the increasingly religious discourse of protest alienated some sections of affected people.² Sharma (2002) points out that in the initial stages of protests against the dam in the 1970s, scientific studies that showed that costs would far exceed benefits were used. In later stages, and especially in the 1990s, religious references invoking the myth of a glorious past have become more important. In particular, the 'holiness' of the water in the Ganga river is often invoked, and the Ganga is tied with the identity of 'Hindu' India. As Sharma points out, what is most dangerous is not just that many anti-Tehri agitators explicitly subscribe to a particular representation of Hindu religion and culture and therefore alienate people who are uncomfortable with this representation, but their conviction that "only through recovery of a Hindu religious platform can a successful case be made against the dam" (ibid: 6), which in turn has led to alliances with fundamentalist political parties such as the Rashtriya Swayamsevak Sangh (RSS) and the Vishwa Hindu Parishad (VHP). Thus, in this case, the property of purity of water becomes the basis of a conservative politics.

¹ The examples in this paragraph were contributed by Soma K.P. (personal communication).

² The dam is supposed to harness the waters of two important Himalayan rivers - Bhagirathi and Bhilangana. When completed, it is supposed to be one of the highest dams in the world (with a proposed height of 260.5 m.). But it will also fully submerge Tehri town and 23 villages, and partially submerge 72 other villages. In all, about 5,200 hectares of land will be lost, and about 85,000 persons displaced.

Secondly, socio-cultural needs could also play an important role in defining and understanding the cultural habits and preferences of different communities, thereby playing a role in the preservation of cultural identity. Some societies draw their identities from water and its manifestations, while others are vulnerable to extinction by its absence. Questions of identity are most evident in communities that have been displaced from traditional water sources, or have had to move away from their root locations and seek to compensate the cultural context of their root location through substitute practices. For instance, the elders among the population displaced and resettled by the Sardar Sarovar dam project prayed every morning to jars filled with Narmada water (Mehta and Punja, 2007).

Often such cultural practices are adopted by communities to mark their own identities, but they may also be used as means of segregation and maintenance of social hierarchies. In fact, denial and exclusion from access to and usage of water has for long been the means of practising and reinforcing hierarchies that have in turn become means of discrimination. Water has been the most powerful means of socio-cultural segregation and discrimination, keeping certain communities labeled as 'untouchables' away from the use of and access to water sources through various practices. Water-related practices may also be blatantly

discriminatory and restrictive on women's freedom. Even in cases where there is no overt discrimination and women are actually reified as carriers and key practitioners of water-related rituals, they may lack the flexibility or the power to determine the course of such rituals. Hence care must be taken to ensure that respect for context-specific socio-cultural norms does not end up feeding into discriminatory practices or a static conception that allows no space for change.

Thirdly, often implicit in socio-cultural needs are different kinds of knowledges, both about water itself as well as about other water-related aspects. Further, these knowledges often have different epistemological bases from western, scientific knowledge systems. This, in turn, can form an important basis of drawing attention to certain (problematic) aspects of the dominant development paradigms (e.g., depletion of a particular resource, people dying in bathing ghats because of sand mining, displacement of adivasis), as well as coming up with alternatives to them. For instance, the knowledge that local people possess can help to make linkages between livelihoods and the ecosystem. Thus the Adivasis in Orissa (such as Dongaria Konds) who are protesting the incursion of industrial houses for mining in their region believe that their region and culture have survived and sustained due to the blessings and maintenance of a balance between various elements of nature. Rather than viewing these elements in separation, their belief is that the mountain - Niyam Raja - has been the source of life for their society over the centuries, and that any disruption of the rhythm of these elements will only lead to the destruction of the region and of their society. Hence, their resistance is not about land or water alone, but about 'Niyam Raja' in all its manifest elements and forms. Another example is of the neolas or natural springs in Uttarakhand, which have been a source of water and venerated for centuries. The cultural practices associated with neolas include practices that kept the water uncontaminated, the location clean and well maintained, etc. With the advent of water pipelines, neolas have become redundant; further, as neolas ceased to be part of the daily routine of people, the other related practices also stopped. This, in turn, brings into question a blanket implementation of piped water systems in all locales, a trend which has acquired considerable importance in the context of the current reforms ³.

At the same time, one needs to guard against making cultural knowledge only instrumental because then there is the danger that only those practices, norms, and beliefs that result in a tangible outcome (increase in productivity or efficiency, for instance) would be valued. There is also the danger that an instrumental approach would not pay adequate attention to the context of the knowledge, and thereby miss many aspects that are critical both for clearer conceptual understanding of the knowledge in question as well as for use in a manner that furthers broadens goals of equity and sustainability. For instance, women's roles in (and knowledge of) managing and maintaining water sources are often emphasised, but this, in turn, often feeds into a stereotyping of their roles. Similarly, water-related practices may have been sustainable in a given context more because of the limits set by demography and technology than out of any innate notions of sustainability (an argument that has been made in the broader context of environmental practices of tribals, for instance, in Baviskar, 1996). Finally, knowledge of socio-cultural needs is often used for undertaking economic activities such as religious tourism, even though such activities are often problematic in terms of sustainability and equity, and/or result in conflicts between

³ Both examples in this paragraph were contributed by Soma K.P. (personal communication).

the needs of different groups.

While the foregoing discussion brings out the importance of recognising socio-cultural needs as a distinct category of needs under the right to water (albeit with certain caveats), no such recognition is currently accorded to it under the National Water Policy, 2002 (GoI, 2002) in spite of the fact that in recent times, there has been an increasing emphasis on the local and the indigenous. However, there is recognition at the international level, with the right to water for socio-cultural needs being mentioned in the General Comment 15 of the United Nations, although it is accorded lesser priority than the right to water for personal and domestic use (UNESCO, 2002: Clause 6).

It would be difficult to quantify total water required for socio-cultural needs; quantification would be possible, at the most, in particular individual cases. Socio-cultural needs are universal as a phenomena but context specific in their manifestations, and therefore any assessment of such needs is only possible through a garnering of experiences and practices of different communities, even while its basic tenets may be common across them⁴. What elements are needed to sustain a way of life - a particular mode of provision of water, recognition of certain kinds of community rights, and so on - would differ from case to case and cannot be laid down a priori; in fact, any attempt to do so would itself be problematic because it would imply some kind of normalisation of specific cultural practices. Instead, what one could perhaps do is lay down a set of general principles which must be followed, along with a broad set of procedures that lays out how the principles would be operationalised in any given context. The principles that should be included in any right to water to ensure socio-economic needs include (but may not be limited to) the following:

- a. All individuals and groups must be granted the right to water to satisfy socio-cultural needs, as long as this does not conflict with the satisfaction of basic water needs (and possibly other kinds of rights as well) of any other individual or group.
- b. In case the fulfillment of a particular socio-cultural need has the risk of adversely affecting sustainability of a water source, attempts must be made to develop alternative modes of fulfilling the needs (e.g., encouragement to mud idols instead of plaster-of-paris idols during Durga Puja and Ganesh Chaturti festivals in West Bengal and Maharashtra respectively).
- c. For each case of socio-cultural needs of water, care must be taken to ensure that adequate attention is paid to the social, economic, and political context in which the needs are embedded, and that the needs are conceived in dynamic terms instead of static terms that attempt to recreate a mythical past. This would also imply that in general, any particular socio-cultural need along with the manner in which it is fulfilled is not unconditionally taken as a given.

In terms of the procedures to be followed to operationalise the principles in any given context, these could be the same as the participatory procedures in place to operationalise the right to water in general. However, there is an important caveat to keep in mind while operationalising socio-economic rights, which is that one must be wary of romanticising the past and in general, of uncritical acceptance of certain ways of life. Maintaining a particular way of life should not become an

⁴Soma K.P. (personal communication).

excuse to maintain older inequities along various axes (be it caste, religion, or gender), or to put in place new ones.

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Critical Issues and Way Forward

The previous chapters have tried to bring out both an overall approach and the important issues concerning each of the uses of water, namely, basic needs, ecosystem needs, livelihood needs and socio-cultural needs. In this concluding chapter, we attempt to bring forth some of the critical issues that cut across all these uses. These issues need to be engaged with to reduce the areas of conflicts across these uses, go beyond the polarised discourse, and tie them together in an integrated perspective. The attempt here is to detail out the issues with certain initial propositions emerging from the different chapters in the report as starting points, for a long term engagement with these issues to develop a social consensus around them.

Prioritisation of different water uses

Proper prioritisation of different water uses is at the core of contending water uses and allocations. Water policies, both at the national and state levels, do talk about water use priorities. By and large all the water policies give first priority to drinking and domestic water use, followed by agriculture, and so on. It is also a welcome step that for the first time the policy talks of environmental needs in its list of water use priorities. However, there are exceptions. The Maharashtra State Water Policy of 2003 gives industry second priority, pushing agriculture to the third place. Some civil society and 'left' organisations have been demanding that the Government of Maharashtra should adopt the same order of priorities as in the National Water Policy. The Orissa State Water Policy has in fact accorded the second priority to ecosystem needs. Though, very often, the order of priorities remains on paper and does not make a difference on the ground in working out allocations across different uses at the basin/sub-basin or project levels, in Maharashtra we find that the increasing diversion of irrigation water to industries and urban uses has been justified in the name of the order of prioritisation of the 2003 state water policy.

A different conceptualisation of prioritisation

The issue is not one of simply changing the order of priorities. Rather, the crux of the matter is how we conceptualise the entire issue. Prioritisation could be seen in two ways. One, proportional prioritisation meaning in a basin/sub-basin or in a project certain proportions of utilisable water are allocated to different uses like domestic use, industrial and urban use, agriculture use and so on. The present practice in India is one of proportional prioritisation. Two, sequential prioritisation meaning unless a higher order priority is met, water does not move to a lower order priority. One argument or proposition that can have wider acceptance is that water uses for basic needs (including drinking, cooking, washing, hygiene, sanitation and water for livestock), water for ecosystem needs and water for basic livelihoods could be prioritised in a sequential manner. The other needs like hydropower, industrial or commercial use, recreational uses and so on could be

prioritised in a proportional manner. The participants of the two national workshops the Forum organised in March 2009 and February 2010 (mentioned in chapter 1) seemed to broadly agree to this viewpoint. Recently in Maharashtra, various individuals and civil society organisations have come together to form *Lokabhimukh Pani Dhoran Sangharsh Manch* to engage with the water sector issues in the state. This initiative has also been articulating such a viewpoint.

Need to change the nomenclatures of water uses

Another related issue is the nomenclature of different uses and the meanings they convey. For example, the term 'drinking water' could be renamed as 'basic water', which if need be can be further categorised into lifeline water, lifeline plus and luxury water as discussed in chapter 2. This gives us a good handle to determine what should be included as part of the right to water, and also gives us a basis for differential pricing (including the possibility of providing life line water free of cost). The term 'agriculture' or 'irrigation' use is also problematic because, first, non-agriculture based livelihoods get left out completely, and second, within agriculture, water used for meeting livelihood needs and water used for surplus generation (commercial agriculture) cannot be separated out. So perhaps, we could disaggregate agriculture use into water for livelihoods and water for surplus generation or commercial use.

An illustrative case of water use prioritisation

This could be further illustrated by the type of prioritisation worked out by *Lokabhimukh Pani Dhoran Sangharsh Manch* for Maharashtra, included in the following table.

Category	Priority	Sequential/ proportional	The proportion in case the priority is proportional
Domestic or basic water (drinking, cooking, hygiene, washing, livestock)	1	Sequential	Not Applicable (100% of the needs to be provided for)
A. Water for livelihood needs (agriculture and natural resource based) - on the basis of minimum water norms B. Water for keeping the water source alive (environmental flow)	2	Sequential	Not Applicable (100% of the needs to be provided for) (However, the requirement to be worked on the basis of specific basins/sub- basins/ projects)
Water required for public facilities and needs (public hospitals, schools, public toilets, public swimming pools and sports facilities, etc.)	3	Proportional	To be worked out on the basis of specific basins/sub-basins/ projects
Rest of agriculture (commercial agriculture)	4	Proportional	To be worked out on the basis of specific basins/sub-basins/ projects

Hydro-power projects	5	Proportional	To be worked out on the basis of specific basins/sub-basins/ projects
Business establishments, industrial use, thermal power plants	6	Proportional	To be worked out on the basis of specific basins/sub-basins/ projects
Luxury water (washing vehicles, watering gardens and lawns, private swimming pools, water parks, etc.)	7	Proportional	To be worked on the basis of specific basins/sub-basins/ projects
Bottled water, production of soft drinks and alcohol, star hotels, etc.	8	Proportional	To be worked out on the basis of specific basins/sub-basins/ projects

Source: This is based on the charter of demand submitted to the Government of Maharashtra titled, 'Maharashtra Rajya Jal Neetimadhye Avashyak Badal: Pani Vatap, Pradhanyakram Va Hakkaribabat Shasanas Magnyanche Nivedan'. This charter of demands was finalised in the meeting of NGOs and organisations held on 3rd July 2010 at Pune.

The purpose of providing the above table is only to illustrate how we can creatively engage with the issue of water use prioritisation. There could be lot of difficulties and constraints in first working these priorities and then implementing them. But we need to go beyond the conventional understanding of water use prioritisation and start thinking creatively, taking into account the relative importance of different needs. We also need to build social consensus around the new conceptualisation of water use prioritisation, and make suitable changes in the policies, laws and institutions that govern the water sector. Only then would it be possible to progress beyond the contestation and conflicts around different water uses.

Right to water and equity

Another important issue this report brings forth, especially through chapter 2 and chapter 4 is the need for a right based approach to water. There are many who see a right to water as one of the important economic, social and cultural rights that have come to the fore in recent times, and argue in favour of institutionalising a 'right to water' in the human rights discourse. In fact right to water is seen as part of a wider agenda of equity. The first important requirement of the framework is to treat equity as central and as a starting point. Equity cannot be added on as an afterthought. In the report equitable access to water is treated as a matter of minimum assurance to all of water required for basic needs and livelihood needs irrespective of their ownership of assets. Here, minimum water assurance is seen as a right that vests in people by virtue of their right to an adequate livelihood, and not as in the conventional approach by virtue of and through the land or other assets that they own. The report argues for de-linking water rights from land rights (chapter 4) to provide access to water to all those who depend on land and water for their livelihoods. There is some ground for this in traditional practices based on natural equity which can be built upon though it is not as easy to extend them to

provide such assurance to the landless or to women rather than traditional men farmers. Special efforts will be needed to bring such disadvantaged groups within the ambit of minimum water assurance as a right of equitable water access. The degree and extent of this right has to be assessed within a framework of the assurance of basic needs (life line and life line plus water) and livelihood needs. The main advantage of this approach is that it provides us with what should count as a basic service that is necessary to fulfill basic needs and livelihood needs. This helps define a minimum water assurance that must be provided at reasonable cost and dependability. Along with this water required for ecosystem needs also has to be provided for. The rest of the portion may then be treated as water available for allocation for other uses.

One of the important justifications for the institution of a universal human right to access to safe and adequate water is that it provides legal protection. It is also useful because it can bring to focus certain critical questions like government obligations, setting priorities for water policy, identifying minimum water requirements and allocation, and so on. In fact, in India an organised effort to push for a right based approach to water is gradually taking shape.

Though there is no explicit mention of a right to water in the Indian Constitution or in any of our water related laws, there is judicial support for the same. The demand to make the right to water a constitutional right can get wider social acceptance because the right to water stems from human dignity. Still, there are areas including what constitutes the right to water, and what needs to be done to operationalise this right, that need more discussion and debate to reach a broader consensus.

Scope of the right to water

There seem to be two schools of thoughts around the issue of what should constitute the right to water. These two approaches were also reflected in the national workshops that the Forum organised around these issues (referred to earlier). There are those, especially working on drinking water and sanitation issues, who argue that the rights component should be limited to only basic needs (drinking, cooking, washing, hygiene, etc.), because including anything else, especially the water required for livelihoods, can dilute the demand for basic needs. However there are others, especially those who work amongst the drought prone toiling peasantry, who forcefully argue for the need to include water for livelihood needs (based on minimum water norms) as part of the right based discourse, because for them meeting livelihood needs is as basic as some of the other needs like drinking, cooking, hygiene and so on. There is probably a need to re-articulate the right to water in such a way that it can include both, water for basic needs and water for livelihood needs, but with a clear understanding that we need to privilege operationalisation of water for basic needs in terms of a time frame. As said earlier, this is an issue that needs further deliberation.

Formalisation of the right to water

Drawing from the South African experience, the report proposes a constitutional amendment to include the right to water as an enforceable right in the National

Water Policy, or drafting a separate policy on this issue in line with the Free Basic Water Policy of South Africa. These issues are outlined in chapter 2, which also presents a model for the provision of basic needs from a rights perspective.

Right to water is different from other rights

It is also important to recognise that the right to water is different from other rights, say, the right to food, or work. For example, in the case of the right to food, a demand is made on the state to provide a certain quantity of food to the people (or at least to the low income groups, or those who are below the poverty line), and it is the responsibility of the state to provide this. Here, the people and the state are seen as some sort of 'adversaries'. However, in the case of the right to water, we may have to take a different stand, and this mainly emanates from the bio-physical, socio-cultural and ownership dimensions of water like a) it is an ecosystem and common pool resource, b) it has competing uses and users, c) it is both a local and non-local resource, d) it is variable in nature and there is the issue of sharing of surpluses and shortages, e) ownership of water is basically in the form of entitlements to use water in a certain way at certain points and times and these entitlements are not absolute but a relative or proportionate share in a common pool, and f) return of water - every use or user generates return flows and in what quality this return takes place is very important as it can affect both surface water bodies and ground water in terms of quality - is as important as right to water, etc. All these characteristics move water further away from the concept of classical private property ownership, which is the basis of most of our laws and our governance system. It also implies working out, as well as building consensus, on critical issues like principles of sharing, the actual share which has to be periodically worked out and reviewed, and different types of institutional processes that need legal backing. Unlike in the case of the right to food or work, people need to get involved or participate in these processes to actualise their right to water.

Mode of service delivery

The issue of privatisation is another large area that needs further deliberation. There are two types of privatisation taking place. The first one is what is called source privatisation in which the source of water itself gets privatised. The case of Coca-Cola in Plachimada in Kerala, or the case of Sheonath river in Chhattisgarh, or the recent efforts in the case of Neera Deoghar project in Maharashtra where private parties are invited to complete the project with certain rights over the stored water, are all examples of efforts at source privatisation. There seems to be a near consensus, especially amongst the civil society organisations, that source privatisation should not be allowed at any cost. The issue that is open to contestation is about the mode of service delivery, and different models could probably be thought of in this regard. State and state agencies (public bodies) is one option (this was the only option till the 1990s), private service providers could be another option, collective action of the users through co-management institutions (like Water Users' Associations, Pani Samitis, etc.) or the Gram Panchayats could be yet another option. Considerable work is also being done the

world over in what are called Public-Public Partnerships (PUPs) to counter the growing clamour for Private-Private Partnerships (PPPs) in service delivery. The experience of Tamil Nadu where professionals working with drinking water, water resources and agriculture sectors and scientists (including social scientists) have come together under the banner of Center of Excellence for Change to improve service delivery in India especially in the water and food sectors is worth looking at.

If water for basic needs is to be guaranteed to all, does it necessarily imply that the state must undertake this function, and that none of the specific tasks involved in providing water to people can be delegated to any private body? Or does it mean that only critical tasks such as tariff-making, and fixing of quantitative and qualitative norms of water should be retained by public bodies, and/or those private bodies subject to regulation by the state with a view to ensuring access to water for basic needs to all? Should private sector bodies (including foreign private bodies such as MNCs) be permitted to undertake provision of basic service either on its own or in partnership with the state or state-owned enterprises? These are all issues that need wider discussion and deliberation.

Non-negotiables

The position that this report has taken is that irrespective of the mode of provision, there should be certain non-negotiables. Among other things, there could be provision of a certain amount of water (with certain quality norms) to meet basic needs, and precise details of the conditions of such supply can be included in the legal instruments governing the working of the concerned public or private body such as contracts and acts of parliament. In addition, in order to actually ensure the right to water, there should be clear mechanisms for redress in case of violation of the non-negotiables. Hence guidelines are needed on which body would be responsible for judging violations, who would be penalised in case of violations and how, as well as whether a system of compensation for those without water for basic needs can or should be put in place.

Pricing of water

The viewpoints around pricing of water range from a plea to provide free water, to recovery of operation and maintenance (O & M) costs, to full cost recovery. The issue of pricing is an important dimension of the right to water. Pricing has also gained added significance because of 'economic reforms' where there is a danger of 'pricing out' the resource poor even from certain basic access to water. On the one hand, using pricing as a mechanism (basically saying that pricing should reflect the real value of water) to bring in more efficient use of water or to guard against wastage is problematic. On the other hand, there is also a greater sensitivity amongst civil society organisations on the issue of pricing, and one broad area of consensus that is emerging is that the O & M costs should come back through user charges (of course, there could be different ways of doing this without too much burden on the resource poor sections) and the capital costs should be borne by the state. The concept of 'affordability', especially in the context of water for basic needs, could be very useful in addressing this issue. A

useful conceptualisation of 'affordability' is provided by WHO, according to which affordability could be conceived in terms of a relation between income and expenditure on water such that no more than three to five percent of an individual's income should be spent on water.

Lifeline water to be provided free of cost

In the case of water for basic needs, the report has taken the position that a part of the water required to fulfil basic needs, namely lifeline water, needs to be provided free of cost to all. The second component, lifeline plus water, could be charged a low tariff. It could be either in the form of a fixed charge for the whole slab, or a volumetric tariff. These two provisions - free lifeline water and low-tariff lifeline plus water - could be uniform across all classes, or could be restricted to lower-income groups; however, the administrative costs of having a policy that differs across income groups would be quite high. Similarly, in the case of irrigation water too, we could take a position that water required to stabilise production for livelihood needs could be provided at a low, affordable rate and water for commercial agriculture could be charged at full cost recovery. This is very close to the recommendation of a graded tariff system by the Committee on Pricing of Irrigation Water headed by Prof. Vaidyanathan way back in 1992. Perhaps once there is an acceptance of the principles embedded in this position, there could be lot of flexibility in working out the details of how these principles can be operationalised.

Water: social good vs. economic good

At the core of the debate around pricing of water is the polarised conceptualisation of the social vs. economic goods character of water. The 'privatisers', who believe that water should be allowed to become a full commodity argue that water is an economic good; the anti-privatisation currents have insisted that water is a social good and should not become a commodity. Unless we can reconcile these viewpoints, it may be difficult to build a social consensus around pricing which is both rational and socially just. If we accept that water combines both the social and economic good character, and water becomes either a social good or economic good depending on the use it is put to, then we can probably go beyond this polarisation. For example, access to certain amounts of clean water is fundamental to human survival, and when water is used for this purpose it has a social good character. Similarly, when people use limited amounts of water to stabilise production to meet their livelihood needs, water enters as a social good. However, when water is used for surplus generation - in the form of commercial agriculture or industrial production - water enters as an economic good. If we can build up a social consensus around such a viewpoint, then we can also evolve certain principles of pricing and how the different services should be provided and at what charge. For example, we can say that a basic service aimed at basic needs or livelihood needs must be provided to all equitably at an affordable price, including the poorest sections, has to be subsidised if need be, through cross subsidy within the sector or across sectors. On the contrary, an economic service provided for surplus generation needs to be charged the full economic cost at premium rates to provide for cross subsidy for the basic service.

Environmental flows

The report makes a plea to ensure water for the environment while planning and developing water resources. Though many countries across the world are increasingly recognising the need for this and putting appropriate protocols to implement it, the same cannot be said of India. Our mindset still seems to be one that sees water flowing to the sea as a waste, and our efforts have been to store and utilise every drop of water. First and foremost, this mindset has to change. Drawing on the twelve national principles adopted and put in place by Australia to ensure allocation of water to ecosystems, chapter 3 outlines some of the critical issues related to ensuring at least environmental flows in our rivers and streams. The important thing to realise here is that ensuring these flows can, apart from meeting ecosystem needs, also to some extent meet other needs like basic needs, livelihood needs and socio-cultural needs, especially for downstream communities. It can expand the overlapping spaces across the different uses and shrink the area of mutual exclusion (see the diagram in chapter 4). The prioritisation of war uses, discussed in the beginning of this chapter, can also go a long way in ensuring environmental flows. If we have to ensure environmental flows, we need to address some of the following issues.

Dams and diversions

In the context of India, dams and diversions have been the main culprits for fragmenting our river systems, thus affecting the downstream ecosystems and livelihoods of people. It is time that we take a hard look at dam building in the country. The planning of water resource development and matching it with basic and livelihood needs of the local people needs to start at the lowest hydrological unit which is a micro watershed, applying the principle of 'subsidiarity'. Only if these needs cannot be met by harvesting water from the micro watersheds should water from a higher hydrological unit be harvested. This way one can also build up sub-basin and basin plans, taking into account the prioritisation of water uses as discussed earlier in this chapter. As far as possible, efforts should be made for in situ water conservation and use, and reducing evaporation and increasing evapotranspiration or conversion into biomass, the cardinal principle of watershed based development. This can reduce the need for stored water. Of course, this is not to say that we do not need storages, or we do not need dams. We do need storages and dams, especially because we have very clearly defined short monsoons and long dry spells. The issue is how do we do it without creating too much destructive submergence and negative downstream impacts. Here, the issue of integration of various kinds of water resources - small and large, groundwater and surface water - becomes critical. The water sector discourse in the country has been highly polarised on this issue, posed as one of large versus small. Integration can help go beyond the limits of both the small and the large. We also need to realise that there are regions in the country which need, along with local water resource development through watershed development efforts, some supplementary exogenous water to stabilise their livelihoods. It is also possible to tap large water sources (not necessarily large dams) without creating large destructive submergence and ensuring unbound post monsoon flows.¹ This is an issue that needs wider debate, and the sooner we come to a collective understanding the

¹ *The issue of integration of sources and how we can utilise large sources without creating large, behind the dam destructive submergence is discussed in Paranjape and Joy's book on the Sardar Sarovar Project. See Paranjape, Suhas and K. J. Joy, 1995, Sustainable Technology: Making the Sardar Sarovar Project Viable - A Comprehensive Proposal to Modify the Project for Greater Equity and Ecological Sustainability, Ahmedabad: Centre for Environment Education.*

better it is for our people (in terms of meeting their livelihoods) and our ecosystems.

Environmental flows are not 'residuals'

The awards given by various tribunals set up to settle disputes over water sharing of inter-state rivers are a good example of how water allocations are made in this country. The entire flow at a particular dependability is allocated amongst the riparian states, and once each of the riparian states utilises its share of water, there is nothing left in the system. There are already many closed basins in our country. The Krishna is one example, where the entire water has already been allocated to different uses, and the water does not reach the sea. Environmental flows are very often worked out as 'residual', meaning that allocations are made to all other uses and if there is anything left over then that is considered as the environmental flow. This needs to change, and as per the order of priorities discussed earlier, after working out the requirements for the water for basic needs, water must be allocated for ecosystem needs and livelihood needs, and only afterwards can water for other needs be provided.

Regulated and non-regulated rivers

Here it may be required that we adopt different approaches with regard to the highly dammed and regulated rivers, and rivers which are not as yet so regulated. In the case of the latter, we can follow the same process of allocation discussed above. However, in the case of the former, we may also have to look at options of increasing efficiency of the present uses, and allow the saved water to remain with the streams and rivers, thus contributing to increased flows. The second option could be to work out a different reservoir operation model allowing for larger releases especially in the post monsoon seasons. One such model is being worked out in the context of the Chalakudy river, a heavily dammed river in Kerala, which could provide valuable lessons.

Environment impact assessments and cumulative impact assessments

We need to critically look at environment impact assessments (EIAs) which are carried out and used only to justify projects. Firstly, processes involved in EIAs must be streamlined such that the entire exercise is more scientific, objective, participatory and transparent, with the local communities having a decisive say. The second critical issue, which has come to the forefront in recent times, is the issue of having cumulative EIAs. Stand-alone EIAs around single projects would not capture the cumulative impacts caused by multiple projects planned in the same river systems. This issue has become very critical in the context of the dam-building spree unleashed in the north-east, and many groups there have been demanding cumulative impact assessments.

Pollution

Another important issue related to water for ecosystem needs is that of pollution. This issue becomes even more critical in lean seasons when the flows are

reduced considerably. Every water use creates return flows, and the form in which these return flows take place is critical. Industries have been the main villains here. The issue is not how much water they use, the issue is in what form and quality the water comes back to the system. The industries have been very callous in this regard, except in places where there have been civil society actions. The other two emerging sources of water pollution are the untreated urban sewages dumped into our streams and rivers, and the non-point pollution caused by agro-chemicals - both have been on the rise in recent times. Taking into account the specific characteristics of these three sources of pollution, both preventive and punitive measures have to be evolved and put in place. A mere 'polluter pays' principle may not work, and often works as a licence to pollute! We need to have a combination of various instruments like a mix of civil and criminal penalties² (keeping civil liabilities high enough to act as a deterrent, and imposing criminal penalties when there are serious health implications), environmental mediation and voluntary compliance.³

Method of assessment and what needs to be done in the interim

Finally there is also the question of the method to be used to assess the minimum environmental flows required to maintain each of our river systems. Apparently, there are more than 300 methods, and a few of the important ones are discussed in chapter 3. We need to adopt a method which can combine scientific knowledge with the experience and perceptions of local communities who depend on the river system. There are such methods already available. The immediate task is to make assessments of each of our river systems using such a methodology, and come up with quantitative estimations of the water required for environmental flows in different seasons. As this process would take quite some time, the steps to be taken in the interim period must be arrived at immediately. One probably has to go by evidences and the sporadic studies that are available presently, as well as certain thumb rules. For example, it is often said that on the minimum about 15 to 20% of the mean flows have to be maintained as minimum environmental flows.

Water for industries

Allocation and diversion of water for industries has been one of the most controversial issues in the water sector in recent times. This is also an issue that needs to be addressed urgently as it is giving rise to many conflicts. Hirakud in Orissa, and the large scale diversions taking place in Maharashtra through the high power committee, both discussed in chapter 1, are examples of the growing number of conflicts around this issue. What is happening today is basically the expropriation of water from the farmers by the industries as part of a wider process of "accumulation through dispossession". Thus, there is a need to come up with a clear cut understanding in this regard. The issue is not that industries should not be given water. Instead, we need to come up with conditions under which water could be made available without dispossessing farmers and other toilers in the rural areas of their share of water and consequently their livelihoods.

² Recommendation in the draft National Environmental Policy (2004)

³ For details, please see Appaswamy, Paul, 2008, "Water Quality Conflicts", in Joy et al (ed.), *Water Conflicts in India: A Million Revolts in the Making*, New Delhi: Routledge.

The nature of industry does matter

The prioritisation of different water uses, discussed in the beginning of this chapter, does provide certain clear cut guidelines for allocation of water for industrial activities. Chapter 4 suggests that the nature of the industrial entity like size, ownership structure, products, pollution impact and extent of reuse/recycling of water should be considered in deciding allocations to industries. We could also make a distinction between industries that use water as part of its process, and industries that use water as a raw material (for example bottling plants and production of cool drinks), and as discussed in the prioritisation of water uses the former gets a higher priority than the latter within the water allocated to industries. Compulsory re-use and recycling of water, and meeting part of industrial water use through harvesting of water from the industry's own premises (including rooftop water harvesting) could constitute part of the conditions under which water would be provided to industries. Pollution caused by industries is another major area and here we need to go beyond the 'polluter pays' principle. As discussed above, minimum environmental flows resort to a combination of measures and instruments which can both prevent and deter industries from polluting water resources.

Industries should invest in water saving, and only the saved water should be allocated to industries

Presently, industries are externalising the costs of water, an issue which needs to be addressed. In fact, chapter 4 poses the question, "If the industry is functioning as a commercial unit, should it be required to purchase the water needed rather than be allotted water for livelihoods"?

Here we can borrow certain lessons from the experience of power sector reforms in California. In California, new power project or capacity addition would be allowed only after exhausting all other options like improving efficiency, demand side management and so on. Similarly, in the case of industries, it should be insisted that water would be provided only after all other measures like re-use/recycling, local water harvesting, shifting to water efficient production processes (the way water is used in thermal power production is a classic example of the inefficient use of water), etc., are exhausted. The industries need to invest in these measures. The other related but important condition is that industries should invest in water saving and efficiency increasing measures and technologies in the irrigation sector, and only the saved water should be allowed to be used by these industries. In other words no diversion of agriculture water to industries should be allowed in the absence of such investments. Diversion of water to industries from agriculture in the absence of such measures, as is presently being done, would amount to denying large sections of farmers their livelihoods. The experience of Jaitapur in Maharashtra⁴ - the proposed site of the nuclear power plant where the government recently enhanced the compensation package by as high as ten times because of the militant resistance of the local people - shows that industries can absorb such costs.

⁴ A few years back, the Pani Sangharsh Chalwal in South Maharashtra demanded that the industries should be forced to contribute 1% of their total outturn, as the purchasing power of the rural population would go up with the spread of irrigation, and consequently the demand for industrial products and the profits of the industries would increase as well.

Way forward: Need for a framework law

Several key issues confronting the water sector especially in the context of entitlements and allocations across different water uses for basic needs, ecosystem needs, livelihood needs and socio-cultural needs have been detailed in this report. The report also suggests certain ways of addressing these issues. Needless to say, the report only provides an initial framework which needs to be further discussed and refined. The Forum would make efforts to further refine and develop this report. The report by the second working group on the legal and institutional issues related to water conflict resolution, a companion report to the present one, would deal with the policy, institutional and legal implications of the issues raised in this report. The Forum would use both these reports to build consensus at different levels as well as influence and change mind-sets and create social acceptance about water allocations across different uses based on equity, sustainability and democratisation. The Forum would also make efforts at policy advocacy so that necessary changes can be made in the existing policy, institutional and legal framework governing water. The different water related working groups set up by the Planning Commission for the 12th Five Year Plan, and the current review process of the National Water Policy, offer opportunities to make policy level interventions.

Framework law

The Forum firmly believes that it is necessary to have a framework law, something along the lines of the European Union Water Framework Directive, for the water sector - which has been also a central gap so far - if we have to tie up the crucial issues related to entitlements and allocations across different uses. The Indian jurisprudence and case law on water have evolved from many different directions and underlying conceptual frameworks, at times incompatible and contradictory. There seem to be two strands of thinking. The first treats water as property, mostly enjoyed through ownership of land (access to irrigation water, groundwater) and the 'eminent domain' of the state (state supremacy and control over water). The second sees water from a framework of human, natural or basic rights as part of the right to life or the right to health, restricted to drinking water such that water for livelihoods and ecosystem needs is not part of it. There are different laws - union, state, natural, formal, customary and sectoral - governing different aspects of water, and a chaotic welter of legal frameworks, provisions and instruments. The issue is not about diversity of laws or customs (or legal pluralism); the issue is that there are no binding common principles or a framework underlying the various water sector policies and legislations. The state led reform process is pushing the water sector in a direction that is in tune with the liberalisation, privatisation and globalisation (LPG) regime that is being pursued in the country since the 90s. However there are also movements from below that are challenging the present legal and policy framework as well as the reform process. They are bringing in new agendas to the table, and the policy and legal regime should try to address these concerns. The policy and legal regime should also develop the necessary inclusive framework and sufficient space and institutional support for negotiation and renegotiation around the critical issues outlined in this report. All these considerations point to the need for a framework law which sets out the principles

that are binding on both the policy and legal processes. Such a framework law needs to take into account: 1) the bio-physical and social characteristics of water, 2) a right based discourse (the right to water should include on the minimum a) potable water of adequate quantity for all, water for livelihoods, minimum environmental flows, and b) only after meeting these needs can water be made available for commercial use), 3) the legal framework must take as its starting point an articulated hierarchy of these rights; and 4) an institutional mechanism to ground it.