

**GIDR WORKING PAPER SERIES**

**No. 202 : May 2011**

**Will Neoliberal Policies  
Resolve Water Sector Dilemmas ?  
Learnings from Maharashtra and Gujarat**

**P.K. Viswanathan**



**Working Paper No. 202**

**Will Neoliberal Policies  
Resolve Water Sector Dilemmas?  
Learnings from Maharashtra and Gujarat**

**P.K.Viswanathan**

**May 2011**

**Gujarat Institute of Development Research**  
Ahmedabad

Abstracts of all GIDR Working Papers are available on the Institute's website.  
Working Paper No. 121 onwards can be downloaded from the site.

All rights are reserved. This publication may be used with proper citation and due acknowledgement to the author(s) and the Gujarat Institute of Development Research, Ahmedabad.

© **Gujarat Institute of Development Research**

First Published    May 2011  
ISBN                81-89023-60-8  
Price                Rs. 45.00

## Abstract

This paper examines how the neoliberal policies have influenced the water sector reform policies and interventions in India, particularly, in the states of Maharashtra and Gujarat. In doing so, the paper tries to engage with three questions: a) what are the national and state-level responses towards the neoliberal policies and their immediate outcomes on reforms in the water sector?; b) whether the neoliberal policies and the regulatory systems as evolved in the developed country contexts would help resolve the burgeoning challenges and conflicts confronting the water sector in India?; and c) what are the critical issues and challenges that the policies and regulatory systems face in achieving the goals of integrated water resources development and a sustainable water future for the country? It observes that the policy responses and regulatory reforms in the case of Maharashtra have been somewhat proactive in addressing the issues of allocation and distribution of water across competing sectors. Nevertheless, the legislations and regulatory systems that came into being are far from internalising the ground level realities concerning the critical issues of equitable distribution and conservation of water harvesting systems in a sustainable manner. The analysis reveals that the incompatibility between the neoliberal policies and the water sector interventions in the Indian context may be explained in terms of the fact that India tried experimenting the macro economic policy reforms as in many other developed countries without giving proper thought on the internal restructuring required for making the water sector institutions perform better in the changed policy environment. As may be seen from the water sector reforms elsewhere, the models in most cases have been found to be following ‘one-size fits all’ type of approach with only minor modifications on a case by case basis. Further, many of these models, say, the US, Chile, Mexico, China and Morocco are found to have been prescribed by the external funding agencies, as water sector reforms in those countries were preceded by macro economic reforms/ policy changes or structural adjustment measures as suggested by such agencies.

**Keywords** : Water Policy, Bulk Water Tariff, Regulatory Regime, Institutions

**JEL Codes** : O17, P48, Q25, Q34

## Acknowledgements

This paper draws on the research undertaken by the author on the water sector reforms in India with special reference to Maharashtra and Gujarat. He expresses thanks to IWMI-ITP for providing financial support for undertaking the study. Thanks are also due to Prof. Philippe Cullet for useful comments on the paper and Tara S. Nair for her efforts to bring this out as GIDR working paper. The usual disclaimers apply.

## Contents

	Page No
Abstract	i
Acknowledgements	i
Contents	ii
List of Tables / Boxes / Figure	ii
1. Introduction	1
2. Water Policies and Regulatory Regimes in India: An Overview	4
2.1 <i>The National Water Policies: 1987 and 2002</i>	6
3. Water Policies and Related Regulatory Reforms in Maharashtra	8
3.1 <i>The Maharashtra Water Resources Regulatory Authority Act (MWRRA), 2005</i>	11
3.2 <i>The Maharashtra Management of Irrigation Systems by Farmers Act, 2005</i>	12
3.3 <i>Fixation of Bulk Water Tariff</i>	13
4. Water Policy and Regulatory Regime in Gujarat	14
4.1 <i>Gujarat Water Regulatory Commission Bill, 2006</i>	16
4.2 <i>The Gujarat Water Users' Participatory Irrigation Management Act, 2007</i>	17
5. Implementation of Water Sector Reforms: Outcomes and Dilemmas	17
5.1 <i>Maharashtra's Water Sector Dilemmas</i>	18
5.2 <i>Gujarat's Water Sector Dilemmas</i>	26
6. Concluding Observations	29
References	33

### List of Boxes

1. Maharashtra Water Policy: Objectives and Strategies	10-11
2. Summary of Stakeholder Consultations on the MWRRA Approach Paper on BWT Fixation	23-25

### List of Tables

1 Trends in Water Consumption by Sector in Maharashtra (Mm <sup>3</sup> )	18
2 Trends in BWT Levied by Sector in Maharashtra	19
3 Trends in Unit Water Tariffs Levied and Realised by Sector	20

### List of Figure

1 Trends in Efficiency in the Collection of Water Tariffs in Maharashtra	22
--	----

# Will Neoliberal Policies Resolve Water Sector Challenges? Learnings from Maharashtra and Gujarat

P. K. Viswanathan

*“Nothing is more useful than water; but it will purchase scarce anything; scarce anything can be had in exchange for it. A diamond, on the contrary, has scarce any value-in-use; but a very great quantity of other goods may frequently be had in exchange for it” (Smith, 1776: 33)*

## 1. Introduction

The world is known to be at the clasp of a serious water crisis. The first World Water Development Report (WWDR) published in 2003 by the UN raises several concerns adding to the water crisis, viz., a) rising population without adequate water and sanitation; b) growing gap between rich and poor as well as urban and rural populations in water and sanitation services; c) rising costs of mitigating water-related disasters; d) declining quality of water resources and ecosystems; e) under-financing of the water sector; and f) rising pressures on water with increasing agricultural and industrial demand and pollution (UN/WAAP, 2003). The imminent threat from the climate change impacts adds a new dimension to the water crisis putting the global water sector in a predicament, necessitating effective policies and actions to overcome the impasse. The problems of climate change risks on the global water sector seem to be precarious in view of the: i) prominence of water being a critical resource in the adaptation and mitigation strategies; ii) centrality of agricultural water management for food security, especially, in the wake of the recent global food crisis; and iii) risk of not meeting the water-related Millennium Development Goals by 2015 (World Bank, 2010).

Incidentally, the impending water crisis had also resulted in a radical transformation, especially, among the developed countries of the North and many of the developing countries in the South by way of evolving policies, legal frameworks and implementing regulatory reforms/ interventions in the water sector. But, by and large, it appears that there is a clear divide between the north and the south in terms of the implementation of policies

---

P.K. Viswanathan (pkviswam@gmail.com) is Associate Professor at the Gujarat Institute of Development Research, Ahmedabad.

and regulatory reforms. For instance, a number of developed countries have been somewhat successful in responding to the crisis by developing policies and appropriate market based instruments (MBIs) as well as management strategies for the water sector<sup>1</sup>. Whereas, many of the developing countries are hard-pressed by either the lack of, or poor implementation of such policy instruments or regulatory systems. It may be observed that though there have been policy initiatives and institutional reforms in water sector in many parts of the Asian and African regions in particular, these initiatives have shown very little impacts in terms of creating effective institutional or governance regimes for sustainable development and management of water resources.

This irony of ‘policies for the sake of policies and reforms for the sake of reforms in the water sector’ as emerged in the south is an interesting episode. It demonstrates how the water sector policies and reforms in the developing countries are explicitly influenced by the neoliberal policies/ ideas as well as market driven technological and institutional solutions as being tried in the developed regions<sup>2</sup>. The growing body of literature on the discourse of neoliberalism advocates that neoliberal policies are integral aspects of global market integration and offers unprecedented opportunities for growth through market reforms, privatisation, financial disciplining and dismantling of the state bureaucracies (Erjavec and Erjavec, 2009). In the case of water sector, the neoliberal policies urge the need to reform the existing institutions, devise new legislations and establish new governance systems to improve multi-stakeholder institutional coordination, regulatory functions, and service delivery in the water sector (Castro, 2008).

---

<sup>1</sup> Often, the case of Mexico is shown to be one of the most successful in the effective implementation of water sector reforms. The core components of successful water policy reform in Mexico are: a) efficiency; b) decentralized management; c) participation; and d) equity/sustainability. Mexico’s transition to the new policy regime was additionally influenced by a range of exogenous and endogenous factors, including the country’s political opening, its turn to neoliberal economic restructuring, a greatly retrenched role for the state vis-a-vis markets, and the emergence of civil society actors demanding more voice over water allocation, services, pricing and quality. See Castro (2006) and Wilder (2008).

<sup>2</sup> The characterization of water as an economic good in the Dublin-Rio principles and the advocacy of water markets and the privatization of water services by the World Bank and the Asian Development Bank have also been instrumental in popularizing the neoliberal principles, particularly their long term implications for financial disciplining through water pricing and the focus on right to water (Mehta and Madsen, 2003).

Thus, the stronghold of neoliberal policies and reforms in the water sector as observed in the developed countries seems to be bringing in radical changes in views reinstating the preeminence of market based instruments (MBIs) as effective mechanisms for resolving the multiple water sector challenges and conflicts in the developing countries. But, this romanticism about the neoliberalism and the replication of neoliberal policies in countries in the south raises important issues, especially when there is a clear divergence in the trajectories of water use, policies, investment priorities and development strategies within the water sector between the semi-arid north and the semi-arid south as observed by Allan (2005). For instance, in the neoliberal north, there has been a shift in policies, especially since the 1980s, towards putting water back into the environment. In sharp contrast, in the south, there remains a predictable commitment to taking more water out of the environment in order to further increase the food output to meet rising food demands, to avoid dependence on imports, and to increase the wealth of the respective economies as a whole (Allan, 2005).

Set in the broader perspective of the neoliberal policies and reforms impacting governance of the global water sector, this paper examines the responses, status and implications of the policy innovations and regulatory reforms in the regional context of India with particular reference to Maharashtra and Gujarat states. In doing so, the paper addresses three pertinent issues, *viz*: a) what are the national and state-level responses towards the neoliberal policies and their immediate outcomes on reforms in the water sector?; b) whether the neoliberal policies and the regulatory systems as evolved in the developed country contexts would help resolve the burgeoning challenges and conflicts confronting the water sector in India?; and c) what are the critical issues and challenges that the policies and regulatory systems face in achieving the goals of integrated water resources development and a sustainable water future for the country?

The paper is organised into six sections. Section 2 provides an overview of the national and state level responses to the neoliberal policies which have taken the shape of national water policies of 1987 and 2002 and the subsequent enunciation of water policies by individual states. Sections 3 and 4 make a critical review of the contrasting scenarios of policy and regulatory reforms in Maharashtra and Gujarat states, which are distinct in terms of the growth dynamism having serious implications for

the water resources by way of over extraction of groundwater and ever growing industrial and urban demands for water. Maharashtra, in particular, has been in the forefront for launching various water sector reforms, mostly guided by the neoliberal policies. Section 5 examines the major outcomes and challenges or the dilemmas in the implementation of water sector reforms in Maharashtra and Gujarat. Section 6 concludes the paper by posing some important concerns on the very relevance and robustness of the neoliberal reforms in water sector in addressing the multi-faceted water sector challenges in India.

## **2. Water Policies and Regulatory Regimes in India: An Overview**

The history of water sector development in India reflects that the national policies and priorities have been highly obsessed with the development of multi-purpose river valley projects (MRVP). Both the national and state governments have been engaged in formulating and implementing policies and programmes for development of water systems aimed at irrigation, flood control, hydro-power generation, drinking water supply and industrial and other uses. Over the past five decades, India had spent more than \$50 billion for infrastructure development in water sector, comprising a large number of small, medium and large dams, barrages, hydropower schemes, canal networks, etc. Indeed, this resulted in tremendous achievements in terms of assured irrigation in the command areas, water supply for hydropower and thermal power development as well as the drinking water supplies. As many parts of post-independent India were facing serious problems of frequent famines and droughts, the construction of large dams for irrigation and other purposes has been certainly justified by the planners and policy makers. Irrigation development has been highly instrumental in the success of Green Revolution (GR) technologies leading to expansion of HYVs of food crops (mainly wheat and rice) in the entire northwest region of the Indo-Gangetic Plains (Chand, 2010).

However, despite the notable achievements, India's water sector has been beset with serious problems of under-performance with poor realisation of irrigation potential. The seriousness of the sub-optimal performance of surface irrigation systems in the country has been further compounded by the parallel developments in extracting the groundwater resources beyond sustainable levels. Today, the groundwater resources that form 65-70 per cent of irrigation water supplies and 80 per cent of the domestic water supplies (World Bank, 2005) are in a critical state in most parts of the

country, especially, in Gujarat, Maharashtra, Punjab and Tamilnadu. Besides, the Water Quality Assessment Authority (WQAA) reports several problems about the poor quality and delivery of drinking water and sanitation services in the country<sup>3</sup>.

Thus, the sorry state of affairs of India's water sector points to a crisis emerging from policy dilemmas and governance failure compounded by several other challenges, *viz*: a) perceptible gap in the provisions of water across competing sectors, especially safe drinking water in rural and urban areas; b) issues of legitimization of rights to water as a fundamental right; c) growing water markets even in the rural fringes; d) absence of institutional and regulatory systems for effectively addressing the dynamic agrarian changes in the canal commands; e) varying degrees of implementation and success of participatory water management interventions; and f) the growing environmental and human health related concerns along with socio-economic impacts of poorly implemented rehabilitation/ resettlement programmes, to mention a few.

If we consider the contextual relevance of launching of policies and regulatory reforms in India's water sector, it may seem that the situations were quite demanding for a paradigm shift in policies and regulatory regimes in the light of the policy interventions that happened among the countries in the North. But it is yet intriguing that how the policies and regulatory reforms as developed in the North could be effective in resolving the policy dilemmas and the governance crises of the sorts in India as described above.

The Indian Constitution provides a solid foundation for evolving legal and policy frames required for the water sector in the country. Water is also a state subject with 'irrigation' being entry 17 of the state list. 'Water rights' irrespective of the limitations due to definition and implementation are derived from the fundamental rights of the Constitution under Article 21. State governments are obviously empowered to legislate on water related matters and ensure good governance.

---

<sup>3</sup> For instance, only 89 per cent of the country's population has access to improved drinking water source with hardly 28 per cent having access to improved sanitation facilities. Further, about 2.17 lakh rural habitations in the country are affected by water quality problems. More importantly, 71 stretches on various rivers in the country have been identified as polluted. See, <http://mowr.gov.in/wqaa/index.html>.

Water sector development, which assumed the centre-stage of the planned development programmes in the country, has been perceived and implemented in a highly 'centralized and top down' framework even by the states. Since water resources are considered as nature's free gift, formal water sector policies were either non-existent or rudimentary. The institutional and or regulatory mechanisms that existed have always been dominated by the centralist decision-making powers. However, the scenario had undergone some changes since the 73<sup>rd</sup> and 74<sup>th</sup> amendments in the constitution passed in 1992, which empowered the Panchayati Raj Institutions (PRIs) to administer water sector development programmes. Since then, there were series of enactments, legislations and policy interventions within the water sector (surface, groundwater and drinking water sub-sectors) marking a paradigm shift in policies, perspectives and approaches mostly confining to the micro level contexts of the Indian states. But, in most cases, these legislations, enactments and policy formulations seemed mere refinements or modifications or additions to the pre-existing legal and regulatory regimes of the colonial era.

### **2.1     *The National Water Policies: 1987 and 2002***

Of late, the two national water policies, *viz.*, Water Policy 1987 and Water Policy 2002 have been quite instrumental in introducing the legal/policy initiatives and regulatory reforms in the water sector in the country. The first National Water Policy (NWP) adopted in September 1987 underlined that 'water is a prime natural resource, a basic human need and a precious national asset'. This policy intended promoting a standardized national information system, data collection, establishment of basin-wise organisations with multi-disciplinary approach to planning, formulation, clearance and implementation of projects, rehabilitation, groundwater development, water zoning, flood and drought management, R & D and training (Kumar and Seth, 2000). In the planning and operation of water resource systems, the priorities of water allocation were set as: a) drinking water; b) irrigation; c) hydro-power; d) navigation; and e) industrial and other uses. The policy also addressed several areas of intervention, *viz.*, assessment of water resources, ground water hydrology and recharge, prevention of salinity ingress etc.

Though the 1987 NWP covered wide ranging aspects of the water sector, a number of challenges emerged in due course of its implementation. Reportedly, the Ministry of Water Resources (MWR) has not been well-

equipped in implementing the policy<sup>4</sup>. To overcome some of the discrepancies in implementing the 1987 policy, the NWP 2002 was announced as a modified version of the 1987 policy. The 2002 policy was set in the backdrop of the impending water crisis and the severe droughts in the country. Hence, provision of drinking water assumed top most priority in the 2002 policy as well. With the inclusion of provision of water for ecological services, the 2002 policy set the priorities as: a) drinking water; b) irrigation; c) hydro-power; d) ecology; e) agro-industries and non-agricultural industries; f) navigation and other uses. In rest of the areas and provisions, the 2002 policy appears to be a replica of the 1987 policy.

A notable difference in the 2002 policy has been its focus on privatization<sup>5</sup>. The policy put forth supply side solutions in terms of institutional mechanisms, technological options, innovations and corporate management strategies for ensuring better financial returns through market driven water pricing solutions. Thus, there has been a big push towards the neoliberal idea of promoting private-public partnerships in the provision of water, especially, rural water supplies, which was anchored by the international development agencies, such as the World Bank and eminently supported by the then national government. But, the two national water policies seem to be mere statement of intentions or pontifications as they

---

<sup>4</sup> This has also been revealed by Ramaswamy Iyer, who was engaged in drawing up the 1987 water policy. He observes that “when we worked on the National Water Policy in 1985-86, we had a vague idea about shifting attention from big projects to a unified, focused water policy. Having converted the Department of Irrigation into the Ministry of Water Resources, we discovered that the National Water Resources Committee, set up in 1980, had not met even once. We had a meeting, and that’s where the National Water Policy originated.... While the National Water Resources Council approved the National Water Policy in September 1987, there was no accompanying blueprint for making it operational, as originally envisaged.... We did try to address the question of institutionalization through periodic meetings at different levels, but over a period of time that initiative petered out, unfortunately” (Iyer, 2007:8).

<sup>5</sup> The policy document observes: “...private sector participation should be encouraged in planning, development and management of water resources projects for diverse uses, wherever feasible. Private sector participation may help in introducing innovative ideas, generating financial resources and introducing corporate management and improving service efficiency and accountability to users. Depending upon the specific situations, various combinations of private sector participation, in building, owning, operating, leasing and transferring of water resources facilities, may be considered” (GOI, 2002).

have not been complemented by supportive legislations or action plans at the national level.

Nevertheless, following the 2002 policy a series of legislations and policies have been introduced by the states in the arenas of rural and urban drinking water and the irrigation water sectors. Many of the states have also come up with respective state water policies. Prominent among them include: Tamilnadu Water Policy 1994; Uttar Pradesh State Water Policy 1999; Karnataka State Water Policy, 2002; Maharashtra State Water Policy 2003; Madhya Pradesh State Water Policy 2003; Kerala Water Policy, 2007; and Orissa State Water Policy, 2007 (MOWR, 2010).

Incidentally, many of these policy and regulatory reforms invariably seem to be similar in setting their priorities and legitimizing the neoliberal approach of market based solutions for the water sector governance. This reasoning is only logical as there are many questionable issues concerning the manner in which water sector reforms are implemented in several of these states, particularly, Maharashtra and Gujarat. In particular, Maharashtra seems to have gone far ahead in implementing water sector reforms with several policy initiatives pertaining to distribution and management of water for irrigation and other competing uses. In contrast, the state of Gujarat has a notorious legacy in the development and management of water resources. Despite a plethora of challenges facing the water sector, the state still remains somewhat closed to the idea of a formal enactment or implementation of water policy and regulatory reforms.

Rest of the section critically examines the diverging scenarios of the status of implementation of water sector reforms in Maharashtra, as against the virtual laxity of Gujarat in initiating any such reform process, when the water sector in the state is beset with increasing problems of over-extraction of groundwater, growing demand for urban and industrial consumption, etc.

### **3. Water Policies and Related Regulatory Reforms in Maharashtra**

Maharashtra is the third largest state in the country with a geographical area of 30.8 million hectares covering a population of 112.37 million as per the 2011 Census (GoI, 2011). The growing population together with booming industrial sector exerts great pressure on the water resources. Agriculture employing 70 per cent of the labour force continues to be the largest sector drawing the state's freshwater, especially groundwater. The state remains as

socially and politically dynamic with the presence of a powerful farmers lobby and several other factors ultimately influencing the governance of water sector. The state also has a long tradition of community water management. A case in point is the 300 years old system of water management - the *Phad system* – a community managed irrigation system prevalent in the northwestern Maharashtra.

The history of legislative/ institutional reforms in water sector in Maharashtra may be traced back to 1960 when the state implemented the Maharashtra Fisheries Act, 1960. This was followed by various other important enactments in the 1970s, *viz.*, a) Water (Prevention and Control of Pollution) Act, 1974; b) Maharashtra Irrigation Act, 1976; and c) Maharashtra Kharland Improvement Act, 1979. In 1972 the state had set up a Groundwater Surveys and Development Agency (GSDA), especially, for the development of minor irrigation schemes based on groundwater. But, many of these legislations were essentially to discipline the water sector and to ensure its optimum development for fulfilling the water needs of different users.

Nevertheless, after a long silence of almost a decade during the 1980s, the state had introduced a number of policy and regulatory reforms in the 1990s, which were more radical in terms of restructuring the institutional and governance systems followed until then. Prominent among these reforms were implementation of the Maharashtra Groundwater (Regulation for Drinking Water Purposes) Act, 1993, followed by enactments for setting up of five major river basin/ irrigation development corporations, *viz.*, a) Krishna Valley Development Corporation Act, 1996; b) Vidarbha Irrigation Development Corporation Act, 1997; c) Tapi Irrigation Development Corporation Act, 1997; d) Konkan Irrigation Development Corporation Act, 1997; and e) Godavari Marathwada Irrigation Development Corporation Act, 1998. Notably, the setting up of the irrigation development corporations may be seen as a radical step towards breaking the conventional ‘command and control’ model of water regulation through privatisation of water control systems in the state.

The last decade witnessed more of radical reforms in the state’s water sector. In 2003, the state announced the Maharashtra State Water Policy (MSWP). This was followed by two major enactments, *viz.*, the Maharashtra Water Resources Regulatory Authority Act, 2005 (MWRRA) and the Maharashtra Management of Irrigation Systems by Farmers Act, 2005 (MMISFA), which have been regarded as quite path breaking in the realm of water sector reforms in the state.

The Maharashtra State Water Policy (MSWP) 2003 was mainly based on the NWP 2002 and the Maharashtra Water and Irrigation Commission's Report. The basic objectives of the MSWP are "to ensure the sustainable development and optimal use and management of the State's water resources, to provide the greatest economic and social benefit for the people of the State and to maintain important ecological values within rivers and adjoining lands" (GoM, 2003: 2). The important objectives and the strategies for achieving those objectives as proposed in the MSWP are presented in Box 1.

**Box 1: Maharashtra Water Policy: Objectives and Strategies**

Objectives	Strategies
1. Create an enabling environment for equitable and productive water management in an environmentally sustainable manner to promote growth, reduce poverty and minimize regional imbalances	<p><i>1. River Basin Agencies (RBAs):</i> Delineate the five river basins into 25 sub basins for integrated planning, development and management of water resources and watersheds in respective river basins.</p> <p><i>2. Participatory water management:</i> To comply this, farmer management of irrigation systems has been made mandatory along with formation of WUAs. Water will be supplied on volumetric basis to WUAs only.</p>
2. Create incentives for efficient use of water and empower WUA to participate in management; to grant the WUAs entitlements to water so as to enable them decide on best use without bureaucratic interference	<p><i>3. WUAs and bulk water entitlements:</i> The concept of 'bulk water entitlements' was introduced mainly to effect water allocations through WUAs. WUAs hold bulk entitlement to water on behalf of their members. WUAs will be formed as federations at the distributory level and will be responsible for the O&amp;M of canals and other structures and facilities.</p>
3. Create new institutional arrangements at river basins to guide and regulate water management; to decentralize the responsibility at river basins & sub-basins	<p><i>4. Water for domestic and industrial use:</i> To launch a perspective plan to integrate the provision of drinking water both to the rural and urban sectors with the multi-purpose projects. Suggests a pricing policy to cover at least the O&amp;M costs of the water supply.</p>

[Contd...]

[Box 1 Contd...

Objectives	Strategies
4. Place a high priority on promoting the development, adaptation and dissemination of new technology to improve efficiency and productivity	5. <i>Private sector participation:</i> Encourages participation of corporates, commercial enterprises and water service providers in preparing the river basin plans. Similarly, partnerships encouraged between the state and the private sector in financing for and introduction of new technologies.
5. Enact appropriate legislation and enabling rules to effect the above strategies: For this, the State will adopt three critical items of legislation including: a) an act to authorize farmers' management of irrigation systems; b) an act to create a state water authority; c) and river basin authorities	6. <i>Priorities in water allocation:</i> Priorities include: a) drinking, cooling, hygiene and sanitation needs including livestock; b) industrial, commercial use and agro-based industrial use; c) agriculture and hydropower; d) environment and recreation uses; and e) all other uses. 7. <i>Transfer of water use entitlements:</i> "Transfer of all or a portion of water entitlement between entitlement holders in any category of water use and priority shall be permitted on both annual and seasonal basis based on fair compensation of the entitlement.

Source : GoM (2003), *Maharashtra State Water Policy*.

### 3.1 *The Maharashtra Water Resources Regulatory Authority Act (MWRRA), 2005*

The state water policy prescribed setting up of two major regulatory instruments, *viz.*, (i) a state water resources regulatory authority and river basin agencies; and (ii) an act to authorize farmers' management of irrigation systems. Accordingly, the state passed the Maharashtra Water Resources Regulatory Authority (MWRRA) Act, 2003 (Mah. Act No. XVIII of 2005), which was adopted in 2005. The MWRRA is supposed to regulate the state's water resources by engaging into multiple tasks: a) facilitate and ensure judicious, equitable and sustainable management, allocation and utilisation of water resources; b) fix water rates for agriculture, industrial, drinking and other purposes; and c) perform matters connected therewith or incidental thereto. The MWRRA

Act also sanctions the formal setting up of the River Basin Agencies (RBAs) or River Basin Development Corporations (RBDCs)<sup>6</sup>.

The MWRRA is also the designated authority to issue the bulk water entitlements (BWE) to WUAs or other entities. The Act also lays down the criteria of allocation and provision of BWEs issued by the RBAs based on the category of use subject to the priority assigned. BWEs are issued for uses, such as irrigation, drinking, municipal and industries to relevant user entities, mainly WUAs and others and not individual farmers *per se*. Individual Water Entitlements will be issued only for the construction and operation of individual lift irrigation schemes using surface water sources through bore-wells, tube wells or other facilities for extraction of sub-surface water. In all cases the BWE will be measured volumetrically and with respect to time of delivery and flow rate of delivery. The Act also suggests criteria in matters of transfer or trading of water entitlements.

### ***3.2 The Maharashtra Management of Irrigation Systems by Farmers Act, 2005***

The second and perhaps the most important legal instrument as prescribed by the 2003 Water Policy in Maharashtra is the Act authorizing farmers' management of irrigation systems (FMIS) in the state. Thus, the policy seems to give greater emphasis for involving farmers, the dominant segment of water users, in the process of management of water resources. This step might help in creating new and strengthening of the existing WUAs in the state. This could be an important step especially in a context when the performance of water sector is undermined by serious issues of underutilization of irrigation potential. In fact, this initiative of management of irrigation systems by farmers may be considered as reinventing of the economic significance of the WUAs as critical instruments for achieving efficiency in irrigation management transfer (IMT) and the participatory

---

<sup>6</sup> The important functions of the RBDCs are to: a) determine and distribute bulk water entitlements for various categories of use; b) establish in consultation with stakeholders a water tariff system at sub-basin, river basin and State level that reflects full recovery of the cost of the irrigation management, administration, operation and maintenance of the project; c) administer and manage interstate water resources of the State; d) review and clear water projects at the sub-basin/ river basin levels and ensure the proposal is in conformity with Integrated State Water Plan; e) review entitlements after three years; f) establish a system of enforcement, monitoring and measurement of entitlements; g) determine and ensure that the cross-subsidies between Categories of Use are totally offset; and h) develop the State water entitlement database.

irrigation management (PIM), which are being tried in countries including India, though with limited success.

Thus, while there are serious apprehensions about the success and effectiveness of such participatory interventions in the country, the government of Maharashtra seems to have taken a bold step by making legislation for farmer management in irrigation systems. Besides, new regulatory systems are put in place by way of introducing water auditing, benchmarking of water resources projects, water entitlements etc. A Project Level Association is made responsible for water budgeting, in the absence of which the Canal Officer is held responsible. Further, the SWP claims that a well-defined transparent system for water entitlements will be established, so that these cannot be changed unilaterally by any state agency or authority. However, a critical analysis of BWEs underlies the limitations in both the conceptualization as well as the broader policy context in which they are situated. Firstly, the entitlements refer to authorization granted to use water i.e., usufruct rights. But this is not linked to any notion of *inherent* rights of farmers over water (Upadhyay, 2005). In fact, even with the new changes in the state, there is no enforceable guarantee offered by the state for access to either drinking or irrigation water. Secondly, the policy permits transfer of all or a portion of water entitlement between entitlement holders in any category of water use, and priority on both annual and seasonal basis based upon fair compensation of the entitlement. However, it is not clear whether only the quota for a particular season or year is transferable, or whether a permanent transfer of the entitlement is also feasible. Further, there is no provision for transfer of entitlements to non-entitlement holders (such as the landless), a provision which may adversely affect women.

### ***3.3 Fixation of Bulk Water Tariff***

One of the major interventions by the MWRRRA is the introduction of a market based instrument, i.e., the fixation of bulk water tariffs<sup>7</sup> (BWT) and this may be regarded as the first of its kind in the country. The MWRRRA claims that the fixation of the criteria based water tariff has been found on

<sup>7</sup> Bulk tariff is the tariff levied by the service provider, Water Resources Department (WRD), for volumetric supply of water to bulk users from its reservoirs, dams and canals. While water drawn by industries and drinking water users is volumetrically measured, as much as 90 per cent of the agricultural users in the State still get water from area based supplies. Only in about 10 per cent of the irrigated area have water user associations, to whom volumetric supplies are possible, been formed (MWRRRA, 2009).

‘sound economic principles and informed economic choices’. Several incentives/ concessions have also been proposed to the agriculture, industry and drinking water sectors to: (i) give relief to the economically weaker sections including marginal and small farmers and tribal farmers; (ii) encourage adoption of micro irrigation techniques; (iii) paddy areas for switching to volumetric tariff; (iv) rural drinking water users and agro industries; (v) encourage adoption of recycling by industries and usage of treated effluent for irrigation. The “polluter pays” principle has been introduced for errant industries (MWRRA, 2009).

Thus, seemingly, the regulatory reforms have been overtly keen on streamlining the institutional structures involved in the governance of the water sector by way of segregating the sectoral administration of water distribution. Accordingly, while irrigation management is administered through CADA and the Irrigation Development Corporations, drinking water supplies are regulated by the Water Supply and Sanitation Department (WSSD), the Maharashtra Jeevan Pradhikaran (MJP) and the Municipal Corporations (MCs). The Maharashtra Industrial Development Corporation (MIDC) takes care of the industrial and domestic water needs (retail and/ or bulk sale) in MIDC areas, and in non-MIDC areas, either Municipal Corporations supply water to the industries or the industries themselves manage it through dedicated pipe lines (MWRRA, 2009). However, the sectoral water allocations as well as the implementation of bulk water tariffs have been beset with various operational level constraints in Maharashtra as we discuss further.

#### **4. Water Policy and Regulatory Regime in Gujarat**

Gujarat occupies about 6 per cent of the land resources and roughly 3 per cent of India’s freshwater resources, and 5 per cent of its population as per 2011 provisional Census (GoI, 2011). The state has low per capita rainwater availability as compared to several others and hence, most parts of the state remain ‘water starved’. Almost 70 per cent of the freshwater resources in the state are concentrated in the south and central regions. Water problems are acute and manifest in the form of depletion and pollution of groundwater aquifers, polluted water bodies, water-logging and salinity in canal commands, salinity ingress in coastal areas, fast growing competition between non-conventional water consumptive sectors such as rural and urban drinking water as well as the industrial sectors.

The future of Gujarat's water sector seems to be bleak in view of the growing water demand and the threat of potential conflicts between competing sectors. Water pollution caused by industrial effluents is a prominent problem. Besides, the growth of urbanisation especially since the last ten years has also been seriously affecting the water sector in the state. Incidentally, there has been a surge in empirical research undertaken by institutional agencies, including government and International bodies, such as the IWMI as well as individual researchers examining the magnitude of the impending water crisis in Gujarat as caused by the rapid changes.

While a review of the empirical studies is beyond the scope of the paper, it may be observed that there is a consensus on the virtual absence of overarching policies and regulatory systems governing the water sector in the state<sup>8</sup>. Of the many studies, mention may be made of the White Paper on Water in Gujarat prepared by IRMA/ UNICEF in 2001, which brought out the status report on water resources in the state. It identifies the pertinent issues and the emerging challenges in Gujarat's water sector and outlines strategies for resolving the issues including identification of options for future action for drought-proofing. The white paper had underlined the need for expediting the announcement of a water policy, which is to be backed by a facilitating law and buttressed by an appropriate organisational structure and governance system. The White Paper also recommended setting up of an autonomous Water Development and Management Board at the state level, to plan, coordinate and direct water management projects.

Though the White Paper made a candid case for formulating the State Water Policy, no such initiative has been taken for developing a comprehensive policy or legislative framework to address the woes of the water sector in Gujarat. However, there have been some efforts in recent years in the state for introducing certain legislations/ policy reforms in the water sector. In particular, the State has introduced two specific policy cum regulatory interventions, *viz.*, a) the Gujarat Water Regulatory Commission (GWRC); and b) the Gujarat Water Users' Participatory Irrigation Management (GWUPIM) Bill, 2007.

---

<sup>8</sup> The literature examining the critical issues affecting the water sector in Gujarat is extensive. Prominent ones are IRMA/UNICEF, 2001; Kumar and Singh, 2001; Dubash, 2002; Mehta, 2003a and 2003b (b); Ranade and Kumar, 2004; Kumar *et al.*, 2004; Shah, 2004; Prakash and Sama, 2006; Kumar, 2007; Cullet, 2007b; TISS, 2008; and Parthasarathy and Dholakia, 2011.

#### ***4.1 Gujarat Water Regulatory Commission Bill, 2006***

The State has been in the process of setting up of the Gujarat Water Regulatory Authority (GWRA) following the MWRRA Act 2005. The Government of Gujarat (GoG) with the help of the Tata Energy and Resources Institute (TERI) has prepared draft legislation for setting up of independent regulatory authority for the water and sanitation sectors. The Gujarat Water Regulatory Commission Bill 2006 aims to bring different departments under one umbrella for the purpose of water distribution, rationalisation of water supply and fixation of tariffs. It is claimed by the officials that the proposed water regulatory authority (WRA) will work towards bringing clarity to the roles of various government bodies involved in water distribution, boost private sector investment, improve productivity and efficiency in the sector and also address the cost aspects. Aiming at an economic costing of water, the Bill includes municipal bodies and industrial users in its ambit. Apart from the Gujarat Water Regulatory Commission (GWRC), the Bill also provides for the setting up of State Water Regulatory Council (SWRC) (chaired by the Chief Minister, with 10 other ministers as members) and a State Water Regulatory Committee (chaired by the Chief Secretary, with 13 other secretaries). The proposed Bill also recommends setting up of a 15 member consultative committee including local bodies, academia, industry, agriculture and labour sectors, non-governmental organisations (NGOs)/ civil society organisations (CSOs) and research bodies to advise the GWRC on policy and tariffs and protect the consumer interests. While no timeline has been set for the formation of the Commission, it was envisaged that the Bill may get official sanction in due course of time.

Nevertheless, it may be observed that even if the proposed WRA is established in Gujarat it need not be as effective as envisaged in addressing the various water sector challenges of the state. It is quite likely that the WRA would turn into a 'monopoly provider', thus questioning the legitimacy of the WUAs in enforcing the rights of people over water. Moreover, the Bill by and large, calls for a radical transformation in the existing legal, regulatory, financial and administrative frameworks to facilitate for private sector participation in the provision of drinking water, especially in the urban areas. The Bill also commits to provide adequate returns through creating an attractive tariff regime that would facilitate the entry of private sector players in the water sector in the state.

Further, there are ambiguities as regards the fixation of tariff rates for various services. For instance, on the one hand, the Bill proposes to set a

tariff that progressively reflects the cost of supply of water and sewage services at improving levels of efficiency and quality in case of consumers apart from agriculture. On the other hand, it also proposes to set a tariff that progressively reflects only the cost of operation and maintenance in case of irrigation water supply system, taking into consideration area, cropping pattern and seasonal rainfall variations. The Bill also lacks clarity when it proposes to set a tariff that progressively reduces cross subsidies and eventually eliminate them. For example, there is no clear mention as to 'what modalities will have to be used for implementing the cross subsidization' and 'which sectors and segments of population to be benefited by the cross subsidization policy?'

#### ***4.2 The Gujarat Water Users' Participatory Irrigation Management Act, 2007***

The second major aspect of legislative reform is the Gujarat Water Users' Participatory Irrigation Management (PIM) Bill 2007, enacted in September 2007. The Act seeks to scale up PIM by giving statutory support to the combined efforts of Water Resources Department, farmers and NGOs. As per the Act, WUAs shall be formed by a competent authority for each service area, consisting of land holders in the command area. However, membership in the WUA is not binding.

There has been notable progress in the implementation of the Act in Gujarat as indicated by the formation of WUAs. For instance, till 2009 over 1266 WUAs have been formed covering 3.48 lakh hectare of command area. The experience so far indicates that PIM programme has resulted in changes in water allocation, distribution and management in almost all areas served by the WUAs (DSC, 2006). The significance of PIM lies in that it aims at improving the performance and financial viability of irrigation structures through a system of cost recovery and turnover of operations and maintenance to local water users themselves. One of the important expectations of PIM is the long run benefit to the government through a reduction in its expenditure. This, however, pre-supposes that WUAs will be self sufficient in maintaining and operating the irrigation system (Parthasarathy, 2010).

### **5. Implementation of Water Sector Reforms: Outcomes and Dilemmas**

In a way, water policies as they emerge in the neoliberal format in India are integral to the efficiency drive adopted by the states depicting the dynamic

responsiveness of the governance systems towards achieving allocative and distributive efficiencies within the water sector. Such an efficiency drive may be imperative given the stark realisation that agriculture, the dominant water consuming sector, has been mainly responsible for the critical state of affairs of the water sector in India. This may further be evident if we examine the contradictions in the inter-sectoral water allocation and the enforcement of the bulk water tariff in Maharashtra, in particular.

The following discussion focuses on the major outcomes and the resultant dilemmas following the implementation of water sector reforms in Maharashtra and Gujarat. It critically examines the performance of water sector in the event of introduction of BWT and the concerns emerge from the stakeholder consultations on the implementation of BWT and bulk water entitlements in Maharashtra. It then discusses the emerging issues and dilemmas in Gujarat's water sector.

### 5.1 *Maharashtra's Water Sector Dilemmas*

Table 1 presents the trends in sectoral water consumption in Maharashtra in the last decade of water sector reforms. It shows that consumption of irrigation water constituted the dominant part of overall consumption (77-83%), followed by that of drinking water (13-20%).

**Table 1: Trends in Water Consumption by Sector in Maharashtra (Mm<sup>3</sup>)**

Year	Irrigation	Drinking/ domestic	Industries	Total
2002-03	13980 (80.4)	2643 (15.2)	773 (4.4)	17396 (100)
2003-04	10951 (77.4)	2579 (18.2)	623 (4.4)	14153 (100)
2004-05	12327 (79.3)	2554 (16.5)	657 (4.2)	15538 (100)
2005-06	15564 (81.7)	2808 (14.7)	677 (3.6)	19049 (100)
2006-07	16497 (83.2)	2624 (13.2)	712 (3.6)	19833 (100)
2007-08	18158 (80.5)	3719 (16.5)	681 (3.0)	22558 (100)
2008-09	17186 (77.3)	4383 (19.7)	668 (3.0)	22237 (100)

Note: Mm<sup>3</sup>- Million Cubic Meters. Figures in parentheses are respective shares in total water consumption.

Source: MWRRRA (compiled).

Ironically, industrial water consumption is reported to be 3-4 per cent of the gross water consumption in the state, which itself is a contradiction, as

Maharashtra is known for its fastest growing industrial sector in the country. In absolute terms, demand for irrigation has increased by about 23 per cent from 13980 million cubic meters (Mm<sup>3</sup>) in 2002-03 to 17186 Mm<sup>3</sup> in 2008-09. The drinking water demand increased substantially by almost 66 per cent during the same period. It is quite strange to see that the industrial water consumption has been stagnating during most years with a decline in absolute terms after 2006-07, which is certainly illogical.

In fact, the above water consumption figures raise several questions about the methodological and the political economy issues underlying the assessment of the sectoral water demand in Maharashtra. The observed high water consumption (75-80%) by the irrigation sector itself may be erroneous given the huge water losses (60-75%) reported from surface irrigation systems due to seepage and other operational factors (MWRRA, personal communication).

In sharp contrast, the BWT levied by the MWRRA indicate that the highest amount of tariff has been levied on the industrial sector, which increased by more than 88 per cent from Rs. 174 crore (2002-03) to Rs. 328 crore (2007-08) as seen from Table 2. Interestingly, the BWT levied on the irrigation sector had increased only by about 31 per cent from Rs. 90 crore to Rs. 118 crore during the period with a relatively lower contribution to the total BWT levied (say, 18%). The share of domestic/ drinking water sectors had increased by two and half times from Rs. 97 crore to Rs. 246 crore.

**Table 2: Trends in BWT Levied by Sector in Maharashtra**

**(Rs. Crore)**

Year	Irrigation	Drinking/ domestic	Industries	Total
2002-03	90 (24.9)	97 (26.9)	174 (48.2)	361 (100)
2003-04	88 (21.5)	99 (24.1)	223 (54.4)	410 (100)
2004-05	77 (16.6)	118 (25.4)	270 (58.1)	465 (100)
2005-06	68 (17.1)	125 (31.5)	204 (51.4)	397 (100)
2006-07	98 (20.0)	114 (23.6)	273 (56.4)	485 (100)
2007-08	113 (18.4)	172 (28.1)	328 (53.5)	613 (100)
2008-09	118 (17.9)	246 (37.5)	293 (44.6)	657 (100)

Note: Figures in parentheses are respective shares in total water tariff levied by the state.

Source: MWRRA (compiled).

An interesting dimension of tariff implementation in Maharashtra pertains to the differential tariff structure as suggested for the irrigation and non-irrigation (domestic/ drinking and industrial) sectors. Based on the actual tariffs levied and realised, the unit water tariffs may be derived for three major uses as shown in Table 3.

**Table 3: Trends in Unit Water Tariffs Levied and Realised by Sector**  
(Rs/ 10,000 litres)

Year	Drinking water		Industrial water		Irrigation water		Total water sector	
	Levied	Realised	Levied	Realised	Levied	Realised	Levied	Realised
2002-03	3.67	2.11	22.51	18.87	0.64	0.16	2.08	1.29
2003-04	3.84	2.72	35.78	26.94	0.80	0.22	2.90	1.85
2004-05	4.62	2.79	41.12	35.92	0.62	0.23	2.99	2.16
2005-06	4.45	2.85	30.11	26.87	0.44	0.22	2.08	1.56
2006-07	4.34	3.43	38.33	33.27	0.59	0.27	2.44	1.88
2007-08	4.62	3.68	48.16	41.70	0.62	0.20	2.72	2.03
2008-09	5.62	2.66	43.89	40.61	0.69	0.21	2.96	1.91

Source: MWRRRA (estimated).

Among the three sectors, the irrigation water tariffs levied are abysmally low (Rs. 1/ 10,000 litres). Whereas, industrial water tariffs has more than doubled between 2002-03 (Rs. 22.21/ 10,000 litres) and 2007-08 (Rs. 48.16/ 10,000 litres), the tariff levied on drinking water increased by one and a half times from Rs. 3.67 to Rs. 5.62 during the period.

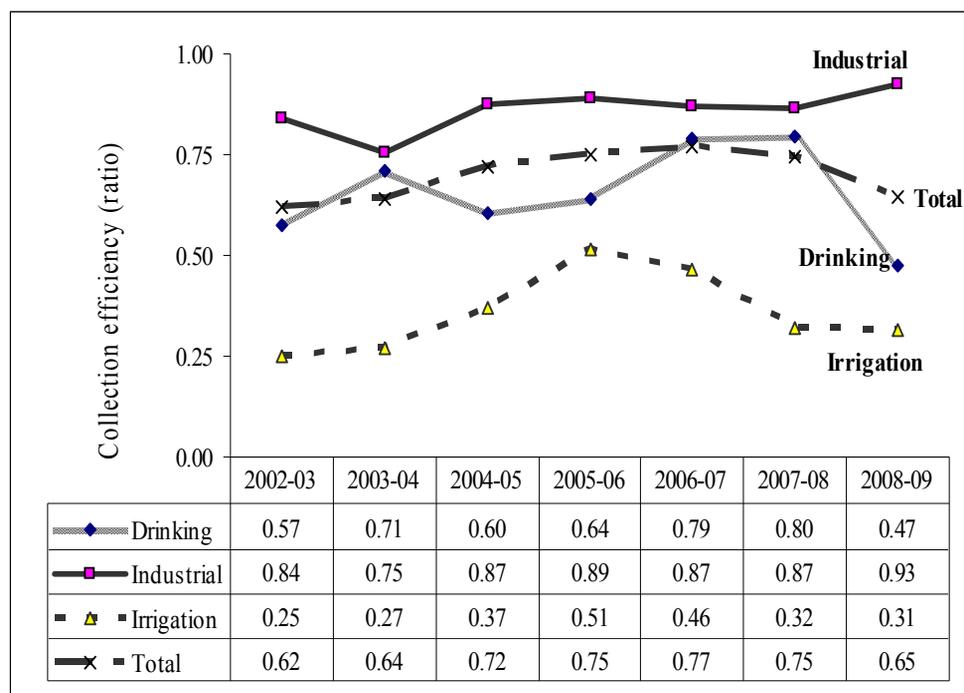
Some important issues that emerge here are: (a) whether the differential water tariffs as implemented in the state are reflective of the sensitiveness of water use in each sector; (b) whether the decision to keep abysmally low tariffs for irrigation water are politically motivated; and (c) whether the seemingly exorbitant water tariffs for industries are vehemently opposed by the industrial sector. Apparently it seems that the water tariffs are differentiated across sectors in response to their sensitiveness to demand. For instance, irrigation water tariffs are kept reasonably low in consideration of equity, timeliness and adequacy in its distribution, whereas, industrial water tariffs are the highest in view of the affordability of the sector. Industries can afford to pay the water charges, as water tariffs are always

included as input costs, burden of which could eventually be transferred to the consumer. Further, industries get water at 90 per cent reliability while irrigation sector is deprived of water at times of shortage.

Thus, the Maharashtra water policy justifies the differential tariff system by keeping high tariffs for industrial sector, which in turn gets the highest priority in allocation than irrigation sector. Though irrigation tariffs are kept the lowest, the political economy of neoliberal policy twist becomes apparent here as irrigation water supplies are cut during drought seasons. On the other hand, industries and domestic sectors get full quota and hence, there is little opposition from these sectors for the higher water tariffs. Seemingly, 'pay more to get more reliable supply' is the market principle that guides this tariff fixation. But, this over prioritization of water supplies to industrial sector creates ripples in the whole process of water distribution as water supplies to the agriculture sector are adversely affected at critical phases of crop growth.

Probably, this certainty in allocation and distribution of water for industrial and drinking water sectors could be a major factor that explains the better realisation and collection efficiency in water tariffs, especially in the case of industrial sector as evident from Figure 1. It shows that the irrigation sector is highly crippled with the problem of inefficiency in the collection and realisation of BWT despite the lower levels of tariff levied on the sector. The efficiency in the collection of water tariff in the irrigation sector has been the lowest at 31 per cent as compared to drinking water (47%) and the industrial (93%) sectors.

**Figure 1: Trends in Efficiency in the Collection of Water Tariffs in Maharashtra**



*Note:* Efficiency in the collection of BWT is measured in terms of the ratio of tariff collected to the tariff levied on each sector.

*Source:* MWRRRA (estimated).

The poor realisation of water tariffs in the case of irrigation sector may also be attributed to reasons other than the affordability and willingness of the farmers *per se*. For instance, it has been reported that most of the irrigation systems in the state suffer from serious problems of poor conveyance efficiency caused due to seepage and other operational factors resulting in lower irrigation efficiencies of 25-30 per cent.

Thus the trends in the allocation/ consumption as well as fixation, collection and realisation of water tariffs bring out contradicting outcomes of implementation of water sector reforms in Maharashtra. In fact, it is yet a matter of debate as to what factors explain this diverging pattern of performance in the allocation of water and tariff imposition and collection across the three sectors. Similarly, it is also important to dig out the real political economy issues underlying the dynamics of lower water allocation

to industries as reported, when the industrial water demand is slated to be very high in the state following massive industrial expansion.

The bulk water tariff system as being implemented in Maharashtra has also been beset with several operational issues and the approach paper on the fixation of bulk water tariff has been heavily criticized by the major stakeholders on various counts as evident from Box 2.

**Box 2: Summary of Stakeholder Consultations on the MWRRA Approach Paper on BWT Fixation**

No	Comments
1	Problems of water losses have not been considered in the approach paper. If system is run more effectively and losses reduced, cost can be recovered without giving any 'tariff shock' to the consumers. Losses due to leakages and water theft should not be loaded on tariff.
2	Review of tariff structure in other states is not done. Maharashtra is already having high water rates than others. Hence, farmers do not reveal the actual irrigated area, report low value crops in place of cash crops and also engage in water thefts. This adversely affects water use efficiency as evident from the Water Audit reports.
3	The Approach paper does not consider assessment of exact area of crops, improved billing system, reducing water losses and thefts, for increasing revenue. Better management of recovery of tariff might help increase the tariff outturn rather than an increase in tariffs <i>per se</i> . Large amounts of arrears from big farmers, industries and Municipal Corporations are yet to be collected. Given these discrepancies, a higher water tariff will only mean further violations by the users by not adhering to pay water tariffs, creating a large number of defaulters.
4	That the water tariffs for irrigation are quite high is acting as a major deterrent in the formation/ functioning of WUAs. Responsibilities of WUAs are still not properly informed to them.
5	Until the experiment of volumetric supply for 286 irrigation projects is not complete, tariff fixation exercise may not be much useful. MWRRA should force the government/ irrigation departments for the time bound implementation of volumetric supply based tariff system.

[Contd...

[Box 2 Contd...

No	Comments
6	The difference between created irrigation potential and actual irrigation is a complex issue. There should be indepth consideration of this issue while making the regulations for determination of bulk water tariff.
7	The proposal for levying fixed water tariff for non-users of water may not be acceptable to the tail enders, who are always deprived.
8	Uniform application of volumetric based tariff system is not possible in Maharashtra, because, currently, proportion of volumetric supply is only 15% and for 85% area, area based water allocation method is prevalent. This means that of the 45 lakh ha, only 7 lakh ha could be brought under volumetric based tariff and the rest 38 lakh ha will continue with area based tariff system. It will require huge investments for a transition from the area based to volumetric based tariff system in the state.
9	Recycling and reuse of water by industries is encouraged by the MWRRA. But, since treatment is costly, persuading industries to recycled reuse is rather difficult. On the other, industries would not mind even paying higher tariff if they get adequate water in time. Industries, such as steel and paper are water intensive with paper industries causing severe pollution problems. This contradicts when the farmers are deprived of water during periods when they want it most. They are also compelled to adjust their crops to suit water availability.
10	Issue of equity is not considered for tariff regulation and social policy consideration for life-line water services is ignored. Environmental consideration is not incorporated as part of tariff regulations. Principle of Transparency-Accountability-Participation-Capacity Building (TAP-C) is neglected completely.
11	There are no field observations made apart from the published data. Experience of increasing water tariff <i>vis-à-vis</i> , net increase in revenue in irrigation sector needs consideration.
12	There are nine agro climatic regions in Maharashtra. Hence, uniform tariff across the state will not be appropriate due to significant variations on account of soil, crops, climate and availability of water. Further, irrigated area in the state needs a reality check in view of the agro-climatic divisions. Most of the western region still remains to be rainfed without irrigation facilities.

[Contd...

[Box 2 Contd...

No	Comments
13	Reject the current approach paper submitted by ABPS Infrastructure. Stop forthwith the public consultation system including public hearing scheduled on the basis of the approach paper. Direct the consultant to revise entire approach paper in compliance with TOR and taking cognizance of various lacunae pointed out by several organizations and individuals during consultations. Ensure adequacy and quality of approach paper by circulating it among experts, social activists, research organizations, etc.
14	For arriving rates of unit quantity of water, some important factors needing consideration are: a) quality of service; b) reliability of water supply; c) economic use of water; d) sector of water use (primary/secondary/tertiary); e) social importance; f) No. of families benefit; g) equitable distribution of resources.

*Source:* Review of Stakeholder consultations conducted by the MWRRA.

As evident from the above, the MWRRA approach paper as prepared by a private consultancy firm (ABPS Infrastructure) did not involve important stakeholders. The approach paper seems to be unrealistic in terms of fixation of BWT and the norms suggested for its implementation are ambiguous. Only the report has been kept in the public domain (MWRRA website) for stakeholder viewpoints, which in most cases were not properly considered while revising the approach paper. It is also apprehended that the consultant suggested the BW tariffs across sectors without adequate field studies reflecting the willingness and ability to pay among the agriculturists, non-farm sectors, and the urban-rural areas.

An important concern as raised during the consultations was the high cost of establishment for irrigation management, including the salaries of the employees in the department of water resources. The approach paper thus ceases to be a neoliberal policy tool which cuts short the jurisdiction of the MWRRA as a cost recovery agency without addressing issues concerning equity, efficiency and sustainability of water distribution as well as pollution of water bodies and the concomitant water losses.

## 5.2 *Gujarat's Water Sector Dilemmas*

As observed, the water governance scenario in Gujarat is much more complex as the state seems to tread on a feeble and insensitive water regulatory regime. The dilemma is that there is no single agency in the state that is concerned with the overall governance of water that deals with legal, policy and rights issues apart from allocation and pricing related aspects (Kumar, 2004). Interestingly, water sector in the state lacks a comprehensive policy framework and an overarching and integrated regulatory system with institutional systems in place to deal with the multipronged crisis surfacing the segment. Water sector development in the state has been quite contradictory in terms of the sub-optimal performance of the surface water sector as against the ruthless exploitation of the groundwater sector, driven by the rapid expansion of tubewells. While this contradiction points to the urgency of a comprehensive water policy and regulatory institutions in the state, the regional disparity in the access to water is a serious issue meriting region-centric planning and policies for management of water resources. In addition to proper planning of water resources management, the distribution of intra-state water resources and optimum utilization of water resources are equally important.

In fact, the launching of neoliberal economic reforms has caused radical transformation in almost all spheres of governance and administration in the state, including the enunciation of several reforms in the water sector, mainly in terms of increased privatization of lead government portfolios on the administration of water. This radical move towards privatization has been promoted in the state in the pretext of achieving performance efficiency in the water sector, especially to achieve better outcomes in the allocation and recovery of water tariffs. However, this paradigm shift raises concerns of equity in water delivery as well as effective implementation of water sector reforms among the heterogeneous farmers who by now have adopted a highly dynamic and water intensive cropping pattern in the state with a heavy dependence on the already depleted groundwater sources. The expanding commercial agriculture calls for increased investments for intensification and expansion of coverage of canal irrigation systems (as in the case of SSP). Similarly, the provision and improvements in quality of drinking water distribution would require significant investments in the sector. In fact, the increasing water demand from the growing urban population along with the over-extraction of groundwater for irrigation and the domestic as well industrial uses signal the deepening water governance crisis in the

state. While this calls for alternate paradigms for development of water harvesting structures and management of water resources in the state, it needs reconciliation that whether large scale entry of the private sector in the provision of water services would be an alternative as propounded by the draft water policy legislation as designed by the TERI.

One of the major challenges for water sector in Gujarat is the rising industrial water demand. There has been tremendous expansion in the industrial activities (Viswanathan and Parikh, 2010) in the state which puts a heavy toll on the already depleted water resources in terms of increasing extraction of freshwater (surface and groundwater) as well as causing high levels of salinity in groundwater sources. There are also severe problems of groundwater contamination caused by solid and liquid waste disposal from industries and human settlements. The regions around the major industrial centres like Vadodara, Bharuch, Ankleshwar, Vapi, Valsad, Surat and Navsari have polluted water sources, which have adversely affected their drinking water sources as well. Perhaps, this hints at a major policy failure, as the state's industrial expansion strategies do not seem to have given proper thoughts on imposing stricter vigilance measures for harvesting and management of water used for industrial and drinking water purposes<sup>9</sup>. That said it seems that, of late, the state has been thinking in terms of developing an industrial water policy. The urge for such a policy drive also comes from the huge infrastructure investments taking place in the state towards development of the 11 plus Special Investment Regions (SIRs), Special Economic Zones (SEZs) and several industrial parks, besides other industrial clusters, all of which would have tremendous implications on the shrinking levels of water resources (Dave, 2011).

One of the important reform steps initiated by the state has been the launching of the Swarna Jayanti Mukhya Mantri Shaheri Vikas Yojana (SJMMSVY) to provide water through Narmada canal in response to the worsening scenario of urban drinking water supply. This scheme targets to ensure adequate water supply to meet the norms of 100 lpcd of water for all urban local bodies (ULBs) with full coverage of household access to

---

<sup>9</sup> Despite promotion of water harvesting schemes for addressing the drinking water scarcity in the state with changing life styles and burgeoning urban demand, it is a matter of serious concern that how far these water harvesting structures can help resolve the problems of water supply in Gujarat. Currently, much of the urban drinking water supplies are sourced from groundwater, which is a serious problem in the context of emerging groundwater depletion and contamination (Goswami, 2011).

pipled water in the next 3-5 years. Essentially, this seems to be an ambitious plan as the urban areas post a tremendous growth in terms of population and urban amenities and infrastructure. Moreover, in view of the shrinking freshwater resources and the emerging climate change induced risks, it may be observed that the provision of drinking water through the Narmada canal would only lead to increased conflicts over sharing or distribution of water between the rural and urban areas in the state.

The neoliberal economic reforms have also been impacting the farmers in Gujarat in terms of a dramatic shift in agriculture driven by the market forces, which in turn have promulgated them to adopt a highly water intensive cropping pattern (Shah *et al.*, 2011). In fact, there have not been any dynamic policy responses in the state to address the challenges and constraints posed on the water front by such an agriculture growth paradigm. With the poor performance of surface water systems in delivering water to the fields, farmers have increasingly relied either on lifting water directly from the canals or deepening their groundwater aquifers to grow those water intensive crops, especially, Bt cotton, wheat, sugarcane, etc. Despite the availability of technological solutions in the form of sprinkler and drip irrigation systems, the diffusion and intake of these solutions have been far from satisfactory in the state. All these eventualities essentially point at the policy and governance failures which should have been dealt by the state through appropriate legislations (including groundwater) or enactments or even regulatory interventions. The criticality of a comprehensive water policy in the context of Gujarat also stems from the fact that much of the recent droughts in the state have been related to hydrological factors rather than those related to climatic risks ensuing from monsoon failures (Dave, 2011).

This raises the imperative of devising robust policies and effective models of water governance for the state. More specifically, there rises the question 'what types of institutional systems or regulatory processes have to be put in place to achieve the larger goals of sustainable water production/harvesting and management as well as equity along with the new prioritization strategies as promulgated by the neoliberal policy regime?' Apparently, there are several evidences suggesting that the conventional state centric or the 'command and control' style of management of water sector has been proven to be highly disastrous in most of the states, including Gujarat.

## 6. Concluding Observations

This paper critically examines how the neoliberal policies have influenced the water sector reform policies and interventions in the Indian states, particularly, Maharashtra and Gujarat. It observes that the policy responses and regulatory reforms in the case of Maharashtra have been somewhat proactive in sensitizing the issues concerning allocation and distribution of water across competing sectors. Nevertheless, the legislations and regulatory systems that came into being are far from internalising the ground level realities concerning the critical issues of equitable distribution and conservation of water harvesting systems in a sustainable manner. The analysis reveals that the incompatibility between the neoliberal policies and the water sector interventions in the Indian context may be explained in terms of the fact that India tried experimenting the macro economic policy reforms as in many other developed countries without giving proper thought on the internal restructuring required for making the water sector institutions perform better in the new policy environment. As may be seen from the water sector reforms elsewhere, the models in most cases have been found to be following 'one-size fits all' type of approach with only minor modifications on a case by case basis. Further, many of these models, say, the US, Chile, Mexico, China and Morocco are found to have been prescribed by the external funding agencies, as water sector reforms in those countries were preceded by macro economic reforms/ policy changes or structural adjustment measures as suggested by such agencies.

As many argue, the physical/ economic scarcity looming large in the country should have been a major trigger for water sector reforms in India rather than the macro economic policies emerging from the globalisation process. For instance, Shah *et al.*, (2004) observes that the institutional reforms already taken place in the water sector are vague and not adequate to manage India's scarce water resources and the plea for real institutional reforms is still a cry in the wilderness. This underlies the imperative of institutional reforms that are highly sensitive to water scarcity issues- be it surface or groundwater related (Shah *et al.*, 2004). The micro level issues that loom large adversely affecting the harnessing, distribution and sustainable management of water resources should have been instrumental in driving policies and institutional interventions in the Indian context.

There are also growing concerns that the inclusion of neoliberal perspectives in framing water sector policies in India has by and large ignored the IWRM

approaches. Though the 2002 National Water Policy tried adopting the IWRM approach and introducing water rights for managing water resources at the river basin level (Shah and Van Koppen, 2006), only very few states are found to follow the IWRM principles in view of the several problems as embedded in the approach. For example, the MWRRA has been created to implement IWRM in Maharashtra and facilitate creation and trading water entitlements, so that these entitlements can be transferred, bartered, bought or sold on an annual or seasonal basis within the market system. However, due to lack of information and guidance, the prospect of the authority to effectively regulate the water markets has become grim. Also, many fear that tradable water rights (TWR) suggested in the IWRM approach will lead to allocation of water to economically powerful people (Dharmadhikary, 2007, cited in Venkatachalam, 2008) and therefore, there will be stiff resistance especially from the resource poor users of water (Kumar, 2007).

A greater challenge confronting the emergent water policy and regulatory regimes in the country in general and Maharashtra and Gujarat in particular is their complete sense of ignorance or lack of appreciation of the multifarious water sector (especially in the arena of drinking water) interventions by the grass roots level agencies, especially, the NGOs and other community based organisations and their impacts on water use and conservation.

There is a plethora of other issues for which the neoliberal water policies do not provide adequate explanations. Some of them, *inter alia*, include:

- a) What are the specific legal/ ethical/ political/ socio-economic, agriculture and external trade policy environments within which these policies and interventions have been evolved and operating in Indian context?
- b) How best these policies are informed to and understood by the varied actors/ stakeholders and how these actors respond to varying scenarios of water governance and institutional regimes?
- c) How realistic and cohesive have been the national as well as the state-specific water policies in respect of context-specific choice of technological solutions, institutional forms and allocation and pricing instruments and regulatory mechanisms?

- d) Do the state-specific water policies adequately capture: (i) the gender roles/ gendered dimensions of water management, access to water and control over the decision making processes; and (ii) spatial vs. temporal, inter and intra-generational distributions and concerns of equity and sustainability?

An important question that still remains unclear in the neoliberal water policy discourse in India is 'what is water right and how the water entitlement is defined?' For water rights to be effectively implemented, two other concepts have to be defined on operational terms: one is access to water and the other is allocation principles of the resource *per se*. Since the water allocation principle laid down by the MWRRA considers the WUAs as the prime custodians of water transaction, the individual farmers would face serious difficulties in legitimising their individual water rights, especially in cases where the WUAs are either non-existent or weaker in performance. The legitimisation and enforcement of individual water rights may also largely depend on the egalitarian or democratic ways in which the WUAs function, without being badly influenced by the local dynamics.

With a lack of clarity on vital elements of managing water resource, the state setting up a plethora of regulatory institutions may apparently make the concept of peoples' (community) participation a major casualty. It becomes evident that in many of the natural resource management regimes there is a need to intercede the management of the resource and the users' interests with clearly defined legal framework and access rights. It also appears that in most states (except Maharashtra and Andhra Pradesh) who have launched water sector reforms, including enactment of water policies, the half-hearted attempts to reverse engineer the process of providing legal support to isolated cases of water distribution (not management) have neither led to improvements in resource management nor in legitimizing users' stake in the resource or its management domains. Therefore in the present context, the adaptation of neoliberal policy prescriptions to the water sector endorsing the involvement of private sector in water resource development and management would only be seen as a means for legitimising the role of market forces in addressing the vast social complexities around water, which is more than an economic commodity with lots of socio-cultural and environmental significance.

This is not to suggest that the neoliberal ideas as they have shaped the formulation of water sector reforms in India seem to be highly detrimental

to the larger goals of sustainability of the water resources. Rather, we would argue that the neoliberal perspective that water, if treated and marketed, is an economic good should also coincide with enormous amount of economic and social activism on the part of the state or the private sector to ensure that the policy reforms improves the efficiency in water allocations along with fulfilling inter as well as intra-generational equity in distribution. Fulfillment of inter and intra-generational equity in water distribution would help achieve sustainability of the resource base through institutional and pricing mechanisms (reflecting the scarcity/economic value) for effective enforcement of water rights among the multiple stakeholders. Thus, while emphasizing the primacy of market based instruments, especially, competitive water pricing, the neoliberal policies should also set the stage for effecting stricter enforcement of water rights, community/ stakeholder participation, decentralisation, privatisation of particular functions in water delivery and a thorough overhaul of the roles of the state pertaining to governance of water resources, especially, the regulation of the market or private sectors as well as regulation of the resource exhaustive water management regimes.

Finally, it has become imperative now to launch a new water policy<sup>10</sup> for the country and the states, which is more holistic and realistic of the imminent crises surmounting the water sector of the country from multiple dimensions. The deliberate choice of a neoliberal policy approach that only addresses the issue of cost recovery or pricing based on market driven policies would only augment the crisis in India's water sector.

---

<sup>10</sup> Iyer (2010) puts forth the genuineness and the urgency for a radical overhaul in India's water sector, including the need for a new National Water Policy (NWP), which stems from the gross mismanagement of water, caused by a host of natural and human induced outcomes, *viz.*, a) intermittent, unreliable, unsafe and inequitable water supply in urban areas; b) rivers turning into sewers or poison and contaminated aquifers; c) intractable water related conflicts between uses, sectors, areas, States; d) major and medium irrigation systems in disarray, rendering poor and unreliable service and characterised by inequities of various kinds; e) alarming depletion of aquifers in many parts of the country; f) inefficiency and waste in every kind of water-use; g) the environmental/ ecological impacts of big water resource projects, poor EIAs, the displacement of people by such projects and the general failure to resettle and rehabilitate project affected persons.

## References

Allan, J.A. (2005), 'Water in the Environment/ Socio-Economic Development Discourse: Sustainability, Changing Management Paradigms and Policy Responses in a Global System', *Government and Opposition*, 40 (2), pp. 181-199.

Bharwada, Charul and Vinay Mahajan (2002), 'Drinking Water Crisis in Kutch: A Natural Phenomenon', *Economic and Political Weekly*, 37 (48), pp. 4859-4866 (November 30).

Burke, Jacob J., Marcus H. Moench (2000), *Groundwater and Society: Resources, Tensions and Opportunities*, United Nations, New York.

Castro, José Esteban (2006), *Water, Power and Citizenship: Social Struggle in the Basin of Mexico*. New York: Palgrave Macmillan.

Castro, José Esteban (2008), 'Neoliberal Water and Sanitation Policies as a Failed Development Strategy: Lessons from Developing Countries', *Progress in Development Studies*, 8 (1), pp.63-83.

Chand, Ramesh (2010), 'Understanding the Next Agricultural Transition in the Heartland of Green Revolution in India', in Gopal B. Thapa, P.K. Viswanathan, Jayant K. Routray and Mokbul M. Ahmad (Eds.), *Agricultural Transition in Asia: Trajectories and Challenges*, Bangkok: Asian Institute of Technology.

Cullet, Philippe (2006), 'Water Law Reforms: Analysis of Recent Developments', *Journal of the Indian Law Institute*, Vol. 48, No. 2, Available at <http://www.ielrc.org/conent/a0603.pdf>

Cullet, Philippe (2007a), 'Water Law in India: Overview of Existing Framework and Proposed Reforms', *IELRC Working Paper, 2007-01*, International Environmental Law Research Centre, Geneva.

Cullet, Philippe (2007b), *The Sardar Sarovar Dam Project: Selected Documents*. Hampshire: Ashgate Publishing.

Dave, Kapil (2011), 'Thrust on Industry, 50 Year old Water Supply Plan in Pipeline', *The Indian Express*, February 21, Gandhinagar, Gujarat.

Davis, J., Kang, A., Vincent, J., and Whittington, D. (2001), 'How Important is Improved Water Infrastructure to Micro enterprises? Evidence from Uganda', *World Development*, 29 (10), pp. 1753-1767.

Department for International Development (DFID) (2001), 'Addressing the Water Crisis: Healthier and more Productive Lives for Poor People: Strategies for Achieving the International Development Targets', DFID, London.

Development Support Centre (2006), *Proceedings of the Regional Workshop on Participatory Irrigation Management*, January 20-21, Ahmedabad.

Dharmadhikary, Shripad (2007), 'A Flawed Model for Water Regulation', *India Together*, [www.indiatogether.org/2007/may/env-mwrra.htm](http://www.indiatogether.org/2007/may/env-mwrra.htm)

Dubash, Navroz K. (2002), *Tubewell Capitalism: Groundwater Development and Agrarian Change in Gujarat*, Delhi: Oxford University Press.

Erjavec, Karmen and Emil Erjavec (2009), 'Changing EU Agricultural Policy Discourses? The Discourse Analysis of Commissioner's Speeches 2000-2007', *Food Policy*, 34, pp 218-226.

Goswami, Subhrangsu (2011), 'Revisiting Sardar Sarovar Canal Based Drinking Water Project in Gujarat', in R.Parthasarathy and Ravindra H Dholakia (Eds.), *Sardar Sarovar Project on the River Narmada, Vol. 3: Impacts so far and Ways Forward*. New Delhi/ Ahmedabad: Concept Publishing Company Pvt. Ltd/ CEPT University, pp. 693-726.

Government of India (GoI) (1987), *National Water Policy 1987*, Ministry of Water Resources, GoI, New Delhi.

Government of India (GoI) (2002), *National Water Policy 2002*, Ministry of Water Resources, GoI, New Delhi.

Government of India (GoI) (2006), *Performance Budget 2005-06*, Ministry of Water Resources, Government of India, New Delhi. Available at <http://www.wrmin.nic.in/writereaddata/linkimages/Chapter19633955671.pdf> (accessed 8 October 2010).

Government of India (GoI) (2010), 'Background Note for Consultation Meeting with Policy Makers on Review of National Water Policy', Ministry of Water Resources, Government of India, New Delhi. Available at [http://www.cseindia.org/userfiles/background\\_note\\_revision\\_NWP.pdf](http://www.cseindia.org/userfiles/background_note_revision_NWP.pdf) (accessed 8 October 2010).

Government of India (GoI) (2011), 'Provisional Population Tables and Annexures', *Census of India 2011*. Available at [censusindia.gov.in](http://censusindia.gov.in).

Government of Maharashtra (GoM) (2003), *Maharashtra State Water Policy (MSWP) 2003*, GoM, Mumbai.

Gujarat Ecology Commission (2001), *State of the Environment-Gujarat*. Vadodara: Gujarat Ecology Commission, Government of Gujarat.

Hirway, Indira and Subhrangsu Goswami (2008), 'Functioning of the Drinking Water Component of the Narmada Pipeline Project in Gujarat', *Economic and Political Weekly*, 43 (9), pp. 51-59.

Hope, R.A. (2004), 'Water Policy and Poverty Reduction in a Semi-arid Catchment', Unpublished doctoral thesis, University of Newcastle-upon-Tyne, UK.

Hope, R. A. (2006), 'Evaluating Water Policy Scenarios against the Priorities of the Rural Poor', *World Development*, 34 (1), pp. 167-179.

Institute of Rural Management, Anand (IRMA)/UNICEF (2001), 'White Paper on Water in Gujarat'. Report prepared for Narmada Water Resources and Water Supply Department, Government of Gujarat, IRMA, Anand.

Iyer, Ramaswamy, R. (2007), 'The National Water Scene', *ORF Discourse*, 2 (2), pp. 1-9.

Iyer, Ramaswamy, R. (2010), 'Approach to a New National Water Policy', *The Hindu*, 29 October 2010. Available at <http://www.thehindu.com/2010/10/29/stories/2010102963801400.htm> (accessed 10 May 2011).

Kumar, Bhishm and S.M. Seth (2000), 'Isotope Hydrology – Present Status and Future Prospects in India'. Paper presented in the International Conference on *Integrated Water Resources Management*, Organised by National Institute of Hydrology, 20-22, December, New Delhi. Available at [http://www.nih.ernet.in/iso\\_stat\\_pap.htm](http://www.nih.ernet.in/iso_stat_pap.htm) (accessed 7 March, 2008).

Kumar, Dinesh, M. (2004), 'Roof Water Harvesting for Domestic Water Security: Who Gains and Who Loses?', *Water International*, 29 (1), pp. 43–53.

Kumar, Dinesh, M. (2005), 'India's Water Economy: Bracing up for a Turbulent Future', *Workshop Report, IWMI-Tata Water Policy Programme, Annual Partners' Meet 2005*, Hyderabad.

Kumar, M. Dinesh (2007), 'Towards Evolving Institutional Arrangements for Managing Groundwater, in M. Dinesh Kumar and O.P. Singh (Eds.), *Groundwater Management in India: Physical, Institutional and Policy Alternatives*, New Delhi: Sage Publications, pp. 288-320.

Kumar, Dinesh, M. and O.P. Singh (2001), 'Market Instruments for Demand Management in the Face of Scarcity and Overuse of Water in Gujarat, Western India', *Water Policy*, 5 (3), pp. 387-403.

Kumar, M. Dinesh and O.P. Singh (Eds.) (2007): *Groundwater Management in India: Physical, Institutional and Policy Alternatives*, New Delhi: Sage Publications.

Kumar, Dinesh, M., O.P. Singh, Rahul Singh and Tushaar Shah (2004), 'Virtual Water Trade in Dairy Economy: Irrigation Water Productivity in Gujarat', *Economic and Political Weekly*, 39 (31), pp.3492-3497.

Maharashtra Water Resources Regulatory Authority (MWRRA) (2009), 'Approach Paper on Preparation of Criteria for Bulk Water Pricing in the State of Maharashtra', Volume – I, MWRRA, Mumbai, November.

Mehta, Lyla (2000), 'Water for the 21<sup>st</sup> Century: Challenges and Misconceptions', *IDS Working Paper No. 111*, Institute of Development Studies, Sussex.

Mehta, Lyla (2003a), 'Contexts and Constructions of Water Scarcity', *Economic and Political Weekly*, 38 (48), pp. 5066-5072.

Mehta, Lyla (2003b), 'Problems of Publicness and Access Rights: Perspectives from the Water Domain', in Lyla Mehta (Ed.) *Providing Global Public Goods: Managing Globalization*, Oxford: Oxford University Press, pp. 556-575.

Overseas Development Institute (ODI) (2002), The "Water Crisis": Fault lines in global debates, Water Policy Programme, ODI, London. Available at <http://www.odi.org.uk> (accessed 28 September 2010).

Oza Apoorva (2007), "Irrigation and Water Resources: Part I: Irrigation: Achievements and Challenges", *In: 3iNetwork (2007): India Infrastructure Report 2007: Rural Infrastructure*, Oxford: Oxford University Press, pp. 178-196.

Parthasarathy, R. (2000), 'Participatory Irrigation Management Programme in Gujarat: Institutional and Financial Issues', *Economic and Political Weekly*, 35 (35 & 36), pp.147-3154.

Parthasarathy, R. (2004), Decentralization and Institutional Dynamics: The Case of PIM Programme in India, Gujarat Institute of Development Research, *Working Paper 147*, September.

Parthasarathy, R. (2005), 'Objects and Accomplishments of Participatory Irrigation Management Programme in India: An Open Pair of Scissors', in R. Parthasarathy and Sudarshan Iyengar (Eds.) *Developmental Paradigms and Challenges for Western and Central Regional States in India*, New Delhi: Concept Publishing Company.

Parthasarathy, R. (2010), 'The Role of Irrigation in the Growth Story of Gujarat', in Ravindra H. Dholakia Samar K. Datta (Eds.): *High Growth Trajectory and Structural Changes in Gujarat Agriculture*, Delhi: Macmillan Publishers India Limited, pp. 114-135.

Parthasarathy, R. and Ravindra H. Dholakia (2011), *Sardar Sarovar Project on the River Narmada: 3 Vols. Vol. 1: History of Design, Planning and Appraisal; Vol. 2. History of Rehabilitation and Implementation; Vol. 3: Impacts So far and Ways Forward*, New Delhi/ Ahmedabad: Concept Publishing Company Pvt. Ltd./ CEPT University.

Pathak, M.D, A.D. Gadkari and S.D. Ghate (1999), 'Groundwater Development in Maharashtra State, India', 25<sup>th</sup> WEDC Conference on *Integrated Development for Water Supply and Sanitation*, Addis Ababa, Ethiopia.

Phansalker, Sanjiv and Vivek Kher (2006), 'A Decade of the Maharashtra Groundwater Legislation: Analysis of the Implementation Process', *Law Environment and Development (LEAD) Journal*, 2(1), pp. 69-83.

Planning Commission (2002), *Tenth Five Year Plan*, Planning Commission, Government of India, New Delhi.

Planning Commission (2005), *Mid-Term Appraisal Plan, Water Resources; (2002-2005)*, Planning Commission, New Delhi.

Planning Commission (2007), *Report of the Expert Group on "Ground Water Management and Ownership"*, Planning Commission, New Delhi, September 2007.

Prakash, Anjal and R.K. Sama (2006), 'Contending Water Uses: Social Undercurrents in a Water-scarce Village', *Economic and Political Weekly*, 41(7), pp. 577-579.

Ranade, Rahul and M. Dinesh Kumar (2004), 'Narmada Water for Groundwater Recharge in North Gujarat: Conjunctive Management in Large Irrigation Projects', *Economic and Political Weekly*, 39 (31), pp. 3510-3513.

Sangameswaran, Priya (2007), 'The Right to Water in Different Discourses', in Sara Ahmed, Margreet Zwarteveen and Suman Gautam (Eds.) *Engendering Integrated Water Management in South Asia: Policy, Practice and Institutions*, New Delhi: Sage Publications.

Sangameswaran, Priya (2010), 'Rural Drinking Water Reforms in Maharashtra: The Role of Neoliberalism', *Economic and Political Weekly*, 44 (4), pp. 62-69.

Shah, Tushaar (2004), 'Water and Welfare: Critical Issues in India's Water Future', *Economic and Political Weekly*, 39 (12), pp.1211-13.

Smith, Adam (1976), *An Inquiry into the Nature and Causes of the Wealth of Nations*, Chicago: University of Chicago Press.

South Asia Network on Dams, Rivers and People (SANDRP) (2007), 'Sardar Sarovar: Drinking Water Allocations Diverted to Industries, Non Drought Prone Areas', *Dams Rivers & People*, 5 (3).

Tata Energy Research Institute (TERI) (2001), 'Regulatory Framework for Water Services in the State of Gujarat', *TERI Project Report No. 2000ER61*, TERI, New Delhi.

Tata Institute of Social Sciences (TISS) (2008), *Performance and Development Effectiveness of the Sardar Sarovar Project*, TISS, Mumbai, August. Available at [www.tiss.edu](http://www.tiss.edu) (accessed 30 March 2011).

Tyagi, N.K. (1987), 'Managing Salinity through Conjunctive use of Water Resources', *Ecological Modelling*, 40, pp. 11-24.

United Nations/World Water Assessment Programme (UN/WWAP) (2003), *1st UN World Water Development Report: Water for People, Water for Life*, Paris: United Nations Educational, Scientific and Cultural Organization (UNESCO) and Berghahn Books.

Upadhyay, Vidh (2005), 'Confusing Water Rights With Quotas', *India Together*, October 27, <http://www.indiatogether.org/2005/oct/vup-rights.htm> (accessed 25 March 2011).

Van Koppen, Barbara, R. Parthasarathy and Constantina Safiliou (2002), 'Poverty Dimensions of Irrigation Management Transfer in Large-Scale Canal Irrigation in Andhra Pradesh and Gujarat, India', *Research Report 61*, Colombo: International Water Management Institute.

Venkatachalam, L (2008), 'Market-Based Instruments for Water Allocation in India: Issues and the Way Forward', in M. Dinesh Kumar *et al.*, (2008): *Managing Water in the Face of Growing Scarcity, Inequity and Declining Returns: Exploring Fresh Approaches*, IWMI-Tata Water Policy Research Program: Proceedings of the 7<sup>th</sup> Annual Partners' Meet, ICRISAT, Patancheru, Hyderabad, April 2-4, pp. 498-512.

Viswanathan, P.K. and R. Parthasarathy (2008), 'Are Water Policies a case of Reverse Engineering in India?', in M. Dinesh Kumar, *et al.*, (2008): *Managing Water in the Face of Growing Scarcity, Inequity and Declining Returns: Exploring Fresh Approaches*, IWMI-Tata Water Policy Research Program: Proceedings of the 7<sup>th</sup> Annual Partners' Meet, ICRISAT, Patancheru, Hyderabad, April 2-4, pp. 692-707.

Viswanathan, P.K. and Jyoti Parikh (2010), *Impact of industrialisation and Related Activities on Marine Protected Areas: A Case Study of Marine National Park, Jamnagar District in Gujarat*, Unpublished Report submitted to IRADe, New Delhi.

Wilder, Margaret (2008), 'Equity and Water in Mexico's Changing Institutional Landscape', in John Whiteley, Helen M. Ingram and Richard Perry (Eds.), *Water, Place and Equity*. Cambridge, MA: MIT Press.

Wood, John R. (2007), *The Politics of Water Resource Development in India -The Narmada Dams Controversy*, New Delhi: Sage Publication.

World Bank (2005), *India's Water Economy: Bracing for a Turbulent Future*, World Bank, Washington DC.

World Bank (2010), *Sustaining Water for all in a Changing Climate, World Bank Group Implementation Progress Report of the Water Resources Sector Strategy*, The International Bank for Reconstruction and Development/ The World Bank, Washington DC. Available at <http://siteresources.worldbank.org/NEWS/Resources/sustainingwater.pdf> (accessed 28 September 2010).

World Health Organization (WHO), (2003), 'Right to Water'. Available at [http://www.who.int/water\\_sanitation\\_health/righttowater/en/](http://www.who.int/water_sanitation_health/righttowater/en/) (accessed 10 September 2010).

World Water Assessment Programme (WWAP) (2009), *The United Nations World Water Development Report 3: Water in a Changing World*, Paris/ London: UNESCO/Earthscan, Available at [http://www.unesco.org/water/wwap/wwdr/wwdr3/pdf/WWDR3\\_Water\\_in\\_a\\_Changing\\_World.pdf](http://www.unesco.org/water/wwap/wwdr/wwdr3/pdf/WWDR3_Water_in_a_Changing_World.pdf) (accessed 29 September 2010).

## **THE GIDR WORKING PAPER SERIES (No. 151 onwards)**

- 151\*. N. Lalitha, "A Review of the Pharmaceutical Industry of Canada", December 2004. Rs. 35.
152. Satyajeet Nanda, "Micro Determinants of Human Fertility: Study of Selected Physiological and Behavioural Variables in SC and ST Population", January 2005. Rs. 35.
- 153\*. Jaya Prakash Pradhan, "Outward Foreign Direct Investment from India: Recent Trends and Patterns", February 2005. Rs. 35.
- 154\*. Puttaswamaiah S., "Drinking Water Supply: Environmental Problems, Causes, Impacts and Remedies – Experiences from Karnataka", March 2005. Rs. 35.
- 155\*. Keshab Das and Pritee Sharma, "Potable Water for the Rural Poor in Arid Rajasthan: Traditional Water Harvesting as an Option", March 2005. Rs. 30.
156. Jaya Prakash Pradhan and Vinoj Abraham, "Attracting Export-Oriented FDI: Can India Win the Race?", April 2005. Rs. 30.
- 157\*. Jaya Prakash Pradhan and Puttaswamaiah S., "Trends and Patterns of Technology Acquisition in Indian Organized Manufacturing: An Inter-industry Exploration", May 2005. Rs. 50.
- 158\*. Keshab Das and Ruchi Gupta, "Management by Participation? Village Institutions and Drinking Water Supply in Gujarat", June 2005. Rs. 30. (OS)
- 159\*. Keshab Das, "Industrial Clusters in India: Perspectives and Issues for Research", July 2005. Rs. 30. (OS)
160. Jeemol Unni and Uma Rani, "Home-based Work in India: A Disappearing Continuum of Dependence?", August 2005. Rs. 35. (OS)
- 161\*. N. Lalitha, "Essential Drugs in Government Healthcare: Emerging Model of Procurement and Supply", September 2005. Rs. 35. (OS)
- 162\*. Puttaswamaiah S., Ian Manns and Amita Shah, "Promoting Sustainable Agriculture: Experiences from India and Canada", October 2005. Rs. 35. (OS)
163. Amalendu Jyotishi, "Transcending Sustainability beyond CBA: Conceptual Insights from Empirical Study on Shifting Cultivation in Orissa", November 2005. Rs. 30. (OS)

164. Sashi Sivramkrishna and Amalendu Jyotishi, "Monopsonistic Exploitation in Contract Farming: Articulating a Strategy for Grower Cooperation", December 2005. Rs. 30. (OS)
165. Keshab Das, "Infrastructure and Growth in a Regional Context: Indian States since the 1980s", December 2005. Rs. 30. (OS)
166. Leela Visaria, Alka Barua and Ramkrishna Mistry, "Medical Abortion: Some Exploratory Findings from Gujarat", January 2006. Rs. 35.
- 167\*. Manoj Alagarajan and P.M. Kulkarni, "Trends in Religious Differentials in Fertility, Kerala, India: An Analysis of Birth Interval", February 2006. Rs. 30. (OS)
- 168\*. N. Lalitha and Diana Joseph, "Patents and Biopharmaceuticals in India: Emerging Issues", March 2006. Rs. 35.
169. Sashi Sivramkrishna and Amalendu Jyotishi, "Hobbes, Coase and Baliraja: Equity and Equality in Surface Water Distribution", April 2006. Rs. 30.
170. Amita Shah, "Changing Interface Between Agriculture and Livestock: A Study of Livelihood Options under Dry Land Farming Systems in Gujarat", May 2006. Rs. 35.
- 171\*. Keshab Das, "Micro and Small Enterprises during Reforms: Policy and Concerns", July 2006. Rs. 25.
- 172\*. Keshab Das, "Electricity and Rural Development Linkage", August 2006. Rs. 30.
173. Keshab Das, "Traditional Water Harvesting for Domestic Use: Potential and Relevance of Village Tanks in Gujarat's Desert Region", November 2006. Rs. 30.
- 174\*. Samira Guennif and N. Lalitha, "TRIPS Plus Agreements and Issues in Access to Medicines in Developing Countries", May 2007. Rs. 30.
- 175\*. N. Lalitha, "Government Intervention and Prices of Medicines: Lessons from Tamil Nadu", July 2007. Rs. 30.
- 176\*. Amita Shah and Jignasu Yagnik, "Estimates of BPL-households in Rural Gujarat: Measurement, Spatial Pattern and Policy Imperatives", August 2007. Rs. 35.
- 177\*. P.K. Viswanathan, "Critical Issues Facing China's Rubber Industry in the Era of Economic Integration: An Analysis in Retrospect and Prospect", September 2007. Rs. 35.

178. Rudra Narayan Mishra, "Nutritional Deprivation among Indian Pre-school Children: Does Rural-Urban Disparity Matter?", October 2007. Rs. 35.
- 179\*. Amita Shah, "Patterns, Processes of Reproduction, and Policy Imperatives for Poverty in Remote Rural Areas: A Case Study of Southern Orissa in India", November 2007. Rs. 40.
- 180\*. N. Lalitha and Samira Guennif, "A Status Paper on the Pharmaceutical Industry in France", December 2007. Rs. 30.
- 181\*. Keshab Das, "Micro, Small and Medium Enterprises in India: Unfair Fare", January 2008. Rs. 40.
182. Bharat Ramaswami, Carl E. Pray and N. Lalitha, "The Limits of Intellectual Property Rights: Lessons from the Spread of Illegal Transgenic Cotton Seeds in India", February 2008. Rs. 45.
183. Keshab Das, "Drinking Water and Sanitation in Rural Madhya Pradesh: Recent Initiatives and Issues", April 2008. Rs. 40.
184. N. Lalitha, "Doha Declaration and Compulsory License for Access to Medicines", June 2008. Rs. 40.
- 185\*. Keshab Das and Aswini Kumar Mishra, "Horizontal Equity and the Thirteenth Finance Commission: Issues and Ponderables", July 2008. Rs. 35.
- 186\*. Jeemol Unni, "Are Gender Differentials in Educational Capabilities Mediated through Institutions of Caste and Religion in India?", September 2008. Rs. 40.
- 187\*. Amita Shah and Sajitha O.G., "Poverty and Livelihood among Tribals in Gujarat: Status, Opportunities, and Strategies", October 2008. Rs. 45.
- 188\*. S. Visalakshi, "Role of Critical Infrastructure and incentives in the Commercialisation of Biotechnology in India: An Analysis", November 2008. Rs. 40.
189. P.K. Viswanathan, "Co-operatives and Collective Action: Case of a Rubber Grower Co-operative in East Garo Hills in Meghalaya, North East India", December 2008. Rs. 40.
190. Suma Scaria, "Looking Beyond Literacy: Disparities in Levels of and Access to Education in a Kerala Village", January 2009. Rs. 35.

191. Keshab Das, "Agency and Access under Decentralised Governance: Water Supply and Sanitation in Kolkata City", February 2009. Rs. 35.
192. Shiddalingaswami Hanagodimath, "Economic Reforms and Expenditure on Health in India", March 2009. Rs. 35.
193. Amita Shah and Sunny Jose, "Asset Creation and Local Economy under NREGS: Scope and Challenges", April 2009. Rs. 40.
194. Jeemol Unni and Suma Scaria, "Governance Structure and Labour Market Outcomes in Garment Embellishment Chains", July 2009. Rs. 35.
195. Tara S. Nair, Jan Postmus and Rachayeeta Pradhan, "Social Responsibility of Indian Microfinance: A Critical Review", December 2009. Rs. 35.
196. Jharna Pathak, "Does the Method of System of Rice Intensification (SRI) Outperform Conventional System? A Case Study of Gujarat", January 2010. Rs. 35.
197. Keshab Das and K.J. Joseph, "On Learning, Innovation and Competence Building in India's SMEs: Challenges Ahead", February 2010. Rs. 45.
198. N. Lalitha and P.K. Viswanathan, "Pesticide Applications in Bt Cotton Farms: Issues Relating to Environment and Non-Tariff Barriers", March 2010. Rs. 35.
199. Cassandra Sweet and Keshab Das, "Institutional and Procedural Challenges to Generic Production in India: Antiretrovirals in Focus", October 2010. Rs. 35.
200. Itishree Pattnaik, "Analysis of Agricultural Performance in Andhra Pradesh and Orissa: 1960-61 to 2005-06", March 2011. Rs. 35. (IP)
201. Rudra N. Mishra and Udaya S. Mishra, "Assessing Characteristic Differential in Dichotomous Outcomes: A Case of Child Undernourishment", April 2011. Rs. 35.

## About GIDR

The Gujarat Institute of Development Research (GIDR), established in 1970, is a premier social science research institute recognised and supported by the Indian Council of Social Science Research (ICSSR) of the Government of India, and the Government of Gujarat.

The major areas of research at the Institute are the following:

### 1. **Natural Resources Management, Agriculture and Climate Change**

Research under this area concerns the broad realm of environment and development. Studies have focused on economic viability, equity, environmental impact assessment and institutional mechanisms. Issues in common property land resources, land use and water harvesting have been researched extensively. Implications of climate change risks for Asia and the adaptation and mitigation strategies at the local levels have begun to be studied.

### 2. **Industry, Infrastructure, Trade and Public Finance**

The main themes include policy dimensions concerning the micro, small and medium enterprises, industrial clusters and intellectual property rights. Studies on basic infrastructure and linkages between infrastructure and regional growth have also been carried out. Trade and development and public finance are new areas of interest.

### 3. **Employment, Migration and Urbanisation**

Studies under this theme relate to employment, labour, diversification of economic activities and migration. International migration has emerged as an additional theme along with urban services and aspects of urban economy and governance.

### 4. **Poverty and Human Development**

Issues examined include access, achievement and financing of education and health sectors. Studies on poverty relate to conceptual and measurement aspects, quality of life, livelihood options and social infrastructure. There is an increasing interest in understanding urban poverty, rural-urban linkages and issues in microfinance.

### 5. **Regional Development, Institutions and Governance**

Recent studies enquire into regional underdevelopment and the dynamics of local level institutions. Tribal area development mainly relating to livelihood promotion and human resource development has been a focus area. Recent analyses have also looked into Panchayat Raj Institutions, Forest Rights Act, MGNREGA and Right to Education Act.

Much of the research informs national and regional policies. The Institute also undertakes collaborative research and has a network with governments, academic institutions, international organisations and NGOs. A foray into specialized training and doctoral programme has just been made.



Phone : +91-02717-242366, 242367, 242368

Fax : +91-02717-242365

Email : [gidr@gidr.ac.in](mailto:gidr@gidr.ac.in)

Website : [www.gidr.ac.in](http://www.gidr.ac.in)

Gota, Ahmedabad 380 060, Gujarat, India.