Water Reallocation and Grabbing

Processes, Mechanisms and Contributory Factors

SUBODH WAGLE
SACHIN WARGHADE
MANDAR SATHE

TISS Working Paper 2

TISS Working Paper No. 2
February 2013

Water Reallocation and Grabbing

Processes, Mechanisms and Contributory Factors

SUBODH WAGLE
SACHIN WARGHADE
MANDAR SATHE

Research and Development
Tata Institute of Social Sciences

TISS Working Paper No. 2, February 2013

CONTENTS

ACKNOWLEDGMENT

We acknowledge the financial support received for this research from the Research Council funds of TISS. We also acknowledge the added support provided by Prayas-Pune. This research would not have been possible without the intellectual support of the various activists and experts in the water sector, especially from all the members of *Lokabhimukh Pani Dhoran Sangharsh Manch,* a people's forum on water policy.

We take this opportunity to extend our gratitude to the various government offices for their support during data collection.

Subodh Wagle, Sachin Warghade and Mandar Sathe

EXECUTIVE SUMMARY

The process of economic reforms unleashed in India over the last two decades is posing newer challenges to water policy, especially the allocation of water. Dams built for irrigation purposes are now being seen as the source of water for fueling the rapid growth in urban-industrial centers. Reallocation of water meant for irrigation to non-irrigation use is the immediate response of the policy makers to satisfy the water demands of these urban-industrial centers. This has resulted in the appropriation of water resources by the powerful urban-industrial water users at the cost of the livelihoods of the marginalized agriculture water users. The paper provides a detailed account of the processes, mechanisms and individual factors contributing to reallocation and to the resulting phenomenon of water grabbing.

Based on the case studies of 14 dam projects in Maharashtra, India, the paper attempts to develop a project life-cycle approach to gain insights into the complexities of water reallocation. The paper is able to show that water reallocation and the resultant phenomenon of resource grabbing is intricately embedded in the project life-cycle, starting with the project design. The increase in urban-industrial activity which has triggered the process of water grabbing, has deeper roots in several dimensions of project planning and implementation. This has created a variety of adverse impacts on 'reallocation affected farmers'. The contributing sequence of events and processes around the development of dam projects has resulted in the continued marginalization of these 'reallocation affected farmers', resulting in protests and agitations by farmers. Hence, the decision by policy makers to satisfy the water demand of growing urban-industrial water users by reallocating water out of irrigation needs to be viewed as part of the these larger processes around development projects. The paper provides empirical data on these larger processes and the related factors and mechanisms that are contributing to the emerging phenomenon of water grabbing in India.

Key Words: *Water reallocation, resource grabbing, inter-sectoral allocation, economic reforms, India*

LIST OF ACRONYMS

DPR: Detail Project Report
GR: Government Resolution
HPC: High Power Committee
JNNURM: Jawaharlal Nehru National Urban Renewal Mission
Mcum: Million Cubic Meter
MI Act: Maharashtra Irrigation Act
MMISF Act: Maharashtra Management of Irrigation Systems by Farmers Act
MWRRA: Maharashtra Water Resources Regulatory Authority
NA: Non-Agricultural
PAP: Project Affected People
SEZ: Special Economic Zone
WRD: Water Resource Department
WUA: Water Users Association

SECTION I
Introduction

Dams have been at the center of one of the most intensive development related debates around the world[1]. There has been considerable discourse around the socio-economic impacts of large dams (Dharmadhikary, 2006; D'Souza, 2008; Joy et al., 2009; Singh, 2002; Shah and Kumar, 2008; Nayak, 2010; WCD, 2002). The emphasis has been on environmental and displacement related impacts. In the aftermath of the economic reforms in India leading to rapid urbanization and industrialization, a new dimension of the controversy around dams is emerging in the form of inter-sectoral water allocation. Water stored in the reservoirs of dams is being reallocated from irrigation to non-irrigation use in order to satisfy the growing demands of the rapidly expanding urban-industrial centers in India. However, this phenomenon of water reallocation has not received adequate attention of researchers and policy makers (Celio et al., 2010; Dixit, 1996; Molle and Berkoff, 2006; Mollinga, 2008). Hence, a study was undertaken to understand the scale, scope, and nature of the phenomenon of water reallocation. Apart from describing the phenomenon, the study also aimed at identifying the processes and factors that contribute to the phenomenon. The case of water reallocation in Maharashtra, India, was chosen for this purpose.

There are two components of the study. The first component of the study was to conceptualize the phenomenon of water reallocation by collecting data specific to the scale and scope of water reallocation, and identifying the policy processes associated with such reallocation. The second component of the study was to identify the broader processes and factors contributing to the phenomenon of reallocation. The first component has already been published as a paper (Wagle et al., 2012) and as a monograph (Warghade et al., 2013). In this current working paper we present the second component of the study that focuses on the local-level processes, mechanisms and other factors contributing to the phenomenon of reallocation.

The first component of the study was able to bring into the public domain a compilation and synthesis of data of water reallocation from 51 dams in Maharashtra. This data was collected from government offices using the provisions and procedures laid down in the Right to Information Act. This data presented in the published monograph shows that 1,983 million metric cube of water from 51 dams have been reallocated from irrigation to non-irrigation uses, without any measures for compensation, restoration or mitigation of losses incurred by affected farmers. Of this, a substantial amount (about 46 percent) of water is reallocated for industrial purposes, that is, water for Special Economic Zones and private power plants. A detailed documentation and analysis of the state-level policy processes was also undertaken as part of the first component of the study. Based on this analysis, the particular phenomenon of water reallocation was conceptualized as 'water grabbing', and the same was first published in the special issue of Water Alternatives. The main argument in the paper favoring such a conceptualization was that the reallocation of water from irrigation to non-irrigation use represents the case of appropriation of natural resources from the marginalized agriculture sector to the powerful urban-industrial sector (Mehta et al., 2012). It presents in detail the policy processes that have led to the denial of justice to the affected farmers who were not given adequate opportunities to raise their concerns and demands while making decisions on water reallocation. This adds to the argument favoring the use of the term 'water grabbing'. Hence, the term 'water grabbing' is used in the current working.

The second component of the study comprised documenting case studies of water reallocation from selected dam projects in order to gain insights into the project-level processes and the dynamics that contribute to the phenomenon of water grabbing. This was done through field visits to the project sites and collecting secondary data from local government offices, NGOs, activists, journalists and experts. Primary data collection was done through interviews with farmers, political leaders, activists, and con-

1 For example refer to the World Commission on Dams (WCD 2002) and local social movements in India against large dams like Narmada Bachao Andolan.

cerned government officers. Case studies of sixteen dam projects were developed. These case studies (Table 1) have been compiled in a separate document, which is available with the authors (Warghade et al., 2011). These case studies were further analyzed to arrive at key findings related to the processes and factors affecting water reallocation, particularly water grabbing. These qualitative findings are based on individual cases as well as on cross-case analysis.

TABLE 1
List of Dam Projects Selected for Case Studies (Maharashtra)

Sr. No.	Name of Irrigation Project	Gross Storage Capacity (Mm3)	Location	
			District	Administrative Region
1	Amba	317.01#	Raigad	Konkan
2	Surya	299.01	Thane	Konkan
3	Hetavane	147.49	Raigad	Konkan
4	Khadakwasla	763	Pune	Pune
5	Veer complex	950.1	Pune	Pune
6	Bhama Askhed	230.65	Pune	Pune
7	Gangapur	212.8	Nasik	Nasik
8	Nandur Madhmeshwar	233.9#	Ahamednagar	Nasik
9	Girna	608.45	Nasik	Nasik
10	Hatnur	388	Jalgaon	Nasik
11	Jayakwadi	2909	Aurangabad	Aurangabad
12	Vishnupuri	322.8#	Nanded	Aurangabad
13	Gosikhurd	1146.75	Bhandara	Nagpur
14	Lower Venna	214.78	Nagpur	Nagpur
15	Upper Wardha	646.88	Amravati	Amravati
16	Pench	1271*	Nagpur	Nagpur

Note: # This figure represents the planned availability of water and not storage capacity.

** This is the figure for live storage.*

The ensuing sections are based on the findings from the aforementioned case analyses. The second section of this paper details the findings of the project and its association with the process of water grabbing. These are generalized findings from the various dam projects, which form the main unit of analysis in the case studies. The third section details the individual factors affecting the grabbing of water in these projects and, therefore, further crystallizes the project life-cycle analysis into specific factors affecting reallocation and grabbing.

The third type of findings that is presented in the fourth section is related to official mechanisms utilized to give effect to reallocation and thereby resulting into grabbing. These mechanisms also comprise the organizational structure within the government responsible for making decisions on water reallocation. The fifth section encapsulates the perceptions of various stakeholders on the reallocation of water. These perceptions cover both 'anti-reallocation' and 'pro-reallocation' points of view.

TABLE 2
Project Life-cycle Associated with Water Reallocation and Grabbing

Project Design and Completion Phase	Pre-reallocation Water Utilization Phase	Reallocation Phase	Post-reallocation Conflict Phase	Entitlement Phase
• Project planning (Detailed project report of dam projects) • Revision in project plan • Project completion • Completion of construction work of dam • Commencement and completion of construction work of distribution (canal) system • Opposition to land acquisition for constructing canals • Rehabilitation of Project Affected People (PAP)	• Irrigation water utilization • Formation and functioning of Water Users Associations (irrigation)	• Urban-industrial development (affecting water allocation) • Industrial zoning by government (declaration and actual development) • Industrial siting driven by market forces • Urban expansion projects • Change in land-use pattern in command area • Change in size of the command area • Reallocation of water in period before and during the existence of High Power Committee (HPC) • Reduction in total water availability	• Agitations by farmers against reallocation • Legal action by farmers against reallocation • Level of cognizance by government towards demands of the farmers • Adaptation by affected farmers • Alternatives or restorative actions by government (of irrigation)	• Distribution of entitlements • Amendment in entitlement related provisions of MWRRA Act

SECTION II
Project Life-Cycle of Water Reallocation and Grabbing

In 2003, the Government of Maharashtra promulgated a Government Resolution for the constitution of a High Power Committee (HPC) empowered to make decisions on water reallocation from irrigation to non-irrigation use. The HPC, chaired by the Minister of the Water Resources Department (Maharashtra), comprised a group of Ministers of various departments, namely, Agriculture, Water Supply and Sanitation, Finance, Industry, and so on. Apart from the HPC, local government officials were also empowered to make decisions related to smaller amounts of water to be reallocated. Prior to the constitution of the HPC, *ad hoc* decisions regarding reallocation were undertaken by various authorities. However, the rate of reallocation has substantially increased after the constitution of the HPC (Warghade et al., 2013) and form the main basis for water grabbing (Wagle et al., 2012). It is, therefore, important to understand the processes that gradually created a context for reallocation. The case studies of individual dam projects provided the main data for such an approach. In this approach the case studies were analyzed to identify the different phases in the life-cycle of dam projects that contributed to the development of the context for water reallocation decisions.

Each case study comprises several events and processes that have impacted and contributed to water reallocation. The comprehensive list of such events and processes and their occurrences in a particular irrigation project or a case is given in Annexure 1. The analysis of these processes and events across different cases strengthens the understanding of reallocation as a process rather than an event. The following sub-sections present in brief the findings related to such a process at the project-level. The case narratives of different dam projects show that reallocation is not just a single event or a decision of allocating water, but a process associated with different life-stages of projects. The project life-cycle associated with reallocation and grabbing is depicted in Table 2. The process is categorized into different phases associated with the development of each project. Each phase is described in the following subsections.

It should be noted that the processes and events presented in the text may not always occur in the same linear sequence as presented in Table 2. They could be occurring simultaneously and sometimes feeding into each other in the form of feedback loops. The categorization of the phases is not exclusive and there is a possibility that a particular phase may extend throughout the life-cycle of the project. For example, water could be reallocated at times even when the project completion phase has not concluded or the gradual reallocation of smaller amounts of water can begin right from the completion phase and continue till the entitlement phase.

2.1 Project Design and Completion Phase

This phase comprises the design and completion of all construction work related to the dam and canal system. The project is ready for operationalization at the end of this phase and water utilization can begin. The different processes and events that affect water reallocation in this phase are described below.

Project Plan

The project plan prepared before undertaking the actual construction of the dam (also called as Detailed Project Report or DPR) includes among other things the plan for water allocation and infrastructure design. The case studies of projects show that in almost all the projects the plans primarily focused on allocation of water for irrigation and the creation of irrigation canals. The plans either did not make any provision for water for non-irrigation use or if they did, the amount of water allocated was so less that, most of the time it would be fully utilized within two to five years of operationalization of the project. This led to new demands for water from non-irrigation users and thereby the need for reallocation.

Overall it is seen that the project design was primarily based on development of irrigation potential. The distribution systems, including the canals, were designed to supply water for irrigation only. The inability to plan for the demands for water from the non-irrigation sector was a serious lacuna. As the allocation plan and infrastructure development plan was geared towards development of irrigation in the state, it was expected that the farmers in the water scarce rural regions of the state would be able to undertake irrigated agriculture and improve the overall rural economy through the planned project. As canals were to be built specifically for irrigation, there was also a 'sunk cost' associated with the construction of the distribution system for irrigation. Reallocation of water from irrigation to non-irrigation in such a situation therefore led to the overriding of farmers' rights as well as loss of capital investment in the distribution system. This focus on irrigation was the basis for the establishment of farmers' rights on water allocated for irrigation.

Revision in Project Infrastructure Plan

The case studies show that almost all project plans have undergone two types of revisions in their life-cycle. One is related to changes in allocation of water and the other is related to changes in the design of the dam and the canal system. It is found that the changes in the allocation plan have been done to accommodate the increased demands of the non-irrigation sector. This was done, at times, even at the cost of loss of irrigation potential. Such revisions showed no consideration for restoration of the irrigation potential lost or rehabilitation of farmers affected. The changes in infrastructure design were visible either as cancellation of a irrigation canal (Amba project) or reduction in length (Gosikhurd project). In this case the decision to reduce the scope of canal infrastructure closes all future options to restore or rehabilitate the loss to irrigation.

The case studies show that the revisions in the design of the canal system have not undergone a systematic planned effort. For example, the canal construction work continued even when water was being reallocated. Revisions in the infrastructure plans are mostly carried out at a stage when some portion of the irrigation canal has already been built. Such revisions have resulted in the escalation of 'sunk costs', as these canals were designed for a much higher flow capacity than the present curtailed irrigated command. Lack of funds to complete these projects has further forced the government agencies to curtail projects.

In anticipation of a rise in industrial activity in the command area of the Amba project, the cancellation of a canal was authorized; that is, even before the construction work of the canals had commenced. However, as the industrial development was concentrated only in the middle and head of the canal command area, the tail-end remained devoid of irrigation water.

Project Completion

The processes involved towards the completion of the project are closely associated with reallocation. Numerous projects affected by water reallocation are still incomplete. In majority of the cases the distribution system of the projects are incomplete due to indefinite and long delays in construction. In some cases the construction of canals had not begun even after receiving the approval. At times the delay had extended for more than 20 years. In almost all the cases studied it was found that while the construction of the dam was complete, the construction of canals remained incomplete. This delay was attributed to insufficient funds at the government level.

The delay in the construction of canals and consequent under utilization of water for irrigation has facilitated the reallocation of water for non-irrigation purposes. With zero or negligible 'sunk cost' and political patronage, reallocation has benefited the non-irrigation sector. Several activists and farmer groups complain that funds get allocated based on political patronage and not on any specific criteria. This results in inequity as far as completion of project and initiation of irrigated farming is concerned.

Farmer opposition to land acquisition for building canals has also contributed to delays in the completion of some projects. For example, take the case of the high rain-fed Konkan region, where this was

used as an important justification by government officials. This view was however contested by the local farmers and social activists who attributed this to lack of efforts on the part of the government in generating awareness on the benefits of irrigated agriculture. The shift from rain-fed rice cultivation to irrigated cultivation is a major technological and cultural shift for agrarian societies. Such a shift requires facilitation and time for accommodation.

Rehabilitation Plan for Project Affected People (PAP)

An important dimension of project design and completion is a plan for rehabilitation of project-affected people (PAPs). As observed in Surya, Gosikhurd, Jayakwadi and Bhama Askhed, the PAPs are rehabilitated in the planned command area of the projects. However, the delay in completion of the project and reallocation of water reduce the planned benefits to the PAPs and the other farmers in the command area. This is an important process dimension of reallocation as it impacts people who have already lost their land and other livelihood sources. It shows the failure of the government to compensate the farmers and PAPs for the loss of land and livelihoods.

2.2 Pre-reallocation Water Utilization Phase

The phase of water utilization begins after the project is completed. Although this phase extends across all the life stages of the project, the focus here is on the period between the completion of the project and 100 percent utilization of water. As observed in all cases, it takes some time to reach 100 percent utilization of water, even after completion of a project. The implications of this phase for water reallocation and grabbing are described below.

Irrigation Water Utilization

It is in the water utilization stage that the water-use for irrigation gets formally recognized and established. It leads to the development of an intensive agro-based economy. Reallocation of water, even with political patronage, gets difficult once strong economic interests are established through various agro-based activities. As observed in the cases studied, economic activities are not just limited to agricultural production, but also include the agricultural market and allied agro-processing activities. Hence, the successful utilization of irrigation water can impact the way water is reallocated for non-irrigation use.

This phase highlights the under-utilization of water even after official project completion. In several of the cases studied, the initial period of the project life-cycle is characterized by lower utilization of irrigation water. At the same time, the demand for water from the non-irrigation sector was gradually increasing. The lower utilization of irrigation water was construed as lower demand for water from farmers, which formed the basis for reallocation. However, there are multiple reasons for low or zero utilization of irrigation water in this phase. Some of the important reasons found in the case studies are briefly discussed in the following paragraphs.

Lack of Maintenance of Field Channels: Field channels fed from upstream canals form the final delivery channels of the irrigation system. These channels are created by the government during the initial stage of the project. The responsibility for the maintenance of these channels is handed over to the farmers upon completion. Lack of maintenance leads to erosion and cessation of water from the upstream canals, eventually leading to defunct channels. Lack of maintenance of these field channels is one of the reasons cited for non-utilization of irrigation water in the initial phase of the project-cycle. Although the government officials are of the view that farmers are responsible for lack of maintenance, the farmers narrate a different story. According to the farmers, the channels were built by the government much before the construction of the dam and the distribution system. The channels became defunct due to the long duration of non-utilization. Building new field channels was beyond the scope of the farmers and hence the demand that the government take on this responsibility. With the tug-of-war continuing over who was responsible for the deterioration of the field channels, the water for irrigation remained unutilized and the same was reallocated for non-irrigation use.

Technical Flaws resulting in no Water Supply: In some cases it was found that inherent technical flaws in the construction of the canals has led to low utilization of water for irrigation. For example, one of the flaws noticed by farmers in the command area of the Surya Dam was that the canal was constructed at a level lower than the farms, that is, against gravitational flow.

Initial Dependence on Groundwater use rather than Canal Irrigation: In certain areas such as in the command area of Hatnur dam, the farmers initially relied on groundwater instead of the newly available canals. Hence, the canals remained unutilized in the initial period of the project. However, as the groundwater extraction increased in the advent of high capacity equipments (deeper bore wells) the aquifer levels dropped, leading to severe drop in groundwater availability. Consequently, the demand for water from canal irrigation, increased in the latter period of the project. However, the canal water had already been reallocated by that time.

Lack of Efforts for 'Command Area Development': Successful deployment and utilization of water does not depend solely on dams and efficient water distribution systems. Various other components of the agriculture production system such as availability of credit for investment, awareness and training on new irrigation systems, quality management to assure timely and adequate water supply, market for fair return on investment, agricultural labor, equipments, quality seeds, fertilizers and other supplies have to be factored in too. The government facilitates the development of such a system through the 'command area development' initiatives. However, farmers argue that these initiatives have not been adequate, resulting in non-utilization of irrigation water in the initial phase of the project-life cycle. Any effort to reallocate water in such a situation is seen as inappropriate and unjust.

Incorrect Seasonal Allocation in the Vidarbha Region: Considering the rainfall pattern in Vidarbha (eastern Maharashtra), farmers in this region expressed that the officially designated timing of water release and supply from irrigation canals was inappropriate. As the rainfall in Vidarbha begins later than the rest of Maharashtra, it also extends beyond the normal rainfall period experienced in other parts of the state. As per the official standard of seasonal planning, the water from irrigation canals is planned for use after the normal rainfall period gets over. Due to the extended rainfall period in Vidharbha region, the farmers from this region are not inclined to utilize the water from irrigation canals during this period. This leads to unutilized water in the dam and cannot be construed as lack of water demand from farmers. The government has not taken adequate cognizance of the demands made by farmers for changing the time schedule of irrigation water supply in such regions. This same water could be utilized efficiently if supplied during the dry summer season.

Defunct Lift-Irrigation Schemes: In certain projects such as Hatnur, the water use for agriculture is through lift-irrigation schemes in combination with canal irrigation. These schemes are maintained by a group of farmers. The contract for these construction schemes was awarded to the politically influential people of the region who used low quality materials, for example, pipes, pumps, and so on. This increased the maintenance costs and reduced the life of the system. As it was beyond the capacity of the farmers to maintain these systems, the schemes were soon defunct and the water for irrigation remained unutilized in the early stage of the project life-cycle itself. This therefore cannot be construed as lack of demand from farmers for irrigation water, which becomes the rationale for reallocation in the early stage of the project.

Low Quality of Water Service: Cultivation of crops is dependent on adequate supply of water at the appropriate time and stage of crop growth. Shortage of water in specific stages of crop growth (such as the flowering stage) affects crop production. Hence, quality of water service is crucial for farmers undertaking irrigated agriculture. Farmers complained that the quantum of water supply in terms of quantity and timing was poor and, hence, were not ready to take the risk of undertaking irrigated cultivation in the initial period of the project-life cycle. This led to non-utilization of water. Also it was observed that the water tariff was not dependent on the quantum of water supplied. Farmers had to pay the pre-determined charges irrespective of the quantity and timing of water supply. This adds to the cost of the risk in irrigated cultivation and deters farmers from utilizing irrigation water.

Water Theft: It is found that there has been a tendency among some farmers to use water without paying appropriate water tariffs. Although this water gets used for irrigation, it does not get recorded in the official data as water utilized for irrigation. Thus, water theft and pilferage led to a situation where water allocation for irrigation was shown as unutilized on official records and thus became the basis for reallocation. The farmers expressed that pilfering of water was done by large landholders and farmers enjoying political patronage.

The above paragraphs highlight the reasons for low water utilization for irrigation in the initial phase of the project. Reallocation of water to non-irrigation use was done in this phase without addressing and resolving the aforementioned problems.

Formation and Functioning of Water Users Association

In 2005, the Government of Maharashtra enacted a law for transfer of irrigation systems to farmers[2]. This is based on the policy of the government to divest itself from the responsibility of maintenance and management of irrigation systems and to transfer this function to the water users associations (WUAs) of farmers. As per the law, once the system is transferred to the WUAs, the farmers will be issued water entitlements, which are the usufructuary rights over water. Hence, the formation of WUAs in irrigation and its successful functioning becomes an important aspect in ensuring successful utilization of irrigation water and thereby a deterrent for reallocating irrigation water for non-irrigation use.

Deterrents can be legal and political. Legal constraints are located within the 'legal framework' or 'agreement' signed between the government and the WUAs (a detailed discussion on entitlements is given in the last phase of the project life-cycle). The organizational structure of the WUAs can facilitate and enable awareness generation and pressure building activities against political interference.

The data in the case studies reveal that reallocation of water has been undertaken in projects with and without WUAs. Thus, formation of WUAs has not necessarily been a successful deterrent for reallocation in these projects. Waghad was the only project in Maharashtra with a well-functioning WUA. The ineffective functioning of WUAs and the time-delay in implementation of related policies is closely linked to water reallocation and grabbing for non-irrigation purposes. There are three specific time-delays discussed in the following points.

Delay in Agreements with WUAs: One of the main delays in implementing the decentralization policy is related to the signing of the 'agreement' between the government and the WUAs. The agreement provides legal sanctity to the functions and duties of various stakeholders including the government. It also comprises the terms and conditions applicable for water allocation to irrigation. However, it is found that 'agreements' have not been signed in a majority of the projects where WUAs are formed. A retired official disclosed that the government has not been able to even finalize the draft of the 'agreement' to be used for the purpose. This has hampered the implementation of the Maharashtra Management of Irrigation Systems by Farmers (MMISF) Act, 2005, under which the policy of decentralization is being implemented. The duration, reliability, and other conditions for water supply for irrigation have been issues of contention hindering the finalization of the agreement.

Delay in the Rehabilitation of Canal Systems: The second delay is in the 'rehabilitation of the canal system', one of the pre-conditions for handing over the system to the WUAs[3]. The main reason cited for the delay is lack of funds. As a result, the WUAs cannot function effectively and would therefore lack the organizational strength to put strong political pressure against water reallocation.

Delay in Determination of Agriculture Entitlements: The third delay is in determination and distribution of water entitlements as per the Maharashtra Water Resources Regulatory Authority (MWRRA) Act, 2005. As per the law, entitlements have to be given to the WUAs in proportion to the land area in the command. Thus, giving legally enforceable entitlements would also act as a deterrent for water reallocation. However, the delay in the process of allocating the entitlements makes this deterrent inef-

2 Refer Maharashtra Management of Irrigation Systems by Farmers (MMISF) Act, 2005

3 Refer Section 22 of MMISF Act, 2005

fective. Thus, these delays are interlinked leading to further uncertainty about the rights of the farmers over irrigation water. Currently the entitlements are being determined only in few projects selected for pilot-level implementation of the 'entitlement' system (detail discussion is given in the last phase titled as 'entitlement phase' of the process related to reallocation).

2.3 Reallocation Phase

In this phase the focus is on instances of direct reallocation through changes in the pre-planned allocation of water after the utilization of water has begun. However, the previous phases of the project life-cycle have direct and indirect implication on water reallocation. The various processes and events that led to actual decisions of reallocation from irrigation to non-irrigation use are discussed below.

Urban-Industrial Development

The development of urban and industrial centers within and adjacent to the command area of the project has triggered water reallocation. Data reveals that reallocation occurred only after a certain period (about 10-15 years) had elapsed since project completion. As mentioned earlier, in some cases, reallocation also took place in the other phases. Therefore, urban-industrial development is seen as an ongoing process that can happen anytime during the life-cycle of the project. The gradual increase in urban population and commercial centers around urban habitats leads to a gradual increase in the amount of water allocated from irrigation.

The following are some of the policies and project decisions that trigger reallocation of water:

Industrial Zoning Policy: The government declares certain geographical areas as industrial zones to be developed by government run corporations, such as the Maharashtra Industrial Development Corporation, or special purpose public utilities like the Maharashtra Airport Development Company developing the Multi-Model International Passenger and Cargo Hub Airport (MIHAN) at Nagpur. According to the SEZ rules prescribed by the Government of India, the zoning policy should include among other things, the plan for sourcing water requirements of the future industries4. Irrigation water is therefore reallocated to satisfy the water demands of these industrial zones. Sometimes the declaration of an industrial zone and the resulting reallocation of water may not actually lead to the development of a particular industry. This could be due to poor response from the private investors. However, the water reallocated for industry is considered as water reserved for future industrial development in that zone. Water is not allowed for irrigation use in such cases even when there is no actual utilization by industry. Thus, the declaration of industrial zones is a separate stage in reallocation as compared to actual development of industry.

Siting of Private Sector Industries: The siting of private sector based industries is determined by proximity to market and raw materials, and other market forces. For example, many privately owned thermal power plants are located in Vidarbha, a region rich in coal deposits. Therefore, the government approval is based on the approval to source water from a reservoir close to the planned industry location.

Urban Development Projects and Programs: Certain expansion and development projects in cities lead to a sudden increase in domestic water reservation. Data from the case studies revealed that these 'reservations' were allocated from the water which was originally meant for irrigation. A case in point are the projects under the central government sponsored Jawaharlal Nehru National Urban Renewal Mission (JNNURM). These water supply expansions or 'system renewal' projects undertaken by local municipal corporations are initiated without considering their impact on agriculture.

Change in Land-use Pattern in the Command Area

The land-use pattern in the command area of the irrigation project undergoes changes as agricultural land gets converted to non-agriculture. However, it was observed that the water released was inadequate, leading to reallocation of water over and above the water released and reduction in irrigation water.

4 Refer Rule 5 of The Special Economic Zone Rules, 2006, prescribed by Government of India

Change in Size of Command Area

Although the command area for irrigation is specified in the project design, it was found that in some of the cases the command area changed if the irrigation canals were cancelled or curtailed. Farmers at the tail-end of a canal are adversely affected when non-irrigation activity develops at the head or the middle part of the canal command area; thereby reducing the irrigation potential of the command over and above the land converted into non-irrigation use. For example, with the expansion of Nasik, water supply to a canal of the Gangapur project was terminated.

An important aspect to be considered for any changes brought about in the irrigation command area is the legal validity. As per the Maharashtra Irrigation (MI) Act, 1976, every command has to be delineated through a 'command notification' to be issued by the government. Experts have pointed out to a number of such projects that are operating without official command notifications. Although the government can take an official decision to curtail the command area, this should be done by taking cognizance of this particular provision in the MI Act. The study shows that these legal processes were not adhered to when changes were made in the command areas, thus raising concerns on their legal validity.

Pre-HPC and Post-HPC Reallocation of Water

A High Power Committee (HPC) at the ministerial level was constituted in 2003 by the Government of Maharashtra for taking decisions on reallocating water from irrigation. Thus, the processes and decisions related to reallocation can be categorized into two periods, viz, reallocations before and after the existence of the High Power Committee (HPC). In the pre-HPC period, approvals for water demands from the non-irrigation sector were given *ad hoc*, that is, by increasing non-irrigation allocation as and when the demand arose.

Post-HPC, pre-defined mechanisms for taking decisions on water allocation to non-irrigation sector came into place. Decisions regarding water reallocation on a long-term basis ranging from 5–35 years were undertaken by the HPC. Screening of government documents revealed that the Water Resources Department had specific instruments for gaining information from project-level offices regarding future water demands from the non-irrigation sector[5]. Analysis of the project-wise data on decisions by HPC shows that the quantum of water reallocated out of agriculture was higher as compared to the quantum of reallocation done in the pre-HPC period.

Reduction in Total Water Availability Affecting Reallocation

Analyses of data of several projects show that there has been a gradual reduction in availability of water in the reservoirs. Accumulation of silt in the reservoir, extraction of water in the upstream of the dam, and reduction in post-monsoon flow are some of the reasons cited for reduction. Apart from the permanent reduction in water availability, scarcity of rainfall also impacted the irrigation sector. This can be termed as 'seasonal reallocation', where the agriculture sector shares a proportionally larger share of the burden of seasonal scarcity.

2.4 Post-Reallocation Phase

With reduction in the volume of water available for irrigation post reallocation, local farmers started voicing their dissent through street agitations and threatened legal action. These are briefly described below.

Agitation by Farmers

The agitations led by the farmers were generally limited to the period of water scarcity. However, it was noticed that in the case of some projects, the agitations were launched before reaching the water scarcity stage and remained active for a long period. Some of the protests have led to litigations.

5 Refer Government Circular Number: ShaKaP-2009(103/2009)/AA/Rawaka, dated 20th June 2009

Interviews with farmers, especially in tribal areas, revealed low level of awareness regarding decisions taken by government officials on water reallocation and consequent reduction in water. They attributed water reduction to siltation of reservoirs and heavy seepage from canals resulting in substantial water loss. Hence, there is a tendency among farmers to consider the decrease in water supply to seepage losses, siltation, varying amounts of annual rainfall received, or other systemic factors rather than to reallocation. Therefore, the farmers have practically no knowledge about the total capacity of the reservoirs, the planned allocation for irrigation and non-irrigation, and the amount of reallocation from irrigation to non-irrigation use.

The low awareness and understanding about the broad project-level aggregate data related to intersectoral water allocation has been a major barrier in the process of mobilization and development of a state-wide agitation by farmers. Therefore, the agitations by farmers have remained localized at the project-level. Also, it was found that the farmers who were living at the tail end or at the middle of the canal system were the most affected by reallocation. Therefore, the farmers from the head region of the system who benefit even after reallocation may not join the agitation.

The cases studied show that agitations around the issue of water allocation have been acute mainly in times of seasonal water scarcity, especially in the summer season of a low rainfall year. This is because all the farmers in the command area are affected during this time and, not just the tail-enders. Even during scarcity, the government officials continue to supply water for non-irrigation use as per planned allocation, while cutting the supply for irrigation. It is only in such limited period agitations that farmers get the opportunity to interact with top government officials and thereby collect information on water availability and allocation. Such agitations have been more reactive and therefore rather short lived with the focus only on equitable distribution of water for irrigation during scarcity.

Apart from these short lived agitations, some projects have had consistent and long-lived protests, for example, the Upper Wardha project. This agitation which started with street protests culminated with the farmers resorting to taking legal action against government authorities. Among the various long-lived agitations, at least in the case of four projects, namely, Surya, Upper Wardha, Hetavane, and Nandur Madhmeshwar, the agitations reached the level of lawsuits filed before courts or a quasi-judicial body. In the case of Surya and Upper Wardha projects, legal petitions have been filed in 1996 and 2009, respectively, before the High Court against water reallocation. In the case of Hetavne Project, a petition was filed in 2010 before the Maharashtra Water Resources Regulatory Authority (MWRRA), which is a quasi-judicial authority established under the MWRRA Act of 2005. The agitation by farmers from the Nandur Madhweshar Project led to a legal petition being filed before a District Court in Kopargaon in 1993. While the Nandur Madhweshwar Project is a case of 'inter-project reallocation' of water, all the other projects are cases of 'intra-project reallocation' of water.

Another peculiar conflict identified is the issue of 'equitable inter-project allocation' during the scarcity period. It was argued by experts and others representing the beneficiaries of the Jayakwadi project that, as per the MWRRA law, water should be released from upstream dams into downstream dams during scarcity period for ensuring 'equitable' storage in all reservoirs. An application was filed before the MWRRA for release of water from the upstream dam. The excess water use by the upstream users, both irrigation and non-irrigation, was increasing the severity of the adverse impacts of reallocation of water from irrigation to non-irrigation within the available water for the Jayakwadi project. The applicants focused on the provision in the law that mandates storage of water in scarcity period in all dams in proportion to its original storage capacity[6]. However, the MWRRA declined to take action citing the absence of rules for implementation.

The Response of the Government

The agitations led by the farmers reaffirm the need to develop alternative mechanisms to prevent or mitigate the adverse impacts of reallocation. Such efforts should be geared towards establishing

6 Refer section 12-6c of MWRRA Act, 2005

an efficient demand and supply management for enhancing water use efficiency for both irrigation and non-irrigation users. The present decision-making process adopted by the HPC does not include comprehensive assessment of alternative options. Alternatives such as the use of 'recycled' water or development of new water sources have been recommended in only a few projects by the HPC. A thorough assessment of whether the demands made by non-irrigation users are reasonable and within certain water-use norms or standards is not undertaken. For example, there are cases where water is reallocated for cities even when the water-use per capita of the city is about three times the recommended standards.

Alternative mechanisms require capital and infrastructural investment from the government as well as the farmers. Due to the lower investment capacities of a majority of the farmers, there is certainly a need for external support by way of subsidies and cross-subsidies for enhancing farm-level water use efficiency. Considering the benefits accruing to non-irrigation users from reallocation, there is a possibility of creating mechanisms for transfer of some of these benefits to farmers in terms of rehabilitation of the irrigation system. So far, no efforts were observed for evolving such a mechanism in any of the cases studied.

It is important to note that the decisions on water allocation before the existence of HPC was made without even the assessment of the reduction of irrigation potential due to reallocation. The process of decision making by the HPC, however, required such an assessment to be made prior to actual reallocation. The government order has therefore provided for collection of 'irrigation rehabilitation cost' from beneficiary users in proportion to the area of irrigation affected due to reallocation[7]. Hence, the government is mandated to officially bring on record the data about loss of irrigation potential due to reallocation. This is an important development because it leads to official acceptance and cognizance of the fact that the irrigation potential is lost due to reallocation.

The data gathered from the minutes of the meetings of the HPC show that the amount of money to be collected as 'irrigation rehabilitation cost' from all the non-irrigation users benefitting from reallocation is about Rs. 700 Cr (Warghade et al. 2013). However, the detailed analysis of the minutes further shows that this sum is not utilized for rehabilitation of the farmers affected by reallocation, but for recovery of expenditure incurred by the government on the construction of irrigation canals. There is no initiative undertaken by the HPC to utilize these funds for restoration of irrigation lost or for rehabilitating the affected farmers.

The cases also highlight the government apathy towards farmer protests and litigations. For example, after a long legal battle of 14 years, the district court accepted the demands of the farmers from the Nandur Madhweshar project fighting against inter-project reallocation. In its order issued in 2007, the district court ordered the government to ensure the allocation of water for irrigation as per the original plan. Instead of taking this decision as a basis to initiate a process of negotiation and dialogue with the farmers for restoring irrigation potential, the government instead filed a counter petition before the High Court challenging the judgement of the lower court and succeeded in getting a 'stay order'.

Similarly, in the court case related to the Upper Wardha project, the government has not been able to take positive steps towards addressing the problems and plight of farmers affected by reallocation. There was neither the initiative from the government to address the water demands of farmers nor was there any consideration given for compensation or rehabilitation of the farmers. The government argued before the court that the decision of the HPC to reallocate the water was well within the jurisdiction of the HPC and the same cannot be challenged.

Analysis shows that justification of the decision to reallocate water on the basis of the Government Order passed in 2003 was incorrect (Wagle et al. 2012). As per the MWRRA Act, the power of determining water entitlements and allocation to various categories of use are vested with the MWRRA after 2005. While exercising this power, the MWRRA has to follow the principle of 'equitable' alloca-

7 Refer GR No. 1001/154/01/Sinch.Wya(Dho), dated 21 January 2003, unique code: 20080512150643001

tion, within which the MWRRA has to ensure that every farmer in the command area gets a particular 'quota' of water for irrigation. But as highlighted by the cases, the HPC totally ignored the powers of MWRRA and also the principle of 'equity'. Therefore, the government was not in a position to come out with any legally valid argument before the court to show that the HPC is the decision making authority and not the MWRRA. The pressure on the government mounted after another petition was filed against the decision of the HPC to reallocate water from the Hetavne Project. This petition was filed before the MWRRA and is based on the same argument that the HPC does not have the decision making authority to decide water reservations.

As the pressure mounted on the government, it was expected that this would lead to a positive initiative for 'equitable inter-sectoral water allocations'. Instead the government went into a retaliatory mode and decided to amend the MWRRA Act in such a way as to favor the HPC and its past decisions to reallocate water from various projects. The amendment was proposed in the form of an ordinance issued in September 2010. As per the proposed amendment, the HPC would replace the MWRRA. The provision of 'equitable' allocations would stand diminished as per the amendment. The ordinance further stated that the decisions taken by the HPC in the past on water reservation to non-irrigation users, including those resulting into water reallocation, will be held legally valid and the same cannot be challenged in any court or any judicial authority. There was tremendous opposition to this amendment from different parts of the state and also from the opposition party. However, the government was able to get the amendment approved.

An important point to note is that the government was open to making changes in the proposal for amendment brought in the form of ordinance. However, the core provisions of divesting the MWRRA from its powers and legalizing all past instances of water reallocation were not open for change. After strong opposition, the only change the government accepted was that instead of the HPC; the powers to decide inter-sectoral allocation will be vested with the Cabinet.

Overall it can be concluded that the HPC, which is the apex ministerial-level authority on water allocations, has not taken adequate cognizance of measures for prevention of reallocation and for mitigation and rehabilitation. The government, including the Chief Minister, has also shown apathy towards formulating a comprehensive and transparent policy framework for equitable and just water allocation among contending users.

The Farmers' Response

The case studies showed that reallocation had led to loss of livelihoods, for example, the farmers living in the command area of Girna, Surya and Amba projects had to migrate in search of alternative livelihood options. The farmers living in Bhama Askhed, Gangapur, Girna and Hatnur had to shift to groundwater irrigation using expensive water extraction equipment. Whereas in the case of the Khadakwasla project, the farmers had to source water from a considerable distance through lift irrigation, thereby increasing the overall cost of irrigation. Thus, tapping of alternative sources has increased the overall financial burden on the farmers, besides the reduction experienced in irrigation benefits.

2.5 Entitlement Phase

The MWRRA law makes a provision for determining and allocating water rights to users known as 'entitlements'. As per the law, entitlements are usufructuary rights and form the basis of deciding who gets how much water on a long term basis[8]. Once entitlements are determined, the law also makes provisions for monitoring the use of water as per the entitlements. Once determined the law also provides for reallocation of entitlements through either the voluntary trading of entitlements in a market system or through the government mediated reallocation involving a transparent process such as a public hearing and thereafter compensation for those who will be affected by it. Thus, the law for the first time

8 Usufructuary rights are 'use' right and not complete ownership rights

recognizes the need for evolving a transparent process for reallocation of water and a compensation mechanism for people who will be adversely affected by water reallocation.

It is found that the provisions in the MWRRA law related to 'entitlements' have not yet been fully implemented across the state. The implementation is at the pilot level and thus restricted to few projects, for example, Hatnur. There is an inordinate delay in the implementation of the provisions related to entitlements. The various factors affecting the delay have been discussed in Section 3 of this paper. Unless the entitlements for irrigation are determined, the farmers would remain devoid of the legal protection of their water rights against the instances of ad hoc water reallocation by the HPC or other authorities.

The entitlements are worked out on the basis of original water allocation to irrigation as mentioned in the original Detailed Project Report. In the context of the amendment in the MWRRA Act, it is necessary to understand the future scenario related to determination of equitable water allocation. As per the amended law the determination of entitlements will be done after 'inter-sectoral allocation or distribution' is done by the government, i.e., by the Cabinet. Also the amendment legalizes all the past instances of water reallocation and does not allow anyone to challenge the same before any court. In that case, it is clear that the inter-sectoral allocations will be determined based on the changes made in allocation after water reallocation by the HPC and other authorities and, not on the basis of the original allocation given in project design. Entitlements determined on such inter-sectoral allocations will completely ignore and exclude those farmers who have been adversely affected by reallocation.

SECTION III
Factors Affecting Reallocation and Grabbing

The findings related to water reallocation has provided vital insights into the process of reallocation and water grabbing. This section focuses on the individual factors that influence the process of reallocation. Since the factors have been derived from the processes of water reallocation, there is an inevitable repetition of certain components of the process findings presented earlier. However, the attempt is to evolve a typology of factors affecting reallocation and thereby enable the identification of the probable areas for improvement in terms of policies for equitable water allocation.

3.1 Categories of Factors

Reallocation can be seen as an outcome of the interplay of different factors. Increase in water demands from the non-irrigation sector is the main cause for reallocation. However, the case studies of various projects show that there are many other factors that influence the process of reallocation. These factors are presented in Box 1.

BOX 1
Factors Affecting the Process of Reallocation

1. **Factors related to Project Completion and Command Area Development (Irrigation)**
   a. Low awareness and low demand for irrigation water initially (first few years of project)
   b. Delay in construction of dam
   c. Delay in construction of distribution system
   d. Technical flaws in distribution system
   e. Termination or curtailment of distribution system
   f. Block system of irrigation
   g. Development of agro-industrial economy
2. **Factors related to Land Use Pattern**
   a. Change in land use pattern in irrigation command (irrigation to non-irrigation use)
   b. Encroachment of industry in canal alignment
   c. Overlapping command
3. **Factors related to Political Pressures and Interests**
   a. Opposition and agitation by farmers
   b. Organizational and political strength of farmers (WUAs and others)
   c. Political dominance of non-irrigation users
   d. Electoral (constituency-oriented) politics
4. **Factors related to Demand and Supply Management Measures**
   a. Ignorance of the possibility of reusing water
      (i) Restoring irrigation through treated urban waste water
      (ii) Catering to industrial demand through treated urban waste water

b. Storage and transit losses
   (i) Reduction in actual water availability in reservoirs
   (ii) Transit losses
c. End-user losses and user-level efficiency
   (i) Uncontrolled excess use of domestic water
   (ii) End-use efficiency
   (iii) Luxury projects affecting water supply
d. Source development and degradation
   (i) Conservation of urban local water sources
   (ii) Development of alternative water sources
e. Pollution
   (i) Release of untreated effluents
f. Planning failures
   (i) Demand estimation and appropriate planning
   (ii) Rehabilitation of affected farmers through 'rehabilitation cost' collected from non-irrigation users
   (iii) Command overlap

5. Factors related to Government Policies and Regulations

a. Provisions of various policy and legal instruments
b. Implementation of entitlement related provisions
c. Demand for implementation of the MWRRA Act

The factors listed in Box 1 can either increase or decrease the possibility of water reallocation and grabbing. In response to an increase in demand for water from the same source of water used for irrigation, these factors could influence the reallocation process in the following four ways:

(i) Non-irrigation demand rejected by the Government.

(ii) Non-irrigation demand satisfied through 'demand and supply management' measures such as reuse of waste water, reduction in per-capita consumption or supply management measures like developing a new source of water.

(iii) Non-irrigation demand satisfied by 'reallocation' leading to adverse implications on farmers.

(iv) Non-irrigation demand satisfied by 'reallocation' but adverse impacts on farmers reduced through partial reduction in amount of water reallocated and implementation of demand and supply measures.

The factors that have influenced the process of reallocation are explained in the subsequent sub-sections. The factors listed in Box 1 can be categorized further based on the implications of these factors on water reallocation. Factors which increase the chances of reallocation can be termed as 'Reallocation Augmenting Factors' while those which decrease the chances of reallocation can be termed as 'Reallocation Abating Factors'. Policy instruments and provisions are also important components of these factors. Along with these factors that directly affect the 'occurrence' of reallocation there are various factors that augment or abate the 'adverse impacts' of reallocation on farmers' livelihoods. These factors can be termed as 'Factors Aggravating Adverse Impacts of Reallocation' and 'Factors Ameliorating Adverse Impacts of Reallocation'. Table 3 presents a possible typology of these factors in a matrix.

TABLE 3
Typology of Factors Affecting Reallocation

S. No.	Broad Categories of Factors	Augmenting/Aggravating Factors	Abating/Ameliorating Factors
1	Factors directly affecting reallocation	Reallocation augmenting factors	Reallocation abating factors
2	Factors affecting the impacts of reallocation on farmers' livelihoods	Factors aggravating adverse impacts of reallocation	Factors ameliorating adverse impacts of reallocation

The typology presented in Table 3 is developed based on the findings presented in subsequent subsections. However, presenting the factors precisely as per the typology presented in Table 3 is beyond the scope of this study. A more detailed study is required to categorize the factors specifically according to this typology. The typology is presented here for evolving future research themes. The subsequent subsections focus on description of the factors mentioned in Box 1 and the way in which they affect the process of reallocation.

3.2 Factors Related to Project Completion and Command Area Development

Project completion is one of the phases in the project-life cycle of reallocation discussed in the previous section. The key factors influencing reallocation are drawn from this discussion and are summarized here with specific details.

The failure to complete a project and the subsequent development of the command area is one of the broad categories of factors that have influenced the reallocation process. Among the 16 projects studied, seven projects were incomplete, namely, Amba, Surya, Hetavne, Gosikhurd, Vishnupuri, Bhama Askhed, and Nira Deoghar. While the dam was incomplete in the Gosikhurd project, the distribution systems were incomplete in the case of the remaining six projects.

Non-utilization of crucial resources in the initial period after completion of the project was the rationale given by local engineers for reallocation. As mentioned earlier, low awareness among farmers regarding irrigated agriculture, especially the tribal population, was responsible for lack of water utilization. For example, low utilization of water in the Surya project was attributed to the reluctance of the tribal communities to undertake irrigated agriculture. However, it was found later that the government had not taken adequate measures to generate awareness among the tribal population. Moreover, the technical flaws in the design and construction of the canals resulted in reduced water supply.

To overcome some of the problems related to lower demand by farmers, the government introduced the 'block system' to ensure continued water supply for a period of six years to facilitate the cultivation of perennial cash crops. This showed that a sound agro-based industrial economy based on successful utilization of the water could ensure maximum utilization and prevent reallocation.

Overall it is observed that the time-delay associated with the project design and successful development of agro-economic activities in the region are important factors that influence reallocation of water.

3.3 Land Use Pattern

With the expansion of cities and growth of new industries, the land use pattern in the irrigation command area has undergone several changes. How is water reserved for irrigation reallocated when land designated for irrigation is converted for non-irrigation? Data from Amba, Gangapur, Hetavane, Bhama Askhed, and Khadakwasla reveal that rather than compensate the farmers for loss of irrigation water and land, reallocation is given priority. In the Hetavane project, land acquired for the Special Economic Zone (SEZ) was diverted for other industrial activity even before the approval for the SEZ proposal was finalized.

There are other problems related to changes in land-use pattern. In Amba, industries at the head of the irrigation command area had encroached upon the land marked for the construction of the irrigation canal. Similarly, in Bhama Askhed, as the urban and industrial development has taken place at the middle stretch of the canal, a proposal to curtail the canal is being considered. This proposal will drastically reduce the chances for farmers at the tail-end of the canal getting water for irrigation.

3.4 Political Pressures and Interests

The case studies show that vested political interests and pressures have considerable influence on reallocation. In some of the cases, farmer agitations have successfully deterred reallocation. For example, in Gangapur and Vishnupuri, farmers opposed the temporary reallocation of water undertaken by the government during scarcity. Farmers in Vishnupuri were also instrumental in preventing reallocation of water to a nearby city for a particular year. However, in the subsequent years, the decision to reallocate water was reversed by the government. In Gangapur, the agitation led to the imposition of water cuts to the city due to excess consumption in the normal rainfall period.

In projects such as the Upper Wardha, Surya, Hetavne and Amba, farmers have consistently agitated against reallocation. However, in the other cases, the protests were not necessarily raised against reallocation, but more as a response to reduction in the volume of water available for irrigation. As official data on water reallocation is hardly accessible to local farmers, farmers attribute reduced water supply to loss or over-extraction of water at the head of the canal and not to reallocation. This lacuna in understanding the causal relation of lack of water availability and reallocation impedes the creation of a strong opposition and agitation by farmers.

Failure of institutional development such as the Water Users Associations (WUAs) undermined the development of political will among the farmers to mobilize against reallocation.

The dominance of the industrial water users in decisions regarding reallocation is clearly visible in Upper Wardha, Hetavne and Amba projects. Despite objections raised by farmers to allocate water to a particular industry in Amba, the concerned ministers went ahead with the reallocation. In Upper Wardha, protests against reallocation towards a private power generating company culminated in the amendment of the Maharashtra Water Resources Regulatory Act, 2005, instituted specifically to protect water rights of farmers.

The electoral politics around particular constituencies also play a role in the process of reallocation. The local activists working in the command area of the Surya project stated that water meant for tribal farmers was reallocated to a suburb of Mumbai to gain political mileage for the ruling party.

3.5 Demand and Supply Management Measures

The study clearly shows that attempts to assess measures for reducing reallocation of water have been completely circumvented by government authorities. Some of the demand and supply management options shared by various stakeholders during the case studies are highlighted in Box 1. These are discussed in the following subsections.

Reusing Water

One of the important measures to reduce the need for reallocation is to ensure reuse of waste water. Gangapur was the only project wherein the HPC had taken concrete decisions to ensure the reuse of waste water from Nasik, as the city had previously benefitted from reallocation. Although the HPC also introduced a condition for supplying treated water to the affected agricultural area; this has not been adhered to yet.

Storage and Transit Losses

Different types of transit losses lead to reduction in the net available water. However, there has been negligible attention given to reduction of such losses. It was found that a majority of the projects were

affected by reduced availability of water due to reservoir siltation and reduced post-monsoon flow. Reduction of the flow is experienced when there is excess tapping of water in the upstream area and erratic rainfall. So far, neither of these problems have been addressed by the concerned authorities.

Neither the HPC nor the other concerned authorities of the department have taken any measures to reduce transit losses. Poor operation and maintenance of the canals have increased the transit losses in almost all the projects. The only exception is in the case of the Lower Venna Project where the Maharashtra Water Resources Regulatory Authority (MWRRA) mandated that the industrial water users should bear the cost of lining the unlined canals for restoring irrigation potential.

In some of the cases it was observed that the non-irrigation users were allowed to draw water from the canals. Drawing water from canals for non-irrigation use is inefficient as the canals have to be kept operative throughout the year, thereby increasing transit loss.

End-use Losses and Low Use Efficiency

Heavy water loss at the level of the end-user is a major problem in non-irrigation as well as the irrigation sector. Measures are required to increase the end-use water efficiency to reduce the adverse impacts of reallocation. Although norms for water use are stipulated, they are not enforced.

There is tremendous potential to increase the agricultural water use efficiency at the farm-level (MWRRA, 2012). Large investments required for micro-irrigation are the main hurdles faced by farmers. Therefore, if water saved through such measures is used for non-irrigation purpose, the non-irrigation sector should also bear the financial liability.

An important issue emerging from some of the cases is the type of use for which water should be allocated. For example, water available in the reservoir of the Khadakwasla Project was allocated to Lavasa City, a luxury real-estate project located in the catchment of the dam. Considering that more than 50 percent of the original water for irrigation is already reallocated for non-irrigation use, allocating additional water for such a luxurious project has led to widespread protests by farmers.

Source Development and Degradation

Development of a new source of water or stopping the degradation of old sources of water is an important supply-side alternative to avoid reallocation or to reduce its adverse impacts on irrigation. In the Gangapur project, the government has decided to construct dams in the upstream project area for restoring the loss of irrigation water due to reallocation. However, data reveals that the amount of water reserved for non-irrigation use far outweighs the potential for restoring the loss of irrigation water. Similarly, the government is planning to build a series of barrages to overcome the problem of reduced post-monsoon flow and to restore the lost irrigation potential due to reallocation in Vishnupuri. Local experts and activists have expressed doubts on the success of the project considering the increase in the upstream extraction of water to an extent that, there would be severe limitations on sufficient water reaching the barrages.

Considering the high social and environmental costs involved in the construction of dams or barrages, it is necessary to look at other measures of conservation and restoration of old sources of water. So far, government attempts towards restoration of degraded water sources such as lakes or groundwater were not visible in any of the cases studied. In some of the project affected areas farmers had to employ expensive equipment for extracting groundwater. However, this has severe implications on the sustainability of groundwater levels as the government has not made any efforts to develop sustainable groundwater recharge and extraction mechanisms. Farmers are therefore left to find their own solutions and alternatives.

Pollution

In a majority of the cases studied the effluents from non-irrigation water use are released into the rivers without adequate treatment. It is therefore important that the government enforce basic norms for

discharge of effluents and only treated water should be discharged into the canals, which can be then released into the irrigation command area affected by reallocation.

Planning Failures

The case studies show that there is very little future planning or assessments related to water demand and supply. Cities such as Aurangabad, Pune, Nasik and Nagpur have experienced tremendous growth in population over the last 20–30 years, thereby increasing the demand for water. No efforts were undertaken for long-term (20–30 years) and short-term (5 years) assessment of population increase and the resulting water demands. The city administrations generally take cognizance of such issues only after experiencing severe water shortage. In Aurangabad, the estimates projected were far below the actual increase in population. It is observed that very often the estimates for population increase are made by simple extrapolation of past population trends without consideration to external factors such as economic growth and possibility of migration.

In Pune, the supply increased with corresponding demands made by the administration, even though the official allocation remained unchanged. This post-facto reallocation of water shows the apathy in planning for future needs. Reallocation of water from irrigation is then seen as the easiest, fastest and least costly measure to meet the increasing non-irrigation demand.

Another planning failure is with respect to the 'overlapping' command area. In case of projects such as Amba, it was found that the farmers who were devoid of water due to reallocation were informed that their area overlaps with the irrigation command of an another project. Hence, they were assured water from the other project. However, the water from the other project was also reallocated for non-irrigation purposes.

The other aspect of planning failure is related to the rehabilitation of irrigation potential lost due to reallocation. As mentioned in Section 2, the irrigation rehabilitation cost collected from the beneficiary non-irrigation users was not meant for actual rehabilitation of lost irrigation, but to recover the government expenditure on canal construction.

Policy and Legal Failure

Various policy and legal lacunae have influenced reallocation. One of the major gaps is lack of comprehensive and consistent policy for 'water allocation and reallocation'. The policy issues related to water allocation and reallocation are scattered across various instruments like: State Water Policy (SWP) 2003, Government Resolution (GR) for Non-irrigation Water Reservation 2003, Maharashtra Water Resources Regulatory Authority Act 2005, Maharashtra Management of Irrigation Systems by Farmers Act 2005, and Maharashtra Irrigation (MI) Act 1975. The focus of the MI Act is on development of dams and canal systems, mainly for agricultural use. The SWP 2003 provided higher allocation priority to industry as compared to irrigation. The GR for non-irrigation water reservation, for the first time specified the proportion of 75:15:10 percent for allocation of water to agriculture, domestic and industry, respectively. However, the same GR also provides for non-irrigation reservation above 25 percent. There are no criteria given for approving the non-irrigation reservation. This leads to lack of transparency in the decision making processes of the HPC and other concerned authorities.

The MWRRA Act 2005 finally brought in a system of 'entitlements' for determining and managing the issue of allocations and reallocations. As per the law, the government can set the criteria for determining entitlements by establishing certain rules and regulations. The MWRRA can actually determine and regulate water entitlements to the various categories of users: agriculture, domestic and industrial users. It also provides a mechanism for reallocation of entitlements through: review of entitlements, transfer of entitlements after public hearing, and trading of entitlement in a regulated market. However, with the opposition from the HPC and the consequent amendment to the MWRRA Act, the confusion on the validity of the said provisions of the MWRRA Act has increased.

Nevertheless, none of the policy instruments provide adequate measures for prevention of reallocation or mitigation of its impact on farmers. Hence, it is found that the HPC and other concerned authorities have not given adequate attention to alternatives to reallocation such as demand and supply management measures. There is only a cursory mention in the GR for 'Water Reservations to Non-irrigation Users', which states that the decision makers should check if the demands of the non-irrigation users can be satisfied through alternative sources of water[9]. The minutes of the HPC do indicate consideration to the possibility of alternative source of water to satisfy the non-irrigation demand. In the table prepared for assessment of the non-irrigation demand, the HPC has included a column titled 'alternative sources'. However, there is no independent assessment of all the possible demand and supply management measures that can provide alternative sources of water. The minutes of the meetings of the HPC show that most often the information filled in the particular column is 'no alternative sources'. Apart from this there are no specifics of assessment done or any other conditions of reuse or restoration of irrigation.

This clearly shows the failure of the government machinery to evolve a concrete policy response to water allocation and reallocation.

9 Refer GR No. 1001/154/01/Sinch.Wya.(Dho), dated 21 January 2003, unique code: 20080512150643001

SECTION IV
Governance Mechanisms for Reallocation and Grabbing

The earlier sections of the paper deal with the broader processes that affect water reallocation. This section details the specific decision making processes related to water allocation in a project. The governance mechanisms existing within the various government bodies and decision makers presented here are based on the contents of relevant official documents as well as the analysis of cases of reallocation documented as part of this working paper.

The study shows that there are two broad mechanisms for water allocation and reallocation: direct mechanisms and indirect mechanisms. Mechanisms where decision is made based on demand for water allocation from specific non-irrigation water users is categorized as 'direct mechanisms'. Mechanisms where decisions on subject matter other than specific non-irrigation demands are made in a way that leads to water reallocation are categorized into 'indirect mechanisms'. Both the direct and indirect mechanisms are discussed briefly in subsequent sections.

4.1 Direct Governance Mechanisms of Water Reallocation

The mechanisms of decision making on demands or applications made by specific non-irrigation water users have evolved in two phases: Pre-HPC Phase and Post-HPC Phase.

Pre-HPC Mechanisms for Water Reallocation

The Government Resolution (GR) for 'Reservation of Water for Non-irrigation Purpose' was issued in 200310. This GR provided for the establishment of the High Power Committee (HPC), the apex body to make decisions on water allocation and reallocation. The mechanisms for water reallocation were *ad hoc*. The applications or demands for water for non-irrigation use were forwarded to the project-level Chief Engineer. Requests for small amounts of water were processed at the project-level. But if the demand for water far exceeded the availability, the applications were placed at the ministerial level office for consideration. There were no specified criteria for approval or disapproval for reallocation in this mechanism.

Post-HPC Mechanisms for Water Reallocation

The GR for 'Reservation of Water for Non-irrigation Purpose' provides for a hierarchical authority structure for decision making on demands for water reservation for non-irrigation purpose. The priority for water allocation given in the State Water Policy of 2003 is the basis used in this GR. As per this policy, higher priority is accorded to industry as against agriculture. The GR further laid down the policy of reservation of water for non-irrigation purpose even at the cost of loss of irrigation potential. It thus laid down the basis for water reallocation and grabbing.

The GR did not take adequate cognizance of the original project plans for allocation. In most cases almost 100 percent of the available water had been allocated for agriculture. The GR, however, without taking cognizance of the original project plans, provided the following generic break-up of intersectoral water allocation from the available water in all the reservoirs: 15 percent for potable water, 10 percent for industrial use and the remaining 75 percent for agricultural use. There are no limits stipulated for the amount of water that can be reallocated from any irrigation project.

The various decision making authorities related to water reservation and their responsibilities as specified in the GR have been presented in Table 4 . It should be noted that these responsibilities are pertaining to reserving water for non-irrigation use up to a certain percentage of total storage of water in a particular reservoir. For example, the Chief Engineer is allowed to approve water for only drinking purposes up to 10 percent of the total storage in a reservoir. This means that the Chief Engineer is al-

10 Refer GR No. 1001/154/01/Sinch.Wya.(Dho), dated 21 January 2003, unique code: 20080512150643001

lowed to take the decision only when the new demand for non-irrigation use made by a particular user combined with the previous approved allocation for non-irrigation does not add up to more than 10 percent of the total storage in the reservoir.

TABLE 4
Decision Making Authorities on Water Reservation for Non-irrigation Users

S. No.	Authority	Responsibility of Water Reservation
Reservation for Drinking Purpose		
1	Chief Engineer	Approval of water reservation up to 10% of the total storage[11]
2	Government Secretarial-level Committee	Approval of water reservation from 10–15% of the total storage
3	Ministerial-level Sub-committee	Approval of water reservation for more than 25% of total storage
4	District Collector-level Committee	Reserving water adequate for drinking purpose till 30th June during scarcity year from sources other than the planned sources
Reservation for All Types of Non-irrigation Water Uses[12]		
5	Zonal Chief Engineer	Approval of reservation up to 15% of the total storage [for projects that are under construction or completed by Water Resource Department (WRD)][13]
6	Inter-departmental Standing Committee of the Secretaries	• Approval of reservation from 15–25% of the total storage • Approval to draw water from proposed sources • To coordinate and solve problems related to water allocation
7	High Power Committee (HPC) – Ministerial-level	• Approval of water reservation for more than 25% of total water storage • Decide on the stages of water reservation and long term planning and financial allocation for irrigation restoration

The above table shows that there is an overlap of responsibilities among the different decision making authorities. The GR does not provide any clarification on this issue nor are the officers able to clarify. However, the table clearly shows that the ministerial-level High Power Committee headed by the Water Resources Department is the apex authority who can take decisions to reserve water for any non-irrigation use irrespective of its implications on irrigation. Although the GR specifies 25 percent of water use for non-irrigation, the HPC is empowered to increase this percentage of water for non-irrigation to even 100 percent.

Norms have been specified in the GR for per capita domestic water use, but there is no concrete provision for disapproval of water reservation if the water use is beyond this norm. There is complete

11 While refereeing to the powers of the Chief Engineer, the GR actually states that the Chief Engineer can approve water reservation up to 10 % of the 'irrigation area of the project'. In all other cases it is certain percentage of the 'total storage' in the dams.

12 The said GR fails to clarify whether "Non-irrigation water uses" here means uses other than drinking water

13 Majority of the projects are developed by the WRD. So the relevance of the particular condition has not been clarified in the GR. There seem to be an overlap in the jurisdiction of this and other authorities mentioned in the GR. There is no explanation in the GR on this overlap.

absence of norms for industrial water use. There are also no specific criteria for recycling and reuse of water so as to avoid the adverse implications of water reallocation on irrigation.

Although there is a provision in the GR for collecting 'irrigation restoration cost' from the non-irrigation water users, there are no specific directions on the utilization of this money for actual restoration of the irrigation potential lost due to reallocation. In practice, it is found that the irrigation restoration cost is considered as the recovery of the capital expenditure done by the government on the canals that would be rendered useless due to loss of irrigation potential. The money is therefore not used for actual restoration of the affected irrigation area.

There is also a provision in the GR for collection of 'capital contribution' from the non-irrigation water users for whom the water is being reserved. This capital contribution is collected in proportion to the share of water reserved for such users. This contribution is towards the recovery of the capital investment on the dam. Once this capital contribution is collected, it is difficult to reduce or stop the allocation to the particular non-irrigation water user, an issue not dealt within the GR.

Further, it is not mandatory to collect capital contribution from all users. The users are given the option of not paying the capital contribution. In that case the users have to pay the applicable higher water tariff for non-irrigation water use. In case the user makes the payment for capital contribution, then concessional tariff is applicable for the users. There has been no consideration of the implications of this tariff related concessions on cross-subsidy needed to make water affordable for the economically weaker sections of the society.

Revisions in Project Plan

The decisions regarding reallocation of water during pre-HPC and post-HPC are often incorporated in the official revisions of project plans, which then become the guiding source for all further decisions.

Annual Water Planning

The annual planning for water is normally done after the monsoon season. The case studies show that water reservations for both domestic and industrial use are based on pre-defined allocations. The water for irrigation is released only after all the allocations for non-irrigation purposes are fulfilled. Water allocation for agriculture is therefore determined by deducting the amount of water reserved for non-irrigation from the total available water for that season. With the non-irrigation sector getting priority in the annual water planning process, even while experiencing scarce rainfall, the agricultural sector has been relegated to as 'residual water users'.

4.2 Indirect Governance Mechanisms for Water Reallocation

The indirect mechanisms that affect water reallocation have been briefly explained in the subsequent paragraphs.

Project Plan

Failure to envisage the future water demands from non-irrigation water users is evident from the negligible water allocated towards non-irrigation in the original project plans, i.e. in the Detailed Project Report (DPR). The case studies clearly show that the focus of the DPRs was solely on irrigation. Some retired government officials expressed that in the past the projects were planned for irrigation, as agriculture was the only economic activity that could be undertaken immediately upon project completion. The cost-to-benefit ratio for project assessment was calculated on the immediate economic benefits that could be realized from increased agricultural production. Subsequently, with the growth of the industrial and urban sector, the same water was reallocated for non-irrigation use. An example of changes in the DPRs related to water reallocation is visible in the Amba project with the revised plans showing canal curtailment and changes in alignment. Consequently, farmers from certain parts of the command area are devoid of water.

Excess Withdrawal without Permissions

It is found in cases such as the Khadakwasla project that the bulk water users, especially cities, tend to draw more water than their official water allocation. Unplanned expansion of cities has led to a gradual increase in demand for water. With no regulatory mechanisms on allocation, cities can keep drawing water. Hence, the official process of allocation tends to be a *post-facto* process. There are no regulatory mechanisms to ensure adherence to the norms of per capita water use in urban areas.

Temporary to Permanent Reallocation

Temporary allocations are often made with the condition that the particular user will return the water after developing alternative sources. However, analysis of the cases show that there are hardly any measures taken to develop alternative sources. The study of projects such as Hetavne and Surya reveal that there is a tendency to first avail of 'temporary allocation' for non-irrigation purpose and later turn this into a 'permanent reservation'. In the case of the Hetavne project, a temporary allocation was justified as the incomplete canals led to the non-use of irrigation water. This mechanism has met with the least resistance as non-irrigation users take the easy way out, that is, to turn the 'temporary' reservations into 'permanent'.

Non-agriculture Land Conversion

The study of projects such as Gangapur and Surya reveal that the process of conversion of land from irrigation to non-irrigation is also an indirect mechanism of water reallocation[14]. This is rampant in the peri-urban areas where a particular area is converted to NA and is excluded from the irrigation command area of the project. The water allocated to this irrigation area also therefore gets allocated for non-irrigation use. This is carried ot despite large stretches of the irrigation area being devoid of water due to past instances of water reallocation from the same project. There is no attempt to compensate farmers for the loss of irrigation potential.

The process of water reallocation linked to NA conversion also happens through industrial zoning. There is often very less or sometimes no development that takes place in such industrial zones or in the peri-urban areas for a long period of time. But the water released due to change in land-use pattern is still consumed by the existing non-irrigation users. This suggests that conversion to NA beyond the immediate requirements of urban or industrial development is one of the mechanisms to reallocate water from irrigation to non-irrigation use.

Excess Upstream Allocations Leading to Downstream Reallocation

The upstream dam projects such as Gangapur have experienced reallocation in their own command. But to restore the lost irrigation potential in that project's command area, various measures are taken that affects the water release in the downstream dams. Construction of new dams in the upstream or reduction in the release of planned water in the downstream are two such measures that lead to reduced water availability in the downstream. Due to such disintegrated planning mechanisms of intra-basin projects, water reallocation in upstream projects leads to loss of irrigation potential in downstream projects.

14 In order to develop any agricultural land into residential area, its status needs to be changed to "Non-Agricultural" or NA land. There is a specific set of rules and process set by the government to convert agricultural land to NA.

SECTION V
Stakeholder Perceptions and Demands

Stakeholder perceptions on reallocation were captured through interviews of various stakeholders conducted for each of the cases studied (overview of the questions presented in Annexure 1). The objective was to capture perceptions that opposed reallocations as well as those that favor reallocation of water from irrigation to non-irrigation. The decisions for allocating water for non-irrigation use through reallocating the irrigation water are made at the level of the WRD and the state-level polity. Hence, the perceptions that favor reallocations have been captured through interviews with government officials and political leaders. Perceptions against reallocation have been captured by interviewing affected farmers. A coalition of civil society organizations (CSOs) and social activists has been involved in raising opposition to water reallocation. The participants in this coalition have also contributed to the anti-reallocation perceptions presented in the subsequent paragraphs. Both the anti and pro reallocation perceptions have been presented in each of the sub-sections below, even though the titles of these sub-sections represent the anti-reallocation perspective.

5.1 Denial of the Right to Livelihood

The farmers and their representatives perceive that reallocation has taken away their right to livelihood. The main argument is that the dams were built to provide livelihood support to the farmers in the drought prone regions. However, due to reallocation, they have lost access and rights over irrigation water and are therefore unable to fulfill their livelihood needs. As observed from the cases studied, there are different categories of farmers experiencing various adverse impacts of reallocation. These categories and their impacts are presented in Table 5.

TABLE 5
Categories of Farmers and Impacts due to Reallocation

Category of Farmers	Impacts due to Reallocation
All farmers in the irrigation command	• Loss of right over water • Loss of irrigation opportunity and loss of livelihoods o In some cases loss is in perpetuity and in some cases limited to scarcity period o If loss is limited to annual scarcity period then there is loss of standing crop leading to loss of investment on cropping • Increased risk burden associated with returning back to rain-fed agriculture • Loss due to lack of compensation or rehabilitation by Government • Increased cost and risk burden for those who are capable to shift to other limited sources of irrigation (like groundwater or far-away water source) • Reduction in the market value of agriculture land due to absence of irrigation facilities leading to reduction in asset value and credit worthiness • Loss of productivity due to lack of irrigation that would have otherwise enabled use of chemical fertilizers

Category of Farmers	Impacts due to Reallocation
Farmers in the tail-end of the canal system (tail-enders)	• Most affected in perpetual reallocation and seasonal reallocation due to last priority in water distribution in the irrigation system • Loss of irrigation potential due to curtailment of canals or reduction in water allocation to agriculture after reallocation • Ingress of saline water in coastal tail-end canal areas (e.g. Amba Project)
Project (Dam) affected people	• Loss of originally held land, livelihood pattern, and habitat submerged by the reservoir water • Loss of irrigation potential in the rehabilitated land in the command area
Farmers downstream of projects affected by reallocation	• Reduction of water supply due to new dam building in the upstream to compensate for reallocation in the upstream • Reduction of water supply due to over-extraction in the upstream during scarcity period • Increased urban-industrial development upstream leading to heavily polluted water downstream
Farmers outside the command area including the landless	• Loss of labor opportunities in the irrigation command • Loss of opportunity for landless to undertake share-cropping on the landowners irrigated land • Loss of trading opportunities related to agriculture inputs and outputs

The important basis for listing the adverse impacts in the above table is the fact that the government has neither been able to restore the lost irrigation potential due to reallocation nor have they given any consideration to rehabilitation of the farmers affected by reallocation. In fact, there is hardly any recognition at the level of the government on the existence of a stakeholder group that can be termed as 'reallocation affected people'. There is neither any recognition of the existence of such people nor the understanding that they would need support for rehabilitation similar to the dam or industrial 'project affected people'.

A counter argument is made by the proponents of water reallocation that urban and industrial development achieved through adequate water allocation to non-irrigation sector provides new employment and livelihood opportunities. The rural population migrating to urban-industrial areas is large and they benefit from water reallocation. But the farmers and their representatives are of the view that the benefits of such development do not reach those farmers who are directly affected by reallocation. The farmers in the drought-prone area are not well equipped to tap the new employment or livelihood opportunities in the urban-industrial areas. Hence, they are the ultimate losers in the process of water reallocation.

The demand emanating from this particular livelihood-based perception to reallocation is that 'water rights' of the farmers should be safeguarded against reallocation. Once such rights are protected then it is assumed that farmers would gain a better bargaining position and would be made party to the negotiation process of water reallocation. This will enable the farmers to raise their voice and thereby get a fair chance to protect and sustain their livelihoods.

Some of the stakeholders are of the view that alternative sources of water should be generated for non-irrigation users. This could be done by constructing new dams or restoring dilapidated local sources such as lakes and wells. However, based on the same livelihood-based perspective, building of new

dams is opposed. Building dams leads to adverse impacts on the livelihoods of the people whose land is acquired for dam building. Instead, the need for integrated water resource management and proper demand-supply side management of water is highlighted.

5.2 Lack of Transparency and Public Participation

The farmers expressed that they were neither consulted nor informed on decisions related to water reallocation and therefore oppose such unilateral decision making on issues that affect their lives and livelihoods. It is observed in some of the cases studied that farmers were not at all aware of the decisions related to water reallocation. Even after water was reallocated from their project, the reduced water supplied for irrigation was attributed to reasons other than reallocation, such as less rainfall or inefficient distribution systems. The data on total storage capacity of reservoirs and the resulting allocation and reallocation is not disclosed to farmers. Thus, lack of participation and transparency in decisions related to water reallocation are important factors contributing to water grabbing.

The government officials expressed that the farmers could not be mobilized to form Water Users Associations (WUAs). In absence of the WUAs, there is hardly any interface between the farmers and government machinery. The absence of this interface leads to lower level of awareness among farmers on issues related to water reallocation. However, the social activists are of the view that there have been several barriers to the development of WUAs in the State including the lack of capacity of the government to undertake rehabilitation of the canal system, which it can then handover to the WUAs. Without effective control of the distribution system the WUAs have remained active only on paper.

The social activists also pointed out to the provision in the MWRRA Act that requires public hearing on decisions regarding reallocation of entitlements. If the entitlement related provisions had been implemented, then probably, this situation of non-transparent and non-participatory decisions leading to reallocation and grabbing would not have arisen. Hence, the activists demand early implementation of the entitlement related provisions, especially, the provisions related to public hearing.

5.3 Inequity Associated with Water Losses and Inefficient Usage

The decisions undertaken by the government to reallocate water from irrigation to satisfy the increasing non-irrigation water demands, when the system for water storage, distribution, and use remain highly inefficient, is questionable. The satisfaction of demands for water by non-irrigation users beyond stipulated norms, using water for lavish lifestyles, unaddressed transit losses, and untreated waste water, are some of the examples cited by farmers to show the unjust nature of water reallocation. The urban elite enjoy the benefits of water reallocation, as priority is given to domestic consumption. The water allocated under the category of 'drinking' purpose is utilized for entertainment and maintaining lavish lifestyles.

While the farmers and their representatives point towards the inefficiencies in non-irrigation water use, the government officials and other stakeholders favoring reallocation point towards the inefficient and inequitable water use within the agricultural sector. Wasteful ways of irrigating cash crops like sugarcane and over-extraction of water by farmers at the head of the canal are some examples cited for such inefficient and inequitable irrigation water use.

Some of the stakeholders representing the farmers expressed that investments required for farm-level efficient irrigation system are huge and hence the beneficiaries of water reallocation should be forced to provide financial support for efficiency improvement in the irrigation sector. The huge transit losses in the canal system are also something that the government needs to address on priority.

5.4 Delay in Completion of Irrigation Projects

It is found that water has been reallocated from incomplete irrigation projects. As the region experiences urban and industrial development, there is a tendency to revise the original water allocation plan to accommodate the demands of the non-irrigation sector. Very often the canals are curtailed due to

reduced allocation to irrigation. Some farmers and their representatives felt that if the government completed the project and farmers started to irrigate their lands, then reallocation could face huge opposition by the farmers. Therefore, projects were intentionally delayed. Also, such a delay not only makes it easy to reallocate water, but also benefits industrialists who can acquire agricultural land at lower rates.

The counter-argument of the government officials is that farmers in certain projects like those in the Konkan region are not ready to give-up their land for constructing canals as they are not convinced about the benefits of irrigated agriculture. Due to smaller land holdings they are reluctant to allow construction of canals on their land. A similar argument is also made in case of reallocation of water from completed projects. In case of completed projects, the government argues that farmers do not demand irrigation water. Since the water remains unused the same is reallocated for non-irrigation use.

The farmers and their representatives argue that the government should be sensitive to the concerns and difficulties of such farmers. There is a need to address the concerns rather than taking extreme steps such as reallocation of water or indefinite delay in project completion. Farmers from the Hetavane, Amba and Surya projects have opposed industrial development and made demands for irrigation. In the case of the Surya project, the faulty canal system was responsible for the low demand for water for irrigation and not reluctance to take up irrigated agriculture. The struggles for land and water launched in opposition to various industrial projects also shows that the farmers have become aware of the importance of these natural resources and, hence, the government should facilitate removal of problems related to land acquisition for canals or lower demands for irrigation water arising due to various reasons.

5.5 Regional Developmental Imbalance and Water Reallocation

It is found that a large number of thermal power plants are proposed in the Vidarbha region of the state, which is considered as backward due to the delay in financial allocation for irrigation and other development programs. This has created a regional imbalance related to development in the state[15]. The backlog related to irrigation, termed as irrigation backlog, is the major concern of the people in this region. Hence, there is strong opposition from the region for the thermal power plants that would take away their agriculture land as well as irrigation water. The reallocation of irrigation water for these power plants is perceived as an attempt by the Government of Maharashtra, dominated mostly by the political leaders from western Maharashtra, to extract valuable resources from Vidarbha for the benefit of the already developed areas in the State. Certain sections of the people from Vidarbha also argue for separate statehood on the basis of this perception.

It is argued that the amount of power that will be generated from these plants is way beyond the requirement of electricity in the Vidarbha region. The plants will benefit big cities in Maharashtra and other states. Reallocation of water for this purpose at the cost of irrigation potential of the region is seen as inequitable from the point of view of regional developmental imbalance. This shows the importance of understanding and addressing the nexus between energy and water that has close association with water reallocation. Demands are being made for sourcing alternative renewable energies sources and efficient use of available power so as to reduce the reallocation related implications. But the government has not been able to adequately address these complex issues of regional imbalance associated with water reallocation.

15 The State of Maharashtra (Special Responsibility of Governor for Vidarbha, Marathwada and the rest of Maharashtra) Order, 1994 issued by the President of India under Article 371(2) of the Constitution of India has assigned the Governor of Maharashtra special responsibility for matters in respect of the areas of Development Boards for Vidarbha, Marathwada and the rest of Maharashtra. On 30 April 1994, the Governor of Maharashtra issued the "Development Boards for Vidarbha, Marathwada and the rest of Maharashtra Order, 1994" constituting separate Development Boards for the said three regions.

SECTION VI
Conclusion

As mentioned in the introduction, this paper presents the findings of the second component of a broader study undertaken on water reallocation in Maharashtra. The first component of the study, already published as a paper and a monograph, highlighted how the process of water allocation from irrigation to non-irrigation eventually became a process of 'water grabbing' (Wagle et al. 2012). The rationale for this being that water resources are appropriated by the powerful urban-industrial sector from the marginalized agriculture sector. In the light of this background work, the current working paper provides a detailed description of the processes, mechanisms and the individual contributing factors leading to water reallocation and the emerging phenomenon of 'water grabbing'. This is one of the most important conclusions of this study and needs to be understood in the context of the economic reforms taking place in the country.

These economic reforms and the consequent urban-industrial growth have severely strained the precarious water resources and, hence, the issue of water reallocation is becoming an area of major concern. The processes around planning, completion and operationalization of water projects provide insights into the complexities of this problem. The paper adopts the 'project life-cycle' approach to gain a deeper understanding of the phenomenon of water reallocation and grabbing. It shows how reallocation and grabbing is not just an outcome of specific decisions of the policy makers made to favor the urban-industrial growth, but also raises concerns on the rationale for the project. Such an approach reveals the political economy of these engineering projects and plans, which contribute to the process of reallocation and grabbing.

The only viable justification for public expenditure on such projects is the rationale for increasing the irrigation potential. However, this rationale was easily sacrificed to fuel the growth of urban-industrial centers in the aftermath of economic liberalization. Water was reallocated for non-irrigation use without any consideration given to the compensation and rehabilitation of affected farmers. This has been further compounded with the failure of the government to either complete the projects or ensure the efficient use of irrigation water. In the absence of any irrigation benefits there is hardly any opportunity for transition from irrigation-based livelihood to industry-based employment opportunities for reallocation affected people. This puts the 'reallocation affected people' in a similar situation to that of the 'project affected people'. Similarly, a failure in effective implementation of policies related to formation and empowering of irrigation water users associations indicates the lack of organized effort on the part of farmers to lobby for the protection of their water rights. Laws like the MWRRA meant for the protection of water rights of farmers have been rendered ineffective by policy makers. The various contributing factors presented in this paper provide evidence that water reallocation and the resulting phenomenon of resource grabbing are deeply embedded in the developmental and operationalization processes of water projects.

The project life-cycle approach related to reallocation pertains specifically to the projects in Maharashtra. A similar study in other states of India will help to develop a more generic understanding of project life-cycle associated with water allocation and reallocation. The case of Maharashtra highlights the relevance of understanding the implications on reallocation during the different phases of project development.

REFERENCES

Celio, M., Scott, C. A. & Giordano, M. (2010). Urban–agricultural Water Appropriation: The Hyderabad, India Case. *The Geographical Journal*, 176: 39–57.

Dharmadhikary, S. (2006). *The Fall and Rise of Big Dams. On the Brink: Desperate Energy Pursuits in South Asia*. At www.panossouthasia.org/pdf/OntheBrink05.pdf (accessed 29 May 2012).

Dixit, A. (1996). Inter-sectoral Water Allocation: A Case Study in Upper Bagmati Basin. *Proceedings of a Workshop on Water Rights, Conflict and Policy*, 22-24 January 1996, pp. 195-219. Kathmandu, Nepal.

D'Souza, R. (2008). Framing India's Hydraulic Crises: Politics of the Modern Large Dam. *Monthly Review Press,* 60(3): 8. At http: //monthlyreview.org/2008/07/01/framing-indias-hydraulic-crisis-the-politicsof-the-modern-large-dam (accessed 22 March 2012).

Joy, K.J., Gujja, B., Paranjpye, S., Goud, V. & Vispute, S. (Eds). 2009. *Water Conflicts in India: Million Revolts in the Making*. New Delhi: Routledge India.

Mehta, L., Veldwisch, G.J., & Franco, J. (2012). Introduction to the Special Issue: Water Grabbing? Focus on the (Re) appropriation of Finite Water Resources. *Water Alternatives* 5(2): 193-207

Molle, F. & Berkoff, J. (2006). *Cities versus Agriculture: Revisiting Intersect Oral Water Transfers, Potential Gains and Conflicts*. Comprehensive Assessment Research Report No. 10. Colombo, Sri Lanka: International Water Management Institute

Mollinga, P.P. (2008). Water, Politics and Development: Framing a Political Sociology of Water Resources Management. *Water Alternatives* 1(1): 7-23.

MWRRA. (2012). *Approach Paper on Criteria for Determination of Bulk Water Tariff 2013-16*. Maharashtra Water Resources Regulatory Authority: Mumbai.

Nayak A.K. (2010). Big Dams and Protests in India: A Study of Hirakud Dam. *Economic and Political Weekly* 45(2): 69-73. At www.indiawaterportal.org/node/22591 (accessed 27 March 2012).

Singh, S. (2002). Taming the Waters: The Political Economy of Large Dams in India. New Delhi: Oxford University Press.

Shah, Z. and Kumar, M.D. (2008). In the Midst of the Large Dam Controversy: Objectives and Criteria for Assessing Large Water Storages in the Developing World. *Water Resource Management* 22(12): 1799-1824.

Wagle, S., Warghade, S. & Sathe, M. (2012). Exploiting Policy Obscurity for Legalising Water Grabbing in the Era of Economic Reform: The case of Maharashtra, India. *Water Alternatives*, 5(2): 412-430.

Warghade, S., Sathe, M. & Wagle, S. (2013). *Water Grabbing in Maharashtra: Analysis of Water Reallocation Decisions and Amendments in MWRRA Law*. Monograph. Pune: Prayas.

Warghade, S., Sathe, M., Khebudkar, A, & Wagle, S. (2011). *Reallocation of Irrigation Water for Non-irrigation Purpose: Case Studies of Different Irrigation Projects in Maharashtra*. Pune: Prayas (unpublished).

WCD (World Commission on Dams). (2000). *Dams and Development: A New Framework for Decision-Making. The Report of The World Commission on Dams*. UK: Earthscan Publications.

ANNEXURE 1
Occurrence of Different Processes Observed in Particular Case Studies

Sr. No.	Stages of Project	Name of Irrigation Project															
		Amba	Surya	Hetavane	Lower Venna	Gosikhurd	Pench	Upper Wardha	Hatnur	Girna	Jayakwadi	Vishnupuri	Bhama-askhed	Nira Deoghar	Khadakwasla	Gangapur	Nandur Madhmeshwar
Project Design and Completion phase																	
1	Detail project report (project plan)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2	Revision in project plan (change in physical design of project)	✓	x	x	x	x	x	x	x	✓	x	✓	x	x	✓	✓	✓
3	Project completion																
	3.1. Completion of construction of dam	✓	✓	✓	✓	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	3.2. Commencement of construction of distribution system	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	3.3. Opposition to land acquisition for canal	✓	x	✓	x	x	x	x	x	x	x	x	x	x	x	x	x
	3.4. Completion of distribution system	x	x	x	✓	x	✓	✓	✓	✓	✓	x	x	x	✓	✓	✓
4	Problems in access to water to 'Project Affected People'	x	✓	x	x	✓	x	x	x	x	✓	x	✓	✓	✓	x	x
5	Delay in completion of project affecting irrigation	✓	✓	✓	x	✓	x	x	x	x	x	✓	✓	✓	✓	x	x
Pre-reallocation Water Utilization Phase																	
6	Irrigation water utilization	✓	✓	✓	✓	x	✓	✓	✓	✓	✓	✓	x	✓	✓	✓	✓
7	Formation of Water User Associations	x	✓	x	x	x	✓	✓	✓	x	✓	x	x	x	✓	✓	✓

Sr. No.	Stages of Project	Name of Irrigation Project															
		Amba	Surya	Hetavane	Lower Venna	Gosikhurd	Pench	Upper Wardha	Hatnur	Girna	Jayakwadi	Vishnupuri	Bhama-askhed	Nira Deoghar	Khadakwasla	Gangapur	Nandur Madhmeshwar
Reallocation Phase																	
8	Urban-industrial development (affecting water allocation)	✓	✓	✓	✓	✓	✓	✓	✓	x	✓	✓	✓	✓	✓	✓	✓
	8.1. Zoning (declaration)	x	x	✓	✓	x	x	✓	x	x	x	x	✓	✓	x	x	x
	8.2. Actual development (Government initiated)	✓	x	x	✓	✓	x	✓	✓	X	✓	x	✓	✓	✓	✓	✓
	8.3. Market based development (not government initiated)	✓	✓	✓	✓	✓	✓	✓	✓	x	✓	✓	✓	✓	✓	✓	✓
9	Change in land use pattern in command	✓	✓	x	x	x	x	x	x	x	x	x	✓	x	✓	✓	x
10	Change in size of command area	✓	✓	✓	x	✓	x	x	✓	x	x	✓	✓	x	✓	✓	x
11	Pre High Power Committee Diversion	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
12	Reallocation of water during existence of High Power Committee	✓	✓	✓	✓	✓	✓	✓	x	✓	x	x	✓	x	✓	✓	✓
13	Reduction in total water availability	x	x	x	x	x	x	x	✓	✓	✓	✓	x	x	x	✓	✓
Post-reallocation conflict phase																	
14	Agitations by farmers against reallocation	✓	✓	✓	x	x	✓	✓	✓	x	✓	✓	✓	✓	✓	✓	✓
15	Legal action by farmers against reallocation	x	✓	x	✓	x	✓	✓	x	x	✓	x	x	✓	x	x	✓
16	Cognizance by government towards demands of the farmers	✓	✓	x	x	x	x	x	x	x	✓	✓	x	✓	x	✓	x

Sr. No.	Stages of Project	Name of Irrigation Project															
		Amba	Surya	Hetavane	Lower Venna	Gosikhurd	Pench	Upper Wardha	Hatnur	Girna	Jayakwadi	Vishnupuri	Bhama-askhed	Nira Deoghar	Khadakwasla	Gangapur	Nandur Madhmeshwar
17	Adaptation by reallocation affected farmers	✓	✓	x	✓	x	x	x	✓	✓	✓	✓	✓	x	✓	x	x
18	Alternatives or restorative actions by government (for irrigation)	x	x	x	x	x	x	x	x	x	x	✓	x	x	✓	✓	x
Entitlement Phase																	
19	Distribution of entitlements	x	x	x	x	x	x	x	✓	x	x	x	x	x	x	x	x

Notes: ✓ - Denotes presence of the influence of particular process aspect,
x - Denotes absence of the influence of particular process aspect

ISSN 2320–1894

February 2013

Subodh Wagle is Professor and Chairperson of the Centre for Water Policy, Regulation and Governance in the School of Habitat Studies, TISS. He is also a Group Coordinator and Trustee of Prayas (Initiatives in Health, Learning and Parenthood), a non-governmental organisation based in Pune. He teaches public policy and theory of regulation to masters students of School of Habitat Studies in TISS. His career, over a period of about twenty years, spans across grassroots-level work in rural areas, policy analysis, and advocacy. Specific areas and themes of his academic work are: sustainable livelihood discourse and perspective, people-centered governance perspective, politics of electricity sector reforms, water sector reforms and regulation, and development schemes of the government. He holds a B.Tech. degree from the Indian Institute of Technology (IIT) Bombay and a Ph.D. in Public Policy from the College of Urban Affairs and Public Policy, University of Delaware, USA.

Sachin Warghade is Assistant Professor at TISS and teaches public utility regulation and regulatory analysis for master students of regulatory governance and water policy. He has worked in the field of agriculture, disaster management and water policy during his decade long association with Prayas, Pune. Currently, he is studying the evolution and functioning of independent regulatory authorities in India with specific focus on water regulatory authorities. He was a member of the Planning Commission's XIIth Plan sub-group for development of 'Model Bill for State Water Regulatory System'. He was a Fulbright Fellow at Washington University in 2011–12. He holds B.E. and M.B.A. degrees from the University of Pune.

Mandar Sathe is Senior Research Associate in Prayas, Pune. He has been working on the issue of water regulation for the last five years. He has contributed in several public interest submissions and petitions filed before the Maharashtra Water Regulatory Authority. He is currently leading a project on water regulation in Prayas. He holds an M.Tech. in Technology and Development from the Centre for Technology Alternatives for Rural Areas (CTARA) of IIT Bombay.

Tata Institute of Social Sciences
V.N. Purav Marg, Deonar, Mumbai 400088 • **www.tiss.edu**

Published by S. Parasuraman, Director, Tata Institute of Social Sciences, and
Printed at Mehta Printing Press, Ghatkopar (East), Mumbai.