INSTITUTIONAL AND POLICY REFORMS IN WATER SECTOR IN INDIA: REVIEW OF ISSUES, CONCEPTS AND TRENDS

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Abstract

The paper looks at the institutional and policy reforms in the context of sources and uses of water. Although the reform measures have been specific about surface water, there still is ambiguity on the groundwater situation in India. The reforms have failed to de-link the conventional linkages between right to land and right to (ground) water. Most policy reforms have been in response to the emerging crisis of water allocation, use and management. The current perspective towards water has been holistic in nature in contrast to the excessive importance to techno-engineering approach that characterized the earlier period of water sector. Further, there have been changes acknowledging the rights of farmers, women and end-users as stakeholders in the whole process of water governance. In this regards, the policy changes have proceeded hand in hand with other reforms in decentralized governance, providing greater emphasis on user participation in decision making concerning water governance.

1. INTRODUCTION

During the last one decade or so, water scarcity has emerged as one of the important themes in discussions about the socio-economic future of the world. There had been enough evidence to indicate that by 2025, nearly 1.4 billion people, amounting to a quarter of the world's population or a third of the population in developing countries, are destined to face absolute water scarcity (Cosgrove, 2003; Rosengrant, Kai and Cline, 2002; Seckler et al., 1999). The human consequences of such water scarcity, besides the environmental deterioration of water bodies, would be, what is now being termed as 'water poverty', indicating the difficulties that human kind would face in procuring adequate and reliable access to safe water for productive and consumptive purposes (see, Shah and Koppen, 2006). Further, the population projections indicate that over the next 25 years, food will be required for another two to three billion people, creating additional stress on demand for water. Irrigated agriculture, which at present consumes more than 70% of all water withdrawals, is estimated to increase another 15-20% to feed the growing population of the world (GWP, 2000). This ever increasing demand for water is likely to raise serious conflicts between utilization of water for irrigated agriculture and for other human and ecosystem purposes.

Besides population expansion, demand for water is ever increasing due to consequential effects of economic development and lifestyle changes. Over the years, there has been a substantial change in urban demand for water owing to industrialization and growth of population concentration. Further, the increasing urban water use involves the demand for better quality of water, along with the increase in quantity of water required. The demand for better quality of water in urban areas, however, involves a paradox (see, Saleth and Dinnar, 1999). On the one hand, the urban dwellers having a better lifestyle and greater political articulation, stress upon better quality of water besides the requirement of quantity. On the other hand, since growth of urban water demand means more residential sewerages and industrial pollution, every increase in urban water consumption, if not addressed properly, could lead to a deterioration of water quality. The challenges of water in terms of quantity are further magnified by the problems of deterioration of water quality in recent years. Deteriorating water quality caused by pollution, through dumping domestic, agricultural and industrial wastes

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into water bodies, also influences water usability downstream, and threatens human health and the functioning of aquatic ecosystems by reducing effective availability and increasing competition for adequate quantity of quality water.

Such being the seriousness of the problem in water sector, which till recently was commonly considered as being plentiful and a virtually free good, global discussions have exhibited varieties of view points about how best developing countries can cope up with this imminent situation. The emerging water scarcity, water conflicts at micro and macro levels, and deterioration of water infrastructures, in the recent decades, have resulted in greater policy attention being paid worldwide to institutional arrangements governing water resource development, allocation and management. The crisis in water sector, both in terms of quantity and quality, has also made explicit the inherent inadequacies of existing institutions in dealing effectively with new and emerging set of problems, which are not so much related to water resource development, rather to resource allocation and management. Such emerging problems in water sector now demand that the means and ways for water allocation, water management, and mechanisms for resolution of conflicts arising over them have to be either created or reoriented by updating the existing policies concerning water governance. Water administration and management have to now accommodate the increasing and much acknowledged role of end users associations, non-governmental and grassroots level organizations, women and self-help groups, and those promoting causes and concerns for environment. In a manner of speaking, as countries move from a state of water surplus to water scarcity, water institutions, which design rules for water resource development, allocation and management, have to reorient themselves to meet the ever emerging challenges. Such reorientation of water institutions to best suit the current situations and meet the emerging challenges and crises in water sector paves the way for water institutional reforms through out the world. To be more specific, most of the water institutions in India, being developed in a time of water abundance – especially during the colonial period – are becoming increasingly ineffective in addressing water challenges arising out of water scarcity. Consequently, institutional arrangements governing water sector are undergoing significant policy changes in the recent years.

While discussing about water sector reforms, a few fundamental questions arise, such as: what are the motivating factor behind water sector reforms, in which direction such institutional changes are heading, and what are the future implications of these institutional reforms for water sectors as a whole. While attempting to answer questions of this nature, the present paper aims to investigate the water sector institutional reforms in India. The broad objective of the paper is to analyze the trends, patterns, directions and implications of institutional reforms in the water sector in India. One of the important considerations of policy reforms in water sector is that of formation of water right arrangements, so that the water users can get an assured and secure claim over the resource. A secured right over water has significant bearing upon the resource as a whole, since an assurance that one will receive benefits from the resource will affect the incentives to invest and conserve the underlying resource (Bruns, Ringer and Meinzen-Dick, 2005). Hence, the paper seeks to investigate how the water sector reforms are working towards establishing water rights in the country by adopting a decentralized framework.

The methodology involves a review of published articles and unpublished documents on water sector in the country. The paper is divided into four sections. Following this introduction, the second section sets a ground for institutional arrangements in water sector and provides an analytical framework for analyzing water institutions and water rights. The third section describes the reform experiences of the water sector in India from a historical perspective. The fourth section then proceeds to generalize the water sector institutional reforms in India, bringing out its problems and future prospects for better water governance.

2. WATER SECTOR, WATER INSTITUTIONS AND WATER RIGHTS: AN ANALYTICAL FRAMEWORK

Water sector, from a broader perspective, may be considered to cover all issues concerning water from sources such surface, sub-surface, ground and recycled sources; along with other water related issues covering water and sewage treatment, management of costal and waterway engineering. However, the main focus on water sector, the policy changes of which this paper tries to analyze, is on the macro level issues of development, allocation and management of water at a national level. In order to understand the institutional arrangements in

water sector, it is apt to understand what institutions mean in the context of natural resource management, including water.

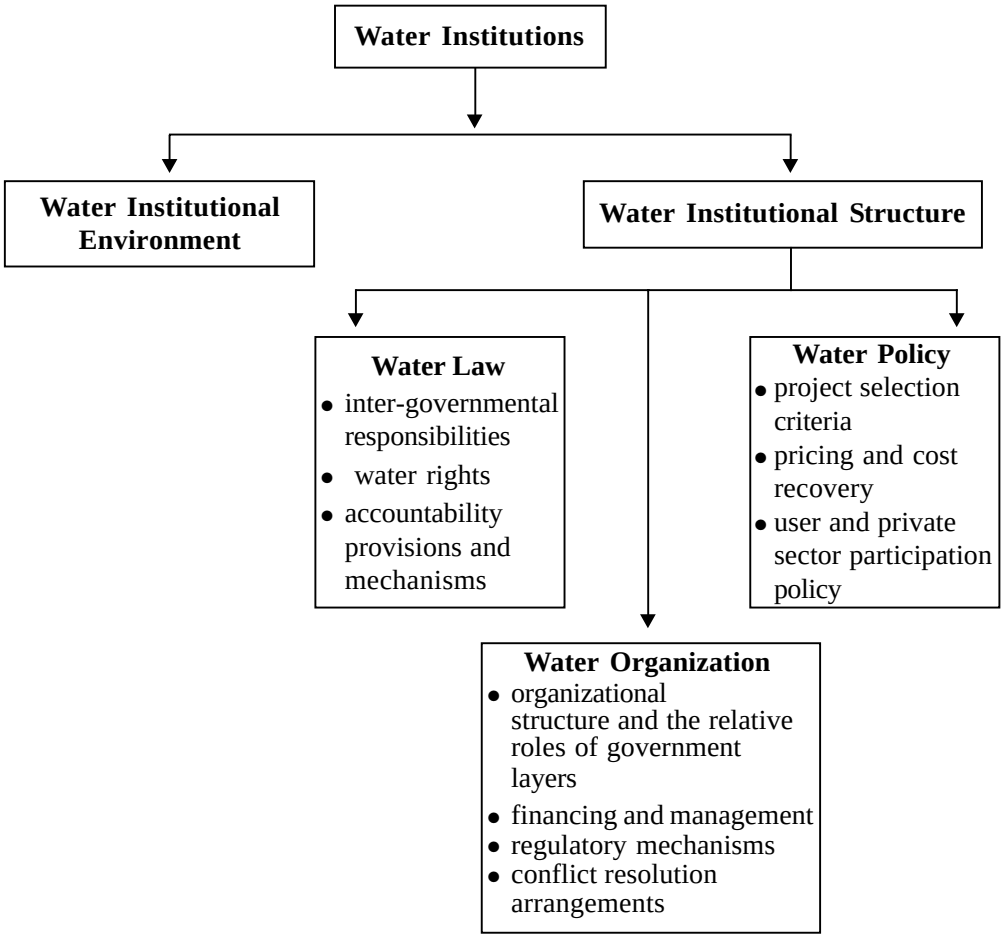
A study of institutions, in the context of natural resource management, focuses on the laws and conventions that either directly allocate resources, or establish processes and constraints for its members to make allocative decisions. Notwithstanding the casual use of the term 'institution' in our day-to-day life, it is mostly used in reference to rules, regulation, and prescriptions to behave in a certain way. It is often defined as rules about behaviour, 'especially about making decisions' (Rinker, 1982: 4) and about 'individual expression and choice' (Pllott, 1979: 156). Within the broader framework of the institutional economics literature, North (1991) defined institutions as humanly devised systems that structure the interaction of its members in social, economic and political arenas. As an organised and well-defined system, institutions constraint some behaviours and favour or facilitate others. They enforce sanctions negatively in the form of punishments when the prescribed set of rules are violated and positively in the form of rewards when such rules are complied. Institutions exist both as formal entities through constitutions, laws and well-defined property rights; and as informal agents through customs, traditions, norms, codes of conduct, social taboos etc.

In consistence with the understanding of institutions, as it is represented in the context of natural resource management and in institutional economics literature, water institutions may be conceived as something beyond the common understanding of institutions as mere organizations or associations. Water institutions may be conceptualized as an entity, which sets the rules and defines the action sets for decision making in the realm of water sector. Water institutions are the '… rules that together describe action situations, delineate action sets, provides incentives and determine outcomes both in individual and collective decisions related to water development, allocation, use and management' (Saleth and Dinar, 2005: 2). Water institutions are subjective and path dependent (see, Hodgson, 1998 and North, 1990). The subjective nature of water institutions stems from the fact that they are often constituted and also influenced by belief systems, behavioral habits and societal conventions. The path dependency nature of water institutions refer that their present status and future directions can not be separated from their earlier course and past history. Water institutions are also hierarchical in nature, being embedded within the cultural, social, political and economic context.

The New Institutional Economics (NIE) literature distinguishes between Institutional Environment and Institutional Arrangements (see, North, 1990). With respect to the water sector, the Institutional Environment would include various government agencies that directly or indirectly deal with water, international agencies dealing with water resources, and water related laws and policies of the states. Institutional Arrangements, in contrast, are the structure that humans impose on their dealings with each other' (North 1990). In the water sector, institutional arrangements would correspond to water markets, water co-operatives, water users associations, etc. (see also, Shah, 2005). Comparing these two aspects of institutions in water sector, we can observe that while the institutional environment functions at a macro level and represent the government's laws and policies, concerning development, use, allocation and management of water, the Institutional Arrangement function at a very micro level involving rules, practices, and conventions governing allocation and management of water at the grassroots level. In a similar fashion, Saleth (2004) distinguishes between institutional environment and institutional structure. While institutional environment is characterized by the overall physical, cultural, historic, socio-economic and political situation of a country or region, the institutional structure corresponds to the interactive effects of legal, policy and organizational or administrative components of government. The institutional environment of the water sector of a country or region would include factors determining the water situation of a country, along with other factors determining water resource conditions as well as to other water related sectors such as agriculture, environment, forest, and urban development. Likewise, the water institutional structure is defined interactively by aspects concerning water law, water policy and water administration.

Saleth and Dinar (1999, 2000, 2004, 2005), in their attempts to understand the innate nature and inherent features of water sector and water institutions, have developed the Institutional Decomposition and Analysis (IAD) framework, which becomes crucial to account for the recent reforms in the water institutions. As discussed above, water institutions, from a wider perspective, can be decomposed into water institutional structure and water institutional environment. Since the rules governing water institutions are formalized in terms of three inter-related aspects, i.e. legal framework, policy environment and administrative arrangements,

Saleth and Dinar, try to decompose the water institutional structure into three inter-related components: water law, water policy and water administration or water related organisations. These institutional components, which consists of both macro level (formal) and micro level (informal) arrangements, are further decomposed to highlight some of their major institutional aspects. Accordingly, the component of water law is decomposed to highlight factors like: inter-governmental responsibilities, water rights, and accountability provisions and mechanisms. Similarly, the water policy is decomposed to emphasise: project selection criteria, pricing and cost recovery, and user and private sector participation policy. Likewise, the organizational components of water institutions are decomposed to focus on: organizational structure and the relative roles of government layers, financing and management, regulatory mechanisms, and conflict resolution arrangements. Such a decomposition of water institutions can be depicted in the following figure.



2.1 Understanding Water Institutional Reforms

Since the rules governing water institutions revolves around three inter-related aspects, i.e. legal framework, policy environment and organizational framework, any attempts to introduce reform measures in the water sector require corresponding changes in water law, water policy and water organisations. The factors that influence water sector and bring changes in the above three main dimensions of water institutions are many with diverse origins and varying levels of impacts. These factors are also country-specific, depending upon the over all water institutional environment, and the degree of formalization of the water economy of a nation. Saleth and Dinar (2000, 2005), however, identify two broad factors, i.e., endogenous and exogenous, which account for the corresponding changes in three inter-related components of water institutional structure. While

the endogenous factors responsible for changes in water institutions are internal to both water institutional structure and water sector, exogenous factors lie outside the strict boundaries of both water institutional structure and water sector. These two factors capture the key features of the institutional environment and institutional structure, and the changes wrought out in them as response to societal demand and water sector crisis. While the endogenous factors correspond to physical and ecological problems of water sector, coupled with the crisis in its legal, policy and organizational frameworks, exogenous factors are mostly related to wider socio-economic problems, which influence the water institutional environment.

The endogenous factors that induce institutional changes in the water sector include water scarcity, emerging conflicts over water due to improper water laws and policy frameworks, financial and physical deterioration of water infrastructure affecting water resource development, and operational inefficiency of water organisations. Besides, the poor linkages between various components of water institutional structure (i.e. water law, policy and organisation) also forms an endogenous factor, since the performance of water institutions depends very much upon these linkages between these water institutional components (see, Saleth, 2004). The exogenous factors resulting in water institutional reforms are related to demographic growth and mounting pressure on water resources for fulfilling the increased targets of food production, economic development and technological pressure resulting in greater demand for water, reforms in the spheres of economy and polity, international pressure and commitments for ensuring sustainability, natural calamities concerning water, such as flood and drought, and changing socio-political values for ensuring equity, inclusion and justice. The exogenous factors, therefore, include the over all environment within which the water sector and water institution functions. Notwithstanding the independent impacts, these factors have upon water sector and water institutions; it is the synergy between these endogenous and exogenous factors, which determines the structure and pace of institutional changes within water sector.

The endogenous and exogenous factors of institutional change are inter-related phenomena, and do not operate in isolation, since they influence each other. For example, the exogenous factor of socio-economic and technological development puts additional pressure on water withdrawal and form the basis for water scarcity and conflicts over water. Similarly, the international pressure and commitment for sustainability may be understood as a response to water scarcity, which forms one of the endogenous factors. The inter-connectedness of these two factors makes it difficult to understand the individual roles of these factors, and thereby generalize the impart of these factors upon the pace and direction of water institutional changes. The institutional transaction cost theory, in the New Institutional Economics literature, however, tries to understand the direction and pace of institutional change by linking factors for institutional change into transaction cost and opportunity cost (see, North, 1990; Saleth and Dinar, 2004). The transaction cost of water institutional changes corresponds to the real economic and social costs of inducing changes in the water Institutional structure. In contrast, opportunity costs in the context of institutional change may be refereed to as the opportunities lost because of changes in status quo. The transaction cost theory of institutional economic literature predicts that institutional changes occur only when the transaction costs of inducing changes in institutional framework becomes lesser than that of the opportunity costs.

Extending this institutional transaction cost argument to the water sector, we may find that while the transaction cost of water institutional changes include both real and monetary costs of altering the regulatory, monitoring and enforcement mechanism related to water development, allocation and management. Similarly, the opportunity costs in water sector may include real and economic values of opportunities foregone, or the social costs of the status quo. These opportunity costs are also the benefits of water institutional reforms in the sense that, in the absence of changes in the existing water institutions these benefits can not be gained. Several studies have estimated the opportunity costs in the water sector and the expected gains from changes in water institutions or particular components of water institutions (see, Frederikson, 1992; Picciotto, 1995; Saleth, 1996; Gazmuri and Rosegrant, 1994).

Rather than being a one time affair, water institutional reforms are continuous and gradual changes over time in response to the factors identified above, depending upon the costs and benefits of reform. Since the water institutions are path dependent, the benefits from the earlier reforms smoothens the prospects for further reforms in the water sector. Saleth and Dinar (2004), in their attempts to study the pace of institutional changes

in water sector, have developed a stage-based perspective of institutional change. They identify four main stages of water institutional changes, which progress as a circular process, and are mediated by information and learning, political lobbying and bargaining, organizational power and politics, and behavioural changes and performance expectations (see also, Saleth and Dinar, 2005). The first stage of water institutional changes correspond to 'mind changes' among individuals, which occur from subjective and objective evaluation of current water situation and water crisis, information feedback and learning experiences they gain from existing institutions and ongoing changes. The second stage of water institutional changes is that of 'political articulation', where intense political debates, bargaining, campaigning and counter-campaigning take place before arriving at a political agreement about details of the institutional change. The third stage is that of 'institutional change', where agreed upon changes are implemented. This stage is the most crucial stage in water institutional reforms, since, at this stage, there is every possibility of differences occurring over reform implementation and actual changes, due to financial, organizational and administrative constraints. There have been many instances where, reform implementation is reduced to procedural changes with policy declarations, creation of new organisations or remodeling earlier ones, without any actual or real changes taking place. The fourth and final stage of water institutional changes relate to actual impact of the changes implemented in stage three.

Identification of these stages of institutional change in water sector does not, however, mean that water institutional reform is a linear and unidirectional process. In the process of reform, the institutional changes may proceed to the next stage, or remain constant in one stage for a longer period, or even revert back to the previous stage, depending upon the suitability of the over all environment for reforms. Institutional change is always slow, evolutionary and continuous, sometimes involving a time gap between the implementation of reforms and the actual gains out of such reform processes. While the implementation of reforms exhibits itself in substantial behavioral as well as organizational changes, the real impact of reforms depends upon the speed and amount of influence these changes have upon allocation, use and management of water.

2.2 Understanding Water Rights

Water rights or rights to access and use of water form a crucial issue in water resource management. Water rights pertain to the micro level aspects of water sector, since these are related to water allocation and use. Water rights are determined by water allocation institutions at the local level. The institutional reforms at the macro level influence substantially the micro level decisions regarding use and allocation of water. The reform process, which calls for an inclusive, participatory and equitable water management with accountable institutional arrangements, results in establishment of new forms of water rights at the micro level. When water was abundant, establishment of water rights never formed a matter of discussion in water governance. However, with the increased scarcity of water, and the emerging conflicts, establishment of rights over water has become crucial.

In order to understand water rights, we have to inquire into the concept of property rights. Property rights can be defined as 'the claim, entitlement and related obligations among people regarding use and disposition of a scarce resource' (Furubotn and Pejovich, 1972). Bromley (1992: 2) defines property as 'a benefit or income stream', and property rights as 'a claim to a benefit stream that some higher body — usually the state — will agree to protect through the assignment of duties to others, who may somehow interfere with the benefit stream'. Thus, property right is, rather, a social relation that defines the rights of the property holder to the resource in relation to others who have a corresponding duty to respect that right. Property rights over a resource may include ownership rights, use rights of access and withdrawal, and decision-making rights to manage the resource, and exclude and alienate others accessing the resource (see, Schlager and Ostrom, 1992; K. and F. von Benda-Beckmann and Spiertz, 1996; Rout, 2005).

In agreement with the concept of property right, water rights may be defined as a secured and assured claim over access to water, which is usually backed by other agencies, including the state, coupled with corresponding responsibilities of others to accept that claim. A secured claim over water matters a lot, since the assurance that one will receive benefits from the resource in future, affects the future incentives to invest in the resource and conserve the underlying resources. Since water rights are related to allocation and reallocation of

water at the field level, several alternate institutional regimes for water allocation, specifying the rights over water can be identified. Water rights regimes for water allocation may be understood as a specific kind of institutional arrangement of property right over water, which defines who will have rights to access to water and who will not. Water rights regimes structure the relationships between two or more individuals (or groups) in the sense that while, on the one hand, it ensures the interests of one party over water by assigning 'rights' over the resource, on the other hand, it makes obligatory on the part of the other party to respect that right by means of 'duties' towards that secured claim or 'rights'. In other words, water rights regimes make one's claims over water secure by establishing 'property rights arrangements', which is respected by those who are outside such arrangement, and also is protected by state or some higher authority of law.

Property rights regimes are broadly classified as public, private and common property, based on who hold the right (see, Bromley, 1992, 1999; Bromley and Cernea, 1989). In public property, the state holds the absolute right over the property, in private property, individuals or corporate houses hold the rights over property, and in common property, rights are held by a group of people together. In congruence with property rights regimes, institutional arrangements establishing water rights for water allocation and reallocation can be grouped into three broad types: user-based allocation, agency allocation and market allocation (Meinzen-Dick and Mendoza, 1996; Meinzen-Dick and Rosegrant, 1997; Bruns and Meinzen-Dick, 2005). In user-based allocation, water users join together to coordinate their actions, managing water as a form of common property. In agency allocation, water is treated as public property and the state holds absolute rights over water for deciding who does and does not receive water in accordance with bureaucratic procedures. In market allocation, which corresponds with private property, water may be allocated through private transactions, with users trading water through short or long-term agreements. The distinction between water rights under user-based allocation regime and that of market-based allocation is that, while in the former the water users enjoy use and decision making rights over water, which are backed by the state, in the case of market allocation, the individuals hold ownership, use and decision making rights over water. The ownership rights over water in the case of user-based allocation are retained by the state in principle. Possession of such ownership rights in the case of market-based allocation, generates tradability rights over water, and consequently water markets in the field level.

3. INSTITUTIONAL REFORMS IN THE WATER SECTOR OF INDIA

As discussed in section one, institutional changes in water sector have been largely a response to the emerging crisis in water resource development, allocation and management. The crisis, partly, has arisen because of failure of the existing institutional arrangements to cope up with the emerging situations of water scarcity and the increased demand for both quantity and quality of water. Often factors outside the purview of water sector, such as population pressure, economic development, economic and political reforms, etc. have contributed to the crisis in the water governance, resulting in greater pressure for inducing institutional reforms in water sector. In the recent years, public policy formulations in India have responded to such crisis by introducing institutional reforms in water sector. Though the success and pace of these institutional reforms in water sector have been ambiguous, yet, it is possible to draw some inferences regarding the nature, trend and direction of such changes. Keeping this in mind, the present section attempts to highlight the Indian experiences of the on-going process of reforms in the water sector.

India is the world's largest peninsula, second most populous country and seventh largest country, covering a geographical area of 3,287,590 km^2. The two main sources of water in India are rainfall and snowmelt of glaciers in the Himalayas. In 1990, the total water withdrawal was estimated at 500 km^3, of which nearly 92% are consumed for agricultural purposes, 5% for domestic purposes and remaining 3% for industrial purposes.

Drawing upon the arguments done in the conceptual section, we may explore the structure of water institutions in India by highlighting its three inter-related components: water organisation, water law and water policy.

3.1 Water Organization in India

The organizational aspects of the water institutional structure in India can be explained by highlighting the important agencies in the water sector. The Union Ministry of Water Resources (MoWR), which evolved from the department of irrigation under the Ministry of Agriculture is the national organization for over all planning and management of water resources in the country. The technical support to the ministry comes from important agencies working under it, such as Central Water Commission, Central Ground Water Board, and National Water Development Agency. Several research organisations including the Water and Land Management Institutes provide the research support to the Union Ministry of Water Resources. There are also important organizational arrangements, like National Water Resources Council (NWRC) and National Water Board (NWB) for inter-state and centre-state coordination. The NWRC, created in 1983, is an important policy making agency in Indian water sector, chaired by the Prime Minister, and includes the Union Minister for Water Resources and the chief ministers and governors of all states and union territories. The NWB is the executive arm of NWRC, and is chaired by the secretary of the MoWR and includes chief secretaries of all states, secretaries of the concerned union ministries.

3.2 Water Law in India

Although India does not have any separate and exclusive laws regarding water, there were water related legal provisions dispersed in various irrigation acts, central and state laws, constitutional provisions, etc. The federal political structure of the country resulted in creation of dual institutional structures in India. Most of the water resource development responsibilities and legislative powers are with the state governments as per the Entry 17 of the State List under Seventh Schedule of Indian constitution. However, the central government also has certain indirect power because of its role in project clearance, resolution of inter state water disputes, and control over several technical organisations. The central government also has regulatory roles in the water sector vide Article 252, which is related to inter-state water projects, and through the Forest Conservation Act, 1980, which requires the states to get central government clearance for executing ecologically sensitive water projects. More so, the central government has an important role in resolving inter-state water disputes as per the provision under Article 262 of the Constitution of India, and the Inter-state Water Disputes Act of 1956 (Saleth, 2004).

3.3 Water Policy in India

Most of the water related laws were either passed during the colonial period or were the amended versions of colonial law, and were outdated due to their inability to correspond to the newly created water demands and water crisis. The drought of 1987, coupled with the macro economic crisis of the late 1980s have led to some policy changes in the water sector in India. While the National Water Policy of India, which was formulated in 1987 was a response to the water scarcity due the drought situation, the reduced water sector investment caused by impact of the economic crisis of the 1980s has forced many states to raise internal resources through better cost recovery and external resources through mobilization of private funds (Saleth and Dinar, 2000).

The main goals of the National Water Policy (1987) of India are the promotion of conjunctive use of water from surface and sub-surface sources, supplemental irrigation, water conserving crop-patterns, and irrigation and production technologies. The policy has called for increase in canal irrigation water rates and promotion of user participation in canal water management (GoI, 1987). Although the water policy of 1987 has recognized the need to limit individual and collective water withdrawals and user participation in water management, it has failed to identify the institutional mechanism of such (Saleth, 2004).

The 1987 Water Policy made it explicit that water is a vital natural resource, and its effective management is crucial for livelihood and environmental security. Recognizing this, the National Water Resources Council (NWRC), the apex body of policy making in the water sector, amended the water policy and adopted the new National Water Policy in the year 2002 (see, GoI, 2002). The new National Water Policy, 2002 calls for a

regulation of ground water extraction so as not to exceed the recharging potential. There has been an urge for integration of water-use and land-use policies. In a remarkable departure from previous policy, the policy of 2002 introduces participatory approach to water resource management in the field of irrigation. The policy makes an attempt to maintain the quality of water and prevent environmental pollution. Finally, the policy calls for appropriate changes, reorientations and reorganization of water institutions, in order to give effect to the planning, development and management of water resources (see, Rout, 2002).

In line with the New National Water Policy, 2002, several state governments have also amended their state water polices paving the way for user participation in management. Although many states have attempted to involve users in water distribution, cost recovery and system maintenance, the extent of actual Irrigation Management Transfer is insignificant except in some individual state experiences such as Andhra Prades, Tamil Nadu, and Orissa. Incidentally, these states under the financial assistance from World Bank through the Water Resource Coordination Projects, have not only restructured their water administration and amended their water policies, but also have made significant progress in promoting user participation in water management (Saleth and Dinar, 2000).

4. COMMON TRENDS AND PATTERNS IN WATER INSTITUTIONAL REFORMS

The institutional changes in the water sector of India discussed in the above section provide us with a scope to highlight the commonalities in such reforms in the water institutions and water sector. These commonalities correspond to changes in orientation of water management, involvement of farmer communities in management and decentralisation, establishment of water rights defining rights to access to water.

From Water Resource Development to Water Resource Management

The reform process in water sector has resulted in a fundamental shift in orientation, i.e. from water resource development to water allocation and management. This paradigm shift in water sector required a radical reorientation of the water institutions. The pre-reform era was characterized by structural engineering approach for development of water, with little or no emphasis on allocation of such water at the field level. The large-scale irrigation projects through construction of bid dams reflected the civil engineering dominance in the water sector in the periods prior to reform. However, the reform policies of recent times emphasised upon the allocation of water at the field level and the required institutional arrangements for its effective management. The Participatory Irrigation Management policies through Irrigation Management Transfer and/or Pani Panchayat Institutions in India indicate the shift in trend towards water management from water development.

4.1 Farmers' Participation in Water Management through Decentralized Institutional Structure

One of the central themes of water institutional reforms in India has been acknowledgement of farmers as stakeholders in the resource and ensure their participation in management of use and allocation of water. The shift in orientation from water development to water management, have brought into focus the potentials of decentralized institutional structures. The centralized management policies do not find place in the newly emerged paradigm, which requires decentralized institutional arrangements for promoting social justice and sustainability of the resource. The functional distinction between centralized mechanisms needed for coordination and enforcement and the decentralized arrangements for user participation and water allocation have been widely acknowledged as a result of the reform process.

The over all financial crisis and deteriorating of the irrigation system have resulted in recognizing farmers as indispensable partners and stakeholders in irrigation management, and their role in water allocation, fee collection and maintenance of irrigation infrastructure was recognized both in principle and practice. The Participatory Irrigation Management (PIM) through Irrigation Management Transfer (IMT) and Pani Panchayat Institutions aim at transferring managerial responsibilities including cost recovery, and operation and maintenance, to formal Water User Associations, forms the main mode of decentralisation in irrigation sector. The new National Water Policy of 2002, in its item 12 states that management of the water resources for diverse uses should incorporate a participatory approach; by involving not only the various governmental agencies but also

the users and other stakeholders, in an effective and decisive manner, in various aspects of planning, design, development and management of the water resources schemes. However, implementation of such a participatory approach practically requires necessary legal and institutional changes at various levels. In this regard, the policy envisions involvement of Water Users' Associations and the local bodies such as municipalities and gram panchayats in the operation, maintenance and management of water infrastructures.

4.2 Water Pricing, Cost Recovery and Issues of Privatisation

One of the controversial and often described as non-populists trends of recent reform processes in water sector of the country has been that of treating water as an economic good, which is said to have been pushed through international organisations like World Bank and ADB. Contrary to the popular view that water is a public and thus, free good, the new reform measures emphasise on accepting water as an economic good, and recognize the need for revising the water rates in the face of poor financial performance of the sector. The recent reforms in water sector demand full cost recovery of operation and maintenance expenses of providing water. The Eighth and Ninth Finance Commission recommended for recovery of operation and maintenance expenses, and the Tenth Finance Commission went a step further and set the target for recovery of one percent of capital cost besides full recovery of operation and maintenance. Further, the Irrigation Pricing Committee in 1992 recommended the recovery of not only full operation and maintenance cost and one percent of capital cost, but also one percent of depreciation cost (See, Saleth, 2004).

The private sector intervention in the water sector is said to be an outcome of poor performance of the sector, such as declining irrigation environment, poor financial performance and the privatization of the new public enterprises initiated by liberalization measures of 1990s. A high level committee was set up by Union Ministry of Water Resources in 1995 to look into the issues of privatization of water, which favored a gradual, selective and state-wise process of privatization of the irrigation sector. Further, the New Water Policy of 2002 also identifies private sector as a potential partner for water resources development and management. The policy in its item 13 states that 'private sector participation should be encouraged in planning, development and management of water resources projects for diverse uses, wherever feasible'. Private sector participation in the changing context is expected to help in introducing innovative ideas, generating financial resources and introducing corporate management and improving service efficiency and accountability to users.

4.3 Establishment of Water Rights

The water rights arrangements under the reform process have become a dynamic phenomenon. The reform process by emphasizing water allocation and farmers' inclusion in water management has specified property rights over water. Under the auspices of IMT, user based allocation has become an institutional alternative to agency based allocation. Further, with provisions for private sector investment in water sector, reforms are also paving the way for market based institutional alternative for water allocation. Water rights have got wider connotations in the wake of reform programmes in water sector in India. Prior to the institutional reforms in water sector, under the top-down centralized model of water development, farmers were only possessing use rights over water, while the state retained with it the ownership and decision making rights. Further, when and how these use-rights will be exercised by the farmers was also to a greater extent influenced by the state. However, with the changes in water management orientations and priorities, farmers are supposed to possess all the three property rights, i.e. use, ownership and decision-making. The IMT process relies on WUAs, and extends all the above three water rights to farmers. Though the state retains with it the *de jure* ownership rights over water, the *de facto* ownership rights are now vested with the farmer, who by virtue of his membership to WUA gains access to the water.

The newly established water rights as a result of the reform measures have heralded several impacts both for the farmers' groups as well as water governance in India. To begin with, it has enhanced farmer groups' access to water with most of the irrigation programmes being designed on a participatory framework. At a larger level, such a right over water may be said to work towards empowerment of farmer communities, who now have got a voice over decision making pertaining to water governance. Further, water governance

has got a bottom up makeover with inclusion of end-users in the matters relating to water resource development, allocation and management.

4.4 From Sectoral to Integrated Approach to Water Management

The pre-reform period in water sector was dominated by sectoral approaches to water, with little scope and platform for inter-sectoral communication. However, the recent policy changes in water sector call for integrating the sectors and agencies relating directly or indirectly to water sector. Therefore, the new National Water Policies of India call for integrating land-use policies with water-use policies. As a consequence, Integrated Water Resources Management (IWRM) has emerged as the dominant paradigm in the water sector. At policy level, Indian water sector is in the process of developing a National Water Plan for providing a technical framework needed to promote IWRM and integrated perspective to water resource management.

4.5 International (donor agency) pressure as a source of change

The endogenous and exogenous factors of institutional change had both long term and immediate impact respectively upon the change process in water sector in India. While crisis in water sector in terms of water scarcity, flood, and drought have been long term and evolutionary causing institutional change in water sector, the immediate factor resulting in such changes has been exogenous in nature. For instance, the impact of the economic crisis of 1980s may have forced India to come out with reform measures for recovering operation and maintenance charges from the farmers by increasing irrigation fee. One of the most important immediate factors contributing towards institutional reforms in water sector has been the intervention, influence and pressure from international agencies. The international lending agencies such the World Bank, Asian Development Bank, and USAID and technical organisations like IWMI and FAO have exercised profound influence on the water sector of the country and have acted as crystallizing factors for water institutional reforms. The World Bank assisted programmes, in irrigation management for instance, have emphasised farmers' participation in project design and implementation, thereby, paving the way for policy reforms favoring greater inclusion and participation by farmers' groups. Such policy reforms have generated new institutional arrangements, e.g. Water Users' Associations, at grassroots level which have operationalized participation in water governance in India. Similarly in donor agency aided drinking water programmes too, community's participation in project design, implementation, and operation and maintenance have been conceived as an integral part.

5. CONCLUSION

Since its evolution, human society has encountered many challenges, and has accordingly experienced corresponding changes to over come those challenges. However, what is important is that the speed in which the world has changed over last few decades has been unprecedented compared to earlier times. In the water sector too, there has been a profound change over the last couple of decades concerning water demands and priorities owing to corresponding changes due to globalisation, technological change, relentless competition for economic growth, rapid increase in population, etc. Thus, water policies and institutions of current times have to be significantly different from the policies, strategies and institutions that were previously in practice to meet the emerging challenges. India has accordingly approached the institutional changes in water sector in a positive manner and has under taken several policy and institutional changes. The present paper attempted to underscore such attempts, while at the same time carried out a conceptual review of terminologies like water sector, water institution and water rights arrangements.

Water sector, for all analytical purposes, was conceptualized as an umbrella term consisting of all issues concerning water from various sources, and the issues related to generation, withdrawal and governance of water. However, the important issues that were identified in water sector were macro issues concerning development, allocation and management of water at a national level. A study of institutions, in the context of natural resource management, focuses on the laws and conventions that either directly allocate resources, or

establish processes and constraints for its members to make allocative decisions. Arguing in a similar fashion, the paper tried to conceptualise water institutions as an entity, which sets the rules and defines the action sets for decision making in the realm of water sector. Having carried out a conceptual analysis of water sector and water institutions, the paper proceeded further to describe the Indian experiences with respects to changes that were wrought forward in the water institutions and several common trends and perspectives were identified in the whole process of water institutional changes in the country.

Before concluding the paper, it is apt to mention about institutional and policy reforms in the context of sources and uses of water. Even though the reform measures – whether the National Water Policy, 1987 or the New National Water Policy, 2002 – have been specific about surface water, there still lies much ambiguity concerning the ground water situation in India. More specifically, the reforms have failed to de-link the conventional linkages between right to land and right to (ground) water. As a result of which the poor and land-less person's right over and access to ground water remained far from being realised. Further, in the absence of specific withdrawal limits of ground water, the sustainability of the resource has remained a question mark. Although the New Water Policy recognized the need for limiting individual and collective (ground) water withdrawals, it has, however, failed to identify the institutional mechanisms necessary for defining and enforcing such physical limits. This is definitely a matter of serious concern, given that ground water aquifer, unlike land resources, is a continuous one, where one persons withdrawal affects the chance of access and use of the other. With respect to sources of water, the National Water Policy of 2002 has attempted to prioritize water uses, with drinking water being accorded the first preference.

To conclude, the paper identified that there has been substantial change in the perspective in which water sector is approached in the country. To be precise, the country has experienced a change from water resource development perspective to that of water resource management. The current perspective towards water has been holistic in nature in contrast to the excessive importance to techno-engineering approach that characterized the earlier period of water sector. Further, there have been changes acknowledging the rights of farmers, women and end-users as stakeholders in the whole process of water governance. In this regards, the policy changes have proceeded hand in hand with other reforms in decentralized governance, providing greater emphasis on user participation in decision making concerning water governance. Finally, the paper identified that external pressure, especially from the donor agencies, has acted as an important catalyst in generating institutional changes in the water sector in India.

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