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Interrogating Institutional Interaction in Governing Water Resources: The Role of *Pani Panchayat* in Odisha

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Introducing the discourse

Since the inception of the human civilization, water as a form of natural capital, in addition, being most precious gift of nature is contemplated as an indispensable ingredient for the sustenance of various life-forms, such as human, animal and plant. In fact, it directly or indirectly influences every aspect of human activities; be it economic, political, social, ecological so on and so forth. However, the increasing population, their increasing demands and also technological breakthrough that emerged in late 20th century in the form of liberalization, privatization and globalization (LPG) has jeopardized the sustainability of water resources. Interactive or collaborative or participation is now an accepted model in the processes of governance of natural resources, like water. It has been strikingly enshrined in National Water Policy, 2002, which states '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'. In this context, the implementation of the Orissa Pani Panchayat (PP henceforth) Act 2002, initiated by the Government of Odisha, one of the initiatives in the processes of institutional reforms in water management, has strongly encouraged the role of farmers in the form of Water Users' Association or *Pani Panchayat* in water especially irrigation management. With this brief introductory note, the present piece of research seeks to delineate various institutions – in the form of various policies, laws, governmental (Water Resource Department) as well as non-governmental (water users associations) institutions – in governing this threatened water resource.

Water: its use and abuse

Water is most commonly used commodity and most widely distributed resource of the 'Mother Earth'. The earth is otherwisely known as 'the blue planet' since the major portion of earth is covered with water (Tiwari and Tiwari, 2003). It is well-known fact that 97.5 per cent of the total available water is salt water that has been contained mainly in oceans; only 2.5 per cent of water is fresh water. In this context, with 2.4 per cent of world's land area and 4 per cent of its fresh water, India has to support 70 per cent of the world's human population and 18 per cent of its cattle population (Sekhar, 2003). Enormous quantity of water is required for meeting the basic human needs for life and health, such as for

production of food, shelter and clothing. Besides, as a gift of nature, water is also indispensable for human beings in order to accomplish different domestic as well as non-domestic activities (for example drinking, irrigation etc.). Furthermore, there is also an outsized demand for hydropower, industrial enterprises and even for maintaining environment and ecosystem (Das, 2003). Nevertheless, during 21st century the world encounters number of challenges affecting the availability, accessibility and sustainability of its fresh water resources. The challenges have been produced and reproduced by multitude forms of man-made innovations in science and technology. In fact, the technological breakthrough, widely considered as the ultimate creation of human knowledge system has largely propagated different 'modules' for various developmental projects. At the same time, this human innovation has caused the paralysis of the environmental as well as the ecological landscape of the world, particularly the developing world. This devastating innovating activities, no doubt show the way of progress in the society in one hand, in other hand leads to the process of degeneration (pollution of air, water, soil etc.) of environment as well as the ecosystem.

Water: Its mismanagement to institutional management

Water as a resource is under relentless pressure due to population growth, rapid urbanization and large-scale industrialization. As population increases and the level of development calls for increased allocations of groundwater and surface water for the domestic, agricultural and industrial sectors, as a result, the pressure on water resources intensifies leading to scarcity, shortage, conflicts among users and excessive pressure on the environment. Decreasing per capita water availability and increasing water

pollution are serious issues now-a-days. According to UN estimation in 1999, more than 1.2 billion people lacked the access to adequate water and 2.9 billion people had inadequate access to sanitation. So, there is a need for development of water resources and their proper management is vital for adequate and safe drinking water supply, food production to meet ever increasing demand, maintenance of basic health and sanitation, generation of hydropower, inland navigation, maintaining the ecology and production of industrial goods (Goswami, 2003). Disaggregated management of water resources and its increasing contamination from industrial, agricultural and domestic sources are further deteriorating the situation. So, there are certain national level policies which are implemented looking at the basic issues pertaining to water resource (discussed in later section). In this light, the State Governments have restructured their institutional as well as the organizational set ups to conserve the water resource. Hence, the 21st century aimed for efficient use and continued sustainable development of water resources with emphasis on people's participation which ultimately leads to equitable economic growth and all-round development of human society.

Institution: Its definitions need not be discussed here so elaborately

The term 'institution' has a different definition: institutions are complexes of norms and behaviours that persist over time because they are valued as well as useful (Abernethy, 1993). The key characteristics are – they are patterns of norms and behaviours which persist because they are valued and useful. The terms 'institution' and 'organization' are often used loosely and interchangeably. Indeed they are overlapping terms, but many social scientists made a distinction between them. 'Organizations' are

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structures of recognized and accepted roles (Uphoff, 1986). There are thus institutions which are not organizations: the laws of a country are institutions in themselves which exist separately from the particular courts which enforce them (Abernethy, 1993). Unwritten customary rules for sharing water in an indigenous irrigation system may be an institution if it is valued and persists over time in a community. Marriage - is an institution, as is kinship; they are valued principles and norms on the basis of which organizations families, lineages – are formed. Organizations may be 'institution' or they may not. An organization that includes a set a norms and behaviors that persists because it is valued and useful is an institution (Abernethy, 1993). Examples include the family, an irrigation department, and a water user's organization that persists over time regardless of whether it is legally recognized. This means that some organizations are not necessarily 'institutions'. An ad hoc group that forms itself to achieve a single short-term objective, then dissolves after sometime is an organization that is not an institution. A water user's organization formed by government officials as part of an irrigation project may be an organization which functions for the construction period; if it persists over time and continues to fill a need that is valued and useful to its members, it becomes an institution. This is what is meant by the term 'institutionalization': a process by which behaviours and roles become valued and therefore worth something, so that they continue as a part of peoples' lives.

As it was discussed in above that the water resource is gradually getting endangered directly or indirectly due to some human induced factors. So, there is need for its proper management and its sustainable use for future generation. The shift from centralized and state-

driven natural resource management is clearly articulated in theories of collective action and Common Property Resource Management (CPRM) where the focus is on getting the institutions right. Research on common property resource institutions has tended to concentrate on visible and formal institutional arrangements (Murphre, 1991), yet there are other hidden and informal institutional arrangements, such as social networks, that are important for appropriating natural resources (Sithole, 2001). Such social networks include kinship ties, church groups, work parties and other informal social gatherings. In the CPRM literature, institutional arrangements are defined as the rules and regulations governing resource use (Ostrom, 1999). Institutional arrangements often form the basis for guiding the activities of an organization, although they may also be informal, and not associated with any specific organization. They can also be norms based on culture. The rules and regulations in use by a community determine who has access to Common Property Resources (CPR), what resources authorized participants can use and at what times, and who will monitor and enforce the rules (Ostrom, 1999). The impact of institutions on water – one of the fundamental common pool resources – has been a matter of concern in recent years. Institutions encompass both socialized ways of interacting and underlying rules and regulations, as well as structures and organizations that influence resource allocations (Adger 2000). In recent years, reforms have been carried out in the process of re-structuration of institutional management of water resources in India starting from national to grassroots levels. This study covers both formal (explicit) and informal (implicit) institutional arrangements governing water use. It aims to enhance our understanding of the effects of existing institutional arrangements on access to water resources.

Institutional requirements for water management vary depending on a number of environmental conditions, which are mainly determined by the stage of development of the country's water sector. Institutions evolve depending on the water-related issues that the sector faces, as the water resources are gradually developed and utilized. Thus, effective water sector institutions are basically demand driven. The term IWRM implied "an inter-sectoral approach, representation of all stakeholders, all physical aspects of water resources and sustainability and environmental considerations" (Savenije and van der Zaag, 1998). The definition of IWRM that came to be popularly known, however, was the one given by the Global Water Partnership (GWP), which embraced the two broad conceptual bases of improved water resources management formulated in the international conferences, namely, "integration" and "sustainability". Accordingly, IWRM is seen as "a process, which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems" (GWP/TAC, 2000). It should be noted that, as it has been defined, the concept of IWRM does not seem to demand a specific institutional arrangement such as the river basin organizations, despite the fact that they are often prescribed along with IWRM.

Institutional reforms in water management

These emerging problems related to water and its adverse impacts on natural and human ecosystem, during recent years, become a subject of debates and discussions by academia, expert bodies, specialists and administrators in national and global forums. Hence, in addressing pros and

cons of these water related issues, both at the national and regional levels, there is an urgent need for an innovation in trans-disciplinary knowledge base (Bandyopadhyay, 2006) and a radically changing institutional framework (Maria Saleth, 2004). As a result, these problems at the local, regional, national and global levels constantly produce new knowledgebase through diverse perspectives towards addressing proper policy frameworks for the conservation of this threat water resource. As a result, the unprecedented water related issues have accentuated several legislative actions, undertaken by the international as well as national governments. A number of International Conferences and gatherings like Mar del Plata Conference on Water, Argentina, 1977, the United Nations Conferences on Environment and Development in Rio de Janerio, Brazil, 1992, the International Conference on Freshwater, Bonn, 2001 etc. were held to focus on the problems regarding the water resources and also suggested measures for its proper conservation or restoration. Considering the importance of many water related problems, the United Nations has declared 2003 as the International Year of Freshwater. Government of India too has declared 2003 as the Freshwater Year for India.

The institutional reforms in water management can be approached from various forms: policy and objectives; laws, rules and regulations; organizations (their by-laws and core value); operational plans and procedures; incentive mechanisms, and norms, traditions, practices and customs (Raju and Taron 2008). The institutional framework for water resources management in the system of irrigation consists of established rules, norms, practices and organizations that provide a structure to human actions related to water management. In fact, we can broadly classify the whole institutional framework into three categories – (i) *Policies*

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[national policies, local government policies and organizational policies]; (ii) Laws [formal laws, rules and procedures; informal rules, norms and practices; and internal rules of organizations]; and (iii) Administration [organizations at policy level for resource management, and organizations at implementation level for delivery management] - all of which are related in some way to water resources management.

Before Independence, India had passed two major legislations related to water: first, the Easement Act, 1882 that allowed private rights to use the resource, and the Indian Fisheries Act, 1897, which established penal offences to the persons who try to destroy any aquatic organisms within the resource. However, soon after Independence, the Indian Constitution asserted water as a State Subject. Further propositions and arguments take one of the two directions: one is to assert that water is rightly a State subject, that this position must be accepted and the Centre must refrain from encroaching into this area; the other is to counter water is a State Subject and to argue that the Centre needs to play an important role with regard to this precious resource, and that in order to facilitate this, water should be transferred to Concurrent List. Entry 17 in the State List reads:

Water, that is to say, water supplies, irrigation and canals, drainage and embankments, water storage and water power subject to the provisions of Entry 56 of List 1.

Further, water as a State List is subject to the provisions of Entry 56 in the Union List that enshrines:

Regulation and development of inter-state rivers and river valleys to the extent to which such regulation and development under the control of the Union is declared by Parliament by law to be expedient in the public interest.

In addition, Article 262 of the Indian Constitution mentions about the adjudication of disputes relating to waters of interstate rivers or river valleys. Apart from these Constitutional provisions, the Government of Independent India has passed several legislative provisions in the process of conservation of water resources. These are:

- · River Boards Act, 1956
- · Inter-State River Water Disputes Act, 1956
- · Merchant Shipping (Amendment) Act, 1979
- Water (Prevention and Control of Pollution)
 Act 1974, later amended in 1979
- Water (Prevention and Control of Pollution)
 Cess Act, 1977
- · Environment Protection Act, 1986
- National Water Policy 1987, later amended in 2002
- · National Water Policy, 2002

Keeping in view the necessity of planning for development of country's water resources in a co-coordinated manner, along with various national policies, the Ministry of Water Resources was formed in September 1985 to assume a nodal role in regard to all matters concerning the country's water resources and to underscore the multifarious uses of water and need for integrated development accordingly. At present, the Ministries of Agriculture, Rural Development, Urban Development, Environment and Forests, Shipping, Power Industrial Development apart from the Water Resources are involved in the management of one or the other aspects of water resources. The Ministry of Water Resources has prepared an Action Plan for implementation of the *National Water policy*, 2002 (NWP, 2002) which is considered as in consultation with the state governments and union territories and with inputs from the non-governmental/voluntary organizations and expert deliberation. NWP 2002 envisages the formulation of State Water Policy

(SWP) by each state and preparation of an Operational Action Plan in a time-bound manner to achieve the desired objectives. This policy (NWP, 2002) calls for development and management of water resources in general and irrigation in particular in a holistic and integrated manner encompassing various sectoral needs through a participatory approach. Obviously, an appropriate institutional mechanism is necessary at the highest level for carrying out the integrated and comprehensive planning and to ensure systematic implementation of the same.

Institutional reforms relating to irrigation

The institutional reforms in the process of management have marked a sea-change since the beginning of the civilization. While construction of small schemes was well within the capability of the village communities, large irrigation works were to emerge only with the growth of the state, empires and the intervention of the rulers. The British colonial rulers who initially came as traders realized the magnitude of the profits that could be made in irrigation and began investing heavily in this area. An irrigation policy built on such foundations disregarded social and ecological factors inherent in traditional irrigation planning. A major chunk of the British investment was in canal irrigation, a technology which led to both inequality in water distribution through the emergence of certain property rights, and ecological destruction, but that provided the colonizers with fat revenue (Singh 1997). The post-British India irrigation policy has its roots in colonial policies. The continued dominance of the landlord class, which was a direct beneficiary of the British policy, helped the continuation of colonial policies.

Due to some financial problem, it has become extremely difficult for the state governments to provide adequate funds for efficient operation and adequate maintenance of the present irrigation projects. Unless farmers are progressively involved, in an organized way, in the operation, management and maintenance of irrigation system, the objective of increased utilization and production per unit volume of water from irrigation commands can not be realized. Formation of Water Users Associations (WUA) offers considerable scope for improving the present situation and in moving towards Participatory Irrigation Management (PIM).

Recent development in irrigation in India has been largely dominated by participatory irrigation management (PIM). Since 1985 Ministry of Water Resources has been inspiring farmers' participation in water distribution and management of tertiary system in the projects covered under the Centrally Sponsored Command Area Development Programme. The concept of involvement of farmers in management of the irrigation system has been accepted as a policy of the Government of India and has been included in the National Water Policy adopted in 1987. Provisions made in the National Water Policy of 1987 were as under:

Efforts should be made to involve farmers progressively in various aspects of management of irrigation systems, particularly in water distribution and collection of water rates. Assistance of voluntary agencies should be enlisted in educating the farmers in efficient water-use and water management.

The dominant objective of NWP, 1987 is to create a sense of ownership of water resources and the irrigation system among the users, so as to promote economy in water use and preservation of the system. This Policy was

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again modified and again amended in 2002 that clearly mentioned provision for participatory approach to water resources management:

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. Necessary legal and institutional changes should be made at various levels for the purpose, duly ensuring appropriate role for women. Water Users' Association and local bodies such as municipalities and Gram-Panchayats should particularly be involved in the operation, maintenance and management of water infrastructures/facilities at appropriate levels progressively, with a view to eventually transfer the management of such facilities to the user groups/local bodies.

In light of the central legislation, several states have modified their irrigation policies. Following participatory irrigation management, states have been passed different legislation for the development of irrigation in their respective states. The forerunners are Andhra Pradesh, Madhya Pradesh, Chhatisgarh, Rajasthan, Karnatak, Odisha and Maharashtra.

Participatory Irrigation Management: the case of *Pani Panchayat* in Odisha

Odisha stands out as an underdeveloped State within the Indian dominion eventhough it has been endowed with rich natural and mineral resources. The estimated water resource of the State is one of the highest in the country, being of the order of 11% with 4% geographical area. The

annual overall availability of surface water in Odisha is about 85.59 billion cubic meters. The per-capita availability of water in 2001 was 3359 cubic meter. By 2051, it is likely to reduce to 2218 cubic meter. With increasing population and the consequential increase in demand for food and water and with the growth in mining and industrial activities, the demand from various sectors is likely to increase to 55 billion cubic meter by 2051 (Water Resource Department, Government of Odisha, 2007). Hence, this increasing scarcity of this natural resource – water – in the State is creating a lot of problems to natural livings as well as its associated activities especially irrigational activities. In this context prior to Independence, the colonial power enacted Orissa Famine Code, 1913 and after independence Orissa River Pollution and Prevention Act, 1953 and Acquisition of Land or Flood Control and Prevention of Erosion Act, 1955 by putting an eye on increasing water related issues. The State is mostly having small and marginal farmers. Based on the National Water Policy (NWP) 1987, the State Water Policy was formulated in 1994 in Odisha. With the amendment of NWP. 1987 in 2002, the Government of Odisha realized to review the State Water Policy, 1994. After due consideration, the State Government has prepared a new Water Policy called Orissa State Water Policy, 2007 keeping in view the National Water Policy-2002. It aims at laying down the principles of equitable and judicious use of water for survival of life, welfare of human beings and sustained as well as balanced growth of the state. This State Water Policy and its amended version give emphasis on the all round development and proper management of water resource of Odisha as a whole and keep on highlighting on irrigation in particular.

On the basis of this State Water Policy, the Government of Odisha with a view to

providing equitable, timely and assured irrigation has introduced the concept of Pani Panchayat based on the PIM. Thus, the first step made in this process of reformation was to hand over a part of the network of the canal system/irrigation system for its operation and maintenance (O&M) to the farmers or the beneficiaries through the "Pani Panchayats" (Water User Associations or WUAs). Pani Panchayat programme has been implemented in the state of Odisha since 1996. Recognizing the need for systematic involvement and participation of farmers in irrigation management, initially 33 irrigation projects were covered under the Odisha Water Resources Consolidation Project (OWRCP) funded by World Bank. Four Pilot Projects in the first phase namely, Ghodahad Project, Rushikulya Distributary No.11 of Ganjam District and Aunli and Derjang Projects in Anugul District were identified for this work during 1996 and related activities of Pani Panchayat started simultaneously in the projects. PIM process was launched christened as Farmers' Organization and Turnover (FOT) programme. In these project areas steps have been taken to motivate farmers to form Water Users' Associations and to turn over the operation and maintenance of the downstream part of the canal to WUAs (Swain and Kar, 2000). The major functions of the WUAs are to operate and maintain the distributary/minor canals, to ensure equitable water distribution among the WUA members, to advise the department on main system operation and ultimately with gaining experience to collect irrigation fees in due course. In OWRCP area the implementation of FOT programme has been entrusted to Water and Land Management Institute, Command Area Development Authority, Nabakrushna Choudhury Centre for Development Studies (an Indian Council of Social Science Research Centre) and some local Non-Governmental Organizations. Since 2000 Pani

Panchayat scheme has been implemented by the personnel of Department of Water Resources in non-OWRCP areas as well. After a lot of experiment this Pani Panchayat programme was enacted by the Odisha Legislative Assembly and was assented to by the Governor on the 25th June 2002. The Orissa Pani Panchayat Act, 2002, is an Act to provide for farmers' participation in the management of irrigation systems and for matters connected therewith or incidental thereto (Pani Panchayat Act, 2002). The Pani Panchayats (WUAs) are registered as legal bodies to provide the required identity. Later, the geographical extent of the programme covers the entire State comprising of about 16.00 lakh hectares of Major, Medium & Minor Irrigation Command Areas in all the 30 districts of Odisha (Department of Water Resources, Government of Odisha, 2001).

Objectives of Pani Panchayat (PP)

The dominant objectives of PP are:

- To promote and secure equitable distribution of water among its users, adequate maintenance of irrigation system, efficient and economical utilization of water to optimize agricultural production.
- To protect the environment and to ensure ecological balance by involving the farmers, inculcating sense of ownership of the irrigation system in accordance with the water budget and the operational plan.

In Odisha the *Pani Panchayat* is a three tier organization for medium irrigation projects and four tier for major irrigation projects as indicated below:

 WUA/ Pani Panchayat at primary level consisting of several chak or outlet committees. September - 2012——————————————————Odisha Review

- Distributary Committee at secondary level (major projects) is a federation of all the WUAs/ Pani panchayats under the distributary.
- A Project Committee at project level is a federation of all Distributary Committees for major irrigation projects. Similarly for medium irrigation projects, a Project Committee at project level is a federation of all the WUAs/ Pani Panchayats.
- A State-level Committee would be constituted by the Government with Presidents of the Project Committees and Government officials not exceeding ten of each category.

Pani Panchayat: Its Institutional Structure

The institutional structure of Pani Panchayat in Odisha is as follows:

- The Pani Panchayats are formed on a threetier system with two informal associations and one formal association on minor/sub-minor basis comprising an ayacut ranging between 300-600 hectares.
- Chak Committees per outlet are formed taking one farmer each from high land, middle land and low land areas of the ayacut. A representative from the chak committee will be a member of the executive body of the PP. Each PP will have a President, Secretary, and Treasurer.
- Each beneficiary landowner within the ayacut of the concerned minor/sub-minor qualifies to be member of the concerned PP.
- For registration of PP, a minimum of 51% of the beneficiaries, possessing 60% of command area, are required to be members. To be eligible as a member in PP, a token

- membership fee Rs. 10 or as decided by the PP is charged. Registration of the PP is done along with necessary documents like bye-law, general body resolution etc. and by depositing necessary amount with the registering authorities.
- A fund be created in the from of share capital with the contribution of the member of PP proportionate to their land holding plus a part of the water rates (Rs 35 per acre) in order to take up maintenance work of canals or to attend any work of emergent nature. The authorized office bearers of the Pani Panchayat will spend the amount.
- There will be an "Apex Committee" in each command area, comprising of all the presidents of the WUAs and with invited official members to prepare the canal operation schedules, O& M of the system, cropping patterns etc and to undertake the over-all co-ordination among the PPs.

Conclusion

Water, as a form of natural capital very much essential for the living organisms, is now facing a range of smouldering issues. This issues or increasing problems have drawn serious attention of the policy-makers, development practitioners and academicians to enforce various policy options — legislations, programmes, projects, and institutional developments - towards the conservation of water resources. The present piece of research work has relied heavily on secondary sources of information and thus it is more a review and less of empirical in nature.

Water has been considered as one of the basic needs of human beings as well as other living organisms. However, the use and overuse of water has been rapidly increased in recent years

because of an unprecedented growth in human population, rapid changes in human lifestyles, consumption patterns and the pollution of environment (due to industrialization, deforestation etc.), which has put unlimited pressure on the water resources as well as have lead to their over exploitation. In fact, this pressure over water resources has threatened/affected the availability of water (both in terms of quality and quantity) on the earth on the one hand, and it has also simultaneously influenced the socio-economic condition of the human society on the other. As a result, serious attempts have been going on to protect and preserve this vital natural resource, through different legislations and policy frameworks. As a result, the unprecedented water related issues have accentuated several legislative actions, undertaken by the international as well as national governments. A number of International Conferences and gatherings like Mar del Plata Conference on Water, Argentina, 1977, the United Nations Conferences on Environment and Development in Rio de Janeiro, Brazil, 1992, the International Conference on Freshwater, Bonn, 2001 etc. were held to focus on the problems regarding the water resources and also suggested measures for its proper conservation or restoration. In line with the international strategies, each country has developed their own policies and laws - River Board Act, 1956, Water (Prevention and Control of Pollution) policy, 1974, National Water Policy, 1987 and its amended version in 2002 etc. - and various institutional mechanisms for proper management and sustainable use of water resources. Following the above-mentioned national water related legislative actions; the State Governments have also formulated several legislations for the protection and conservation of water resources like Odisha River Pollution and Prevention Act, 1953; Acquisition of Land or Flood Control and

Prevention of Erosion Act, 1955; State Water Policy 1994, which has been further amended in 2007 by following the National Water Policy 1987 and 2002 respectively, The Odisha *Pani Panchayat* Act, 2002 and *Pani Panchayat* Rule in 2003 so on and so forth.

Thus, the present study has focused mainly on the legislative actions in India and specifically in Odisha water resource in general and irrigation in particular. It examines the effect of government policies in governance of the resource, simultaneously gives emphasis to the involvement of the local community and their active participation in proper utilization of the resource. It observes the impact of institutions on water which encompass both socialized ways of interacting and underlying rules and regulations, as well as structures and organizations that influence resource allocations. It is at best elaborated through participatory irrigation management (PIM) and the enactment of The Odisha Pani Panchayat Act, 2002 which aims to promote and secure equitable distribution of water among its users, adequate maintenance of irrigation system, efficient and economic utilization of water to optimize agricultural production under the banner of various water users' association. Finally it is concluded that the enactment of this Act by Government of Odisha is very much significant for the farmers to use or govern their resource – water – in a better way under the proper guidance of government personnel.

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