Under the Water & Climate Resilience Programme (WACREP) CEDSJ submitted a three year work proposal entitled “Participatory River Basin Management in Semi Arid Areas of Rajasthan- Search for a new governance system in 2015 to evolve a participatory river basin model for water resource development and management in Mashi River Sub Basin in Rajasthan. In the first phase of the project all the technical part of the water resource mapping and other dimensions and only writing part of socio-economic survey was completed. The remaining part was to be completed in phase II.

In the First Phase CEDSJ was supposed to conduct a water balance study for the sub Basin to facilitate people and state government line department to better plan the water resources in the Sub Basin and take care of the impact of climate change. It could not be conducted because it required inputs from other studies and those got completed only at the end of the year and also partly because of budget cut. Therefore, the Water Balance Study was carry forwarded in the Phase second. The study was completed and draft report was submitted to IWP office for comments. The earlier report and this report will serve as training material, i.e. Capacity Building Modules for different stakeholders.

It was planned that studies conducted in the Phase-I will be the input for the formation of River Basin Parliament in Phase II and to plan and develop water resources in the basin and seek cooperation of people in executing the plans. The major work proposed in the Second Phase of the project was capacity building of stakeholders by developing training modules and organising training sessions at different levels.

The Activity plan proposed for the year 2016 was as follows:

1. Development of River Basin Concept
2. Intervention Activity Planning
3. Preparation of Capacity building modules
4. Group formation at watershed level
5. Workshop/consultations

The proposed five activities were planned in collaboration with the proposed two NGOs namely GVNML, Laporia and SSS, Chaksu, already working in the Mashi river Basin. The role of the two NGOs was to
provide support in community mobilization and formation of stakeholder groups in the six watersheds of the Basin. As IWP funding was limited to only meet partial expenses of CEDSJ proposed work it was planned to raise additional funds from some external donors to cover NGO activities. Funding proposals were prepared, submitted to donors, meetings and presentations on proposals were made and in principle they did agree to support our activities. Despite our best efforts NGO component could not be supported and that affected our time frame and plan of work.

With this backdrop the progress of work under each activity is as follows:

1. Development of River Basin Concept

Review of literature on the River Basin Management was undertaken to learn lesson from success and failure cases where attempts were made to organise people and manage water resources at river basin level. The nearest and similar parallel practical case was Arwari River Parliament formed by Tarun Bharat Sangh in Alwar District of Rajasthan.

Based on the review a paper was prepared and presented in an International Conference at Asian Institute of Technology (AIT), Bangkok (copy attached) to seek comments/opinion from international peer group on our model of river basin management. A draft document on constitution of Mashi River Parliament was prepared to share with stakeholders and obtaining their comments/reactions (draft document attached). The Basin level meeting of stakeholder will be used to finalize the document.

2. Intervention Activity Planning

This was a continuous activity undertaken during the year in the form of organising stakeholder consultations, group meetings, meeting with PRI representatives, line department officials, Agriculture University staff particularly the Department of Extension, and civil society groups working on different issues in the Basin. The activities were reported in the monthly progress report submitted to IWP office at Delhi.

3. Preparation of Capacity building modules

The meeting of experts involved in the preparation of capacity building modules for the stakeholders was called in the beginning of the project. Experts were identified, they took lot of time
to join together to understand out concept and inputs required for the stakeholders training. They demanded some basic data and material on the Mashi Basin which was collected and supplied. Experts also wanted to test their modules with different stakeholder groups before finalizing the modules.

Meetings with the two resource persons, i.e., Geo-hydrologist and Agronomist was undertaken to discuss the contents of the stakeholders training modules. Resource persons have agreed to prepare the modules but wanted field visit to know more about the field area and assess the needs of stakeholders.

Field visit of Geo-hydrologist was organized in the basin and meeting with farmers were held to assess the stakeholders requirement for capacity building activity. The insights from field visit were supposed to be used in preparation of modules. Draft modules are attached herewith.

4. Group formation at watershed level and Consultations

The first step in the process of formation of River Basin Parliament is to mobilize people and form watershed wise stakeholders groups. The next stage is to build their capacity for participation in the institutional model proposed by CEDSJ.

From entry point of view first a meeting with the local MLA was arranged to apprise him of the community management of water resources, formation of River Basin parliament in his constituency and to seek his support and suggestion to undertake various activities in the basin. He willingly agreed for full cooperation and suggested a larger meeting of selected PRI representatives from the six watersheds at a convenient date in the month.

Identified 20 Sarpanch’s, got their mobile numbers and contacted them with a request to facilitate meetings in their Panchayat’s to build awareness about water issues and the concept of community management of River Basin. Meetings in Panchayat’s were organized, details were sent in the monthly report.

In the absence of NGO support CEDSJ under took the work of formation of groups. The first step was identification of Panchayats and key people in the six watersheds to form Stakeholder Groups to
represent the Mashi River Basin Parliament with the support of PRI representatives. Since the larger meetings of Panchayats could not be organized it was difficult to finalize groups and their members, despite we could identify few members from our side. The names of group members have to be ultimately approved by respective Panchayats then only they can become the member of the River Parliament.

The List of villages where the consultations were organized and the names of few important representatives is enclosed herewith. Consultations were organized with the Identified Sarpanch’s in different watersheds. There were several rounds of visits and meetings with lead people in the villages and once people agree to assemble on a given date consultations were organized.

The basic objectives of these consultations were to find the following:

a. Are people willing to join this movement to save the Mashi River and better plan the water resources in the basin?
b. Is river important for them, if yes why?
c. What they expect of the proposed Mashi River Basin Parliament?
d. Which Sarpanch/Pradhan/person is more committed and will be willing to join parliament?
e. What are the views of PRIs regarding governance and other issues relate to the proposed model?
f. Identification of members for watershed groups.
g. Areas/issues of present and future water related conflicts.
h. Views about present water related programs and projects, gaps and achievements and scope for convergence with our approach.

We tried to document the views of different stakeholders to build our understanding of the stakeholders so that appropriate strategy can be followed in formulation of river parliament. In the below listed consultations/meetings people of different occupation and interest came to attend, such as, Politicians, Sarpanch, Pradhan, farmers, government employees, contractors(river bed sand mining), lawyers, industrialists, etc.

**Water Shed wise Consultations organized by CEDSJ in the Mashi Basin**

( Name and Mobil Numbers of prominent persons attended consultation)

<table>
<thead>
<tr>
<th>Name of district/Block/watershed</th>
<th>Name of Panchayat</th>
<th>Name of Sarpanch/Ward Member/Other prominent persons attended consultation</th>
<th>Issues discussed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Contact Person</td>
<td>Issues</td>
<td></td>
</tr>
<tr>
<td>---------------------------</td>
<td>------------------------------------</td>
<td>----------------------------------------------------------------------</td>
<td></td>
</tr>
</tbody>
</table>
| Jaipur/Jhotwara/ Watershed 1 | Rupa Ram Prem Lal Sapete Dr. Raghuvir Singh | 5. Lack of coordination between line departments  
6. Agricultural development and linkage with river water management, farmers’ issues  
7. Reliability of river flow data  
8. Environmental flow issues |
|                           | Jagdish Saini Advocate Bishan Singh Kailash Chotiya Sunda Ram Mohan Rolania Bajrang Singh Nathawat Rajendra Prasad Jamu | 1. Encroachment in riverbed area  
2. Watershed management issues, Community mobilization issues  
3. River ownership and pollution issues  
4. Lack of coordination between line departments.  
5. Rural-Urban river water sharing conflict.  
6. Reliability of river flow data  
7. Environmental flow issue  
8. Dumping of sewage water in the Bandi River |
| Jaipur/Dudu/ Watershed 2  | Arjun Lal Jat Surendra Singh Virendra Singh Shanti Lal Jain | 1. Encroachment in riverbed area  
2. Extension of peri-urban area and conflicts with farmers.  
3. Manipulation of land records by colonizers  
4. Over exploitation of groundwater  
5. Neglect of traditional water bodies. |
| Jaipur/Dudu/ Watershed 3  | Shakur Khan | 1. Information about existing watershed committees and their desolation  
2. Use of the watershed committee in river basin area  
3. River basin planning and community participation  
4. Impounded water ownership issues in river basin areas  
5. Law related to river basin management |
2. Encroachment on Talab catchments  
3. Inter-linkage of Talabs and their management.  
4. Farm pond based irrigation |
| Jaipur/Phagi/ Watershed 4  | Kavita Shrimal Shankar | 1. Riverbed sand and other mining Issues  
2. Livelihood issues related to sand |
<table>
<thead>
<tr>
<th>Location</th>
<th>Name</th>
<th>Contact</th>
<th>Issues</th>
</tr>
</thead>
</table>
| Jaipur/Phagi/     | Chandama Kalan                          | Badri Lal Mali9928488097 | 1. Sand mining issues  
| Watershed 4       |                                         |                 | 2. Encroachments issues on river areas  
|                   |                                         |                 | 3. Environmental flow issues  
|                   |                                         |                 | 4. Project based development v/s River Basin based planned development approach  
|                   |                                         |                 | 5. Role of PRIs |
| Jaipur/Dudu/     | Khudiyala                               | Babita devi7689910588  
| Watershed 4       |                                         | Jairam Jat  
|                   |                                         | Kamal Rojh  
|                   |                                         | Ram Charan Saran  
|                   |                                         | Rameswar Jat  
|                   |                                         | Jadav Devi |
|                   |                                         |                 | 1. Working of Watershed Committee and conflict with watershed official  
|                   |                                         |                 | 2. Watershed Committee composition and activities  
|                   |                                         |                 | 3. Encroachments issues on river areas  
|                   |                                         |                 | 4. Environmental flow issues |
| Jaipur/Dudu/     | Mammana                                 | Ram Niwas Mali9928984549  
| Watershed 4       |                                         | Ramswaroop Mali  
|                   |                                         | Suwa Lal  
|                   |                                         | Ramchandra  
|                   |                                         | Dhanna Lal Mali |
|                   |                                         |                 | 1. Working of Watershed Committee and conflict with watershed official  
|                   |                                         |                 | 2. Watershed Committee composition and activities  
|                   |                                         |                 | 3. Encroachments issues on river areas  
|                   |                                         |                 | 4. Environmental flow issues |
| Jaipur/Dudu/     | Mangalwara                              | Rameswar Jat9414057288  
| Watershed 4       |                                         | Sair Balai  
|                   |                                         | Ratn khati  
|                   |                                         | Rodu Ram  
|                   |                                         | Avdhesh Sharma |
|                   |                                         |                 | 5. Working of Watershed Committee and conflict with watershed official  
|                   |                                         |                 | 6. Watershed Committee composition and activities  
|                   |                                         |                 | 7. Environmental flow issues |
| Jaipur/Dudu/     | Madhorajpura                            | Bhag Chand Jain9829228700  
| Watershed 5       |                                         | Dinesh ji9929016794 |
|                   |                                         |                 | 1. Encroachment on riverbed or other water resources  
|                   |                                         |                 | 2. Planning of groundwater and surface water  
|                   |                                         |                 | 3. Watershed based planning or River Basin planning  
|                   |                                         |                 | 4. Water conservation and recharge based on geo formation |
| Tonk/Malpura/    | Ajmeri                                  | Mrs. Shobhag Devi Sharma 9829406352 | 7. Working of Watershed Committee and conflict with watershed official  
| Watershed 6       |                                         |                 | 8. Watershed Committee composition and activities  
|                   |                                         |                 | 9. Encroachments on pasture lands and Fallow lands |
ACWADAM team of experts comprising of two geologist and Geohydrologist visited CEDSJ to provide technical input in the project in Mashi River Basin. Many questions were raised by the stakeholders in the meetings last months and the answers were difficult without scientific study of the issues. Since the problems were location specific general reply could not convince them, therefore the experts from ACWADAM were called. The experts were in field for seven days (from November 19 to 28\textsuperscript{th} 2016) along with CEDSJ team and covered the entire area of Mashi Basin. The activities undertaken were as follows:

i) Groundwater mapping of Bandi and Mashi tributaries.

ii) Micro-watershed wise geophysical survey

iii) Measurement of groundwater draft using censors.

iv) Use of micro irrigation and its impact on groundwater draft in shallow water system.

v) Log data from farmers, testing yields of tubewells at different locations in the Basin.

vi) Identification of groundwater recharge possibilities in the Basin.

vii) Polly house and water use- interview with farmers.
Photographs of ACWADAM team visit in Mashi Basin

Sensor for pump testing in well

Wells in river bad at joining Point of Shodra River and Mashi River
Geology of well

Open well near Diggi village
Step well in Mashi Basin

Khet Talai in Mashi Basin
Polly House in Mashi Basin

Geo-physical survey in Mashi Basin
Consultation photographs

Watershed 1: Meeting at Khajdon ka Bas

Watershed 2: Meeting at Jhag
Watershed 3: Meeting at Sali

Watershed 4: Meeting at Chandama Kala
Watershed 4: Meeting at Nimera

Watershed 5: Meeting Madhoraj Pura
Village - Khajdro ka Bas
Village: Madhorajpura
Village - Chandma Kala
Village - Nimera
Village - Nimera
Village - Sali
Watershed II: Jhag Gram Panchayat-with community members
Jhag: Consultation with PRI members and Line Department officials
MULTI-STAKEHOLDER NEGOTIATING PLATFORMS FOR EFFECTIVE WATER GOVERNANCE: A CASE OF MASHI BASIN, RAJASTHAN, INDIA

M.S. Rathore

1Centre for Environment and Development Studies, Jaipur, India
* Corresponding author. E-mail: msr@cedsj.org

ABSTRACT. Freshwater management (surface and groundwater) is both a global and local concern, and involves a plethora of public, private and non-profit stakeholders in the decision-making, policy and project cycles. Most countries are currently moving away from conventional forms of water governance. The trend now is for distributed water governance systems to supplement formal authority by an increasing reliance on informal authority, through genuine public-private coordination and co-operation. It seems that the policy makers, planners and executers find difficult to internalizing the concept of IRBM and implementing the concept at different levels. The paper discusses the new approach/model of community management of water resources in a river basin in Rajasthan, India. Mashi River Parliament as an institution and governance model is expected to emerge as a unique model of distributed governance in Rajasthan and can also be replicated in other parts of India.

Key words: River Basin Parliament; Distributed Governance; User groups

Introduction

Rapid economic development and societal change are putting increasing pressure on water ecosystems and other natural resources. There is worldwide demand for changes that leads to more effective, more efficient and more sustainable water resource management. Efforts are being made to rethink water planning and management. Water management today poses multi-dimensional challenges, with complex geographical, ecological, social, political and economic factors. Also water stress and water scarcity are challenges with far-reaching economic and social implications. Growth in population, increased economic activity and improved standard of living lead to increased competition for and conflicts over limited fresh water resources. The deep appreciation to the complex issues surrounding water resource development has led to new approaches that seek to meet the ecological, social, political and economic challenges posed by the prevalent practices.

Water management has moved from the sectoral approach to an integrated approach. All water management techniques have complex and multidimensional implications, related to the existing geographical, ecological, socio-political and economic situations. However, these techniques need to be modified, updated and adapted in response to changes in existing order.

Globally water shortages, quality deterioration and flood impacts are among the problems which require greater attention and action at all levels. Accessible and high quality freshwater is a limited and highly variable resource. OECD projections show that 40% of the world’s population currently lives in water-stressed river basins, and that water demand will rise by 55% by 2050 (OECD, 2012a). In 2050, 240 million people are expected to remain without access to clean water, and 1.4 billion without access to basic sanitation. Freshwater management (surface and groundwater) is both a global and local concern, and involves a plethora of public, private and non-profit stakeholders in the decision-making, policy and project cycles.

In most countries water sector reforms are being carried out, governance and management needs more attention than water augmentation and access. In India, World bank and other donor agencies supported
water sector reforms and under that water governance issues are addressed, but the outcome is less than the expectation mainly because of lack of political will and wider understanding on governance issues.

**Water Governance**

An important distinction should be made between governance and management, with management being a sub-category of governance. Effective management, although an important part of governance of natural resources, is not sufficient to secure good governance (Oviedo, Mansourian, and Surkin, (IUCN)). The literature is rich with diverse and varied definitions of water governance (GWP, 2002; UNDP, 2001; Moench et al., 2003; Rogers & Hall, 2003). There is no single definition of governance and therefore, different approaches need to be followed. Some may see governance as questions of financial accountability and administrative efficiency while other may focus on broader political concerns related to democracy and human rights and participatory process. However, good governance is the demand of the recent and future times to address the vital natural resource.

Most countries are currently moving away from conventional forms of water governance, which usually had a *top-down supply-driven approaches*, towards bottom-up demand-driven approaches, which combine the experience, knowledge and understanding of various local groups and people (UNDP, 2007a). Governments are also moving towards better policy alignment in recognition of the fact that many policies outside the water sector can have a major bearing on levels and patterns of water demand and use (e.g. agricultural, trade and energy policies). These changes require improvements to water governance systems that include: more effective stakeholder dialogue, better vertical and horizontal sharing of information amongst stakeholders, conflict resolution at a range of different scales and planning procedures that are based on a vision that is common to relevant stakeholders (Batchelore, C.).

There is a growing perception that the governance of water resources and water services functions more effectively within an open social structure which enables broader participation by civil society, private enterprises and the media, all networking to support and influence government (Batchelor, C.). The ideology of a *command and control* or a *hierarchical* central State system caring for its citizens has to be replaced by *market-led* water governance models. The trend now is for distributed water governance systems to supplement formal authority by an increasing reliance on informal authority, through genuine public-private coordination and co-operation.

Achieving good water governance cannot be undertaken hastily using blueprints from outside any given county or region. Good governance needs to be developed to suit local conditions. Incremental improvement and flexibility are key (Batchelor, C.). Rogers and Hall (2003) argues that there is no single model of effective water governance; indeed to be effective governance systems must fit the social, economic and cultural particularities of each country. Nevertheless, there are some basic principles or attributes that are considered essential for effective/good governance, such as, in Approach: Open and Transparent, Inclusive and Communicative, Coherent and Integrative, and Equitable and Ethical, while in Performance and Operation: Accountable, Efficient, Responsive, predictable, participative and Sustainable.

Governance can take many different forms depending on the economic, cultural and traditional political norms of a country and the behavior of the legislature and legislators. We want to have a governance system in Mashi River basin in Rajasthan, India where there will be a balance among politicians, people and government, cooperating within the given legal framework in the larger interest of the society on long term basis aiming at sustainable development and management of natural resources in the Mashi River Basin. This will require the politicians to move away from the mentality of severing the constituency to ensure reelection and look for long term development of the people by sustaining the health of natural resources. Our objective is to create a framework (institutional and administrative) within which people
with different interests can peacefully discuss/debate and agree to co-operate and coordinate their actions to sustainably manage the natural resources of the River basin.

Generally much doubt is expressed about the capacity of people to come together and act like community in larger interest of protecting environment in the present competitive world and ask question such as, can society coordinate and manage itself? In the River Parliament Model, distributed governance is visualized, where in, coordinated interaction of people, civil society organizations, government, and technocrats with a defined role and responsibility will participate in the larger interest to sustainably manage the resources with minimum conflicts. Though there will be well defined role for each of the stakeholders but more role for people so that it is a people centric governance system contrast to what have been presently practices as State Driven Government Centric Decentralized Model, which in most cases failed to deliver. The state will provide all legal, financial and other support with minimum interference in the working of River Parliament. Government should also play major role in financing the planned infrastructure and other activities by convergence of the line departments activities and allotted budgets and also create enabling environment for better democratic functioning of the Parliament. While the team of technocrats is assigned the role of providing all kinds of technical advice on different aspect of natural resources rejuvenation, conservation, protection and sustainable management. They will also build the capacity of stakeholders to facilitate equal and better participation in governance system and also facilitate selection of better livelihood options to reduce pressure on natural resources.

In India at national and state level there is greater attention on water management aspects both at the level of policy and practice and governance issues are sidelined or given low priority. The result is that there are number of line departments dealing with water resource management yet not getting the desired results. In the following section water resource management is discussed to identify gaps and lessons for our new approach.

**Water resource Management**

India’s water demand has increased many folds because of economic development and fast increasing urban and rural population. Agriculture sector continues to be the main user of water (85%), largely groundwater. Lack of access to safe water is an important impediment to the progress of public health, education and poverty reduction in the country.

Water resources management is big challenge because of multiple sources of supply, multiple stakeholders with competing demands, unclear ownership of water resources and unequal access to varied level of supply, and complex social and political context. The conventional model of water resources management is based on four practical elements: policies, laws and plans; an institutional framework of management and technical instrument; and investment in water infrastructure. In order to address the existing and emerging challenges change is necessary in the four basic strategies of water resources management.

The Integrated River Basin Management (IRBM) approach, globally accepted as solution to the overwhelming need for sustainable and equitable development and management of water resources has been accepted formally by the Indian national government in its National Water policy and gradually the states’ are also adapting it by enacting River Basin Management Acts.

It seems that the policy makers, planners and executers find difficult to internalizing the concept of IRBM and implementing the concept at different levels. The paper will discuss the new approach/model of community management of water resources in a river basin in Rajasthan, India.
The demand, supply, availability and access of water resources do not always match and more particularly in the Arid and Semi-Arid water scarce areas. As the population increases the demand for fresh water and irrigation water to grow more food goes up. Changes in the land use patterns, climate variability and diminishing efficiency to use of resources only strain the available reserves further. Ultimately the new water scarcity will shape how we live, how we work, how we relax. It will reshape how we value water, and how we understand it. There is mark difference in the perception and value system of traditional societies and modern world and that is reflected in emerging water problems.

User groups as institutions in parallel with and in preference to PRIs were promoted by Donor agencies as part of their approach to decentralized planning in India (EUSPP 2012). Since the institutional decentralization was not fully followed rather unrelated with decentralization of powers the system did not work efficiently and consequently could not deliver the desired results. This applies to all sectoral developmental programs attempted in India. Coordination and integration could not be practiced as these words remained on paper or policy documents. Despite the new understanding that community participation is central in improving effectiveness of government schemes in general, currently the level of community participation and thus local-level transparency, accountability and ownership of planning within the water sector vary considerably (EUSPP 2012).

**Review of Water Resource Management Approaches**

Water resources management has been a major challenge of all the societies in the past. Countries have adopted different approaches of management based on their resource availability and usage pattern. However, globally Integrated Water Resource Management (IWRM) approach has been recommended as universal solution to water related problems. In this section few well known approaches to water resources management are discussed to look for a alternative new approach based on Rajasthan socio-economic and political environment. The Few approaches are as follows:

(a) **The Techno-economic Approach** to water resource management has been the conventional or mainstream approach throughout the latter half of the twentieth century. This approach has solved some of the short term crises of availability that plagued the countries of the Third World during the mid-twentieth century. Food production, availability of power, and access to water has increased for significant number of people. However, the long term adverse effects of such large scale interventions on the natural environment and on human communities raised doubts about such projects and this in turn led to a new way of looking at water management.

(b) **The Integrated River Basin Management (IRBM) approach** is a concept that aims to conserve and utilize the natural resources within a river basin sustainably, through integrating the needs and skills of various stakeholders like farmers, industries, government departments, academics, NGOs and people and their representatives. IRBM has been accepted formally by the national government in the National Water policy 2012 but water management continues to be a centralized top-down approach causes more problems than solutions.

It seems that the policy makers, planners and executers find difficult to internalize the concept of IWRM and working out practical implications of implementing the concept at different levels. The resultant outcome is that even the integration of identified line departments to be involved in water resource management at state level has become difficult proposition. To address the emerging issues a new approach namely Negotiated Approach to IRBM is tried. The negotiated approach is a variant of conventional IRBM. It is aimed at creating space for negotiation, including with local stakeholders, on river basin management options. The negotiated approach calls for the reverse, allowing local actors to develop basin management plan and strategies specific to their local context, which are then incorporated in the larger basin management plan. This allows their knowledge to influence regional and national decisions and feel sense of ownership, responsibility
and accountability towards the change in the management and implementation system. This ultimately results in a truly participatory bottom-up process of policy development and management.

(c) **The IWRM Approach**

Integrated Water Resource Management (IWRM) approach has emerged at Global level from the United Nations Water Conference in 1977, with most governments later committing in 2002, to application of IWRM by developing IWRM and water efficiency plans. By 2012, more than 80% of countries had made progress towards meeting the target.

IWRM is a process which can assist country and within country different States in their endeavor to deal with water issues in a cost effective and sustainable way (GWP 2000). IWRM as an approach to manage water resources has been Globally accepted by most countries including India as it find place in National Water Policy 2012 and in Rajasthan State Water Policy 2010. The recent announcement and promulgation of The Rajasthan River Basin and Water Resources Planning Act 2015 on April 24, 2015 is a big step in this direction.

General principles, approaches and guidelines relevant to IWRM are numerous and each has their areas of appropriate application. The Dublin principles are particularly useful set of such principles and out of the four principles particularly the principle; “Water development and management should be based on a participatory approach, involving users, planners and policy makers at all levels”, is critical for sustainable management of water resources particularly at local level, i.e. basin or aquifer level. The requirements for IWRM is to have holistic approach to management, recognizing all the characteristics of the hydrological cycle and its interaction with other natural resources i.e. land, biomass and ecosystem. The effects of human activities lead to the need for recognition of linkages between upstream and downstream users of water. Upstream users must recognize the legitimate demands of downstream users to share the available water resources and sustain usability. This clearly implies that dialogue or conflict resolution mechanisms are needed in order to reconcile the needs of upstream and downstream users. Groundwater management also need understanding among users on regulating it to ensure sustainable present and future use.

The other important component of IWRM is participatory approach. Real participation only takes place when stakeholders are part of the decision making process. Participation occurs only when participants have the capacity to participate. It implies that, first, build the capacity of the stakeholders, particularly women and marginalized social groups. This may not only involve awareness building, confidence building and education, but also the provision of the economic resources needed to facilitate participation and the establishment of good and transparent source of information.

The main practical elements of IWRM can be listed as follows;

(i) A strong enabling environment – policies, laws and plans that put in place “rule of the game” for water management that use IWRM
(ii) A clear, robust and comprehensive institutional framework for managing water using the River Basin as the basic unit for management while decentralizing decision making.
(iii) Effective use of available management and technical instruments – use of assessments, data and instruments for water allocation and pollution control to help decision makers make better choices.
(iv) Sound investments in water infrastructure with adequate financing available – to deliver progress in meeting water demand and needs for flood management, drought resilience irrigation, energy security and eco-system services.
The ultimate objective of IWRM is to make changes in water management approach in the complex social and political context. Besides water management and governance issues there are other issues and the most pertaining is the food or agricultural issues, as water use in irrigation is the highest among all other usages.

IWRM Approach in Rajasthan\(^1\) at Gram Panchayat level was initiated by the Water Resource Department (WRD) of the Government of Rajasthan in 2007 with the following broad objectives under water sector reforms undertaking activities such as, human resource development, institutional reforms (Government and Panchayat Raj), legal reforms by undertaking review of existing laws and preparing comprehensive water laws, financial reforms by adopting Medium Term Expenditure Framework (MTEF), creating data bank, organising mass awareness campaigns, take initiatives to seek NGO participation, etc.

The Government of Rajasthan (GoR) developed a New Approach to multi-level Integrated Water Resource Management (IWRM). The approach was ensuring the emphasis of the GP plan by way of:

- sustainable management of water resources;
- regulating major users and uses;
- allocation of water to primary needs;
- equitable and secure access of the poor and marginalised to water services;
- to ensure that issues of inter-sectoral, inter-village and inter-block equity and sustainability are picked up.

The review of the GP-level planning process indicated many fundamental Gaps.\(^2\) The main learning from the Pilot IWRM in Rajasthan were; (i) The GP-IWRM Planning process was being ineffective as a result of the bypassing of the regular structure of planning and monitoring of government activities that were operational at district and sub-district levels. (ii) villagers' key water problems could not be identified for lack of their active participation in the planning process.

**Our Model of Mashi River Basin Parliament**

**General Features of Mashi River Basin**

Mashi River Basin is part of the larger River Basin called Banas River Basin, which is located in the middle of the Rajasthan. There are 11 sub basins in Banas River Basin namely: Banas (1,174,039 ha), Dain (306,138.4 ha), Gudia (92,038.56 ha), Kalisil (62,308.94 ha), Khari (639,052.9 ha), Kothari (229,852.1 ha), Mashi (647,615.8 ha), Morel (572,250.7 ha), Sodra (151,942.2 ha) and Berach (830,788.6 ha). The catchment area including all upstream Major/Medium projects is 5,872.0 Km\(^2\) where as the differential catchment area (area excluding upstream catchment areas of Major/Medium projects) is 3,641.4 Km\(^2\) and falls in Tonk District.

The Mashi River Basin area falls in three districts namely Jaipur, Ajmer and Tonk Districts. The two main tributaries of Mashi River are, namely Bandi and Mashi, which originates from the hills of Samod and Ajmer district respectively. Mashi River originates from the Silora hills about 6 kilometers south of

\(^1\)For details see A J James, M S Rathore et al. (2015) Monitoring and Evaluation of EC-assisted State Partnership Programme (Rajasthan), Submitted to ICF International, UK, Institute of Development Studies, Jaipur

\(^2\)For details see A J James, M S Rathore et al. (2015), pp.6-8.
Kishangarh Town in Ajmer district and passing through Phulera tehsil in Jaipur district. It flows initially in an eastward direction and then towards south for about 96 km in partly hilly and partly plain areas along the borders of Jaipur and Tonk districts between the tehsil of Malpura and phagi until it turns south to join the Banas River at Galod village near Tonk. The catchment of the Mashi River is located between latitudes 26°11 and 26°16’ and longitudes 74°48’ and 75°54’. It has got one tributary called Bandi. Bandi River the tributary of Mashi River originates from hills located in the North-West of Jaipur and passes through Kalwar town near Jobner and meets Mashi near Madhorajpura. These tributaries are fed by large number of small rivulets originating from the plains of tehsil Sanganer, Dudu, Chaksu, Malpura, etc. All of them are non-perennial rivulets.

The Figure 1 shows the automatically delineated catchment of Mashi Sub Basin is shown in Figure 1.

![Figure 1: Automatically delineated catchment of Mashi Sub Basin](image)

**Water Management Issues in the Basin**

- The soils of the region suffer variously in the different soil regions from excessive drainage, low water retentive capacity, moderate erosion by wind, and low fertility mostly in the upper northern part of the basin. Salinity, alkalinity, poor drainage accompanied moderate to severe erosion are the problem of the soils.
- Five hydrogeological formations viz; **Younger Alluvium, Older Alluvium, Phyllite & Schist, Quartzite and BGC (Banded Gneissic Complex)** are the main water bearing formation (aquifer) in the Basin.
- **Land Use**: The Cultivated area (including current and permanent fallow lands) accounts for 78.2 percent of total geographical area of the Basin. The forest area is around 3.6 percent and Barren/un-culturable/Wastelands 14.5 percent. Other categories are covering less than 5% area.
- **Surface Water**: The number of Water Harvesting Structures (WHS) constructed in with differential catchment is 3,087 with total water holding capacity is 112.23 Mm$^3$. Actual mean annual water yield to the Mashi sub basin is computed to be 203.95 Mm$^3$ (with all interventions).
- Rainfall occurs mainly during the monsoon season in Mashi Project catchment therefore, major portion of stream flow occurs only during these months. The annual dependable water yield at 50% is 59.6 Mm$^3$, while water yield at 75% dependability is 6.4 Mm$^3$ (13.3% of gross storage capacity).
- **Major and Medium Projects**: There are 3 upstream projects in Mashi sub basin catchment. The live storage capacity of these three existing upstream project in the Mashi Sub Basin catchment is 81.36 Mm$^3$.
- **Minor Projects**: There are 97 Minor projects in the catchment area of Mashi Sub Basin with total live storage capacity of 90.64 Mm$^3$. There are large numbers of minor projects constructed in the
catchment of Mashi Dam capacity of which exceeds its design yield which may have substantial impact on inflow to project.

- **Groundwater**: Groundwater availability for long-term exploitation, clear of any current state of overdraft is the basic element. Since it is a derivative of rainfall, the dependability level of such rechargeable ‘dynamic’ groundwater availability relies on the statistic occurrence of precipitation. The total net annually assessed groundwater resource in the Mashi Basin is 2586.29 Mm³ and groundwater draft 3497.64 Mm³. The stage of groundwater development in the basin is 135.24% and the basin is categorized as overexploited basin.

- **Groundwater Quality**: The groundwater quality in the Mashi Sub Basin has been reported with reference to selected parameters, namely, concentration of Chloride, Fluoride, Nitrate and EC value.

  - The average chlorides concentration was relatively stable and ranges from a minimum of 175 mg/l to a maximum of 474 mg/l during the period of 1984 – 2010.
  - Fluoride concentrations are above the upper permissible limit for drinking water in most of the basin's area. The 100% non-potable water area belongs to quartzite aquifer unit in Mashi sub basin.
  - The average nitrates concentration ranges from a minimum of ~25 mg/l to a maximum of ~267mg/l during the aforementioned time period 1984 – 2010. The concentration rose from a value of ~41mg/l during 1984 to a value of ~100mg/l during 2010, a total rise of ~144% within 27 years. The average nitrate concentration is between the desirable and maximum allowed concentrations for drinking water (45 mg/l and 100mg/l, respectively); nevertheless, the last average value (2010) is very close to the maximum allowed limit. Most of the area in the basin is affected by nitrates ion concentrations above permissible concentrations.

There are numerous problems of water resources i.e. of availability, distribution, equity in access, quality, competition in usage, water pollution, encroachment on water bodies and catchment areas, ownership and right issues, etc. It is for this reason that this basin was selected to attempt a new model of water resource management. Also the State Government has enacted a River Basin Act without much understanding the implication of it in terms of governance of water. The proposed River Basin Parliament may help in understanding and addressing the future water governance and management needs of the State.

**Key Governance Features of the Parliament**

Based on the learning’s from the above review of experiences in Rajasthan the CEDSJ is trying to adopt a new approach of Participatory Community Management of River Basin. It is planned to have two associated partner NGOs namely Gramin Navyuvak MandalLaporia (GVNML) and Gramodaya Samajika Sansthan (GSS) as field level implementation partners to facilitate, i.e., community mobilization, formation of River Basin organisations in the Mashi sub-Basin starting from Gram Panchyat, micro watershed and sub-Basin level, Undertake capacity building activities jointly with CEDSJ in order to prepare IWRM plans. The information generated in the CEDSJ (2015) study with the input from Hydrologist or Hydro-geologist and Remote sensing expert etc. to map the land, water (water bodies and drainage system) and other natural resources in the Sub-Basin based on IWRM approach and document changes/obstructions caused in the sub-basin hydrological system by people, development agents and development activities by the State, will form the basis for capacity building training modules. Trainings will be imparted to the three group members, i.e., Stakeholder Group, Technical support Group and Public Representatives Group as shown in the organogram (Figure 2). The details about the groups are as follows:

- **Stakeholder Groups**: The Stakeholder group comprise of three sub groups; (i) Farmer and Non farm sector members, (ii) Industrialist Group, and (iii) Unorganized sector members. The First sub group will be at the watershed level and as there are six watersheds in the Mashi Basin in total there will be six groups of 5 members each adding to a total of 30 members. The Second Sub group will be of Industrialist
and there are two major industrial area, namely SEZ-Mahindra City and RIICO area. This group will have 5 representatives. The third sub group is of unorganized sector members representing business groups on road side and will have two representatives.

**Technical Support Group**: The group will comprise of representative of line departments at block level, subject matter specialist, such as Geologist, Geohydrologist, Agronomist, Watershed Specialist, Economist, Institutional expert, NGO representatives, CEDSJ representative, etc. In total this group will have 14 members. Technical support group will act like a advisory group to facilitate smooth working of parliament and help preparing IWRM plans and implementation of the plan.

**Public Representatives**: It has been observed that in most of the development groups formed by NGOs or State Government the public representative are either missing or are considered as passive members. Since each public representative has been allocated fund for development works in his/her constituency we thought of involving them in the River Basin activities and also take the issue at the state level. Their participation will ensure political support to the River Basin Parliament. Hence MLAs, Pradhans and Sarpanch’s will be the member of this group and in total there will be 29 members.

**Mashi River Basin Parliament**: Mashi River basin Parliament will be constituted after discussion with the three group members. The process of formation will start from below with capacity building trainings of all the stakeholders. The constitution and working procedures of the Parliament will be formulated in the stakeholder meetings though the draft document prepared by CEDSJ based on the review of community based organisations working in different parts of India. The experience of working with the Tarun Bharat Sanghin formation of Arvari River Parliament which is functioning for last 20 years will also be applied at each stage of its formation. In total there will be 80 members in the parliament. The River Parliament organisation is as follows (Figure 2):

![Figure 2: Organizational Structure of Mashi River Basin Parliament](image-url)

- **Stakeholders Group**: (37 Members)
  - Farmers & Nonfarm Sector (30 Members)
  - Industrialists (5 Members)
  - Unorganized Sector (2 Members)
  - Watershed 1 (5 Members)
  - Watershed 2 (5 Members)
  - Watershed 3 (5 Members)
  - Watershed 4 (5 Members)
  - Watershed 5 (5 Members)
  - Watershed 6 (5 Members)

- **Technical Support Group**: (14 Members)
  - Technical * (5 Members)
  - Line Department (5 Members)
  - NGO (2 Members)
  - CEDSJ (2 Members)
  - SEZ & RIICO

- **Public Representatives**: (29 Members)
  - MLA (7 Members)
  - Pradhan (12 Members)
  - Sarpanch (Nominated) (10 Members)

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References


Government of Rajasthan (2012), Detail Project Report- IWMP IV, Rural Development & Panchyati Raj Department, Watershed Development & Soil Conservation Department, Rajasthan, Jaipur


Oviedo, G., Mansourian, S. and Surkin, J. ( ) IUCN Contribution to “Environmental Justice and Global Citizenship” Governance of Natural Resources: Reconciling Local and National Levels, IUCN, UK.
