

## **RIVER BASIN MANAGEMENT-II**

### **Complexities of river basin in south Asia**

River basin and irrigation system in south Asia are marred with complexities and fractured institutional structures, which pose an enormous and effective, constraint for adopting an IWRM framework.

**The problems have been identified by Dr. Janakarajan and listed as follows**

- Myopic policies, competitive populism of successive government and lack of political will for good governance
- Disintegrate/ uncoordinated/fractured institutional structures
- lack of information flow
- lack of scientific data generation
- Inadequate and unscientific planning which have resulted in chronic upstream and down stream conflicts, mismatch between groundwater recharge and extraction and water logging and salinity problems.
- Growing population and increasing demand for water for attaining food security
- Rapid urbanization process resulting in increase in drinking water needs and sanitation, industrial expansion which demands more water, and competing demand for scarce water across sectors and emerging conflicts.
- Growing problem of water pollution. Laws exist but without effective law enforcement mechanisms
- Progressive decline in the ground water table and competitive deepening of wells

Conflicting interests among water various water users (stake holders) have been on the rise.

- Between head and tail enders within an irrigation command area or a river basin.
- Between economic efficiency and welfare (such as between high values users and use of water for agricultural production.
- Across uses and users(inter- sectoral conflicts)
- Between groundwater and surface water
- Between urban and rural areas
- Across states within a country(interstate water disputes)
- Between countries over water sharing (India , Bangladesh and Nepal)
- Between ecosystem and economic development or to maintain balance
- Between livelihood and water as a vital natural resources; and
- Between present and future generations of water users

## **Appropriate management strategies**

The fractured institutional structure, combined with myopic populist policies and lack of political will, stand in the way of adopting any management instruments prescribed by IWRM. Complexities and variability in the institutional structure of south Asian countries do not provide the required enabling environment to adopt strategies prescribed by the IWRM tool. Nevertheless, the emerging water crisis leaves no option but to work hard to achieve the fruits of IWRM (Janakarajan, 2006).

## **Threshold Approach' towards River Management**

With the growing perception of global environmental change and uncertain behaviour strategies of the river systems, River Basin Organization (RBO) need to evolve strategies to prevent (acceleration of man-made intervention), adapt and manage with the dynamic nature of the river systems. Though technocratic solution is crucial, many a times it is shaped by beliefs, values and attitudes of the individual experience, which is in-turn conditioned by their social, economic and political milieu. To reduce uncertainty, river managers need to understand the behaviour of the river systems by blending scientific tools for predicting, with that of local community knowledge system. At best the river managers in RBOs can play a major role to facilitate the objectivity through consensus and cross-fertilisation of technological options with social actors for improved management of river. The RBO should create opportunity for debate in public, where the social judgement of the community creates a natural validity around acceptance of technological options that exist in river management.

In recent years there have been significant efforts to evolve river basin institutions, through watershed development or sub-basin development, in India by NGOs and government agencies. Some of the significant ones are user groups promoted across the river Aravalli in Rajasthan (by Tarun Bharat Sangh, Alwar, Rajasthan), Chain of tanks based sub-basin development adopted by Development for Human Action (DHAN) Foundation, in Madurai Tamil Nadu and on river Kali-II in Gujarat (by N.M. Sadguru Water Development Foundation, Dahod, Gujarat). However, there is no simple solution to the participatory governance system. People also need to take an active role themselves in river basin management.

## **Development at Origin - *Rational option for resource management***

To promote resource management, these institutions have evolved combination of technological interventions through community-based approach in the region, rather than techno centric large dams as the only option. In the past, technologies of river basin management have largely been guided with a perspective to control, conserve and manage through large dams. Past experience has shown that there are very serious and increasing problems with costs, benefits and impacts of large dams and RBOs having large dams in focus. Because the complexities and existence of the unlimited knowledge of the river system is inevitable, long-term prediction of the behaviour of the river system is difficult. However, understanding them is critical for river basin management. This

requires not only the states and RBOs to totally restructure their role in managing of the river basins but also the local communities need to be given effective rights for informed participation.

## **Case Studies – Tamil Nadu**

### **1. IAM WARM - Irrigated Agriculture Modernization and Water-Bodies Restoration and Management Project (IAMWARM)**

The Project Development Objectives is to improve irrigation service delivery and productivity of irrigated agriculture with effective integrated water resources management in a river basin / sub-basin frame work in Tamilnadu. It is a **Multi Disciplinary Project** unit

Tamil Nadu is one of the driest states in India, averaging only 925 millimeters of rainfall a year. Per capita availability of water resources in Tamil Nadu (population about 62 million) is only 900 cubic meters a year, compared with 2,200 cubic meters for all of India. The state's dry season lasts five months (January through May) even in good years, and severe droughts occur in 3 of 10 years, severely limiting cultivation of crops between June and September. A recent series of droughts and water shortages has highlighted the importance of good water resources and irrigation management. Tamil Nadu's geographic area can be grouped into 17 river basins (127 Sub Basins) a majority of which are water-stressed. There are 61 major reservoirs, about 40,000 tanks (traditional water harvesting structures) and about 3 million wells, that heavily utilize the available surface water (24.2 BCM) and groundwater (22.4 BCM). Agriculture is the single largest consumer of water in the state, using 75% of the state's water. Irrigation through a combination of canals, wells, and tanks increases the reliability and availability of water for farming and is essential for cultivating crops in much of state. Approximately 30% of the net irrigated area of 30 lakh hectares is watered by canals and 21% by tanks, while 49% is fed by wells. The remaining area is irrigated by other sources such as streams and springs.

In an agrarian state like Tamil Nadu, there is need for intensifying efforts to improve productivity and income. Growth in agriculture depends on increasing the efficiency and productive use of water. So there is a need for strengthening and integrating institutional structures which can help farmer's access to irrigation management and improved agriculture practices.

### **2. River Basin Studies**

Kodaiyar River basin is one among the 34 river basins in Tamil Nadu. For the purpose of taking up micro level hydrological studies and water resources planning activities, the 34 river basins are grouped into 17 major river basins.

The State Water Plan (SWP) can be formulated the identification in each basin of: (i) problems and issues of strategic importance to the State and (ii) options for their solution (Fig.A & Fig.). The report deals with scientific assessment of Water Resources in the

river basin (Surface & Groundwater) using the latest technology like Remote Sensing and GIS techniques available, for computing the sectorized demands for various sectors like domestic, agriculture, industries, livestock, power generation, environment and other uses and future planning of water resources in the state for the benefit of the society.

**Assessment Report discussed the following aspects of the River Basin**

- Hydro meteorological Characteristics
- Surface Water Resources and Irrigation System
- Groundwater Resources and Quality
- Present and Future Water Demands
- Environmental Aspects
- Simulation Studies for Water Planning
- Present Institutional Setup and Issues
- Policies, Legislation and Institutional Strengthening
- Development Plan
- Action Plan – Economic Evaluation and Prioritization of the Projects

The report is a comprehensive study of a river basin. It is a prerequisite to the river basin planning. Tamil Nadu has 34 river basins, out of which it is grouped as 17 river basins. There are 16 river basins studies published by Institute for Water Studies, Government of Tamil Nadu.

**2.1 Cauvery River Basin - A case of interstate dispute**

The Cauvery is one of the important rivers of peninsular Tamil Nadu. Karnataka and Tamil Nadu are the major states staking claims on the Cauvery water. Kerala and Pondicherry are the other riparian states which benefit in a small way. Therefore, Cauvery is an inter state river as per the provisions of the constitution of India. The basin covers an area of 48,730 sq.km in Tamil Nadu and 36,240 sq.km in Karnataka. The river travels a distance of 800 km before reaching the Bay of Bengal on the southern Tamil Nadu coast. The Cauvery water dispute between the riparian states is quite different from other inter state water disputes such as Krishna, Godavari or Narmada. In the case of the latter, the disputes revolve around the utilization of the untapped potential in the concerned rivers. The Cauvery dispute is, in contrast, around the issue of allocation and reallocation of already committed and used water. This is unprecedented in the history of any inter-state water disputes in India.

Realizing the tricky situation, the Supreme Court immediately intervened and passed strict order. As a result the chief minister of Karnataka not only tendered an unconditional apology for having disregarded the supreme courts directives, but also started releasing water. The Karnataka chief minister has taken this decision despite strong protest from the Cauvery basin farmers in his state. There was a sigh of relief from many quarters, in particular from civil society in both states. However the situation that followed the release of water was quite grim in Karnataka: farmer's violence caused enormous damage to public property.

Under these violent circumstances, it is very difficult to speculate for how long the crest gates of the Krishnaraja sagar dam (Karnataka) will remain open to augment the water supply to the Mettur dam (Tamil Nadu). It further raises a pertinent question: Can the Supreme Court provide a lasting solution to this century –old problem. Unfortunately, political dialogues that have taken place so far in both states have only promoted regional prejudice.

## **2.2 Palar River Basin-Approaching IWRM through Multistakeholder’s Dialogue (MSD)**

In an atmosphere of intense competition and bitter conflicts, how does one bring together the various stakeholders for a dialogue and coordinated action? Who should initiate the multi stakeholders’ dialogue (MSD) --- the government of NGOs or academics or any other group interested in civil society? The real usefulness of MSD lies in the fact that it provides a platform for all stake holders to express their views and concerns and discuss them with other stakeholder. It provides an enabling environment for a better understanding and analysis of the situation.

### **Multi Stakeholders Meeting**

The first step was to organize a meeting of multi stake holders with participants drawn mostly from the Palar river basin. However, to involve tannery owners the main polluters in the meeting was found to be very difficult. Greater difficulties were encountered in involving the government officials, in particular those from the Tamil Nadu Pollution Control Board (TNPCB). Many officials it a ‘sensitive matter’ and expressed fear about participating in the meeting.

Other participants from the Palar river basin were (representing) farmers, NGOs, local doctors, residents of local towns, microbiologists, lawyers, media persons, academics and interested general public. Thus the multi stakeholders meeting of water users of the Palar river basin was held on 28 and 29 January 2002 at Chennai, with 120 participants

The basic objectives of this meeting were:

- To take stock of use and abuse of water in the basin in the overall context of urban and industrial expansion and in the context of poverty, food security and hunger.
- To assess and examine who are the defaulters of law, and their positive and negative contributions to society and economy.
- To bring together various stakeholders for a fruitful dialogue with a view to hear, debate, document, and make public their voices.
- To find ways to prevent further degradation of natural resources in question and to work towards sustainable development with a common agenda within a framework acceptable to all stakeholders.
- Most important of all, to find ways to turn situations of conflict and distrust into opportunities for mutual aid and cooperation.

There were many heated argument and the discussion was lively. At one stage, the discussion was quite intense and many strong words were used. In the dialogue process, remedial resources for the problem of effluent discharge and environmental pollution were debated and discussed extensively.

The dialogue centered on the following issues.

- Do we need new laws
- Legal remedies – filing public interest litigation cases, would it help the cause.
- Technologically more efficient ietps and cetps: used cleaner technologies and recycle and treated water. Do we have an efficient monitoring mechanism?
- Put pressure on the loss of ecology authority for the reversal of ecology. Is it possible?

Towards the end of the meeting there was a big sigh of relief. At that time it was widely acknowledged that MSD is a continuing process and result was the birth of the social committees with 24 members representing different stake holders. The two day meeting was given wide publicity by the media, which carried stories for two days. The objectives of multi stakeholders committee of water users of the Palar river basin are.

- A comprehensive attempt will be made with an interdisciplinary focus to document information pertaining to water and environment in the Palar basin.
- The monitor pollution levels in the surface and ground water at different strategic points within the basin.
- To measure the quantum of water consumed by different sectors such as agriculture, industrial and economic users;
- To measure the actual quantum of water that goes out of the basin for non-agricultural uses such as for domestic and industrial purposes, amusement parks etc.
- Reversal of ecology
- Developing rapport with various government agencies such as TNPCB, NEERI, CLRI, PWD, TWAD Board, National River Authority, Department of Mines and Minerals, District Administration, Department of Industrial and Commerce, etc
- Critically assessing the findings of the loss of ecology authority and their recommendations for the reversal of ecology.

## **References**

1. Janakarajan .S (2006), “Approaching IWRM through Multi-Stakeholders’ Dialogue: Some Experiences from South India” by, Integrated water resources management-Global theory, emerging practice and local needs: Eds.Peter P.Molinga, Ajaya Dixit and Kusum Athukorala, sage publications: New Delhi.
2. Report on Micro level Reappraisal Study on Kodaiyar River Basin, Tamil Nadu, and Institute for Water Studies, Government of Tamil Nadu
3. [www.sandrp.in/rivers/rvrbsin\\_org\\_wcd.pdf](http://www.sandrp.in/rivers/rvrbsin_org_wcd.pdf)
4. [http:// www.tn.gov.in/spc/workshop/WRM\\_DEENADAYALAN.PPT](http://www.tn.gov.in/spc/workshop/WRM_DEENADAYALAN.PPT)
5. [www.iamwarm.gov.in](http://www.iamwarm.gov.in)