STRIVER POLICY BRIEF

Strategy and methodology for improved IWRM
- An integrated interdisciplinary assessment in four twinning river basins

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Strategies and Recommendations towards an IWRM approach in Tungabhadra sub-basin, India

In Tungabhadra sub basin, the concept of IWRM has made very little headway in practical terms. However; there are a number of small-scale initiatives that could serve as a starting point for an integrated approach. An overall integrated plan is needed to envisage how transformation can be achieved with a basin wise management approach in this transboundary river.

The STRIVER Brief series translate the results from the EC FP6-funded STRIVER project into practical and useful information for policy makers and water managers

Strategies and Recommendations towards an IWRM approach in *Tungabhadra* sub-basin, India

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Abstract

In the Tungabhadra sub basin (TBSB), Integrated Water Resource Management (IWRM) is currently seen in a number of smaller initiatives at local scale. The concept of integration is new in water sector and it has for the first time been specified in the National Water Policy (2000), the Karnataka State Water Policy (2002). Currently, water management is based on administrative and not hydrological boundaries resulting in allocation, distribution and usage problems within and across sectors. A number of institutional measures can be implemented to develop IWRM initiatives. To begin with, a complete hydrological characterization apart from reforms of water laws and water institutions through participatory approaches is required, considering several stakeholder interests. The Participatory Irrigation Management policy (2002) and Andhra Pradesh *Farmers' Management of Irrigation Systems Act*, 1997 demonstrates that it is possible to make changes, but needs to be put in practice. Number of government programs exist for capacity building, which have to be customized to suit the local needs and prepare managers and other stakeholders to strengthen IWRM competence, In addition, integration of rain fed and irrigated agriculture, integration of dispersed storages like tanks and with larger sources like the major and medium irrigation projects, improving water use efficiency, and livelihoods of marginal communities is important in TBSB.

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Fact box

Tungabhadra (TBSB) is a closed river basin, where the available water is shared between agriculture, domestic and industrial sectors. Irrigation accounts for nearly 90% of the water use and and irrigated agriculture has been rapidly expanding in TBSB since the 70s driven by the Green Revolution. Land use changes in TBSB has resulted in a shift in the water use resulting in more competition for water demands. Agricultural activities, together with industrial effluents, domestic sewage and mining activities cause river water pollution. Runoff from agricultural fields has resulted in salinity, alkalinity and water logging in the downstream of the command area affecting an area of 52000, 8345 and 35850 ha respectively. Fish kills are frequent affecting livelihoods of thousasands of small scale fishermen households each year. The major problem in TBSB is the transboundary conflict between the two states Karnataka and Andhra Pradesh over the sharing the waters.

TBSB – present status and future needs for an integrated development

In TBSB, a transboundary river, water management is based on administrative and not hydrological boundaries resulting in various allocation, distribution and usage problems within and across various sectors. The major share (94%) of water is allocated for irrigated agriculture, which heavily influences the water management decisions followed by urban use. The concept of integration is new to water managers. It has for the first time been specified in the National Water Policy (2000) and the Karnataka State Water Policy (2002) and Water, Land and Trees Act (2002) However, these general 'framework' policies are rudimentary regulatory mechanisms for implementing and enforcing more specific policies, which for that matter hardly exist. Although it is stated as the future vision, implementation is not happening in a basin perspective and management plans do not exist at the catchment level. Traditionally, water management has been very sectoral in India with a strong emphasis on infrastructure and technological interventions. The departments have conflicting interests and often find it difficult to integrate their interests with a common goal. There are large data gaps in assessing availability of water and the estimate is a rough one.

Main problems in TBSB

Analysis from various STRIVER activities has shown that:

1. Agriculture expansion, mining, industrial development and forest fires cause severe pressures on land use causing degradation.

2. In addition, deforestation due to illegal occupation, mining activities and forest fires is a matter of concern, causing soil erosion, siltation, reduced reservoir water storage capacity, water pollution and fish kills.

3. Monitoring and enforcement of impacts due to various activities is rather weak.

4. Water pollution is a serious concern in certain parts of the river, due to release of untreated municipal and industrial waste discharged into the river.

5. Political interests have resulted in more conflicts rather than contributing to integrated management in the basin.

Fig 1: A farmer operating in System of Rice Intensification (SRI) field in TBSB, Karnataka, India

6. Irrigated and rainfed agriculture are largely treated in isolation with very few signs of 'integration' and also within each domain policies and programmes tend to be narrow in orientation.

7. Contending water uses across different uses, especially between agriculture, industrial and urban uses is prominent and was also identified during the stakeholders meeting.

Stakeholder perspectives, inputs and scenarios

As part of the STRIVER project, three stakeholder workshops were organized in TBSB. The purpose of the workshops and field interviews was to bring together a range of stakeholders ((State agencies, NGOs, Research Institutions, farmers, fishermen, etc), in order to exchange ideas on the key challenges facing the TBSB and discuss future scenarios and policy guidelines. A number of key challenges and opportunities emerged from the stakeholder discussions.

Water is sourced and used in a widely dispersed manner and only a small amount of it is intercepted by a centralized system. Water

sourcing and use often creates externalities, and more often than not, asymmetrical and unidirectional externalities. Barring piped water supply, water supply mechanisms have very high exclusion costs for potential water recipients. Moreover, it is recognized that water use and access encompasses both aspects of water as a social good and economic good. These two aspects generate stakeholder interests and consequent policy directions often moving in opposite directions needing a balance. From the point of view of stakeholder interaction in reference to an IWRM perspective all these aspects need to be taken into account in planning stakeholder policy at a basin/sub-basin level.

Fig 2: Second Stakeholders Meeting of TBSB held at Bangalore, India.

Over the last few years, there has been a greater effort, in varying degrees in moving towards greater stakeholder participation:

1. Stakeholder participation has been included in water policy documents and legislation, for example, the National Water Policy, 2000, mention stakeholders under clause 6.8 of the section "Planning" and in clause 12 of the section on "Participatory Approach to Water Resources Management".

2. The Karnataka State Water Policy, 2002 and Andhra *Pradesh Farmers' Management of Irrigation Systems Act*, 1997, promotes stakeholder participation in participatory irrigation management through water users' associations.

3. Many drinking water schemes, micro-watershed development programmes are being promoted with guidelines for community participation. Institutions such as village councils, Watershed Development Committees, User Groups and Self Help Groups are formed and include the poor and women.

In short, in all the three major sectors – irrigation, drinking water and watershed development – efforts are on to promote participation. However with the limitation that these efforts are entirely intra-sectoral and very little across inter-sectoral and it is all 'local' at lower levels with no participatory governance at sight.

In the STRIVER stakeholder workshops, for the first time Stakeholders from both the states – Karnataka and Andhra Pradesh participated and shared their experiences and views that are reflected in the brief.

To this end, what is needed is a dispersed regulatory mechanism that will provide for effective and transparent stakeholder interaction at all levels in a nested manner from the watershed/village level to the basin level within a state with a special forum at the multi-state level. Planning this for each state is a massive task that needs to be taken up in earnest by both Tungabhadra sub-basin riparian states of Andhra Pradesh and Karnataka.

Towards an IWRM approach

There are, already a number of initiatives at different levels that could serve as a starting point for improved integration of water management in the TBSB. These include: Major intervention to protect the catchments and forest cover was the introduction of the Forest Conservation Act, 1980, which prevented the conversion of forestland for other purposes without prior approval. In addition, large areas within the TB catchment were also declared as National Parks to protect biodiversity. Similarly, watershed development initiatives have focused on holistic development of human resources, soil, land and water management.

Karnataka State Pollution Control Board (KSPCB) has been monitoring the water quality samples regularly and warns polluters during violation but has not been able to influence major policy decisions at large as there is no analysis at a basin level. NGO's working with fishing communities and civil society organizations like Samaj Partivarthan Samudaya (SPS) have protested against the

release of industrial effluents and brought some regulations in place for effective monitoring of effluents and also resulted in the formation of Tungabhadra Watchdog Committee. This demonstrates the potential of stakeholder influence in policy formulation and changes.

Integration in TBSB should first start at the interstate level based on negotiation and stakeholder participation. But, instead, interstate disputes are handled by tribunals set up under interstate disputes act. TBSB is part of the larger basin 'Krishna' and decision making on it is part of the disptutes proceedings. TB Board has been set up for implementing the provisions of the Krishna Water Dispute Tribunal (KWDT) award. Bachawat Award was agreed in the mid 1990's and it stipulates a fixed scheme of water allocation in the Krishna basin, including the TBSB. The operation of the Tungabhadra reservoir is being done by the interstate TB Board and the Award is presently under revision. Currently, the Tribunal has been reconstituted as the earlier award has lapsed and renegotiation is on. As was evident at the stakeholder meetings, the pushes and pulls on the allocation with in the two states and between the states (intra-state and interstate) are quite active. Neither the existing award, nor any other agreement, provides practical procedural arrangements for negotiating allocation and distribution under varying and changing circumstances. At the same time States treat data very secretly, and a lot of confusion tends to exist around it. There is no statutory requirement for States to exchange data and information in general. Agreed upon data is a precondition for meaningful stakeholder participation and this is virtually absent in the case of Tungabhadra. Regular stakeholder interactions at various levels can help in resolving conflicts and other than tribunals, which are often influenced by political interests.

The National Water Policy and the State Water Policies give water use priorities across different sectors, but do not have much of relevance in terms of actual water use planning and allocation. So far as sectoral allocations are concerned, most of the changes are taking place in the rural allocations and within it mainly from irrigation use to other uses. Also, there are no explicit legal agreements between sectors regarding sharing of water. Competing water demands in the basin have to be met by reallocating water from other sectors. This creates a problem, since reallocation would mean cutting down the water quotas from certain sectors that could lead to conflicts. Water use conflict in the TB is politically a sensitive issue leading to demonstrations by farmers and legal disputes between Karnataka and AP. On the whole there is a continuous pressure from different stakeholders and at different levels. Ineffective governance aggravates increased competition and water management is usually in the hands of top-down institutions, the legitimacy and effectiveness of which have increasingly been questioned.

Strategies and Recommendations

As mentioned earlier, the National and State water policies although reflecting the principles of IWRM, are not implemented in a basin context. There are several organizations across the basin working on various aspects; however, there is no single authority as River Basin Organization or an effective co-coordinating mechanism for existing agencies in the TBSB. In this backdrop it is important to bring about major policy changes with specific reference to the following:

- Formulate an overall plan addressing mutli-sectoral and interstate needs, balancing competing water demands taking the supply and demand, climate change impacts and water pricing. The plan should envisage how the IWRM transformation can be achieved with a basin wise management approach.

- Carrying out a complete hydrological characterization to get an account of the water resources available and of their regularity in time and space. Need for an appropriate basin level land and water use database for developing a holistic perspective.

- Reforms of water laws and water institutions through participatory approach holding extensive consultations involving affected agencies and public. Policies have to be directed to balancing requirement and availability across space and time.

- Adequate institutional and policy support to clarify the entitlement and responsibilities - roles, allocations, legal status across users

and water providers for sustainable use. Integration of responsibilities of water management between departments with a formal mechanism to ensure co-ordination.

Some specific measures

- Provide supportive system to link the water users and providers. It is also important to improve the policy and technologies; innovations to have impact on water use efficiency and livelihood assurance.

- Promoting artificial recharge for increasing ground water availability. Recharging through existing private dug-wells, rejuvenation of tanks, small ponds, check dams etc.

- Need for planned integration of policies and programmes for rainfed and irrigated agriculture and also dispersed sources like the tanks and the larger sources like the major and medium irrigation projects.

- Need for improving water use efficiency, through promotion of options like SRI in irrigated agriculture through government programmes and promoting fisheries in the basin. Water efficient technological innovations have provided promising options for irrigated agriculture to paddy, sugar cane and orchard crops, which are prominently grown. The most popular innovation in paddy is System of Rice Intensification (SRI) that saves up to 40% water use and simultaneously increases yields. Drip irrigation systems of varying sophistication are available for growing sugarcane and orchid crops. However, these methods are only partially adopted. Efficiency of industrial use through proper pricing and providing credits for reuse and recycling and strict enforcement of effluent quality standards.

- Formation of a regulatory body and regulatory mechanism that provides for dispersed access to the authority and/or its officials. Special care supporting women and marginal communities in having adequate access to the regulatory authority in the defense of their rights and entitlements.

- Provision for mandatory periodic presentation of State level Water Resource Plan for all sectors in the basin including allocations and tariffs after due consultation and representation from all stakeholders.

- Redressal mechanism for disputes over water entitlements, allocations and tariffs

- Capacity building of stakeholders to enable them to participate effectively in the stakeholder interaction on an equal footing with other stakeholders. It should also be recognized that this might involve positive discrimination and corresponding weightage for the poor and the disadvantaged.

- Sufficient budgetary allocations to support the activities of incorporating stakeholder interaction and regulatory activity into IWRM at the basin level.

- At an inter-state level there is also a need for continuous interaction at the basin level with respect to inter-state allocation, scheduling flows, monitoring water quality and environmental flows, anticipating and effectively dealing with impending disasters like floods and droughts. For this it is important that an interstate forum of the state level basin organizations be set up in a spirit of co-operative interaction.

- Provide support to the newly formed Tungabhadra Stakeholder Forum and develop it as an inclusive stakeholder forum of all the stakeholders in the basin and use it as a space for dialogue and consensus building space within the basin

Bringing some of the principles of IWRM into a water sector policy and achieving political support may be challenging, as hard decisions have to be made. The contexts of the poor are diverse and need to be addressed in a holistic approach in future development programs

Fig 3: Fisher Women selling fish at TBSB, Karnataka, India

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About STRIVER
STRIVER- Strategy and methodology for improved IWRM - An integrated interdisciplinary assessment in four twinning river basins is a three year EC funded project 2006-2009 under the 6th framework programme (FP6) coordinated jointly by Bioforsk and NIVA. The point of departure for STRIVER is the lack of clear methodologies and problems in operationalisation of Integrated Water Resource Management (IWRM) as pointed out by both the scientific and management communities.13 partners from 9 countries participate as contractual partners in addition to an external advisory board.

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Disclaimer

Front-cover photo: Sandy river bank on the Tungabhadra River (India). Photo: Manasi, S.

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