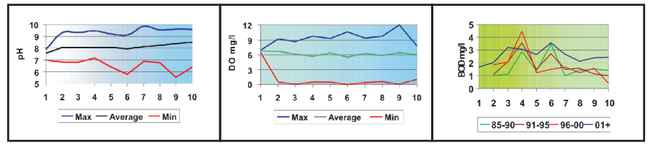
Pollution in Tungabhadra basin

In the Tungabhadra basin there are a number of processes that lead to pollution. There are more than 8000 small industries in the basin. Twenty seven large scale industries are functioning in the basin and another 50 are in the process of coming up. Very few of them treat the effluents they generate. Municipal sewage, that is, waste we ourselves generate, is another source of pollution. Of the 28 urban local bodies in the basin 20 do not have underground sewage disposal and in the rest too it is partial. None of them treat their sewage and depend upon natural degradation and dilution to take care of the problem. The third important source of pollution is that of fertiliser and chemical use and these have been growing over the years. About 150 villages are affected by severe groundwater pollution.



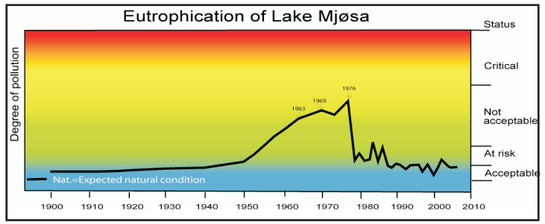
Data provided by KPCB show that pollution had been increasing and peaked in the period 1996-2000 but has fallen somewhat in later years. However, it is important to realise that seasonal variation indicates that seasonal impacts of pollution are large, conditions are worse in summer and have not improved much. The improvement can be traced to a persistent struggle by people in the basin during the nineties which also forced the closure of some of the polluting industries and a greater concern about quality problems by the authorities. But this has to be supplemented by a change in the way we do things in all three major areas - treatment of effluents by industries, of sewage by urban bodies and villages and also methods of cultivation that will bring down the use of chemicals.

Suhas Paranjape and K. J. Joy (SOPPECOM)

Water quality abatement in Glomma (Norway) - a success story

Glomma is the largest river in Norway. The Glomma basin (41 200 km2) is the most populated river basin in Norway, and has 47 hydro power stations and 26 regulations and water and diversion schemes. Hydropower development in Norway has a long historical tradition where minimum flow requirements based on ecological considerations have been set by the authorities and implemented in laws.

The most important water quality issue in Glomma has been the excessive eutrophication of Lake Mjøsa located in the middle of the Glomma river basin. Domestic sewage, industrial waste and runoff from agriculture resulted in large input of nutrients and an excessive growth of algae causing problems for ecosystems and for the use of Mjøsa as source for drinking water supply and recreation. The level of eutrophication was at its peak in the late 1960s and 1970s with a dramatic maximum in 1976-77 with a massive bloom of bluegreen algae. Gro Harlem Brundtland, then Minister of Environment in Norway, initiated a massive action to save the lake. The so-called "Action Lake Mjøsa" with huge investments was launched - and proved a success! The scientific advice given by NIVA to reduce the input of phosphorous from more than 350 ton/year down to sub critical levels of 175 tons per year proved to be the right medicine. A sharp decrease in eutrophication level followed the decrease in discharges.



A wide variety of actions was behind the success: sound and good political, technical, scientific measures and public awareness. New treatment plants for cities were built with chemical treatment removing phosphorous, existing plants upgraded, new sewer networks installed and existing network upgraded, treatment plants introduced in densely populated areas, the storm runoff systems upgraded, phosphates from detergents banned, waste management and industrial treatment plants improved, inputs from agricultural sources reduced and agricultural practices improved. Good monitoring systems for water quality and quantity existed. There were open public hearings by the local authorities and publicity in media. However, pollution issues in many side tributaries remain. More measures are needed for ensuring improved water quality. For example, Norway will implement the EU Water Framework Directive which stipulates the goal of ensuring good ecological status in all water bodies by 2015 with a "combined approach": emission limit values, quality standards, getting the prices right, getting the citizen involved more closely and more streamlined legislation across sectors.

To conclude: Ensuring good water quality requires collaboration and a holistic view that goes beyond individual demands and short-term economical interest, strong river basin institutions with clear mandates and involvement of local interests.

Per Stålnacke (Bioforsk), Line Barkved and Haakon Thaulow (NIVA)

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Note: This News letter is for free distribution.

Tungabhadra News

STRIVER

September 2008, Issue 2

Introduction

This is the second issue of the Tungabhadra News. The intervening period since the first issue in January 2008 has been a period of intensive work in STRIVER. Intensive field work was also taken up in both upper and lower parts of the Tungabhadra basin looking at water quality, intersectoral water use, land use changes, livelihood issues and so on. Reports on these studies will soon be uploaded on the STRIVER website (www.striver.org). This issue of the Tungabhadra News tries to capture some of their important insights coming out of these studies. This issue also brings readers the experience of the Glomma river basin in Norway, one of the four case basins of the STRIVER project, in tackling pollution issues, an experience we hope will inspire and help in drawing lessons for Tungabhadra.

The mid-term evaluation of the STRIVER project also took place at a meeting in January 2008. The European Union evaluators appreciated the work done so far and also advised the research teams to give more emphasis on policy issues. It was decided to bring out policy briefs based on the research outputs of various work packages. The final product of the project would be a book which we are sure would contribute to the IWRM discourse globally.

This second issue of Tungabhadra News is being released at the second stakeholder meeting of Tungabhadra basin on 30 September-1 October 2008 at Bangalore. We hope the Tungabhadra News becomes an effective means of communication and dialogue amongst different stakeholders of the basin.

We are thankful to all those who have contributed to this issue: the authors, translators, layout artists and the printer.

SOPPECOM STRIVER team

SRI A new method for food security and reduce water conflicts

Rice is the staple food of majority of the population in our country. Rice cultivation consumes more than 70% of irrigation water, as it is conventionally grown in flooding method. According to Food and Agriculture Organisation (FAO) estimate, for every kilogram of rice produced 3000-5000 litres of water is consumed! The demand for growing rice is increasing every year due to various reasons - population growth, changing food habits, government schemes like public distribution system, minimum support price (MSP), and food and livelihood security opportunities for millions of families. But, increasing water scarcity is making rice cultivation difficult; the situation will worsen in future. Besides, high inputs are not giving desired levels of high yields. We are unable to even cross the average production of three tonnes per ha for many decades now. In this context, there is need for alternate methods of growing rice that can reduce water consumption and give more yields. System of Rice Intensification, popularly known as SRI, has great potential to address the issues of food security and water scarcity.

SRI method of rice cultivation is different from the conventional flooding method in many ways. It advocates use of organic manure, less seed (2 kg/ha), transplantation of single young seedling (8-12 days old) at wider spacing of 25 X 25 cms, water saving by alternate wetting and drying without flooding the fields and weed management using mechanical weeders. SRI practices enable rice plant to grow vigorously with profuse tillers. More productive tillers give more panicles and grains leading to higher yields. In many areas, yields are reported 20-40% higher than the conventional method and reduction in water consumption by 30-40%. Pest and disease incidences are also low. Strong roots in rice plants can

In this Issue:

withstand windstorm and loss in crop yields due to lodging of mature plants can be avoided.
Now SRI is spreading out to many states across the country. Many farmers, NGOs and government agencies are advocating promotion of SRI for its benefits. Rice farmers can easily adopt the method with one-day field training and hand holding support while adoption in one season. The benefits of SRI will be much more visible in our country if we adopt it in at least 20% of irrigated rice area and reduce pressure on irrigation water by at least 30%. Appropriate policies and institutional mechanisms are needed at state and central levels to promote SRI method on a large scale in order to get positive impacts on the food security and water resources in the country.

Vinod Goud (WWF- ICRISAT)

Multiple uses of tanks in the Tungabhadra basin

SOPPECOM, with the help from Vikasana and ICDO, two NGOs working in Tungabhadra basin, carried out a detailed study of five villages served by four tanks from Shimoga and Davangere districts in the upper catchment of the Tungabhadra basin. Two are balance tanks (tanks which harvest rainwater as well as receive water from the Bhadra irrigation project) and two are stand-alone, rainfed tanks. Multiple uses of tanks was one of the important issues that we investigated during the study.
The house listing data from the five villages shows that 574 ha from 575 households out of a total cultivated area of 1885 ha of 1655 households (about 30% of the cultivated area from 35% households) receives irrigation from the tanks.

Non-irrigation uses of tanks

The study shows that the non-irrigation uses are significant and generally higher in the case of balance tanks/reservoirs. More than 75% of the households use the tanks for washing clothes and more than 40% use as a source for drinking and also to bathe cattle. Tanks are also used for bathing, fishing, swimming, worship, tank bed cultivation and silt application for farm land and sometimes directly for drinking water. The details are given in the adjoining table.

Type of use	Monsoon (No. of HHs)	Rabi (No. of HHs)	Summer (No. of HHs)
Drinking water (directly from tank)	19	23	26
	(1.1)	(1.4)	(1.6)
Washing clothes	1,252	1,296	1,243
	(75.6)	(78.3)	(75.1)
Bathing	135	152	151
	(8.2)	(9.2)	(9.1)
Drinking water for cattle	666	676	678
	(40.2)	(40.8)	(41.0)
Washing cattle	666	676	678
	(40.2)	(40.8)	(41.0)
Fishing	25	19	22
	(1.5)	(1.1)	(1.3)
Swimming	130	213	345
	(7.9)	(12.9)	(20.8)
Worship	264	222	222
	(16.0)	(13.4)	(13.4)
Tank bed cultivation	20	14	21
	(1.2)	(0.8)	(1.3)
Silt for farm land	7	12	148
	(0.4)	(0.7)	(8.9)

(**Note:** Total No. of households surveyed: 1655; percentages given in parenthesis; percentages are of the total number of households; the data about drinking water use is only about HHs who use water directly from the tank; use of tank water through drinking water schemes exist extensively)

This finding has implications for policies, institutions and practices around tank management which most often are driven by irrigation use. There is a need to broad base them taking into account the different uses and also include all the different users in the institutions crafted for the management of tanks.

K. J. Joy and Suhas Paranjape (SOPPECOM)

IWRM and livelihoods: fisheries in Tungabhadra basin

Improving livelihoods of marginal communities and promoting economic growth is one of the basic principles of IWRM. A study was carried out of livelihoods of fishing communities based on interaction with 160 households from 16 communities in the Tungabhadra sub basin (TBSB). The communities were found concentrated around major water bodies. Majority were poor and comprised small scale household enterprises with the women and children often sharing the burden, mostly of sorting and selling.

Annual migrations, often in fishing camps of larger operators, mostly involving male members only, and living in temporary settlements were common and caused hardships and disrupted social life. Migration was more a constraint than an advantage to the fishermen.

Licensing to tenders

Initially, the Fisheries Department (FD) acquired fishing leases for water bodies in TBSB and licensed fishing rights to small fishermen for small license fees, who would register annually with the Department of Fisheries by paying the prescribed fee and fish throughout the year. Since 2001, the Tungabhadra Board began calls for open tenders from fishermen societies giving the highest bidder the overall rights to fish. Soon village water bodies also began to call for open tenders to realize more revenue. Small fishermen could not easily acquire access, became dependent on middlemen, came into conflict with societies and large private investors could use the societies as proxies and resulted in over exploitation of fisheries for short-term gains.
In fact, between 2000 and 2005, fisheries in the Tungabhadra have declined by almost half (GOK, 2005) due to: inadequate and poor quality fingerlings, lack of integrated efforts by the Department of Fisheries, illegal fishing, pollution from industries and lack of integrated water resources management.
The small scale fishermen still had to bear the brunt of the effects droughts and shortages. At the same time, water allocation is farmer and agriculture centred, does not involve FD and the needs for fisheries and as fishermen complain, stretches of Tungabhadra become dry by early March-April.

Policy implications

A number of policies and institutions already exist in TBSB, which if implemented properly, can facilitate the entry of poor into fisheries. For example, the policy for auctioning fishing rights in tanks, reservoirs, and rivers requires priority to be given to the Water Users Associations or the registered Fisheries Cooperative Societies or the registered water users cooperatives etc. A number of integrated measures can be taken such as improving the fish stock in the water bodies, issuing licenses only to small and traditional fishermen, customizing fisheries training programs and targeting government welfare schemes to benefit the poorest fishermen. Government agencies need to review how fishing rights will be granted and how not to sacrifice welfare of the fishermen for the revenue from fisheries.

Udaya Sekhar Nagothu (Bioforsk), Manasi S. (ISEC)

Competing water uses

Water demands from different sectors have significantly changed over time in the Tungabhadra sub basin. Agriculture has been the major consumer and intra-sectoral demands within agriculture and urbanization have led to high demands on water. In the process, crucial sectors like environment and fisheries are not given adequate importance. Conflicts within and across sectors are common apart from interstate disputes, due to the transboundary nature of the river. Total water allocation is 230.31 TMC, of which, agriculture gets 94.3 %, 1.96 % for drinking water and 3.72 for Industrial usage.
Although allocation for drinking water is given first priority, water availability is still a problem. Pollution further enhances water scarcity. Designed cropping pattern has been specified for semi arid crops but water intensive crops (paddy and sugarcane) dominate. Tourist and religious places add to competition. A combination of social inequity and economic marginalisation have forced people living in extreme poverty to overexploit soil and forestry resources, with damaging impacts on water resources. Scope for political interventions aids in favouring the economically better off ignoring the poor. Violation of rules is prominent making it difficult to manage.
The challenge has been to make rational use through sharing and better management of water. There has been no water regulatory authority, nor clear or enforceable water entitlements and rights for the TBSB as a whole. An overall plan is required to envisage how the transformation can be achieved with a basin wise management approach. Although it is mentioned in the water policy to reflect the principles of sustainable management through integrated water resources management, it is not implemented. Among the existing ones, regulatory mechanisms for implementing and enforcing them are limited or non-existent. To put the policy into practice is likely to require the reform of water law and water institutions. This can be a long process and needs to involve extensive consultations with affected agencies and the public. 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 which requires major legal and institutional reforms.

Manasi. S. and Latha N. (ISEC) and Udaya Sekhar Nagothu (Bioforsk)