

Rivers, floodplains, cities and farmers

Floodplains of rivers can provide a new source of water. They are a local, non-polluting, perennial and non-invasive source of water for urban centres. Our work and research on the Palla floodplain scheme which was launched by the Delhi Jal Board in 2016 is a tangible realisation of this idea. The scheme (on a 25 km stretch of the Yamuna) is currently running at half its potential and providing water to about one million people in the city — of a daily requirement of 150 litres per person.

Floodplains are formed over millions of years by the flooding of rivers and deposition of sand on riverbanks. These sandy floodplains are exceptional aquifers where any withdrawal is compensated by gravity flow from a large surrounding area. Some floodplains such as those of Himalayan rivers contain up to 20 times more water than the virgin flow in rivers in a year. Since recharge is by rainfall and during late floods, the water quality is good. If we conserve and use the floodplain, it can be a self-sustaining aquifer wherein every year, the river and floodplain are preserved in the same healthy condition as the year before. The 'conserve and use' principle demands that no more than is recharged by rain and floods each year can be withdrawn from this aquifer. This ensures that the groundwater level in the floodplains remains steadily above that in the river in the lean non-monsoon months when the river is often polluted. Drawing out any more water than is recharged can contaminate and eventually finish off this precious resource.

Rivers today are facing problems of abysmally low flows due to an indiscriminate extraction of water for use in cities, industries and agriculture. They are also highly polluted because sewage and effluents are being released into them. But a floodplains 'conserve and use' scheme, which is a socio-economic-environmental scheme, can provide water to urban centres along rivers; it can also engage farmers by providing them an assured income and restore rivers to a healthy condition.

Let us take the example of the Tamirabarani river in Tamil Nadu which flows for 100 km through two urban settlements, Tirunelveli and Thoothukudi. For the population of close to a million people in these two cities, the water requirement of both towns combined is less than 54 million cubic metres (MCM) per year, when calculated at 150 litres a day per person. Leaving out the area of the river banks that is built over, we are left with 75 km of river length which is agricultural land; 1 km of this stretch on both sides of the river can be preserved as a water sanctuary and used to provide water to towns.

This floodplain (75 km) absorbs about 50% of the rainfall (about 100 cm/ year) and saturates during floods late in the monsoon. Flooding can cause an approximately 4 metre rise in the water level which allows us to dewater about 3 metre depth of floodplain. The specific yield of this aquifer is about 15-20% of its volume and hence we can draw about 75-90 MCM of water from the floodplains in a year.

Floodplains have more water than the needs of cities. Half the water can be drawn and provided to meet the needs of cities by developing a grid of about 120 wells, each of which operate at 0.3 million gallons a day. If priced at the domestic Delhi Jal Board tariff of 30 per kilo litre, we can sell the water for 162 crore a year.

Preserving the floodplain in its entirety is critical for this scheme to work. This can be done by engaging farmers whose land will have to be leased for such an effort. Farmers today have an erratic income and this scheme can be realised through a public-private partnership, where farmers on this land tract of 1 km on either side of the river can be provided an assured and steady income of 30,000 an acre which would amount to 112 crore a year for the first 10 years for

the entire river length (75 km) that is not encroached. In addition, farmers can grow a food forest, fruit orchards or nut trees but not water-intensive crops on this land. It would guarantee not only a good farming income but also great earnings from the water for the farmers without taking the ownership of the land away from them. The capital cost for building such a scheme would be minimal (a few hundred crores) and the revenue generated would be able to pay for the costs and for farmers' income without any subsidy. It would also generate substantial revenue for the cities.

Ecologically, a water sanctuary would prevent erosion, heal the river ecosystem, and restore the ecological balance in floodplains. Even after withdrawal, floodplains would have enough water to slowly release back into the river in a lean season. This scheme would help curb illegal extraction of water, stop pollution by local agencies and industries and also encourage cities to be more responsible in their waste management.

This scheme will also help improve the quality of rivers, quality of life for citizens, and at the same time guarantee farmers a healthy fixed income. This is a new scheme of living. This is the philosophy of "conserve and use".

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