

Conclusion

The present study aimed at linking water pricing to the sustainable development agenda of Rio+20. In the process the pricing aspect was studied in relation to various aspects of water management as it is a prerequisite to the topic; that is the sustainability aspect cannot be addressed without addressing the problems of water resource management like water scarcity, water use efficiency, equitable distribution, efficiency in management, investments and the revenue recovery etc. The basic question is 'Can water be managed in the same way as has been done during the last half century in India or does it require an out of the box approach to meet this challenge?'. Therefore, the practical approach to the water pricing has been reviewed in detail to understand where it stands. In case of later it is essential to know if the appropriate pricing of water will play a major role in resolving the water issues.

Around the world the appropriate pricing of water has been a contentious issue due to its linkage to various economic activities and its position in the nature. The impact of water pricing basing on its true value is not known at the same time the impact of its non-pricing is conspicuous. Several countries have tried to overcome this problem through allocation of tradable water rights, but its impacts have been minimal. The various studies carried out by UN agencies have shown that the availability of fresh water resource is finite for humankind and may not be sufficient to meet its future demand if not managed prudently. Though the oceans are full of water but using the same through desalination is energy intensive, hence costly both economically and environmentally. The use of energy has an impact

on the projected carbon emissions affecting the climate change which again has an adverse impact on the availability of the fresh water. While considering the environmental impact of the water use social equity also has to be considered. There is a bottom billion who are to be supplied food and potable water as well as respectable standard of living. As has been pointed out appropriate pricing of water requires an appropriate level of economic development of a country which is evident from the fact that the developing countries are yet to price water optimally for its various uses, halting depletion of their natural resources in an unsustainable fashion. In other words they are in a vicious circle of unsustainable development. For example excessive abstraction of ground water limits the ability of the future generations to use the same. Similarly over-use of surface water has got various environmental externalities like water pollution, loss of fish stock and depletion of other natural capitals which would make the future development costly. Since economic development and availability of water resources go hand in hand any form of its degradation and/or depletion is likely to limit the growth. In this context the need for sustainable development for the developing countries is of utmost importance where water is at the core.

Historically water issues have been approached from supply side as the resource constraints were never felt as severely as they are now. Various studies have pointed out that due to several compulsions water issues cannot be solved locally, hence need policy responses at regional, national, supra-national and global level. The state water policies, national water policy, EU WFD and the Rio+20 are the examples of such responses. The global response for the first time talked of linking water to the sustainable development at Rio+20 outcome document. In other words the water issues need to be seen in its three dimensions i.e.

social, environmental and economic. Use of water by mankind should be such planned that it helps social equity, environmental sustainability and economic viability. Due to socio-political reasons the social issues always took precedence over the economic or environmental issues particularly in the developing countries. As a result there has been large scale degradation of natural assets and inefficient functioning of the water sector institutions due to paucity of funds for their up gradation and maintenance. In this context the role of appropriate water pricing is extremely important for sustainable management of water.

Since the propagation of Dublin Principles, 1992 and inclusion of drinking water as a part of the MDGs there has been lots of studies on the water pricing issues particularly in developed countries on the domestic water supply. As discussed earlier marginal cost pricing has been accepted to be a better model rather than the fixed cost model. However, it has widely been agreed that the two part tariff is a better way as the fixed part to take care of the assets employed and the variable price to indicate the scarcity value. It has also been advocated that the cost should include the resource cost, environmental cost and the financial cost. In case of irrigation, the costing aspect is similar to domestic use except for the fact that measuring the environmental as well as economic externalities accurately is a big challenge.

It has been well acknowledged that the pricing is an economic instrument for changing consumer behavior. By communicating the scarcity value of the resource or the externalities created through use of such resource the consumers are helped to take informed decisions for themselves and therefore help in conservation. Through compensatory efforts, the damages to the environment can be reduced

and natural assets can be sustained. This is possible when societies seek inter-generational equity in addition to intra-generational equity. To safeguard the interests of the youngest generation who are voiceless at the moment it may be necessary to create appropriate institutional framework for their representation in the decision making. In case of water use the present generation must pay for their use and should not pass on the burden to the generation next. In case of water resource, the use should not exceed the renewable capacity of the system which can be ensured through appropriate pricing as discussed earlier.

Efficient water pricing acts as an incentive to reduce pollution and improve the efficiency of water use. Thus, it reduces the pressure on water resources and the environment, and it ensures that the available resources are efficiently allocated between water uses. As a result, water supply and treatment infrastructure can be more adequately sized. This means providing water services and protecting the environment cost-effectively. It mobilizes financial resources to ensure the financial sustainability of water infrastructure and service suppliers, and to pay for environmental protection. It is argued that the lack of importance given to economic and environmental issues in designing existing water pricing policies, as opposed to more general social or development objectives, has led to the current situation of inefficient use, over-exploitation and degradation of surface and groundwater resources. Hence, water pricing policies need to reflect different cost types as rightly advocated by the European Union i.e. financial costs, environmental costs and resource costs. Taking the above costs in to account, the overall price P paid by a given user can be computed as:

$$P = F + a.Q + b.Y,$$

Where;

F: an element related to fixed costs, general taxes, etc.

a: a charge per unit of water used;

b: a charge per unit of pollution produced;

Q: the total quantity of water used;

Y: the total pollution produced.

A reduction in the quantity of water used (Q) and/or the pollution produced (Y) will then lead to a reduction in the overall water price P paid by the user. Thus, it provides an incentive for users to increase water use efficiency and reduce pollution. India need to adopt a strategy similar to above considering the water scarcity situation which is getting exacerbated due to water pollution.

Alternatively, many countries have implemented the water allocation systems and water trading. But since water cannot be considered as a commodity alone and has its footprints everywhere, there has to be centralized planning, coordination and control. It is a fact that water was always considered as a local subject, but when the problems have crossed the local boundaries like scarcity and pollution etc. policy planners have gone beyond the local boundaries and talked of basin and inter basin management of the supply side without paying much attention towards the demand side management. Pricing is an instrument for demand side management of water for its sustainability hence a minimum benchmark pricing may be introduced for reducing energy footprints in all kinds of water services. The pricing should be such that it reflects the actual cost of the commodity carrying virtual water thereby encouraging the reduction in water footprints on each product. The methods of pricing in vogue like fixed cost or marginal cost pricing are not the instruments for sustainable development but meant for financial sustainability of the water servicing institutions. If the water infrastructures could be developed

through tax revenue why not the cost of its maintenance which is too small compared to the capital employed? In case the water supply is completely free, what happens to the economy of a country? In third world countries the water charges are almost negligible thereby breeding inefficiency in management and unreliability in supply. The poor are affected most by not getting assured water supply of proper quality on time. The sectorial efficiency can be generated only through revenue sufficiency which is a far cry for the water sector. The short term planning process has to be BAU³⁵ only. Hence third world countries need to take a long term view in their planning process for vital resources like water, energy and land to make these sustainable. In case of appropriate water pricing the same may have an impact on the household budgets but that can be offset through reduction in taxes on the various commodities having water footprints to encourage efficiency and innovation. The notion of policy planners to increase the tax revenue at the cost of the tariff revenue is counterproductive in the context of efficient resource management.

In India prior to 1960, flood control and limited irrigation was the dominant paradigm which was followed by the notion that water is a resource which need to be exploited fully through engineering infrastructure (1960 to 1970). During the period 1980 to 1990 it was realized that water can't be over exploited, which led to demand side measurements and introduction of regional and national planning instead of project approach. Accounting for ecological and social constraints were also started. In the period 1990 till date IWRM was considered to be a panacea for water problems. But without proper implementation strategy the IWRM remains a solution in search of its problem in India.

³⁵ Business As usual

India having 2.5% of the land area endows 4% of the fresh water resource of the earth is very ill placed when compared to its population (16%). It faces many water sector problems like physical water scarcity, water related disasters like flood, cyclone and drought, over exploitation of ground water, quality degradation, water security i.e. uncertainty of availability, emission of greenhouse gases due to water use, threat of impact of climate change, Trans-boundary problems, inadequate investments etc. but as pointed out by Prof. John Briscoe³⁶, Harvard University in the World Bank report "*despite the alarming situation there is widespread complacency on the part of the authorities in India*" reflects the actual situation in India. The Supreme Court of India in its judgment (SC PIL, 2001) felt that science alone can solve this problem and directed DST³⁷ to take actions in this regard. The identified problems and action plan to solve them is kept at Annexure- 6. But the fact is that all the proposed technological solutions focus on the supply side management without considering the tradeoffs on the environment and economy. Hence there is a need for supplementing the scientific advancements with that of softer side of water management like economic aspect, law, institutional framework and policy responses to generate a long term strategy. In this context the pricing aspect is also extremely important in evaluating the technology developed in economic terms taking all its externalities.

In India Water as a subject is dealt by many departments/organizations like Planning Commission for overall fund allocation for funds and central policy making, Ministry of Water Resources for overall assessment and allocation of water

³⁶ As quoted by the Supreme Court of India vide. Public Interest Litigation Writ Petition (C) No. 230 of 2001 titled Shri M. K. Balakrishnan and Others versus Union of India and Others.

³⁷ Department of Science and Technology, Government of India.

resources in the country as well as interstate and international water disputes, Ministry of environment for water pollution, Ministry of Urban Development for standards setting and harmonization of urban drinking water supply issues in urban areas, Department of Drinking Water for drinking water issues in rural areas, Department of Science and Technology for development of science and technology for tackling water problems etc. Moreover, it is a state subject where center's role is limited to inter-state and international water courses. This fragmented approach has eluded a coordinated approach for holistic management of water resources and setting a benchmark pricing for its inter basin and intra sectoral trading for establishing the market value of water.

India has invested heavily in water infrastructure and has also accrued its benefits in terms of self-sufficiency in food production and supply of safe drinking water under MDGs. But it is also a fact that a large number of water infrastructures in rural areas are becoming unproductive in few years due to over exploitation or lack of maintenance calling for further investments. The large water infrastructure which is in place will require large investment for its upkeep and replacement. It is time to think of such requirements as well as arranging water from more difficult sources which may be deeper aquifers or pumping from long distance reservoirs. In case of ground water recharge to sustain the availability it may be necessary to delineate the recharge zones and protect them through appropriate regulations. But who will bear the cost? Funding from tax money comes in a lengthy bureaucratic procedure invariably resulting in cost and time over run of the project and increase in maintenance cost due to delay. Hence, it is necessary to allow water sector institutions to raise revenue through pricing and trading to fund its maintenance and expansion activities. In this context water sector requires institutional reforms

which need not be privatization or execution of projects through PPP mode as water cannot be treated entirely as a commodity. Through internal revenue generation, the issues relating to pollution and environmental degradation can be addressed successfully improving sustainability of the resource.

Since UNCED, 1972 at Stockholm, Water had never got the importance as it got in UNCSD, 2012 at Rio. Though sustainable development is an idea of ideals, still recognition of water as its core leaves the scientific community and economists to understand its nexus with social issues like poverty, economic issues like its virtual presence in almost all commodities and its role in the environment as its controlling parameter. In other words water cuts across all the three pillars³⁸ of sustainable development hence has to be dealt within its nexuses rather than in sectoral silos. In India the various departments chalk out their plans keeping in mind their expansion and spending requirements under budget which is almost funded from the tax money. The water sector needs reform in the similar manner as electricity in India though not the same way considering various economic dimensions of water. Like the NTP in electricity sector there can be pricing strategy benchmarking the costs as well as the minimum revenue recovery to trigger innovations for reducing the cost of supply through gravity flow instead of multi-stage pumping or use of green water instead of blue water, better technology for water treatment, merger of ICT with water metering for real time metering etc. which is unlikely to happen in the third world countries without proper revenue model. In this context pricing of water in all its uses as a commodity need to be priced at its economic cost and in other uses where it is a public good, state funding may be the ideal. For pursuing the goal of sustainable development, the water sector will

³⁸ Earth Summit, 2005 New York

require heavy funding which is possible when a proper revenue model is in place. Its absence is evident from the fact that the corporation (IWRFC)³⁹ which was created for exclusive funding of the water sector projects in March 2008 is yet to start its business operations.

India got its new water policy in 2012 wherein the objective of pricing of water has been envisaged to ensure its efficient use and reward conservation. It talked of fair pricing which should be arrived at through independent statutory Water Regulatory Authority, set up by each State, after wide ranging consultation with all stakeholders. It also talks of incentivizing through tariff the recycle and reuse of water, after treatment to specified standards. In the absence of the voice of the voiceless stakeholders fair pricing will not be fair. The experience from Maharashtra show that the Regulatory Act itself restricted the Regulator from deciding the appropriate price for water use.

Important Policy Recommendations

- 1. The water sector should be made free of the support from tax revenue in India by allowing it's pricing at the MOC in a step by step manner for generation of sufficient revenue to invest in sustainable development.**
- 2. To recognize the value of water necessary institutional framework should be in place for trading on water. For this it may be necessary to delink water rights from that of land holding. India may consider water trading at individual and institutional level for achieving water**

³⁹ Irrigation and Water Resource Finance Corporation (IWRFC) was formed by Govt. of India in March 2008.

use efficiency and generating sufficient funds for the water sector organizations to pursue the sustainable development goal.

3. The water utilities need not be privatized but function in a commercial manner working with suitable revenue model in place to attract commercial funding.
4. There should be national level water sector regulator to establish the benchmarking of cost and price with incentive for efficiency and inter-generational and intra-generational equity.
5. Lots studies are needed to establish the appropriate pricing of water in its different use in time and space. Since India is a signatory to the Rio+20 outcome document it should aim for a paradigm shift in water sector management from the present state funding and meagre revenue recovery (which is not even sufficient to meet the O&M expenses) to no profit no loss organizations.
