



# World Scientific News

WSN 4 (2015) 17-31

EISSN 2392-2192

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## **Water privatization in developing countries: Principles, implementations and socio-economic consequences**

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### **ABSTRACT**

Water related problems are continuously affecting the social infrastructures and jeopardizing the productivity of modern globalized society. As the water crisis intensifies, several governments around the world are advocating a radical solution: the privatization, commoditization and mass diversion of water. Water privatization involves transferring of water resources control and/or water management services to private companies. The water management service may include operation and management, bill collection, treatment, distribution of water and waste water treatment in a community. The privatization of water has already happened in several developed countries and is being pushed in many developing countries through structural adjustment policies. Water privatization will invariably increase the price of this common property resource because there are hidden costs involved in water collection, purification and distribution systems. Increase in water consumption will be satisfied through the market dynamics often at the cost of the poor who cannot afford the increased water tariffs. The corporations will recover their costs by exploiting the consumers irrespective of their economic conditions. Another possible threat of water privatization is the unsustainable water extraction by the water corporations for maximizing profits and subsequent destructions of water bodies and aquifers. Corporations in search of profits can compromise on water quality in order to reduce costs. Privatization can also favour bulk water exports as the control over water will be transferred from local communities to global corporations, which will have disastrous ecological and

environmental consequences. Indiscriminate mining of groundwater by multinational companies in Andhra Pradesh, Tamil Nadu and Kerala has resulted behemoth threats to the local water resources, biodiversity and economic structures. Water pricing and privatization will inevitably increase the price of the major crops and vegetables all around the world, which, in turn, can adversely affect the food security of the common people. Community based water management practices like rainwater harvesting, sustainable watershed management, integrated river basin management and irrigation efficiency are sustainable alternatives to water privatization in the third world countries including India.

**Keywords:** Water Crisis; Privatization; Water Pricing; Food Security; Economy

## **1. INTRODUCTION**

Water is a compound whose material constitution becomes secondary to its symbolic value because of its reflection in our mind as a symbol of life. The access to water is a basic human right, as because water is a social and cultural good, not merely an economic commodity. The hydrological cycle of the globe can be referred to as water democracy, because it is a system of distributing water for all the living beings. Providing water is absolutely essential for a country's development objectives – job creation, food security, GDP growth and social goals including poverty reduction (UNESCO, 2009). Despite significant progress of human society, water related problems are continuously affecting the social infrastructures and jeopardizing the productivity of the society. A substantial proportion of ill health in India can be attributed to lack of safe drinking water, poor sanitation and hygiene practices. In 2002, the World Health Organization estimated that 1.1 billion people (17% of the global population) lacked access to safe water resources, and 2.6 billion people (42% of the global population) lacked access to improved sanitation, which is the primary cause of water contamination and waterborne diseases" (WHO, 2004).

Shallow aquifers generally suffer from agrochemicals, domestic and industrial waste pollution. Major water pollutants include microbes (like intestinal pathogens and viruses), nutrients (like phosphates and nitrates), heavy metals and metalloids (like arsenic, lead, mercury), organic chemicals (like DDT, lubricants, industrial solvents), oil, sediments and heat. Heavy metals can contaminate the aquifer and subsequently can bioaccumulate in the tissues of humans and other organisms. For example, more than 100 million people are living in the arsenic affected districts of India and Bangladesh. 9 districts out of 19 in West Bengal, 78 blocks and around 3150 villages are affected with arsenic-contaminated groundwater (Bhattacharya *et. al.* 2012). Changed consumption patterns and unsustainable management policies of our society are continuously leading us towards a polluted and water stressed world.

Global consumption of water is doubling every 20 years, more than twice the rate of human population growth. At present more than one billion people on earth lack access to fresh drinking water. By the year 2025 the demand for freshwater is expected to rise to 56% above what currently available water can deliver, if current trends persist (Barlow and Clarke, 2003). Many of the world's major industries are highly water intensive. In many areas, agriculture is also irrigation intensive. Such irrigations need a huge amount of water. India has the highest volume of annual groundwater extraction in the world, and in most parts of it,

groundwater extraction is twice the rate of annual recharge (Barlow and Clarke, 2003). Interestingly, the annual average rainfall in India is 4000 billion cubic meters, but the annual water requirement of India is only 450 billion cubic meters (Rao, 1995). Still the country is plagued by environmental issues such as water pollution from raw sewage and runoff of agricultural pesticides, water crisis and unequal distribution problems, which, in turn, is making the whole situation paradoxical (Sharma, 2005).

A region where renewable fresh water availability is below 1700 cubic meters/capita/annum is a 'water stress' region, and one where availability falls below 1000 cubic meters/capita/annum is termed as water scarce region (Falkenmark, 1992). The annual per capita availability of renewable freshwater in India has reduced from around 5,277 cubic meters in 1955 to 2,464 cubic meters in 1990. Considering the projected increase in population by the year 2025, the per capita availability is likely to drop to below 1,000 cubic meters and India will face severe water scarcity (The Energy and Resources Institute, 1993).

From the 1970s onwards, the costs of the hydraulic state model began to receive greater attention. A convergence of different factors led to this situation. On the one hand, there were financial considerations: dams' cost-effectiveness started to be questioned; many industrialized countries witnessed a stagnation of water demand; and most governments faced deep fiscal constraints, in the wake of the oil crises (Bakker, 2003).

In India, changes in the economy have been made with the liberalization, privatization and globalization of almost every aspect. While this process began in 1991 in sectors like power, it has gradually expanded in the water sector in recent times. Privatization is the process of transferring ownership of a business, enterprise, agency, public service, or public property from the public sector (a government) to the private sector, either to a business that operates for a profit or to a nonprofit organization. It may also mean government outsourcing of services or functions to private firms, e.g. revenue collection, law enforcement, and prison management (Rezapour *et. al.*, 2014). A more tacit form of privatization is what has come to be called 'corporatization'. The principal objective of corporatizing a public service is to let it function as a business. While ownership, control and management of the assets remains in the public sector, a corporatized entity operates on a commercial basis. Furthermore, corporatized entities often engage in outsourcing of some of their services, and, sometimes, corporatization can be a stepping stone to full-scale privatization or, at least, pave the way for the involvement of private actors.

In India, privatization has been accepted with a lot of resistance and has been dormant initially during the inception period of economic liberalization in the country (Kappor and Ramamurti, 2002). Privatization got tremendous boost by the introduction of new economic policy in 1991 that allowed delicensing, relaxing entry restrictions and equity funding (Gouri, 1996). To solve the growing water crisis, one of the possible solutions that has been proposed and has been implemented is privatization of water, which in effect leads to treatment of water as a commodity (Mukhopadhyay and Bhattacharya, 2011; Bhattacharya *et. al.*, 2013). The ideological choice of treating water as an economic good or a 'cashable resource' is based on the assertion that market is the principal mechanism to regulate the flow of goods.

What has changed in the past 10 years is the entry of private corporations, which will account for nearly 28,577 MW of hydropower by December 2011. Big corporate houses are in the business of water, sanitation, solid waste management, sewerage, bottled water, beverages and more in different forms of public-private partnership. The entry of bottled drinking water in India in the last 15 years is an important aspect of commodification and

privatization of water. It is observed that citizens assume the quality of municipal water to be bad, and choose bottled water while they are outside (Kumar and Furlong, 2014).

The world of privatized water is overwhelmingly dominated by two French corporate houses. Suez Lyonnaise des Eaux (which built the Suez Canal and had 1999 profits of \$1.5 billion on sales of \$32 billion) and Vivendi SA are referred to as the General Motors and Ford Motor Company of the water world (Barlow, 2001). Both are ranked among the 100 largest corporations in the world by the Global Fortune 500. Between them they own, or have controlling interests in, water companies in over 120 countries on five continents, and distribute water to almost 100 million people in the world (Barlow, 2001).

However, issues of privatization and pricing of water are not new to the water sector. Since ancient times, water has been recognized universally as an invaluable resource. Water has been harvested in India since the dawn of civilization. The Ramayana, Mahabharata and various other Vedic, Buddhist and Jain texts contain several references to water harvesting structures in existence and water being revered as a life giving and sustaining force (Bhattacharya *et. al.*, 2011). *Kautilya*, also known as *Chanakya*, was the minister of Chandragupta Maurya (321-297 BC), India's first emperor. The book *Arthashastra* written by him is a treatise on government and economics of ancient India. According to Kautilya, Water tax was on irrigation facilities in ancient India in his period. Private owners used to give water to farmers from their tanks and wells against payment of a part of the production (Bhattacharya *et. al.*, 2011). *Kautilya* said that those who cultivated land irrigated by manual labour, shall pay one-fifth of the production as water tax; if water was carried on the shoulder, then one-fourth of the production; for water lifts, the tax is one-third of the production; if water was raised from rivers, lakes, tanks and wells, then one-third or one-fourth. In case of damage to the crops or seeds in another's field by the use of a reservoir, channels or a field under water, compensation should be paid in accordance with the damage (Bhattacharya, 2014). In later periods, ground water is practically private property. The existence of personal borewells, supply of water by water tankers and other smaller practices of water supply in villages and cities has existed for a long time. These practices, however, were mostly community managed, or restricted to personal use. The person, who owns the land, owns the water below the land. The landowner has virtually unlimited right to pump out this water, regardless of the fact that the boundaries of the ground water storage may go beyond the person's lands. This unlimited access has also given rise to well developed water markets – for e.g. in North Gujarat. Many industries, even large residential colonies pump out their own ground water (Dwidevi *et. al.*, 2007).

## **2. METHODS OF WATER PRIVATIZATION**

Water privatization involves transferring of water control and water management services to private companies. The water management service may include collection, purification, distribution of water, and waste water treatment in a community. Traditionally this service has been provided by the local governmental infrastructure such as the municipality or local city council. The World Bank and IMF has aggressively campaigned in favour of water privatization on the grounds that, while water subsidies promote wasteful practices, commodification of water should allow market forces to set the water tariff, which in turn will reduce water consumption and can promote water conservation.

It is also argued that opening this sector to private providers will bring in badly needed capital for upgrading and development of infrastructure (Dwidevi *et. al.*, 2007).

There are several models of water privatization that are currently in vogue in different parts of the world. Depending on the degree of privatization, these models can be broadly categorized into:

**A. Service Contracts:** In this model, public authority retains overall responsibility for the operation and maintenance of the system, and contracts out specific components. The process involves short-term contracts of 1 to 3 years for provision of specific services - for example, meter reading and bill preparation. Normally there is no investment from the private company, no financial risks to it, and also no direct legal relationship with the user (Dwidevi *et. al.*, 2007).

**B. (Design), Build, Operate, Own and Transfer or (D)BOOT:** This model of privatization is usually used for system infrastructure development such as water treatment plants that require significant finance. The private operator is required to finance, construct, operate and maintain the facility for a specific period of time (usually more than 20 years). At the end of the term, the infrastructure may be turned over to the municipality or the contract is renewed. This model is more prevalent in developing countries. Examples of (D)BOOT include Tiruppur Project in Tamilnadu, India and construction of water treatment plant in Chembarambakkam, Chennai.

**C. Concessions:** Long term contracts in which the private company takes full charge of the system, takes responsibility for the provision of the service and is also responsible for expansion, new investments, recovery of bills etc. (e.g. Buenos Aires, Argentina, La Paz, Bolivia) (Dwidevi *et. al.*, 2007).

**D. Divestiture:** In this model, the government or public authority awards full ownership and responsibility of the water system including the water source to a private operator under a regulatory regime. This is also done in the form of 10-20 year renewable contracts on the entire system. The government moves operation to private hands thus improving efficiency. Competition is limited through the process of bids on the divestiture (Dwidevi *et. al.*, 2007). The private sector firm is then expected to take the risks and recoup investment/profits. This model cedes tremendous power over an essential resource to corporations. Examples of divestiture include the *Rasmada* scheme, under which a 22-year lease over a stretch of the *Shivnath* River in *Chattisgarh* was accorded to Radius Water, Inc.

### 3. CASE STUDIES OF WATER PRIVATIZATION

#### India:

Privatization in water sector was introduced late in India, and the initial pace was slow. Both drinking water and irrigation are very sensitive in the country, and this may be the reason for the late introduction of privatization. Some of the examples are as follows:

**Tiruppur, Tamil Nadu:** The New *Tiruppur* Area Development Corporation Ltd. (NTADCL) was set up by the state government in 1995 to execute a Rs 13 billion (EUR 281 million) water supply project, with financial support from USAID and the World Bank. NTADCL issued a 30-year BOOT contract for the project to a consortium including Mahindra & Mahindra, United International, North West Water, Larsen and Tubro and Bechtel, which would transfer water over a 55 km. long pipeline from the river Bhavani and supply 185 million liters of water per day to nearly 1,000 textile units and more than 1.6 million residents in Tiruppur and its surrounding area (Water Technology, 2015). According to the project document, United Utilities and NTADCL will run the joint venture at a "fixed operation and maintenance fee" that will be recovered entirely from Tiruppur municipality. However, the Tamil Nadu government has guaranteed profitability to the investors in the project by creating a hedge fund to pay the interest and operative expenses of the project in the event of a water shortage in the Bhavani river, with no stipulations on amount of water withdrawal from the river for this project (Water Technology, 2015).

**Shivnath River, Chhattisgarh:** The *Chhattisgarh* State Industries Development Corporation (CSIDC), which is in charge of industrial development in the state, commissioned the project to meet the demand on water in the *Borai* Industrial area situated on the banks of the *Shivnath* - a non-perennial river. As part of the project, a 23.6 km stretch of the river was ceded to Radius Water through a 22-year renewable contract, under which the company had absolute monopoly over the stretch of river water. In return, Radius Water would provide water to the CSIDC from the *Shivnath* during the lean 6 months. The company built an integrated water supply system to control the water flow automatically depending on the level of the *Shivnath* and set the water tariff at substantially lower rates than that charged by the neighboring states of Madhya Pradesh and Maharashtra (Sharma, 2002). The project was initially hailed as a success by the Government. However, the catch was that the agreement assured Radius Water of payment for a minimum of four million liters of water per day by the state government, regardless of the amount of water used and irrespective of whether the CSIDC recovers this amount from the industries. The CSIDC lost Rs 12.9 million between December 2000 and June 2002 (Down to Earth, 2003). Furthermore, Radius Water's monopolistic deal with CSIDC and the water resources department covered ground water as well in an 18 km-radius covering the *Borai* industrial area. The company promptly prohibited fishing in the stretch of the river and also charged local farmers for access to water from tube wells. Ultimately, bowing to pressure from several NGOs and adverse media reports, the government had to scrap the deal (Dhar, 2003).

**Degremont, New Delhi:** Degremont – a subsidiary of the French water giant Suez – has been awarded a Rs 2 billion contract under a 10 year BOT agreement with the Delhi Jal Board (DJB) for a drinking water treatment plant in Sonia Vihar near New Delhi. The water treatment plant is expected to yield 635 million liters of drinking water a day. While Degremont is getting the raw water for free through pipelines from the Upper Ganga canal of the Tehri Dam project (near Muradnagar, Uttar Pradesh), the amount it will get as a fee for treating the water will be much in excess of what the DJB will charge the consumers when selling the water. The DJB is also providing Degremont with land, electricity and treatment cost. At the same time, Degremont has been kept free from transmission losses and revenue collection and has also been assured the purchase of treated water and productivity incentives

once the plant begins operations (Kaur, 2003). The Sonia Vihar plant has been plagued by controversies since its inception. The leader of the opposition party and some ruling party members has leveled allegations of corruption and irregularities in the allotment of contract to Degremont. A Delhi-based NGO - Research Foundation for Science, Technology - has accused the Delhi Jal Board of wasteful practices. The Delhi Jal Board, which does not rule out an increase in water price for the residents of New Delhi, has not made public any of the project documents (Navdanya/RFSTE, 2005).

#### **4. WATER PRICING: AN INTEGRAL PART OF PRIVATIZATION**

Water pricing is the immediate consequence of water privatization as the private companies try to gather profit by putting price on it while supplying it to the common people. Water pricing is a term that covers various processes to assign a price to water. The need to fix an appropriate charge of price for urban water has been strongly advocated in recent years. Several reasons have been put forward in support of appropriate price policy:

- (1) Urban water is underpriced in relation to the cost incurred on the provision of water resulted in serious concerns about the financial viability and sustainability of urban water utilities.
- (2) Underpricing has resulted in poor and unreliable water services, especially in the city areas.
- (3) Water is provided at subsidized rate because poor could afford it. In practice, however, it is the rich, not the poor, who always benefit disproportionately from subsidized water services. Paradoxically, the subsidies, in fact, favour the rich and middle class.
- (4) Underpricing has seriously affected the finances of the state governments. As a consequence, the service expansion becomes relatively slow (Mathur and Thakur, 2003).

The tariff structures used in urban water supply also vary across states like the institutions involved in its provision. A tariff structure is a set of procedural rule used to determine the conditions of service and monthly bills for water users in various classes and categories. The water charged may be in the form of non volumetric flat rate tariff, non volumetric water tax, uniform metered tariff, metered block tariff or a combination of above. Several types of water tariffs are used in water sector:

**(a) Increasing block tariffs:** An alternative to marginal cost is increasing block tariffs (IBTs). An IBT is based on volumetric component. In this price structure, water use per billing is divided into a number of discrete blocks for which separate prices can be set. A water user in particular category, such as domestic water consumption, is charged a relatively low per unit price for consumption up to a specified amount. This amount defines the end of the initial or first block. A user who consumes more water faces a higher per unit price for this additional consumption until reaching the end of the second block, and then a still higher price until reaching the end of the top block structure (Boland and Whittington, 2000). Increasing block tariffs are popular tariff structure in many developing countries. Water utilities in Bangalore, Delhi and Hyderabad use block tariff for domestic and non - domestic supplies in combination with other price structures.

**(b) A uniform volumetric charge:** A uniform tariff may differ according to the category of users. Although simple to use, a uniform rate does not provide any incentive to consumers to effect the savings on water use (Mathur and Thakur, 2003).

**(c) A linear water charge:** A linear water charge rises with consumption. It prevails in Kerala where a monthly water charge is specified for discrete quantities of water. Thus, a consumer in Kerala is required to pay a monthly charge of 22 INR for a consumption not exceeding 10 kls; the charge increases to 25 INR for a consumption level of 11 kls, and rises to 550 INR for a consumption of 100 kls/month (Mathur and Thakur, 2003).

Though pricing is considered to be crucial for efficient allocation of water, allocation of water as a pure economic good is more complicated than other goods and services. This is mainly due to its public good nature and externalities associated with it. The critical linkages between water and poverty, food security brings the equity dimension in to its allocation.

## **5. POSSIBLE CONSEQUENCES OF WATER PRIVATIZATION**

Water privatization has several complicated and intersecting consequences. Though the concept can help to solve the problems related with water management and crisis, it can affect the socio-economic structure of a society in several dimensions:

1) It should be remembered that under fundamental rights in the Constitution of India, Article 21 entitled 'protection of life and personal liberty' states: 'no person shall be deprived of his life or personal liberty except according to procedure established by law' (Gol, 1986: 7). In view of the scope of this right, environmental and ecological damage of water resources are regarded as amounting to violation of Article 21. Further, 'the entitlement of citizens to receive safe drinking water (potable water) is part of the right to life under Article 21' (Sinha, 2001).

2) Water privatization will invariably increase the price of this common property resource because there are hidden costs involved in water collection, purification and distribution. The corporations will recover their costs by exploiting the consumers. It has been argued that privatization will help to reduce unsustainable water use and will promote water conservation. But the market dynamics will inevitably affect the economically weaker class of the society who cannot afford the increased water tariffs (Barlow and Clarke, 2003; Navdanya/RFSTE, 2005).

Water privatization has invariably led to price hikes in almost all the regions in the world where water has been privatized. This is because there are considerable costs involved in upgrading water harnessing, purification and distribution systems. For such expensive projects, water companies borrow private money, which is subject to high interest rates from financiers and state taxation. The companies recover their costs and expenses by charging the consumer. Not only is the capital cost divided among all the consumers but also the interest, taxes and overheads on the capital. Thus, the consumer is forced to bear the burden of higher payments on company loans. In contrast, tax-free public financing results in low costs for

such projects in community owned or state controlled water systems. It has been argued that privatization will lead to reduced water consumption and promote conservation (Bhattacharya and Mukhopadhyay, 2011). However, while market forces will determine the water tariff and make it costlier in scarce areas, it is doubtful if this can actually reduce consumption. The price hikes following privatization have almost always made water unaffordable to the poor. However the rate increase does not make a dent on agriculture and industries where the price hikes are affordable (Barlow and Clarke, 2003; Navdanya/RFSTE, 2005).

When water services are privatized, public control is transferred to a corporation, be it domestic, foreign or transnational. Once water rights have been signed over, very little can be done to ensure that the private company will work in the best interest of the community. The prime directive of private water companies is to maximize profits, not to protect consumers (Public Citizen, 2015).

**3)** Another possible threat of water privatization is the unsustainable water extraction by the water corporations for maximizing profits and subsequent destruction of water bodies and aquifers (Bhattacharya and Mukhopadhyay, 2011). Corporations in search of profits can compromise on water quality in order to reduce costs. This is especially relevant in India, where the water quality regulatory boards do not have the efficiency to enforce their standards. There have been numerous examples of outbreak of epidemics because of poor water quality management and regulations. For example, indiscriminate mining of groundwater by a multinational soft drink giant in Andhra Pradesh, Tamilnadu and Kerala has resulted severe threats to the local water resources. They are extracting 1 million liter of groundwater per day which is destroying the balance of the local ecosystems and human societies. Many wells are dried up and also become contaminated (with excessive calcium and magnesium) in the adjoining areas of the soft drink bottling factory in Kerala. The company's usage of agricultural land for non-agricultural purposes is also questionable (Bhattacharya and Mukhopadhyay, 2011). A study of World Wildlife Federation in 2001 showed that the bottled water industries use 1.5 million tons of plastic every year, and after disposal, these bottles release toxic chemicals in the environment (Barlow and Clarke, 2003). In India, the drinking water and soft drink industries have been shown to have high pesticide levels in their products. In 2003, the New Delhi, India based Centre for Science and Environment showed that some of the soft drinks that were being sold in India contained lindane, DDT, malathion and other deadly pesticides which can cause cancer and can affect the immune systems (Wikipedia, 2014).

**4)** In the hydropower sector the country has seen drastic changes in government policies on private participation. The sector has been liberalized and made suitable for the private companies with incentives and guarantees to such an extent that companies are rushing at an amazing speed to grab projects to construct hydropower dams and stations in several eco sensitive zones. This has lead to private control of the river water flows and severe impacts on the local ecology and people, mainly in the fragile Himalayan regions of India (Bhattacharya and Mukhopadhyay, 2011).

**5)** Privatization by definition eliminates public control of the resource in question. Public control of water is essential not only because water is necessary for survival and human

fulfillment, but also because of the severe and ever-worsening water crisis that the world is faced with. Once a government agency hands over water systems to a private enterprise, it becomes extremely difficult and prohibitively expensive to reverse the decision. What makes it so difficult is that the global market for water as a commodity is estimated to be over \$500 billion globally and \$2 billion in India. With such huge profits at stake, corporations around the world strive to ensure that water as a commodity remains in private control (Barlow and Clarke, 2003; Navdanya/RFSTE, 2005). Unlike privatization of other sectors such as airlines or telecommunications, privatization of water services (and other essential services) often does not leave the consumers with a choice of provider. Physical reliance on a single water pipe network (and often a single water source) leaves little room for competition, which lends monopolistic attributes to privatization in this sector. Once a private company gets a contract, it tries to assert control over the water resource itself. For example, in Sheonath Industrial Water Supply Project in Chhattisgarh, even though only the water supply was privatized, the owner asserted the right to a large stretch of the river, banned the locals from using the waters, and was supported by the state in this. This is inherent in the nature of the contract, as any company would like to maintain control on the source of its 'raw material' - in this case water (Dwivedi *et. al.*, 2007).

**6)** Privatization can also favour bulk water exports as control over water is transferred from local communities to global corporations, which will have disastrous ecological and environmental consequences. Many crops and vegetables need huge amount of water for their growth and production. For example, in India, production of 1 kg. of Basmati rice requires 4200 liters of water, for long duration coarse rice it is 2500 liters and for wheat the amount is 700 liters (Shiva, 2003). Water pricing and privatization will inevitably increase the price of the major crops and vegetables all around the world, which, in turn, can adversely affect another human right issue of food security (Bhattacharya and Mukhopadhyay, 2011; Bhattacharya *et. al.*, 2013). While government management of water resources is partly responsible for the water crisis we face today, privatization will at best compound the problem. The benefits and costs of privatization in particular circumstances have to be considered broadly, not merely in terms of operational inputs and outputs. The perspectives of water footprint and virtual water should be carefully and precisely considered in the context of water privatization.

**7)** Corporations in search of profits can compromise on water quality in order to reduce costs. This is especially true in a country such as India, where the water quality regulatory boards do not have the teeth to enforce their standards. There have been numerous instances of outbreak of epidemics due to poor quality of water. As discussed earlier, Coca-Cola's indiscriminate mining of ground water has contaminated ground water deposits with excessive amounts of Calcium and Magnesium in Kerala, which has lead to health problems among the villagers in the area (Bhattacharya and Mukhopadhyay, 2011).

**8)** Water privatization can encourage corruption. Checks and balances that could prevent corruption, such as accountability and transparency, are conspicuously missing from the process. With water contracts being worked out behind closed doors, executives and government officials are free to make deals in their own, rather than in the public interest (Public Citizen, 2015). Executives of Vivendi, Suez Lyonnaise de Eaux, and other water

companies, for instance, have been convicted for bribing government officials to obtain contracts (Hall, 1999).

**9)** There has been a remarkable degree of public and political opposition to water privatization in different parts of the world. This has been visible in campaigns globally, in both north and south. The opposition includes trade unions, environmentalists, consumer groups, citizens' organizations, elected politicians and other groups. A common theme of opposition campaigns includes the belief that water supply is an essential service, which should be public. A chronological event on opposition to water privatization in the world is shown in Table 1.

**10)** Private control over water services, supplies, and facilities raises domestic security concerns, especially in this age of terrorism. The domestic water supply has received considerable security and anti-terrorism attention by all levels of government since September 11, 2001. Water privatization agreements should mandate that private companies not only undertake standard security measures that are now normal for water systems in this age of terrorism, but also fully cooperate with, and disclose relevant information to, appropriate law enforcement and anti-terrorism planning officials to ensure maximum security of local water supplies.

## **6. CONCLUSIONS**

The water footprint of humanity has exceeded sustainable levels at several places and is unequally distributed among people. Reducing the water footprint is the need of the hour, just like reducing the carbon footprint, to ensure our environmental, economic and social security. In the context of water scarcity, perhaps the most important step is the recognition of water as a fundamental human right, and the responsibility of the State in ensuring its provision to all citizens.

Community based water management policies such as rainwater harvesting, check dam construction, sustainable watershed management, integrated river basin management and irrigation efficiency are far better and sustainable alternatives to water privatization.

These actions also can respect the human rights as well and should be implemented in large scales. The meaningful implementation of sustainable development can now be further advanced to help link social development and human rights aspects of sustainable development with the environment, as well as ensuring economic well being through the benefits that adequate supplies of water can provide. It is absolutely essential for us to secure the right for saving water resources and environment in general. Though a lot of regulations, acts and laws have been enacted here and there, but it is more important to raise the general awareness of the common people about their basic rights.

Then only the people will come to understand how their rights are being violated. Knowledge about development and environment is not enough, rather the upsurge of the common people and pushing the principles of human rights are extremely important.

**Table 1.** Opposition to privatization of water: some worldwide examples, 1994-2002 (Hall et. al., 2005).

<b>Year</b>	<b>Country</b>	<b>Event</b>
1994	Poland	Privatisation proposals rejected
1995	Hungary	Privatisation proposals rejected
1995	Sweden	Privatisation proposals rejected
1996	Argentina	Termination of privatisation
1996	USA	Privatisation proposals rejected
1998	Germany	Privatisation proposals rejected
1999	Brazil	Privatisation proposals rejected
1999	Canada	Privatisation proposals rejected
1999	Panama	Privatisation proposals rejected
1999	Trinidad	Termination of privatisation
2000	Bolivia	Termination of privatisation
2000	Germany	Termination of privatisation
2000	Mauritius	Privatisation proposals rejected
2000	USA	Termination of privatisation
2001	Argentina	Termination of privatisation
2001	France	Termination of privatisation
2002	Brazil	Continuing campaign
2002	Ghana	Continuing campaign
2002	Indonesia	Continuing campaign
2002	Paraguay	Privatisation proposals rejected
2002	Poland	Privatisation proposals rejected
2002	South Africa	Continuing campaign

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### References

- [1] Bakker, K.J. 2003. *An Uncooperative Commodity: Privatizing Water in England and Wales*. Edited by Gordon Clark, Andrew Goudie and Ceri Peach, *Oxford Geographical and Environmental Studies*. Oxford: Oxford University Press.
- [2] Barlow, M. 2001. *Blue Gold: The Global Water Crisis and the Commodification of the World's Water Supply*. Retrieved February 7, 2015, from: <http://www.global.wisc.edu/development/resources/blue-gold.pdf>
- [3] Barlow, M. and Clarke, T. 2003. *Blue Gold – The Fight to Stop the Corporate Theft of the World's Water*. Leftword Books, New Delhi, India.
- [4] Bhattacharya, S., Chaudhuri, P., and Mukhopadhyay, A. 2011. *Hydraulic Structures and Water Management Systems in Ancient India*. In: *Aspects of Indian History and Culture*. Kaveri Books, New Delhi, India. pp. 61-67.
- [5] Bhattacharya, S., Kumar, A., Chattopadhyay, D.J. and Mukhopadhyay, A. 2011. *Water Crisis and Human Rights: Changing Interactions and Dimensions in the Third World*. In: *Global Environment: Contemporary issues and challenges*. Integrated research and development foundation, India. pp. 438-446.
- [6] Bhattacharya, S., Gupta, K., Debnath, S., Ghosh, U.C., Chattopadhyay, D.J., and Mukhopadhyay, A. 2012. *Arsenic bioaccumulation in edible plants and subsequent transmission through food chain in Bengal basin: with special reference to rice*. *Toxicological and Environmental Chemistry*, 94(3): 429-441.
- [7] Bhattacharya, S., Chattopadhyay, D and Mukhopadhyay, A. 2013. *Changing dimensions of food security in a globalized world: A review of the perspectives for environment, economy and health*. *International Research Journal in Environmental Sciences*, 2(3): 1-7.
- [8] Bhattacharya, S. 2014. *Forest and biodiversity conservation in ancient Indian culture: A review based on old texts and archaeological evidences*. *International Letters of Social and Humanistic Sciences*, 30: 35-46.
- [9] Boland J. and Whittington D. 2000. *The political economy of water tariff in developing countries: Increasing block tariffs versus uniform price with rebate*. In: *Political Economy of Water Pricing Reforms*, Ed. Ariel Dinar, Oxford University Press. Oxford.
- [10] Dhar, A. 2003. *Chhattisgarh to cancel water supply contract*. *The Hindu*, India, April 12, 2003.

- [11] Dwivedi, G., Rehmat and Dharmadhikary, S. 2007. *Water: Private Limited: Issues in Privatisation, Corporatisation and Commercialisation of Water Sector in India*. Manthan Adhyayan Kendra, Badwani (MP), India.
- [12] Falkenmark, M., and Widstrand, C. 1992. *Population and Water Resources: A Delicate Balance*. Population Bulletin 47, Population Reference Bureau (PRB). Washington, DC.
- Goi. 1986. *Constitution of India*. New Delhi: Government of India.
- [13] Gouri, G. 1996. *Privatization and Public Sector Enterprises in India: Analysis of Impact of a Non Policy*. Economic and Political Weekly, 31(48): 63-74.
- [14] Hall, D. 1999. *Privatization, Multinationals and Corruption*. Public Services International, University of Greenwich, July 1999.
- [15] Hall, D., Lobina, E., and Motte, R. 2005. *Public resistance to privatization in water and energy*. Development in practice, 15(3/4): 286-301.
- [16] Kapur, D. and Ramamurti, R. 2002. *Privatization in India: The Imperatives and Consequences of Gradualism*. White Paper, Conference on Policy Reform in India, Stanford University, June 3-4, 2002, pp. 1- 40.
- [17] Kaur, N. 2003. *Privatizing Water*. Frontline, 20(18), 2003. Retrieved February 16, 2015, from: <http://www.frontline.in/static/html/fl2018/stories/20030912002004100.htm>
- [18] Kumar, M. and Furlong, M. *Securing the right to water in India: Perspectives and challenges*. Retrieved September 7, 2014, from: <http://www.indiaenvironmentportal.org.in/files/file/RTW-India.pdf>
- [19] Mathur, O., and Thakur, S. 2003. *Urban water pricing: setting the stage for reforms*. National institute of public finance and policy, New Delhi, India, pp. 1-53.
- [20] Mukhopadhyay, A. and Bhattacharya, S. 2011. *Development and Environmental Issues vis-à-vis Current Perspectives of Human Rights*. In: Human rights and the Third World: Issues and Discourses. Lexington Books, Rowman and Littlefield Publishing Group, New York, USA, pp. 59-80.
- [21] Navdanya/RFSTE. 2005. *Financing the water crises: World Bank, International Aid Agencies and Water Privatization*. Research Foundation for Science, Technology and Ecology, New Delhi, India.
- [22] Public Citizen Report. 2015. *Top 10 Reasons to Oppose Water Privatization*. Retrieved March 26, 2015, from: [https://www.citizen.org/documents/Top\\_10\\_%28PDF%29.pdf](https://www.citizen.org/documents/Top_10_%28PDF%29.pdf)
- [23] Rao, K.L. 1995. *India's Water Wealth*. Orient Longman, India.
- [24] Rezapour, M., Zeynali, M., Shahvalizade, A. 2014. *The analysis relationship between privatization of governmental companies and economic value added*. Arabian Journal of Business and Management Review (OMAN Chapter), 3(9): 46-53.
- [25] Sharma, A. 2002. *Water Colour of Money*. The Sunday (Indian) Express, India, July 14, 2002.
- [26] Sharma, S. 2005. *Background and perspective: Infochange water resources*. Retrieved April 7, 2011, from: <http://www.infochangeindia.org/WaterResourceIbp.jsp>

- [27] Sinha, S. 2001. *Environmental Protection: Role of Constitutional Courts*. In: Contribution of the Andhra Pradesh High Court in the Development of Constitutional Law, High Court of Andhra Pradesh, Hyderabad.
- [28] The Energy and Resources Institute 1996. *State of India's Environment (A Quantitative Analysis)*. Report No. 1995EE52.
- [29] UNESCO. 2009. *World Water Assessment Programme. The United Nations World Water Development Report 3: Water in a changing world*. Retrieved April 5, 2011, from: [http://www.unesco.org/water/wwap/wwdr/wwdr3/pdf/WWDR3\\_Water\\_in\\_a\\_Changing\\_World.pdf](http://www.unesco.org/water/wwap/wwdr/wwdr3/pdf/WWDR3_Water_in_a_Changing_World.pdf)
- [30] Water Technology. 2015. *Tirupur water and wastewater treatment project, India*. Retrieved February 16, 2015, from: <http://www.water-technology.net/projects/tirupur/>
- [31] Wikipedia. 2014. Criticism of Coca cola. Retrieved April 7, 2014, from: [http://en.wikipedia.org/wiki/Criticism\\_of\\_Coca-Cola](http://en.wikipedia.org/wiki/Criticism_of_Coca-Cola)
- [32] World Health Organization 2004. *Water sanitation and hygiene linked to health*. Retrieved March 7, 2011, from: [http://www.who.int/water\\_sanitation\\_health/publications/facts2004/en/](http://www.who.int/water_sanitation_health/publications/facts2004/en/)

( Received 20 April 2015; accepted 05 May 2015 )