https://doi.org/10.20896/saci.v6i5.482

EDITORIAL OPEN ACCESS

# Cities Have Water History And We Need To Understand That

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**Abstract**

The water crisis is not a new issue, but new is the quantum of crisis. Cities are the centres of civilisation and so are the largest consumers of water. Water had always played a significant role in deciding the location as well as in sustenance of cities. Before the technological innovation of the central pipe water network, people developed different indigenous means to ensure access to water. Those are collectively called 'traditional community-managed water system'. However, along with the technological advancement and consequent ease of water supply, these traditional systems were forgotten. This article, without getting into 'romanticising the past', claims that each city has a water history and explains why we need to understand that. Those systems can never be an alternative but can supplement the modern centralised system to a certain degree.

**Keywords**: Cities, Water Crisis, Traditional Community-Managed Water System, India

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## Introduction

> Recently urban environmental scholars have become increasingly pessimistic about the future of large cities and their ability to reach the levels of sustainability if the current trend of resource use and economic development continue. As a historian, I am in no position to provide models and technical solutions to these problems. History, however, can offer perspectives and analyses that provide scholars of the current environment and policymakers with a deeper understanding of the urban predicament. By so doing, historians can also help to clarify choices and options in the formulation of current policy (Dieter Schott, 2004, p. 519)

The management of water resources is emerging as one of humanity's most significant challenges. The signs of water scarcity have been appearing everywhere around the globe. It is estimated that 41 per cent of the world's population lives in river basins where the per capita water supply is so low that disruptive shortages could occur frequently (Fitzhugh and Richter, 2004, p. 741; see also, Kummu et al., 2011).[1] The cities are increasingly suffering from diminishing sources of water at one hand and the increasing demand for water for the growing population especially amongst the high water consuming middle class. Policy makers and engineers always try to find newer sources of water to cope with the increasing demand in the cities. Schott (2004) reminds us to look at the histories of the water supply system from which we can probably learn some lessons and correct certain strategies to prevent a water-poor future for the cities. An in-depth analysis of environmental history reveals to us the right and wrong decisions humans have taken to mitigate the demand for water at different times. Although right and wrong are very subjective and time-specific terms, there is a need to look into the sustainable dimension of the environment over a longer period, considering the historical context.

In dealing with the problem of the present condition of water and developing a model for the future, people have started rightly to fall back on history. In developing a six-staged water transition framework from 'water supply city' in the 1800s to 'water sensitive city' of the future and in identifying sustainable urban water management policies in major Australian cities, scholars (Brown, Keath and Wong, 2008) have depended on the history of water management policies in the country. Through a historical analysis of changing institutional and technological arrangements supporting urban water management practices for the last 200 years, they have developed the water transition framework to provide a typology of the attributes of hydro-social contracts and proposed the potential future hydro-social contracts underpinned by the sustainable principle.

In India, the studies available on the environmental history of water are more commonly located within the geographical spaces of forest, agriculture and rivers. The Urban environmental history studies by Dossal (1991) in Mumbai and Sharan (2014) in Delhi accommodated one chapter each on the colonial history of metropolitan water supply. There might be a possibility that the history of urban water studies lies in documents in the vernacular languages of different states in India, which is hard to access for the mainstream English academia. Thus there is an emergent need to explore the history of water in different cities of India located in different geographical locations and having different trajectories of development. In this process of digging history, the traditional but diversified water management systems worth re-visiting.

[1] 70% of the World's Population Will Live in Cities by 2030, While 60% of Urban Settlements Remain to be Built (UN-Habitat, World Cities Report), World Water Council, retrieved 08 March 2019 from, https://www.uclg.org/sites/default/files/final_press_release_major_city_networks_en.pdf

**Traditional Community Managed Water Systems**

The significance of traditional knowledge in water resource management of the country has been explained by many people like Anupam Misra and Rajendra Singh (Mishra, 1993; Sebastian, 2003).[2] They are often appreciated and awarded by the governments and international organisations at different levels (like Ramon Magsaysay Award, Stockholm Water Prize, Ahimsa Award, Jamnalal Bajaj Award, Indira Gandhi Paryavaran Puraskar, Chandrasekhar award and others), but enough initiative has not been taken to actually learn about the traditional knowledge of water management practised by various communities across India. According to the environmentalist Anupam Mishra, the governments need to rely more on people's traditional wisdom in matters concerning water harnessing (Mishra, 1993). In the post-independence era, both the governments and the people of this country started ignoring their traditional, time-tested techniques of water conservation. What these people are trying to encourage today is an exploration of the history of water management at local levels by different community groups, utilising their traditional knowledge.

Traditional knowledge has been defined as 'a cumulative body of knowledge, know-how, practices and representations maintained and developed by peoples with extended histories of interaction with the natural environment. These sophisticated sets of understandings, interpretations and meanings are part and parcel of a cultural complex.'[3]There was no dearth of traditional knowledge on water resource management in India among different community groups before the advent of technology took over human skill. Since the historic past, we have had indigenous methods of water harvesting and conservation, which are often limited within local areas and in smaller communities. Indian towns, cities and settlements have been around for thousands of years, surviving through droughts on dry and arid land on the basis of these systems. Anupam Misra alone has tried to revive several types of traditional water harvesting methods. One of those methods, as he detected, was in the Jaisalmer of Rajasthan. Jaisalmer town had a traditional water harvesting system using water tanks and roofs, which never failed to supply water to the people of the city in the past. In this system, the rain falls onto the roof of the house, runs to a hole in the roof that is connected to a pipe, and the pipe runs to a storage tank. Misra tells us, these types of systems can store up to 25,000 gallons of water per year. Misra went on exploring many other systems till his death in 2016. One of those examples of traditional rainwater harvesting is seen in the Jaigarh Fort near Jaipur. This 400-year-old building can store up to 6 million gallons of water in one season. It collects water from a little over 9 miles of canals that run out from the building. Step wells of the cities of Rajasthan are also significant traditional water management systems using which people of those cities survived for generations in the desert.

In another study on traditional water conservation and management practices, Iyengar (2007) identified twenty different kinds of traditional sustainable water management practices in the state of Karnataka. These practices were scattered over spaces, starting from old forts to cities and villages, and from drought-prone areas to flood-prone areas. The traditional water systems were practised using different kinds of water sources such as ponds, tanks, water pools, wells, and so on. The most common thread among all these different stories of traditional water conservation and management systems is that of community management and ground knowledge outside the

[2] 50 people who could save the planet (2008,5 January). *The Guardian*, retrieved 08 March 2019 from, https://www.theguardian.com/environment/2008/jan/05/activists.ethicalliving

[3] Article 8(j): Traditional Knowledge, Innovations and Practices Introduction, *WaybackMachine*, retrieved 8 March 2019 from, https://web.archive.org/web/20060820080828/http://www.biodiv.org/programmes/socio-eco/traditional/default.aspx

mainstream organised literature of water management. These systems survived for a long time in history, but the main condition for these to succeed was control over the demand.

Now the question arises, what made those traditional water harvesting systems defunct? Anupam Mishra told a story at the TEDIndia Talk in 2009[4] about how the government spent millions of dollars on building a number of large canals to bring in water from the Himalayas. While they were constructing the canals, advertisements were posted along the way, telling the people to abandon their traditional systems because these canals would bring them all the water that they needed. While the canals did work in some places, they were plugged up with Water Hyacinth (a type of vegetation) in some parts, while in other places sand blew into them, resulting in their eventual clogging. Anupam Mishra went on to explain why the traditional systems ran and served people with uninterrupted water supply over centuries. According to him, it was because of the respect the community had for nature, for everybody in the community and the traditional knowledge of the elderly people. Thus, it is very clear that because the new technology promised a sufficient supply of water to the people, they left the traditional systems of water management. Presently the new technology cannot solve our current problems, and we need to fall back on the history of traditional water management systems to learn how to cope with the current crisis.

The cities are spaces where the sheer size of the population prevents the implementation of an easy solution for the water problem using the traditional management system. Moreover, the traditional management systems were based on the philosophy of minimising consumption and wastage which are not practised by the citizens of consumerist societies in today's world. In spite of consistent negligence of traditional knowledge, we find that some such systems still exist in certain cities of India. Some of these systems are not even documented either by historians or by scholars of traditional knowledge of water management.

During my fieldwork in November 2015, in the hill town of Kalimpong located in the Eastern Himalayan region, I detected a traditional water management system called *bagdhara*. To trace back its history, I tried to search online and saw that the search engines do not recognise the word. This means that there is no mention of this system in online resources. I spent a few days in that small city, and to my utter surprise, I observed that many people in the city do not know anything about *bagdhara*. I also tried in vain to trace any material written on this system in the local library. Failing to get access to historical material sources, I tried to depend on exploring facts on *bagdhara* from the available oral history

Kalimpong town faces endemic water scarcity because of its location on the hills. The city's built-up area has been expanded, destroying many water sources called *jhora* (natural spring) in and around the town. On the contrary, the water demand has increased due to the increases in population and the per capita demand. As a result, middle-class households, in most cases, buy water from public vendors to supplement the meagre municipal supply, while the poor who cannot afford the cost of private supply suffer the most. Poor people usually try to collect water from natural springs sometimes located at distant places and spend a long time just to collect and carry water. To cater to the needs of the poor, a local businessman developed a 'water point' at the beginning of the twentieth century. After interviewing local elderly people, I retrieved the following information about this *bagdhara* system:

[4] Anupam Mishra: The ancient ingenuity of water harvesting', Video Filmed November 2009 at TEDIndia and retrieved 07 March 2019 from, https://www.ted.com/talks/anupam_mishra_the_ancient_ingenuity_of_water_harvesting?language=en

*Bagdhara* water management was established in 1922 by Sriram Moolchand Agarwala. He probably considered this as a charity for poor people as per his religious beliefs. The system basically works to restore a natural spring by building a concrete structure around it so that people can use the water at the place itself. What is strictly maintained in the system is that nobody can take water from these public places for commercial purposes and/or in bulk like in big trucks. People are allowed to use the water for bathing and washing at that place and can also take away water for home use in buckets and other small water containers which they can carry along with them. No pipelines or pumping is allowed from this water point. As the source of the spring is natural, the intensity and volume of flow changes from season to season-high flow during the rainy season and low in winter and summer months.

As for the management of this community water system, it is controlled by the local community through an organised institution called the All Star United Youth Club. There are 50 members in this club, and the membership is open to anybody who would like to join. The management strategies are decided in open meetings where water users also have some say on management and can raise problems if any that they face in using the water. No decision is taken without a discussion on the issue in the open meetings. If anyone, either from the members' list or from outside, would like to clean or maintain the area, they are always welcome, all that they need is advance permission from the club. For repair and construction work, the local ward commissioner provides financial help from the municipality. The capacity of this water point is high but is not used by many people except the poor, as most people who can afford it, either have access to the piped water supply or water delivered at home by private vendors.

The lesson we can learn from understanding the history of this traditional community water management system, which has been functioning for almost a century and from which people are still getting water, is that these modes can be more sustainable options in the long run. We are not sure how many other hill cities in India had developed such community-managed water systems which have been ignored as soon as the cities developed centralised piped connections.

A similar history of small scale traditional community water supply system developed in Nepal during 500–800 BC and lasted for generations—over 2000 years. Its loss during the augmentation of centralised piped water supply and its revival again after the failure of piped water supply in Kathmandu has been narrated by Shrestha (2014, pp. 139-140) as follows:

> As early as 1875, Kathmandu has a rudimentary piped water supply system. The valley experienced an exponential population growth around 1950. To deal with growing water demands, the government built modern water supply systems, by constructing dams and diverting river water to artificial reservoirs and distributing water through pipes. Many people including the traditional *guthi* (local community associations to maintain the network of springs, canals, stone sprouts and dug wells) system, who depended on stone sprouts, started to receive water in their houses through the new government-managed system which diminished the importance of these traditional sources of water. Most of the new users of the stone spouts were recent migrants who had no tradition and, hence no understanding and appreciation of the traditional water supply system. This disconnection between the new users and the old caretakers of the stone spouts further deteriorated the system since the users had no idea whom to approach if and when the system malfunctioned.

Shrestha's study (2014) also indicates that since the 1980s, the condition of piped water supply started to become inefficient and the water distribution system went on deteriorating because of lack of newly available sources of

water and the continually increasing demand. With no improvement in the piped water supply system and no prospects of improvement in the near future, the local communities are coming together to form new users' groups and to revive the small-scale community-based water supply systems. Based on the overall performance of such small-scale traditional community water systems, Shrestha (2014) states that such traditional systems can offer viable alternatives to the centralised water supply system at the local level, but they cannot replace the centralised system due to the inherent nature of limited size and scope.

Thus, both the empirical study in Kalimpong and the study by Shrestha (2014) in Kathmandu, clearly point to the fact that the history of water in the form of traditional management needs to be well explored by environmental historians, who can inform the policymakers about the importance of the traditional water supply/distribution systems and how to preserve and maintain the diverse sources and systems for a healthy and sustainable water supply alternative for cities. However, in doing so, we have to keep in mind that beyond each traditional community-managed water conservation and management system was a system of control over the demand and use. Presently, the control over demand has become a very problematic issue in water management due to the high interference of political, economic power in present-day Indian cities. Today's urban societies are no longer in the control of the traditional community like before. Consumerism and neo-liberal economy have complicated the systems to a large extent, and that is why revival of conventional water systems alone cannot solve the problem. However, it can supplement the total supply to a certain extent, and in the days of the extreme crisis of water in cities, these small are also significant.

**Conclusion**

India belongs to the list of high water stress countries with 40 to 80 per cent water users exposed to water stress (Reig et al., 2013). Although this water stress is not an urban issue only, according to a recent report by Shukla (2019), around 21 cities will run out of water in 2030. The cities, because of its high concentration of population and higher water consumption rate per person by affluent class, are in a problematic state. The policymakers, who are in search of quick makeshift management to mitigate the supply-demand gap, are also in a fix. This particular condition leads us to delve deeper into the past and to learn from our mistakes in building our cities and in destroying water conservation systems. Although the political, ecological debate is important to look into, similarly important is to know the water history and traditional community-managed essentially diverse water systems.

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