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By Dr. Narayan Billava & Prof. Nayanatara S. Nayak

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Tracking Scale-Up of Continuous Water Services in Hubli-Dharwad, Karnataka: Discussion on Sustenance Issues

Dr. Narayan Billava [α] & Prof. Nayanatara S. Nayak [σ]

Abstract- Municipal water utilities across the state provide intermittent water services (IWS), with frequencies ranging from daily to weekly deliveries. To expand supplies, increase coverage and improve services, municipal bodies are looking for alternative ways to fund drinking water services. Public-Private Partnerships (PPP) are one of the means being explored by many municipal bodies to attract private investment in the water sector. In 2008, under a loan from the World Bank, as part of a scheme administered by the state of Karnataka, Hubli-Dharwad upgraded eight wards as a demonstration project (demo wards) to continuous water services (CWS). Hubli-Dharwad upgraded an additional 18 wards to CWS in 2015 (extension wards) and has plans to scale up CWS to all remaining wards shortly. In this background, we tried to understand the ongoing affordability issues and water scarcity challenges in the scale-up of CWS as compared to demo zones of CWS and to discourse on sustenance issues regarding the management and provision of urban water supply, including planning, the role of the public and private sector, involvement of stakeholders, availability of water, their sources, networking, financing, and maintenance, in India. Out of 67 wards, we selected 28 and collected information from 840 households. Proponents of the scale-up of CWS claim success in providing CWS, increasing regular issuance of bills, and improving revenue collection rates. But, in scaling up CWS to the entire city, the municipal corporation has yet to deal with pending cases of arrears, calls for subsidized rates, or insufficient water supplies. PPPs redefine the role of the HDMC and in the long term, could have implications on whether water services remain accessible and affordable. The pilot/demo project protected by 100% grant and coordination of enthusiastic stakeholders appears to be successful in continuous supply of water, reduced nonrevenue water, increased billing and collection. But, in upscaling of the project to the entire city, the municipal corporation has to deal with cost-sharing, new private operators, pending cases of arrears, subsidized rates, ensure coordination in implementation and availability of water throughout the year and, redefine its role as well that of government agencies, which in the long term could have implications on municipal governance and sustenance of the project.

Keywords: continuous water services, public-private partnerships, sustenance, stakeholders.

I. Introduction

Water is at the core of sustainable development and is critical for socio-economic development, healthy ecosystems, and for human survival itself (UN Water 2015). Due to population explosion and urbanization, the demand for water by households and industries has increased tremendously in countries like India. Most of the urban areas are lacking availability of quality drinking water for domestic and drinking purposes in India. In India, public sector agencies like city corporations or urban water boards have taken the responsibility for the providing of water to consumers in urban areas. However, the management of urban water supply has resulted in negligence of groundwater management, intermittent and insufficient water deliveries, and a general lack of capital maintenance leading to a water crisis in many urban centres (Iyer 2007; Priya et al. 2008, and Mathur 2013). In urban India, the most of cities deliver water through publicly management water systems; but nearly all of them provide inadequate service levels, with low coverage and intermittent deliveries. Recently, a few cities in India have begun piloting continuous (or 24x7) water supplies under a program sponsored by the World Bank and through the introduction of PPPs. Delhi (the federal capital) has planned a process of privatization of water since the year 2005 (Singh et al. 2010). In Karnataka, the state government has sanctioned 24x7 through a PPP structure for 20 cities; four larger (Mysore, Hubli-Dharwad, Gulbarga (Kalaburgi), and Belgaum (Belagavi) and 16 other smaller.

II. Review of Literature

Many Indian cities are opening to reforms in the urban water sector compared to other Asian metropolitan regions and are set to face some of the political economy involved in the water sector reforms (McKenzie and Ray, 2009). However, many studies (McKenzie and Ray 2009, Shamsher 2013) have also found that the PPP model has suffered from a lack of co-ordination, a mismatch between the contract of actual requirements and estimates to connect pipeline for households, a lack of awareness and involvement of the public, a lack of coordination between government departments, poor tariff collection rates and controversy among grass-roots advocacy groups. Many studies have tried to extend the concept of sustainability to urban water management. A study by Larsen and Gujer (1997) defines urban water systems as including collection, treatment, and distribution of water,

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wastewater and stormwater and stated that sustainable development in the urban water supply is only possible through efficient use of available water resources and adopting new technologies. The Asian Development Bank estimates a loss of around 29 billion cubic meters of treated water every year in Asia (and resulting in nine billion dollars of annual revenue losses). The study concluded that by fixing water leakages and addressing water pilferage, it is possible for water utilities in the region to significantly cut the amount of water lost, freeing up a significant amount of both revenues and water resources. A few more studies (Liemberger et al. 2007; Dragan et al. 2007, Burt et al. 2018) have focused on water losses (non-revenue water) and leakages. These studies suggest that water losses can be controlled by adopting innovative technologies. Tiwari et al. (2007) has focused on reforming the water sector in Delhi. The study tried to analyze the life cycle costs and create a multi-criteria analysis based on the opinion of experts and stakeholders on indicators such as sustainability, equity, efficiency, and overall performance of water utilities. The authors used a Logit model to estimate an index and considered the following four indicators for the study; 1. Efficiency (quality, quantity, and reliability of services), 2. Financial aspect, (Adequacy of cost recovery for operation), 3. Equity aspect, (Affordability, equitable access, and participation and decision making), 4. Sustainability and environment aspect. The study found that sustainability and management of resources are the key drivers of governance reforms in water management. Finally, poor service in the provision of water services, water is treated as a commercial entity rather than a fundamental right, accountability, and equity in access to water are all serious challenges to urban areas in low-income countries like India. Therefore, more studies on sustainable management of water supply addressing issues of management, fixing affordable prices, and improvement in technology are needed.

III. 24 X7 in Hubli-Dharwad Twin Cities

As per the Census 2011, Hubli-Dharwad twin cities have a population 9,43,788. Around 19% of the population constitutes slum dwellers, and the number of houses administered by HDMC exceeds two lakhs. 24x7 in Hubli-Dharwad twin cities is a project operated and managed by multiple players including, private and public entities. The scheme is a part of the KUWASIP, implemented in three cities of Karnataka viz. Belgaum, Hubli–Dharwad and Gulbarga. The agreement for the project was signed in 2005 between Hubli-Dharwad Municipal Corporation (HDMC), Karnataka Urban Infrastructure Development and Finance Corporation (KUIDFC), KUWSDB, and the Operator Consultant (OC) or the private operator. The pilot project has been financed through a World Bank loan routed as a state government grant to HDMC and its share. 24x7 is a bold step in water sector management as the municipal supply of water to citizens in Hubli-Dharwad was unable to meet even the costs of O&M, leave alone capital costs. But, the road to 24x7 was not smooth. It received an initial setback when announcements were made for the installation of pipes in demo zones (wards) in the twin city. The agitations were led by people who were skeptical about the scheme. However, on the other hand, a study on 24x7 water supply in Hubli-Dharwad twin cities reveals that the system does not satisfy the assumptions that were expected to be fulfilled with its implementation in twin cities (Burt and Ray's (2014), Ray et al. (2018). The study finds that the consumers continue to store water, the reasons being reliability and convenience of storing water. Secondly, cases of non-payment of water bills were also found in 24x7 demo zones due to the inability of lower-income groups to pay water bills and due to lack of trust between water users and providers. Such behavior poses problems to the sustenance of the program, as 24x7 runs on the principle that supply of water on a commercial basis to cover O&M, and part of coping costs is feasible and 24x7 reduces coping costs arising from the need to store water.

IV. Objectives and Methods

The objectives of the research article are:

1. To study the household's perception of water quantity, quality, pressure, and scarcity of water provided by upscaling CWS as compared IWS.
2. To examine the success of scale-up of CWS (extended) to demo zone wards (piloted wards in 2008).
3. To assess the equity of water supply between Slum and Non-Slum areas.
4. To analyze sustainable issues in scale-up of CWS (i.e., affordability issues, water scarcity and finance in the up scaling CWS.

a) Methods

This paper is based on the insights drawn from a sample study carried out in Hubli Dharwad twin cities during 2017-18. We conducted an impact evaluation of the pilot-scale conversion from intermittent to 24x7 water delivery in Hubli-Dharwad, one of the first cities in India to implement such a conversion. We selected 28 wards for our household survey, across four categories: i) CWS demo zone =4 wards; ii) CWS eight extension wards (Fully covered); iii) Eight IWS wards (Not covered 24x7); iv) Eight IWS areas in wards that contained areas with CWS services (Partially Covered).

For all four categories, half of the wards contained slums and Non-Slums and randomly selected 30 households in each, for a total sample size of 840 households. We collected household perceptions on water access, water quality, and the water tariff. In addition, we also conducted key informant interviews

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(KII) with local water managers. The discussion in this paper is restricted to the process of implementation, consumers' satisfaction, comparative usage of water in 24x7 with the usage non 24x7, payment of bills, customers' perception on water charges, willingness to pay, issues in Public-Private partnership and sustenance of the project, which we expect can help in understanding the issues in upscaling of the project to other wards covering almost one million population.

V. Results and Discussion

The results from household-level analysis although, they appeared to be in favor of 24x7, did pose many questions about its sustainability, which we discuss later. We collected customers' perceptions about satisfaction over the quantity of water supplied, its quality, and the pressure in the pipes supplying water. For all the three parameters, the level of satisfaction was better in CWS than in IWS wards (see Fig1). Our recent visits to 24x7 demo zones revealed that several households followed the earlier system of storing water and filled fresh water once in 3 days, reasons. These reasons are uncertainty about continuity, slow flow during peak hours, and the feeling that the rates may go high if they daily use the water. So the new system has not made any difference to some of these households. Concerning quality, there was not much difference between the opinions of customers in CWS and those in IWS as they could not make a clear distinction. A few households who used to get muddy water during the rainy season under IWS due to leakages in pipes were happy as 24x7 had put an end to it. Although 24x7 assures high pressure of around 22-40 meters (World Bank 2010) minimum, being 6 meters in pipes, it was found during the survey that those staying on the first and second floor had slow water flow in the morning hours, and could fill their overhead tanks only during noon and after that. Only 58% of households have treated drinking water. We found households in IWS wards treated water compared to CWS. Moreover, we found slum households are less concerned about the treatment of drinking water than the Non-slum areas (see fig 2).

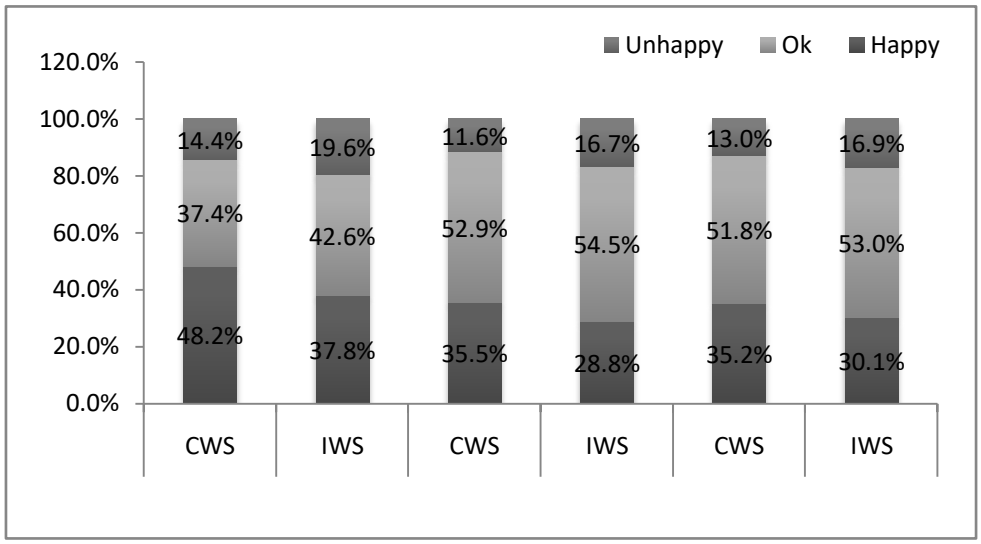


Figure 1: Satisfaction of customers (%) about the pressure, Quantity and Quality of water supplied by HDMC

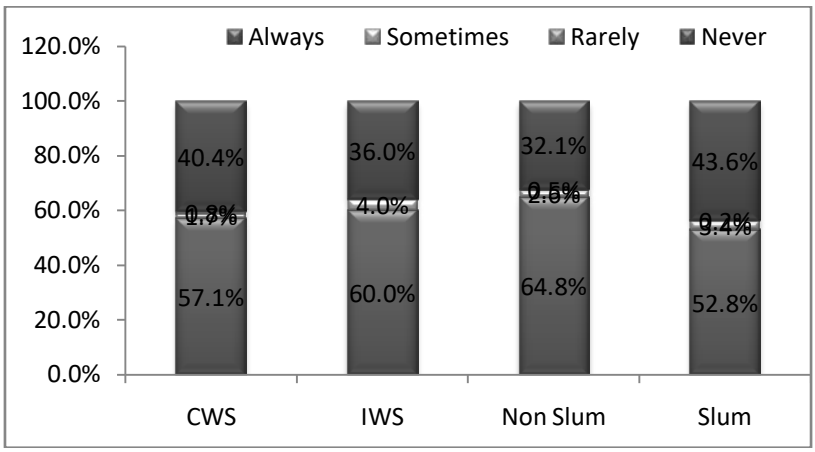


Figure 2: How often do you treat your drinking water

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We have collected household's perception about the water pressure, quantity, and quality of water accessed differs between the non-slum and slum dwellers in the IWS and CWS areas and found that In IWS wards, there is differences between a slum and non-slum dwellers with regarding water pressure, quantity and quality of water (See fig 3a and 3b).

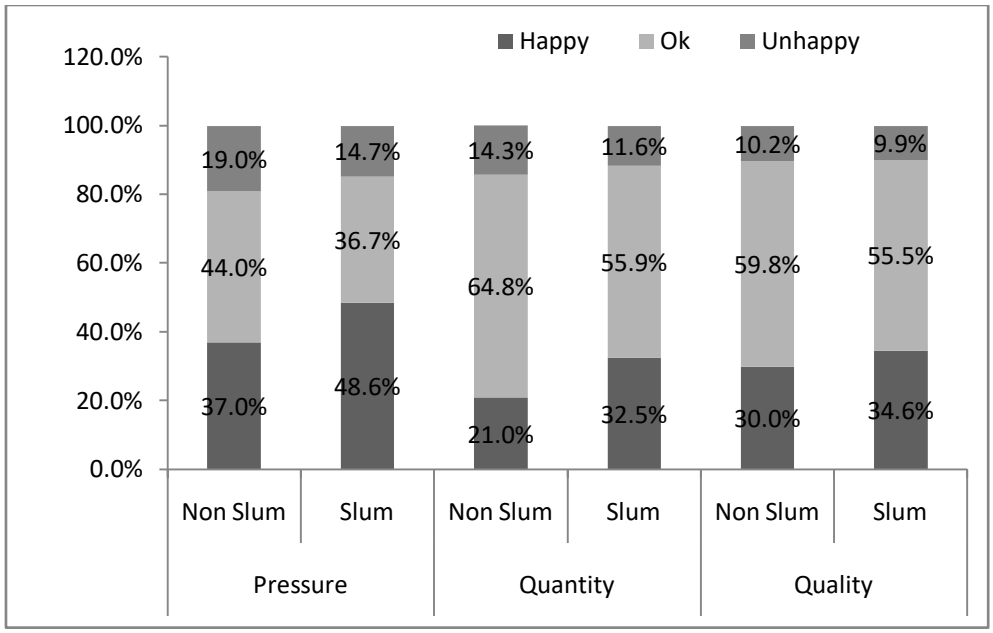


Figure 3a: HHs opinion about the pressure, Quantity and Quality of water supplied under IWS

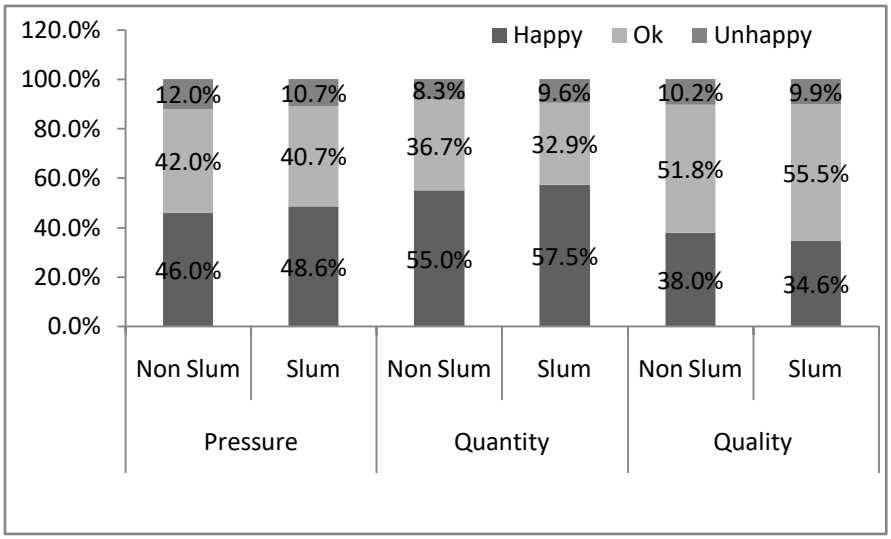


Figure 3b: HHs opinion about the pressure, Quantity and Quality of water supplied under CWS

Despite being happy with the 24x7 water supply, it should be noted that 35% of the households in 24x7 demo zones had arrears in water bills during the survey period. The share of defaulters was 23% in non24x7 zones. Slum households had much higher average arrears (almost three times that of non-slum) in CWS and IWS. We tried to know whether customers had arrears pending for long or were not punctual in payment of water charges. We asked them some additional questions on the current status of their water bill to know if the arrears were due to pending bills from the earlier system or occurred after the installation of 24x7. Regarding of whether the water bill was paid for the previous month, it was found that more than 50% of the customers in slums and 45-46% in non-slums both under 24x7 and IWS had not paid the water bills for the previous month. Demo wards are receiving good service, and extended wards face irregular water supply by HDMC after implementations of 2 years. It is likely that the customers pay the bills later, but these cases depict irregularity in payment. And, sustenance of the program and efficient implementation depends on the regular flow of income required to maintain the schemes. As per KIIs, the failure of CWS in extension,

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wards was due to water shortages. Hubli-Dharwad cities have faced severe water problems due to drought during 2015 to 2018. We found that slum areas households have not much suffering in the last three years as compared to nonslum, but households that comes come under IWS wards have been faced water shortages than the CWS (See fig 4).

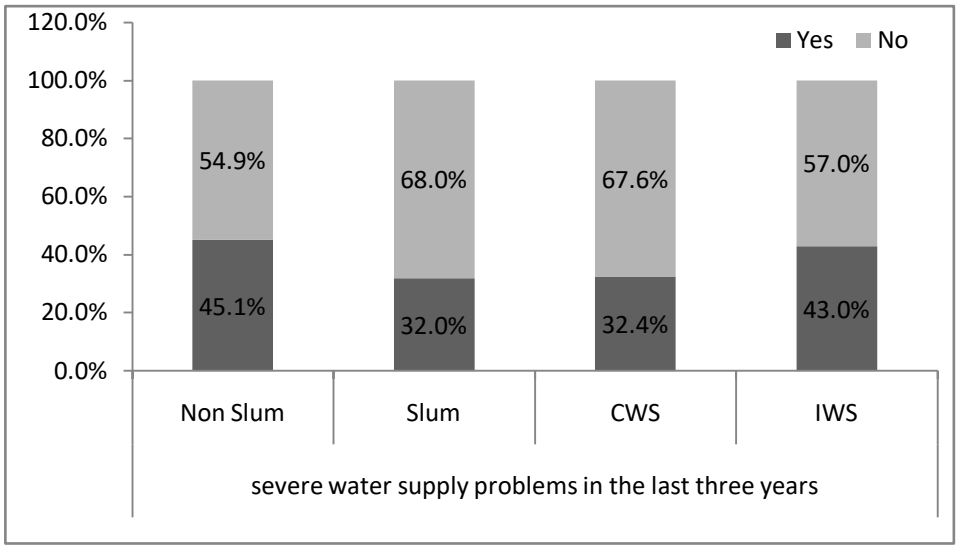


Figure 4: HHs is facing severe problems in water supply in the last three years (2015-18)

VI. Up-Scaling 24 X7 for the Entire City-Sustenance Issues

The pilot project covering eight wards, which was to be completed in 2008, got the further extension and was finally completed in 2011, taking almost six years. The scale-up as per initial plans was to be started in 2009 and completed by 2014. In 2012, when the then Mayor, HDMC, announced that World Bank had agreed to extend the loan to cover 24/7 in the remaining 59 wards, he also assured that by 2016 the entire city would be covered with the scheme. But, to date, installation of pipelines and connections to 24x7 is complete in only one layout, which is just a fraction of award. Why was upscaling not started as per the plan? What lessons can be drawn from 24x7 in pilot zones for the sustenance of the project? We tried to get answers for some of these issues.

Although 24x7 is a successful project in demo zones, one cannot assume similar results in the remaining wards scale-up. There appear to be missing links and the lack of coordination between the departments. While the plans for scaling up the project for the remaining 44 wards are being finalized, the installation work taken up in 17 plus are sluggish and stalled due to a lack of planning and cooperation from other government departments. KUWSDB officials express their helplessness in speeding the work as per plans due to lack of coordination and clearance from other departments like traffic police, railways, and Public Works Department (PWD). New roads constructed by spending crores of rupees even after receiving the World Bank approval for the extension of 24x7 to other ward, have been spoilt by re-digging for laying out water pipes. All the departments in the city are aware that the entire is going to be covered 24x7. Despite this, there is no pre-plan for coordinating the network for lying pipes in new roads.

Secondly, Sustenance is an important factor that needs to be considered for the success of any program while designing and implementing the program itself. Implementing partial or cost recovery is the first step in addressing the issue of sustainability in terms of financial implications. The extension of 24/7 to be implemented in 6 phases in the entire city requires about Rs.1146 crores, excluding 113 crores already invested by KUWSDB in laying down HDPE pipes and creating the infrastructure required for 24x7 in around 17 full wards and partly in 14 in the second phase. Since the upscaling is financed by the World Bank loan, PPP in terms of involvement of private operator and financial contribution by HDMC as its share is a must for initiating the project. In the upscaling of 24x7 by KUIDFC to the entire city, HDMC was required to bear around 30% of the cost in the first phase and 100% of the cost in the second phase towards capital investments, unlike the pilot project wherein 100% of the capital cost was provided as a grant from the State. Out of total estimates of 1146 crores, HDMC's share as per present estimates is Rs.213 crores in the first phase and Rs. 383 crores in the second phase. As per the discussions with the officials of KUIDFC, KUWSDB, and HDMC, financial constraint due to HDMC's share was the main challenge in upscaling the project to the entire city. Until recently, it

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was doubtful whether HDMC could contribute its share towards project costs in upscaling the project.

In addition to financial stability, in terms of physical requirement the implementation of 24/7 demands a permanent source of water, which is sufficient to meet the demand of the people throughout the year. One of the important risk factors in maintaining sustainability is the availability of bulk water from the main sources to cover the entire city with all legal connections and 24x7 water. As we understand the bulk of the water available from the main source (Malaprabha River) is entirely being utilized, and there is volatility in the second source (Neersagar), which is dry during summer. There are concerns about the availability of water in Malaprabha reservoir to sustain upscaling of 24x7 for the entire city. Any decrease in the water level in Malaprabha reservoir and Neersagar can lead to a water crisis in twin cities (Anon 2011). Many times, the reservoir has witnessed water shortage. In 2012 the water level in Malaprabha had gone down for the first time in ten years from 37.04 TMC to 3.15 TMC (Huralimath 2012). So the discussion on how increased demand for water will be sustained for the existing population is crucial. The present water requirement, including the supplies for upscaling wards of Hubli-Dharwad town, as per commitments, is 20 to 30 MLD water are shortages as against demands. As per officials of the water board lack of water storage and fully depending on the private organization for water network are the main reasons for the delayed project for implementing remaining wards of Hubli-Dharwad. The following statement made by the Asian Development Bank in its final report on water supply models in India raises doubts about the sustainability of 24x7 if the project is scaled up in the entire city or is replicated elsewhere; "24/7 water supply is possible as long as the capital investments are provided as a grant from higher-level governments, and as long as the charges for the bulk water supply do not include either capital investments or electricity costs. In addition, the Operator Consultant is paid for his services through a contract with guaranteed payment without requiring him to make any capital investments or risk consultant's funds to support the O&M" (ADB 2014:15).

VII. Conclusion and Policy Initiatives

The project 24x7 water supply has been completed and is working smoothly, although there are some hurdles that question its achievement and sustenance. A majority of the customers are satisfied with the quality and quantity of water and services of the private operator. People have saved time due to collecting and storing water and are free from disturbances of odd-time supplies. However, based on household surveys and interactions with customers and other stakeholders, the study finds that households were not satisfied with the quantity, quality, and pressure of water provided by IWS compared to CWS. Demo wards have continued to provide CWS since 2008. Still, in extension wards, households report regular gaps in service, for example, receiving water only five days per week or only part of the day. According to our KIIs, the failure of CWS in extension wards was mostly due to water shortages. At the same time, slum households had much higher average arrears (almost three times that of non-slum) in both CWS and IWS. Some groups were advocating for their own discounted water rates as well: urban farmers practicing animal husbandry claimed greater water needs; sewage workers claimed to need more water to washcloths and bathe. KIIs inform us that financial constraints at the HDMC and continued challenges with insufficient water availability will lead to increases in the water tariff shortly.

Proponents of the scale-up of CWS claim success in providing CWS, increasing regular issuance of bills, and improving revenue collection rates. But, in scaling up CWS to the entire city, the municipal corporation has yet to deal with pending cases of arrears, sufficient storage of water and networks, calls for subsidized rates, or insufficient water supplies. PPPs redefine the role of the HDMC and in the long term, could have implications on whether water services remain accessible and affordable. The pilot/demo project protected by 100% grant and coordination of enthusiastic stakeholders appears to be successful in continuous supply of water, reduced nonrevenue water, increased billing and collection. But, in upscaling of the project to the entire city, the municipal corporation has to deal with cost-sharing, new private operators, pending cases of arrears, subsidized rates, ensure coordination in implementation and availability of water throughout the year and, redefine its role as well that of government agencies, which in the long term could have implications on a sustenance of the project. The main impediment in the sustenance of the project is the mounting of arrears from the earlier and current system. Waiving off arrears may boost the confidence of the users and make them regularly pay their water charges. But, this could set a bad example for the consumers in the remaining 44 wards likely to get 24/7 within the next two-three years. So before connecting households in 44 wards to 24/7, KUWSDB has to ensure that arrears relating to intermittent water are paid, and there is redressal of grievances, due to errors in billing, faulty meter, change of ownership, etc. If this issue is left unaddressed, it could keep on bouncing back with mounting arrears and remain an unresolved issue. Hubli Dharwad Municipality should ensure that it will not fall short of funds towards developmental activities on account of diversion of regular or special grants towards 24x7 and look for alternative arrangements and sources, including enhancing its tax base to fill the gap. And,

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finally, the project should ensure timely availability of funds and water and execute the plans as per the designs to meet the requirements for augmentation of water resources.

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