

Cross Comparison of the South Asian Water and waste Water Utilities using the Key Performance Indicators

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Abstract—The purpose of this study is to compare the Key performance indicators (KPIs) of the water and waste water utilities of South Asia. The KPIs shows us whether the concerned utility doing well or not by comparing its performance with time. As South Asian countries are the developing countries, the majority of the people are poor, so the government can't apply high rates on water utilities, because due to high rates the poor will be deprived of the basic facility. In order to cope with this situation the government always give subsidy to the people for such kinds of basic facilities. These situation compel the water and waste water utility department's officials to run the utility in the best way possible to facilitate the citizen with least cost as much as possible. In order to achieve this goals, Performance Indicators (PIs) play a pivotal role. The data of water and waste water utilities of Pakistan, Bangladesh and India is taken from International Benchmarking Network for Water and Sanitation Utilities (IBNET) database and then analysis of the data is also practiced. The findings shows that the, Water utilities of Bangladesh is running well as compared to the India and Pakistan.

Keywords—Key performance Indicators; Water Utilities; Waste Water utilities; South Asian countries; Utility Financing; Service Delivery;

I. INTRODUCTION

Achievement of Sustainable Development Goal for water and sanitation i.e. SDG-06 requires high investment, best management and the involvement of all the stakeholders, It is highly demanding in developing countries where utility inefficiencies and ineffective management are still most prevalent. The high growth rate in urban areas of developing countries, made the condition worsen for the provision of water and sanitation [1].

The performance of a Water Supply and sanitation system can be assessed by suitable performance indicators [2, 3]. PI is a type of performance measurement that helps you understand how your organization or department is performing [4]. The general concept of evaluating the performance of a Water and sanitation utility is to compare its performance with established benchmarks through cross comparison [5]. the stakeholder's The good performance is the one that satisfy needs [6]. A good PI system is one that contains PIs which are fewer in number, clearly defined, non-overlapping useful for global application, easily understandable refer to a certain time period, address a well-defined geographical area and represent all the relevant aspects of water utility performance. [7].

The IBNET system is suitable for cross utility and cross country performance comparison in developing countries [6].

The performance indicators constitute the building block of both type of benchmarking [3].

There two primary objective of benchmarking:

- To provide a set of performance indicators related to managerial, financial, operational and regulatory activities.
- To enable an organization to compare its performance on KPIs with those of other relevant utilities to identify areas needing improvement.

There are two types of benchmarking; Metric and process benchmarking. Metric benchmarking involves systematically comparing the performance of one utility with that of other similar utilities, and tracking one utility's performance over time. Process benchmarking is a normative tool with one utility can compare the effectiveness of its processes and procedure for carrying out different functions to those of selected peers. A utility can compare its billing and collection system for example to those used by other utilities to see which system performs better. When the comparison reveals one utility's system to be more effective or efficient than the other's the underperforming utility can adopt and internalize those processes and procedures as appropriate [3].

II. Methodology

First of all the data is extracted from the IBNET database for the South Asian countries, after the extraction the data is analyzed for different performance indicators using Excel tool. For the Analysis purposes the main performance Indicators are selected. A total of 107 utilities for the seven countries of south Asia are available, for these seven countries minimal data is available for Sri Lanka, Nepal, Maldives, Bhutan, and Nepal, so for the analysis purposes these countries are discarded and only the data of Pakistan, India and Bangladesh are analyzed for the 10 years from 2008 to 2017. In IBNET database, there were a long list of performance Indicators, but for the analysis purposes 5 important are selected. The KPIs that are selected for the analyses are the following:

1. Water Coverage
2. Sewerage Coverage
3. Non-Revenue Water (NRW)
4. Metering Level
5. Hours of supply

S. No.	Country Name	No. of Utilities
1	Sri Lanka	2
2	Pakistan	10
3	Nepal	1
4	Maldives	1
5	India	32
6	Bhutan	1
7	Bangladesh	60
Total		107

Table 1: South Asian countries, and their water utilities

III. Analysis of the Data

1.1 Water Coverage

1.1.1 Pakistan

For the seven water utilities of Pakistan, data is available for water coverage for the years 2008-2017, the average water coverage of these water utilities for the 10 years is 64.65%. The Water Coverage for 5 best water utility of Pakistan is given below in the bar graph. The Bar graph shows that Peshawar (PDA) has 100 % water coverage for the year of 2016, while KW&SB and Rawalpindi WASA has the 90 % water coverage recorded for the years of 2007-2009.

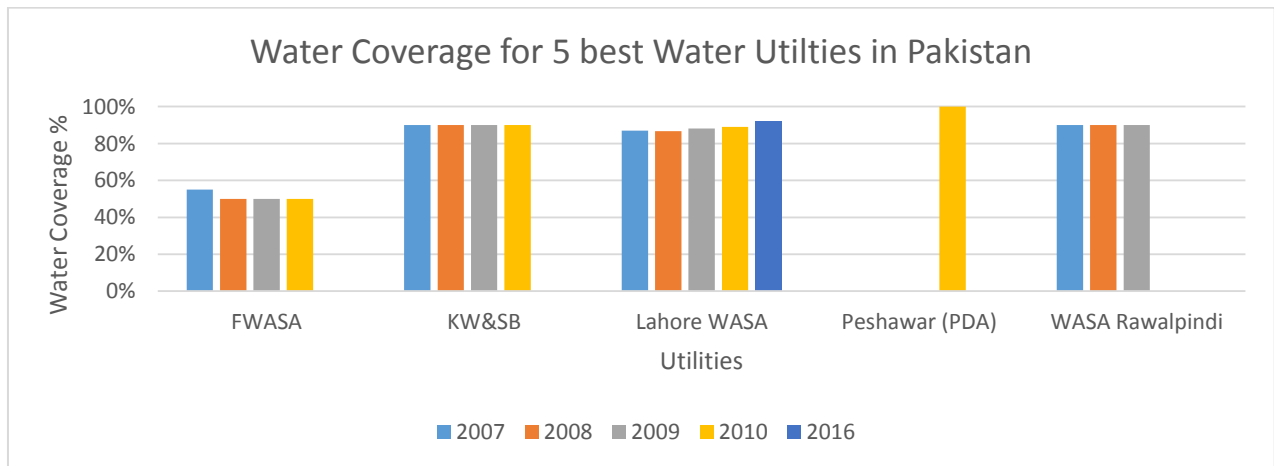


Figure 1: Water Coverage for the five best water utilities of in Pakistan

1.1.2 India

For the year of 2009 data is available for 16 water utilities of the India, about water coverage the average of these 87.85%, out of which the five best are plotted as given below. The bar graph shows that the best 5 water utilities of India have maximum water coverage of 100 %.

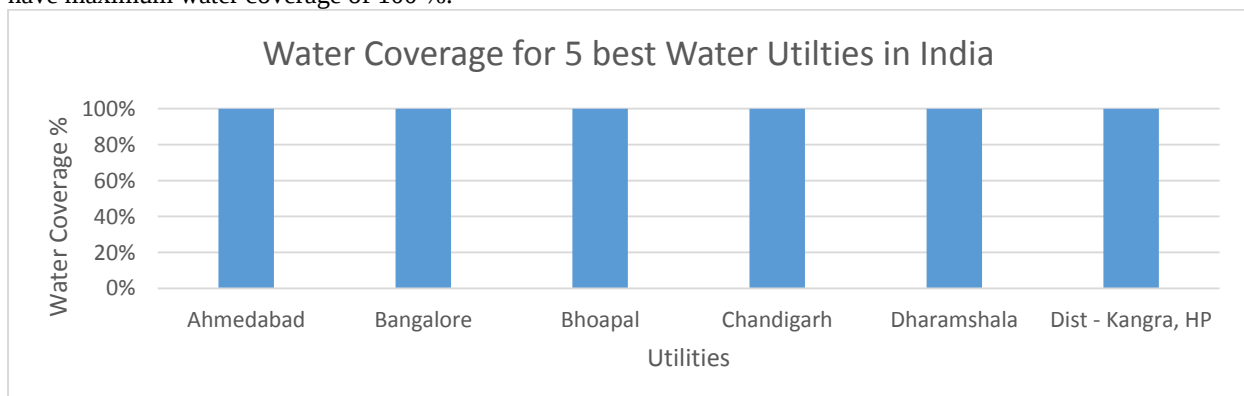


Figure 2: Water Coverage for the 5 best Water utilities of India

1.1.3 Bangladesh

Data is available for 29 water utilities of Bangladesh, the average water coverage for these 29 water utilities is 49.74 %. The good finding about Bangladesh is that, data is available for almost every year between 2008- 2017. The Dhaka WASA has 100% coverage for the years of 2014-2017, while CP Chandpur and JPS. Jessore has 90 % of water coverage.

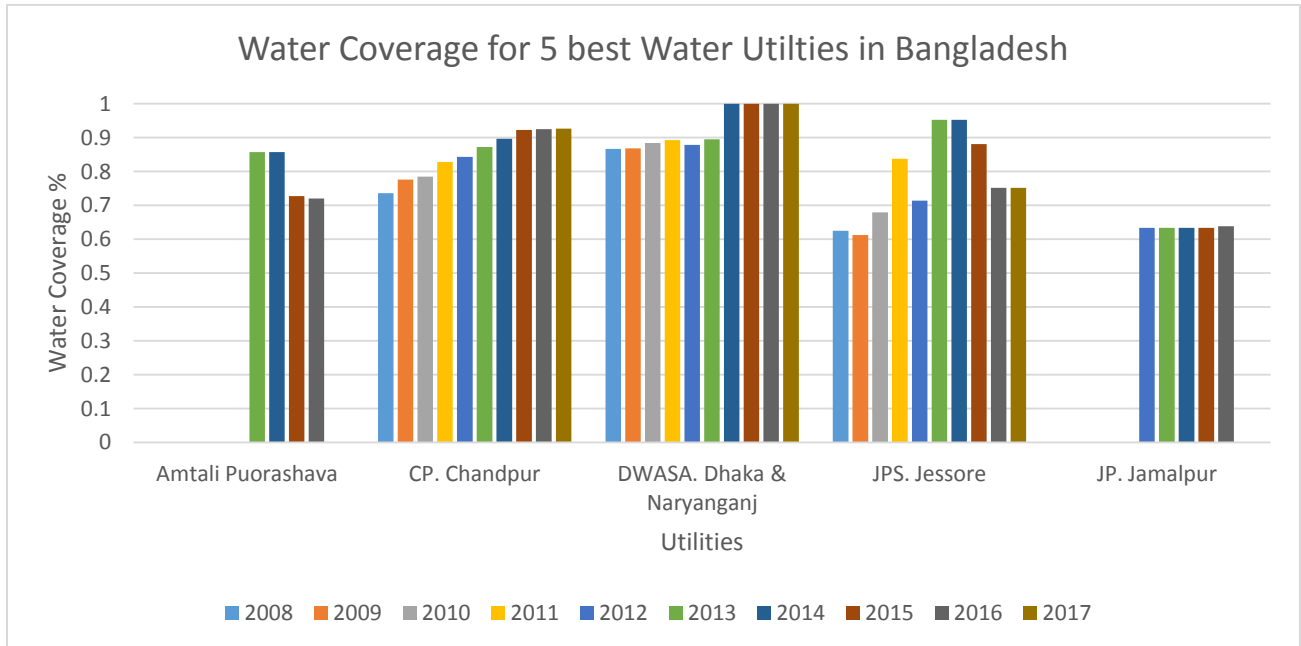


Figure 3: Water Coverage for the 5 best Water utilities in Bangladesh

1.2 Sewerage Coverage

1.2.1 Pakistan

For seven water utilities of Pakistan the sewerage coverage is given in the IBNET data base, the average sewerage coverage for these seven utilities is 72.18 %, out of the 7 the five best is plotted as given below, the bar graph shows that Peshawar (PDA) has the maximum sewerage coverage of 100% for the year of 2010.

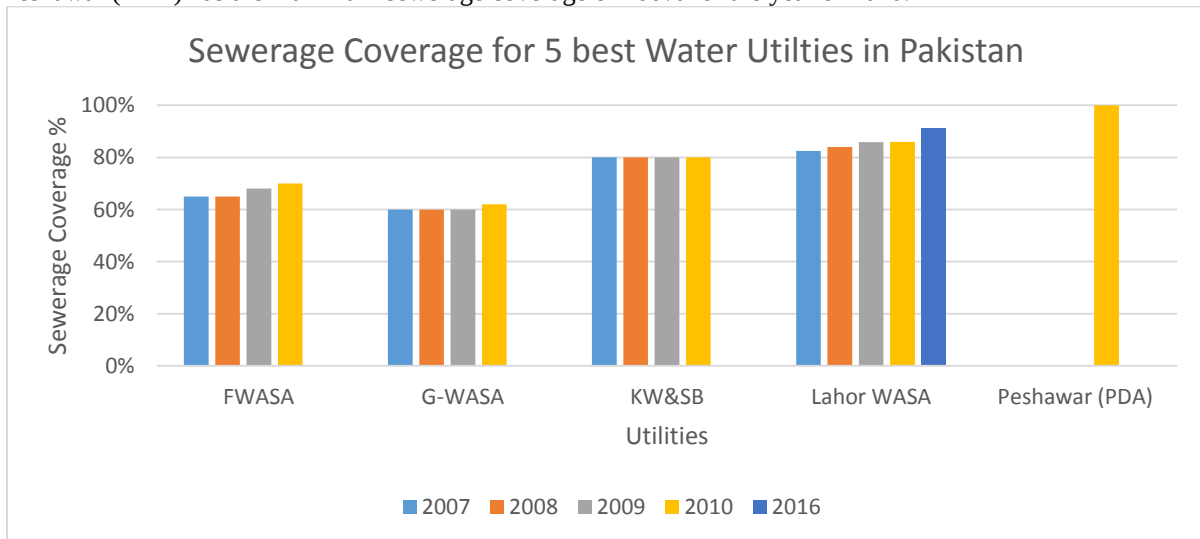


Figure 4: Sewerage Coverage for the 5 best Water utilities of Pakistan

1.2.2 India

The sewage coverage for 15 water utilities for the year of 2009 for India is given, the average is 23.10% for these utilities, out of the 15 the five best is plotted as given below, and the maximum sewerage coverage is for Kerala (39.13%).

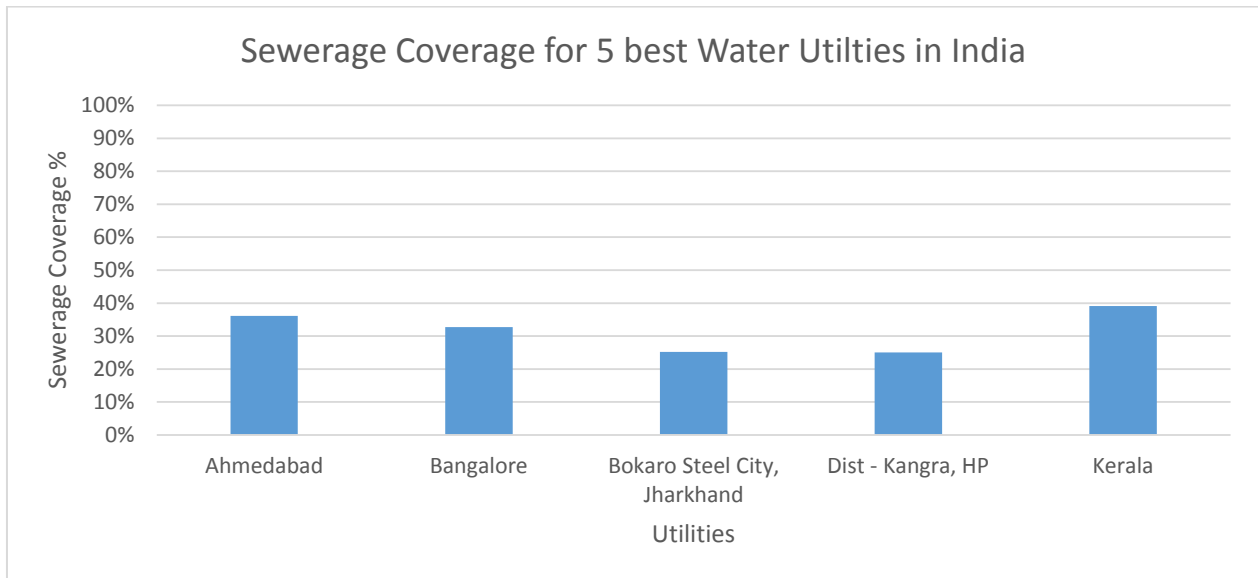


Figure 5: Sewerage Coverage for the 5 best Water utilities in India

1.2.3 Bangladesh

Only for Dhaka the sewerage coverage is available for the year 2012-2017, which is taken as 30%.

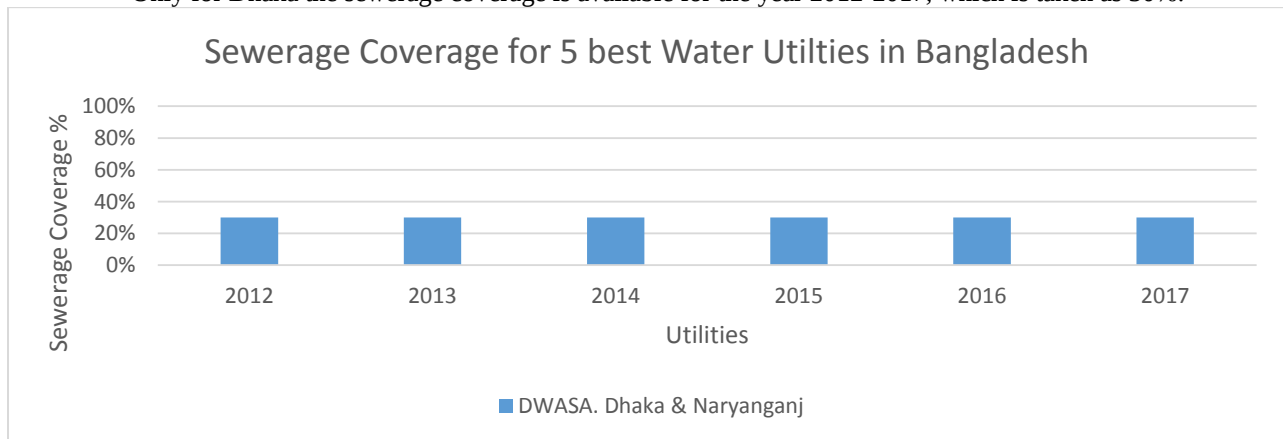


Figure 6: Sewerage Coverage for the 5 best Water utilities in Bangladesh

1.3 Non-Revenue of Water (NRW)

1.3.1 Pakistan

There are 7 utilities observed having NRW data available for Pakistan. The average Non-Revenue Water (NRW) is 36% for these seven water utilities for the years 2008 -2017. Out of which the best five which have least NRW among the other utilities are shown in the graph below. The Faisalabad water utility is the best one having the least NRW (<10%) for the years 2008-2010, Peshawar (PDA) is the second one having NRW of 23% in the year of 2010.

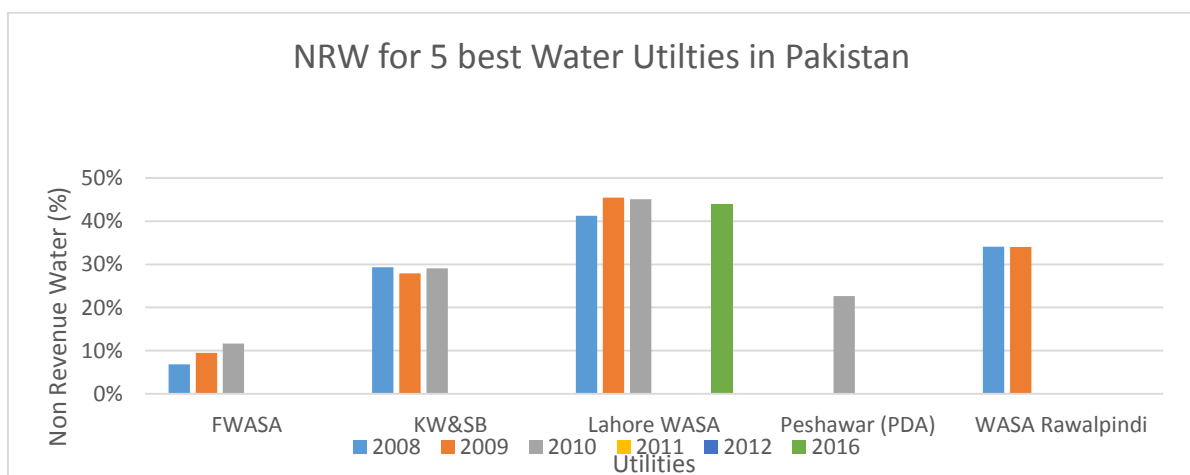


Figure 7: NRW for the 5 best water utilites in Pakistan

1.3.2 India

For India data for NRW is only available for 2009 only among the year of 2008-2017, for 17 utilities. The average non-revenue water for these 17 water utilities is 48.31%. Out of which the Bhopal water utility is the best one having 30% NRW, while Ahmad Abad and Chandigarh have NRW of 31%.

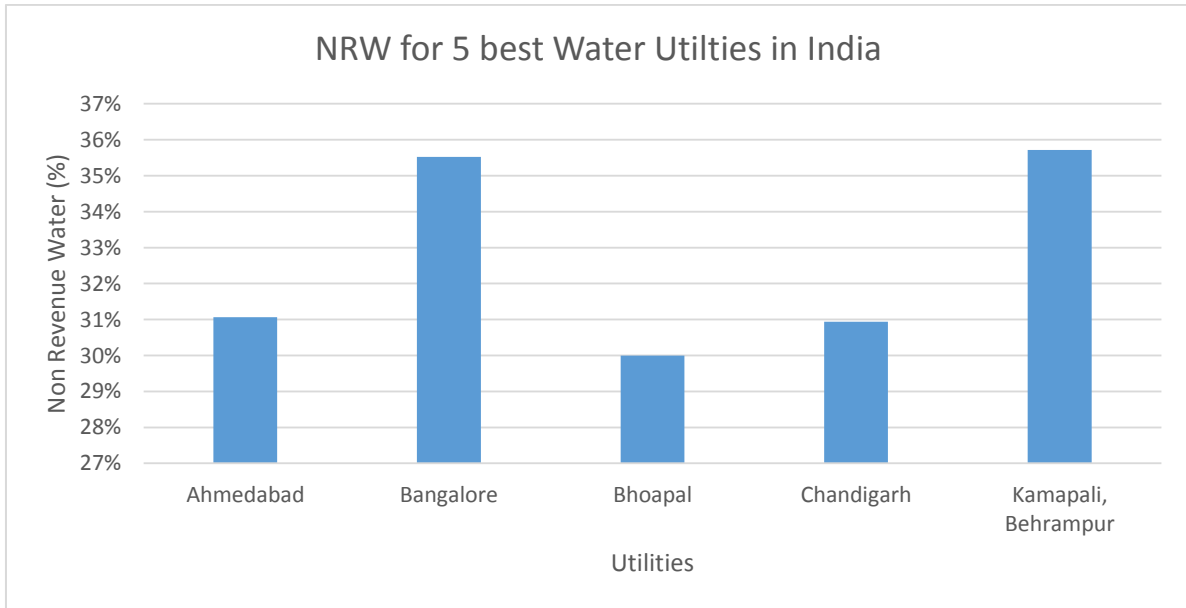


Figure 8: NRW for the 5 best Water utilities of India

1.3.3 Bangladesh

For Bangladesh, data is available for 30 water utilities, for the years of 2008-2017. The average NRW for these utilities is 19.64%. The good aspect about Bangladesh water utilities is that, the data is available for almost every year for these 30 utilities. Out of these utilities the JP. Jamalpur is best one having the NRW below 10% for the years 2012-2017.

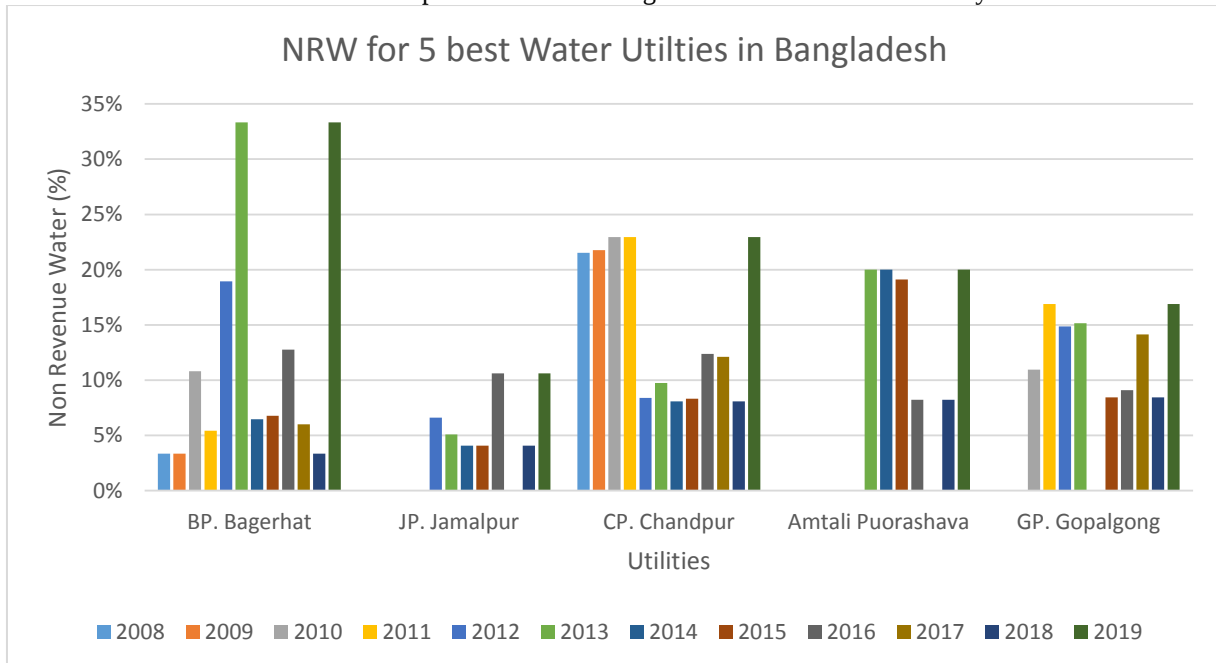


Figure 9: NRW for the 5 best Water utilities of Bangladesh

1.4 Metering Level

1.4.1 Pakistan

The metering level is observed for three water utilities of Pakistan, the maximum metering level is observed for WASA Rawalpindi which 15% for the year of 2008.

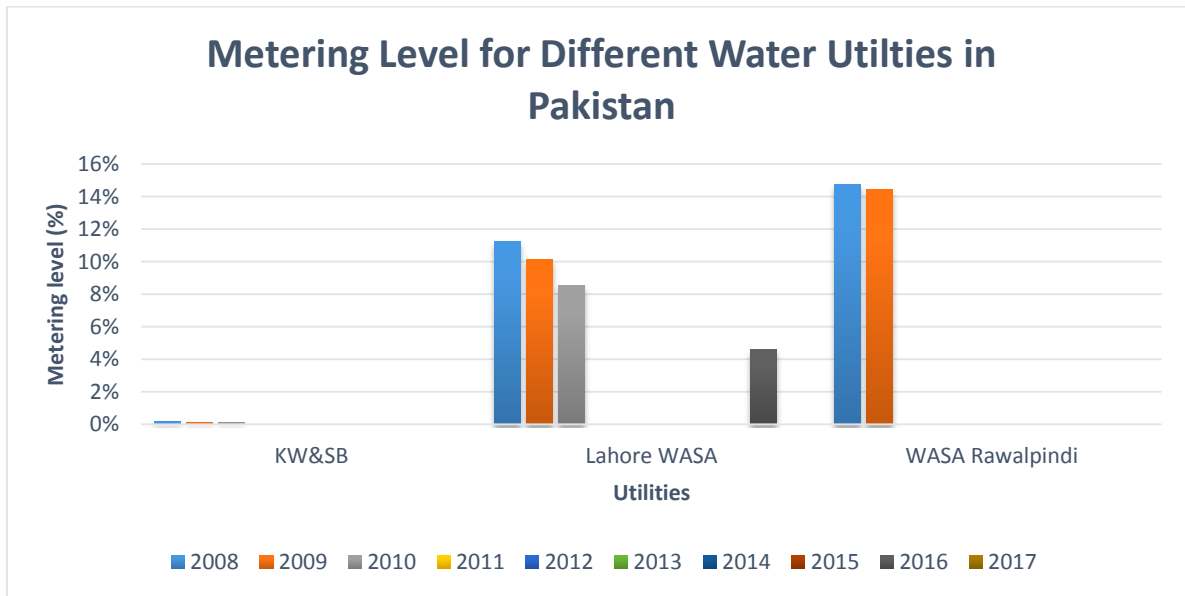


Figure 10: Metering level for the different water utilities in Pakistan

1.4.2 India

Metering level is observed for 10 water utilities of India for 2009, the average metering level for these utilities is 30.8 %, the maximum metering level is observed for Kerala water utility which is 84.21%.

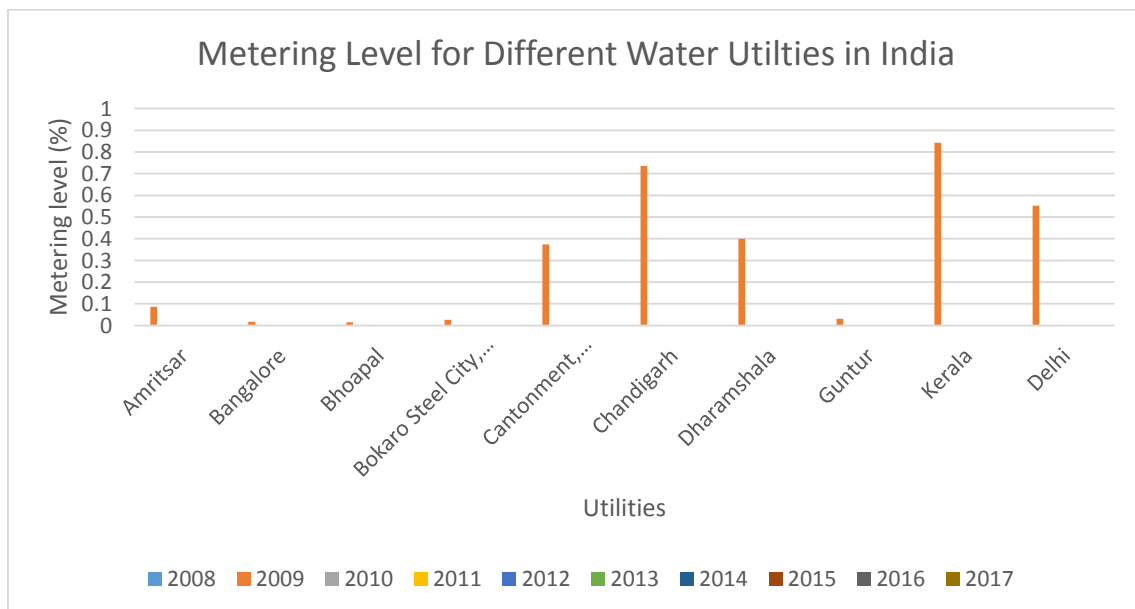


Figure 11: Metering Level for Different Water Utilities in India

1.4.3 Bangladesh

The metering level for 9 utilities of Bangladesh is given in IBNET database, the average metering level for these utilities is 75.46%. The data shows that Amtali Puorashava, CWASA Chittagong, and JhaP Jhalalathi practices full metering.

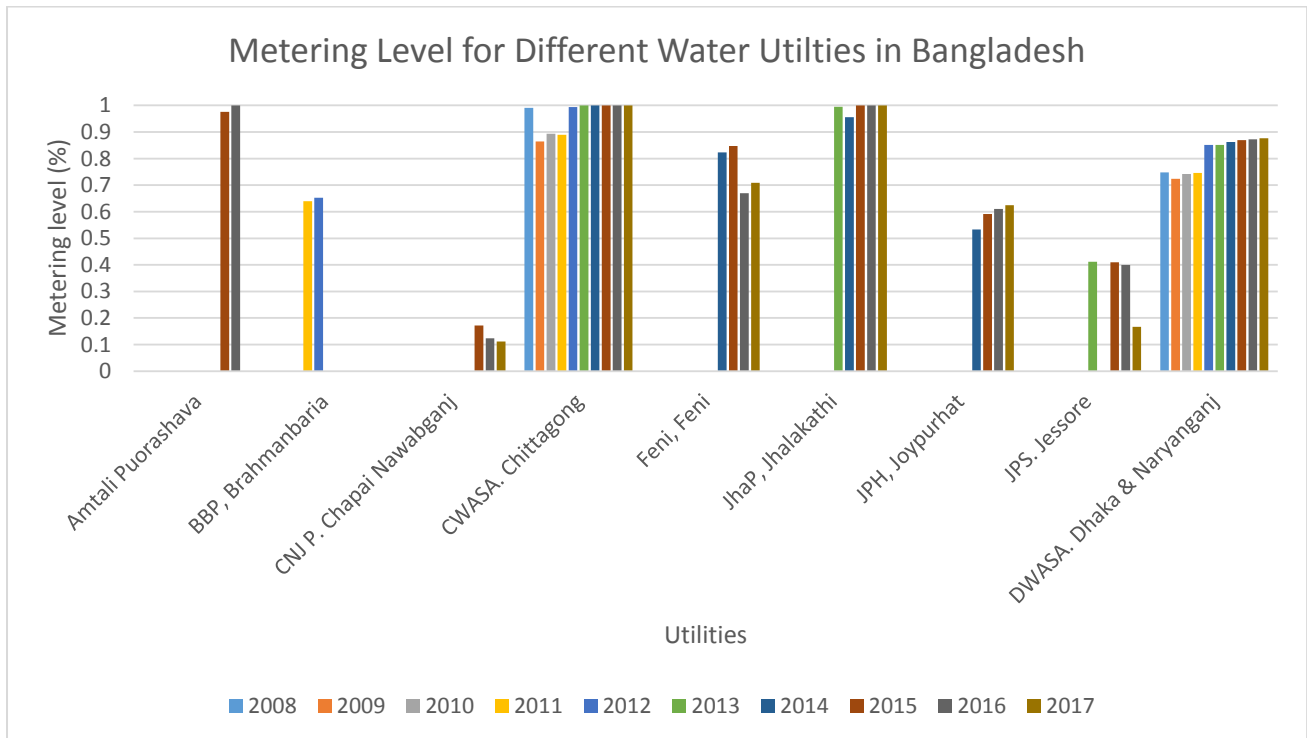


Figure 12: Metering Level for Different Water Utilities in Bangladesh

1.5 Hours of Supply

1.5.1 Pakistan

For 7 utilities of Pakistan, hours of supply are given in IB-Net Database. The average hours of supply for these seven utilities is 10.55 hrs. Lahore WASA is best having hours of supply up to 18 hours, the second one is the Gujranwala WASA having maximum hours of supply is 14 hours, while Peshawar development Authority having 12 hours supply recorded in the year of 2010 only. The data shows date there is no utility in Pakistan which provide continuous water supply to the consumer.

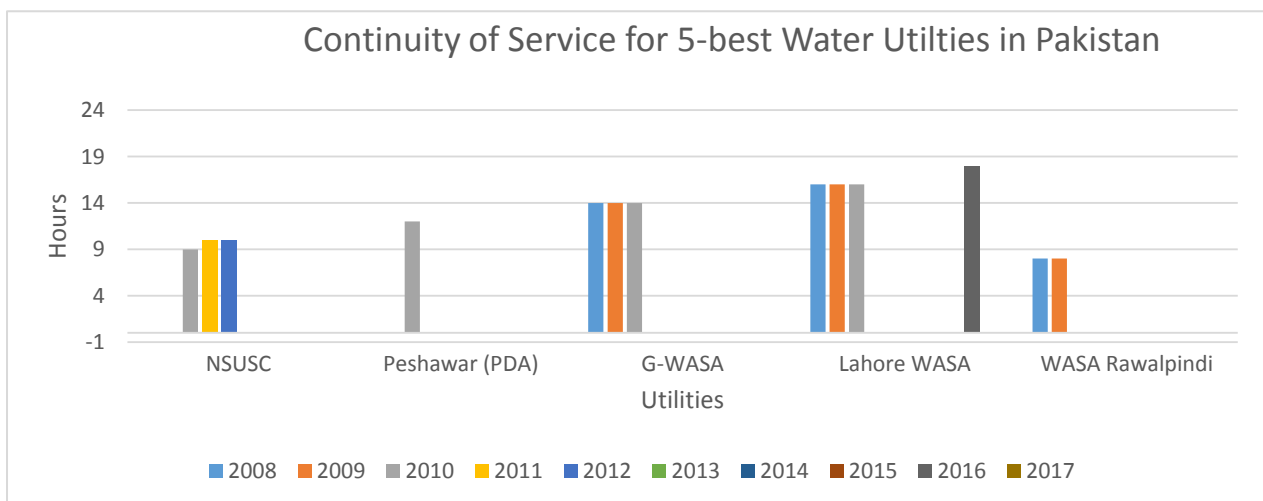


Figure 13: Hours of supply for the best 5 water utilities in Pakistan

1.5.2 India

The data from IB-Net shows that there is no utility in India which provide continuous water to the consumer. Data is available for 10 utilities about the hours of supply for India, the average hours of supply for these 10 utilities is 4.93 hrs. Out of the 10 utility it is observed that Chandigarh is the best of 18 hours of water supply, the Bangalore water utility is the second one for providing 13 hours of water supply, while District Kangra Water utility provide 12 hours of water per day.

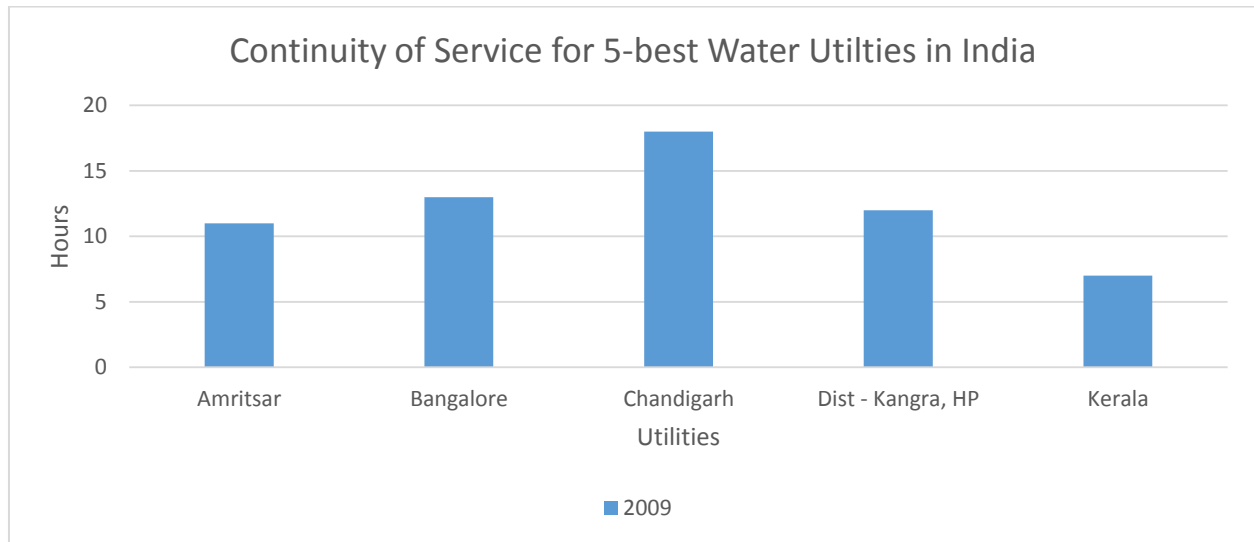


Figure 14: Hours of Supply for the best 5 water utilities of India

1.5.3 Bangladesh

IB-net provide data for 30 utilities for continuity of water supply in Bangladesh, The average hours of supply for these 30 utilities is 9.28 hours, the best five utilities in terms of continuity is plotted as given below. In these five the Jhkalathi is best one in terms of providing hours of supply, the JhaP, Jhlakanthi provided 24 hours of supply from 2013-2017, the second one is the Amtali Puorashva which has provided 24 hours of supply in the years of 2013-2016, the third one is Dhaka WASA which has provided 22.5 hours of supply from 2008 to 2017.

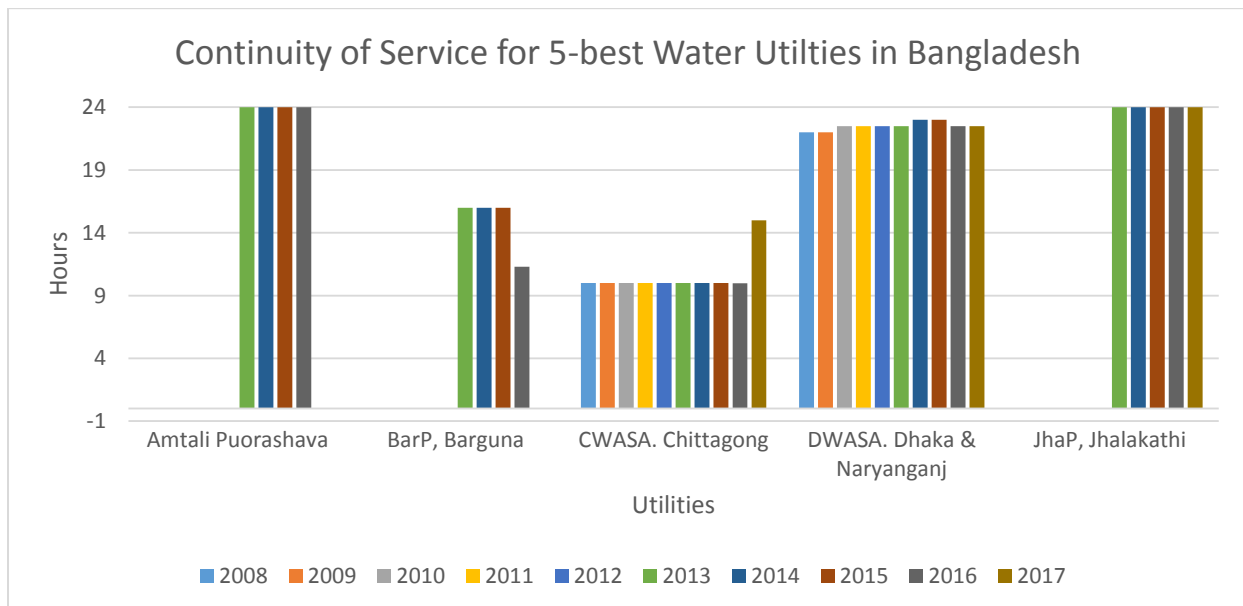


Figure 15: Hours of Supply for the best 5 water utilities of Bangladesh

IV. Conclusion

For Pakistan multitude of data is available for 2008-2010, for 10 water utilities. For India's Utilities reasonable data is available for the year of 2009 only. In terms of data availability Bangladesh is ahead of Pakistan and India, for Bangladesh data is available from the year of 2008 to 2017, for 60 water utilities, also the Bangladesh is constantly improving their utilities from year to year

The Analysis results shows that the performance of Bangladesh's utilities is better than India and Pakistan. The findings also shows that the sewerage system of Pakistan is better than the sewerage system of India and Bangladesh.

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