

Costs and Service Levels of Water and Sanitation in Peri-Urban Locations of Andhra Pradesh



Summary of key points

- Peri-urban locations are defined as the locations that are not directly served by (conventional) urban utilities but located on the periphery or very close to the urban areas and provision of water and sanitation services to these areas is a challenge.
- Insufficient investments resulting in scanty services, mostly informal, adhoc and uncertain. For assessing the differentiation in service and the costs associated, Life Cycle Cost (LCC) approach (Fonseca, et. al., (2011) is adopted to estimate the actual cost components of service provision.
- Despite high investments on fixed costs of water i.e creation of infrastructure for both water and sanitation, service levels are either basic or sub-standard in most of the peri-urban locations.
- Estimates of unit cost of water, indicate the average capital costs in peri urban areas are very high than that of rural areas and vary widely across the eighteen peri-urban locations. This large difference in average capital costs of water could be due to variations in source of water as well as infrastructure provided.
- Allocations towards planning and designing of water in peri-urban locations are negligible. On the other hand, expenditure on operation and maintenance is quite substantial (21%) when compared to rural areas.
- Expenditure on water CapManEx is negligible indicating that infrastructure is maintained well without major break downs, due to higher investments in OpEx with preventive maintenance.
- Households also spend on fixed infrastructure in order to improve or complement the water service levels. It ranges between US\$ 3 in Gadwal to US\$ 37 in Salur which are substantial at 25 percent of the total expenditure.
- Irrespective of technology, households spend substantial time in fetching water. Another critical issue in terms of provision of water services is the huge gap between normative and observed life span of the infrastructure. Allocations towards capital management along with proper designing and governance of the systems could help reducing the gap.





Nearly 50 percent of the peri-urban areas do not have proper drainage and the rest of the area is covered with sewer lines (covered and uncovered).

- The analysis on water services reveal that the service is basic and above basic in case of quantity, quality and reliability but below basic in case of accessibility
- With regard to sanitation, households spend about US\$ 20 on an average and the capital cost is about US\$ 46. This comes to about 43 percent of the capital cost at the aggregate (state) level. Across the locations, the share of household capital expenditure ranges between 70 percent in Saluru to 10 percent in Gadwal. Households also spend about US\$ 0.7 on OpEx at the state level and they range between US\$ 0.1 in Gadwal to US\$ 1.9 in Guntakal. On the whole US\$ 2 are spent on OpEx at the state level.
- Nearly 50 percent of the peri-urban areas do not have proper drainage and the rest of the area is covered with sewer lines (covered and uncovered). As poor colonies get neglected in the provision of sanitation facilities, the sanitation costs may not reflect the comparable service levels across locations.
- Except in two towns, majority of the sample locations had SC households which did not have toilets and many of the BC households owned toilets. This indicates that subsidies are not benefiting the deserving and intended beneficiaries. But this aspect needs further probing, as the higher ownership of toilets among others could be due to their own investments.
- Usage of the toilets is low, and those who use the toilets are mainly, women and adolescent girls, while men and children resort to open defecation. Open defecation takes place in bushes or open places followed by roadside.



II. Provision of WASH services a challenge in Peri-Urban Locations...

Urbanization in India is on the high growth path, which is expected to continue due to the projected sustained high growth of the economy in the coming years. Presently, India has the lowest level of urbanization (percentage of urban population) among all the comparable countries in the world. By the year 2000, the extent of urbanization in India was 28 percent as against 37.5 percent in Asia and is projected that urbanization in India would reach 40 percent by 2030 (www.un.org/population/publications). The bulk of population growth in India is expected to occur in the small towns with population greater than US\$ 2240 (Approximately 1 lakh) (Scott, et. al., 2004). In most of the towns the peri-urban fringe is expanding not only due to the expansion and emergence of new colonies but also due to the merger of surrounding villages with the urban centres.

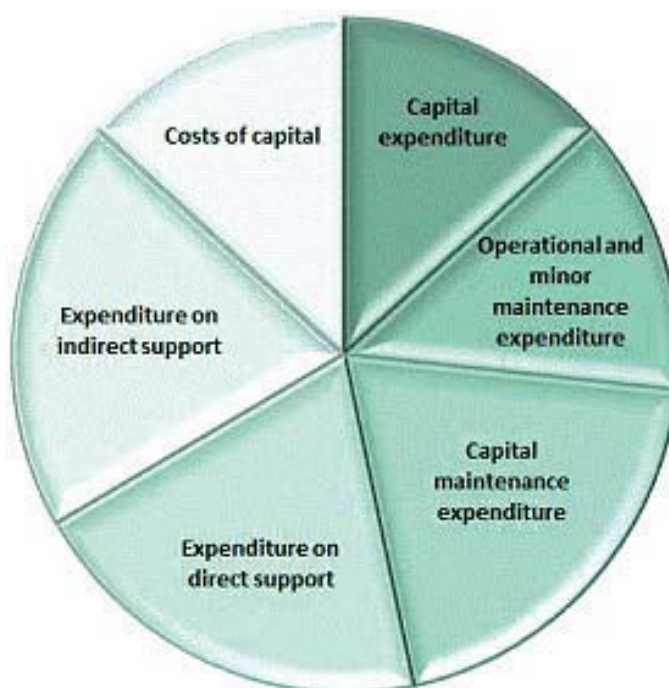
Adopting Life Cycle Cost Approach (LCCA) for Analysis of Costs and Services

Life Cycle Cost (LCC) approach (Fonseca, et. al., (2011) is adopted to estimate the actual cost components of service provision. The costs assessed here cover the construction and maintenance of systems in the short and long term, taking into account the need for hardware and software components, operation and maintenance, cost of capital, source protection, and the need for direct and indirect support costs, including training, planning and pro-poor institutional support (Fonseca, et. al., 2011). Both public and household expenditure are included in the analysis, as households may be investing more in water and sanitation infrastructure due to the poor service levels.

Methodology

- The analysis is carried out using data collected from 18 peri-urban locations spread over nine agro-climatic zones of Andhra Pradesh. The sample locations were selected on the basis of a stratified sampling design in each of the agro-climatic zones at four stages
- The data is generated at two levels. At level one cost data were obtained from 18 municipalities - 2 from each zone. This data were generated from the official records of Public Health and Engineering Department (PHED) at the municipality level.
- At level two, detailed household level data on socio-economic aspects along with the information pertaining to drinking water and sanitation are gathered from a selected ward from each of the 11 municipalities.
- General household information was collected from all the households in the selected ward (totaling 5122), while detailed information was elicited from a sample of 50 households from each selected ward (550 households)

The Life-Cycle Cost Approach (LCCA)



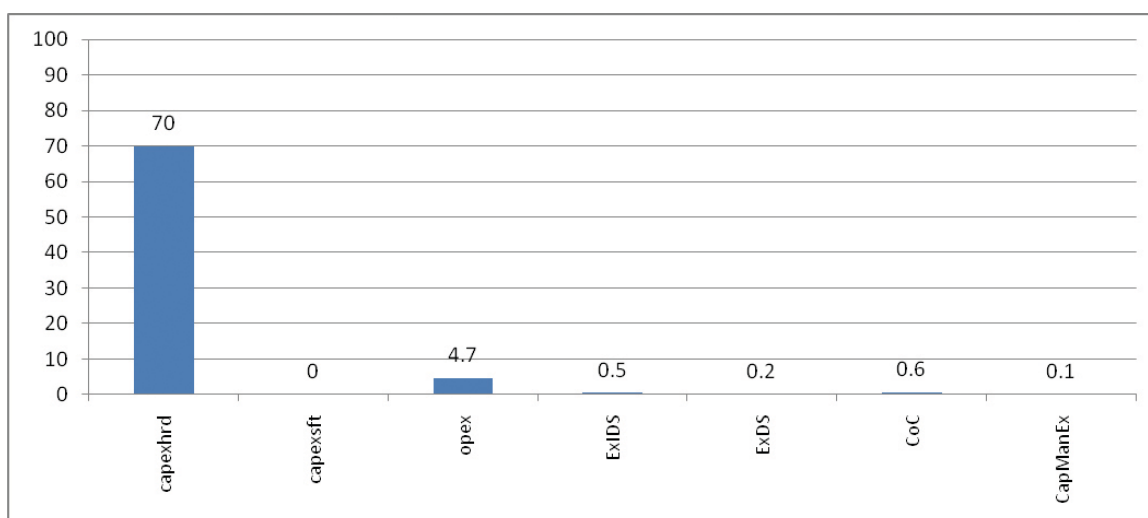
This fast paced urbanization has costs associated with it, such as increased demand for basic amenities like water, sanitation, power, etc. Often, peri-urban locations are not part of the designing of the urban water systems and hence become an additional burden on the existing systems. The service levels and the costs associated with it are expected to be different in these areas. This brief explains such differentiation in the unit costs and service levels of water and sanitation in selected peri-urban locations.

III. Peri-Urban Water Supply:

Costs of systems are high but unable to serve larger periods.....

The costs for provision of water basically include, total fixed costs (CapEx) and recurring costs include capital maintenance (CapManEx), cost of capital (CoC), operation and maintenance (OpEx) and direct and indirect support costs, apart from the household costs (expenditure spent for improvement/complement the service levels). The study pointed out that the peri-urban locations are characterized with high capital cost as well as high maintenance costs. Even such high costs are not able to provide longer life to the systems and observed life of the systems is much less than the normative life, which

Disaggregated Costs spent on WASH services in peri-urban locations.



forms the basis for allocating the resources. The following were the critical observations regarding costs relating to water provision in the selected locations.

WASHCost research in Andhra Pradesh analysed the disaggregated costs spent on WASH services in 5122 households belonging to eleven municipal towns. The average cost of provision of water is US\$ 42 per capita per year across the eleven municipal wards.

Per capita costs of water show wide differences with the lowest being in Srikakulam (\$18) and highest in Jangaon (\$94). Costs being less in Srikakulam, does not mean that, it is cheaper to supply water in this municipality. Costs need to be compared with service levels and other associated factors. One thing that comes out very clearly from the analysis is that the policy of identical or comprehensive per capita allocations across wards and municipalities does not seem to be the right approach. However, when we look into the current methods of disbursement, they tend to allocate equal or blanket amounts that fail to take into consideration local differences and factors such as agro-climatic conditions, source of water, hydro-geological conditions etc.

Actual costs of water estimated indicate that allocations are biased and tilted towards capital expenditure on hardware (70%), while operational expenditure accounts for nearly 5 percent of the total costs and the

remaining component costs are negligible. One interesting feature to note in this context is the absence of allocations towards capital expenditure on software. Apart from public expenditure, households also spend on fixed infrastructure in order to improve or complement the service levels. Household expenditure range between US\$ 3 in Gadwal to US\$ 37 in Saluru. These costs are substantial at 25 percent of the public expenditure. Among the recurring costs operation and maintenance takes a lion's share i.e., 80 percent of all the recurring costs at the state level.

IV. Peri-Urban Water Service Levels:

Irrespective of seasons, the service delivery is same...

At this juncture, we ask a crucial question. Costs, on their own, are they useful? Mere analysis of costs is not sufficient - we need to know, what kind of services are received given the expenditure that is spent. A detailed household survey was conducted to extract information on sources of quantity of water available, quality of water, time spent on fetching water etc. How much tariff did the households pay and how much amount did they collect for O&M.



If we look at the state as a whole, owning a tap presents a dismal picture as only 30 percent of the households own tap. In Jangaon, around 95 percent of the households buy water, whereas in Bodhan only 2 percent of the households buy water. The difference could be explained in terms of poor services (low pressure, quantity, etc). For instance in Jangaon majority of the sample households have their own house connection in a pit in order to increase the pressure. Data clearly shows that in all the eleven towns, major water sources are HPs and PSPs. Only in Jangaon town, we see that nearly 45 percent of the households buy water despite having nearly 44 percent of PSPs, indicating poor quality of water supply.

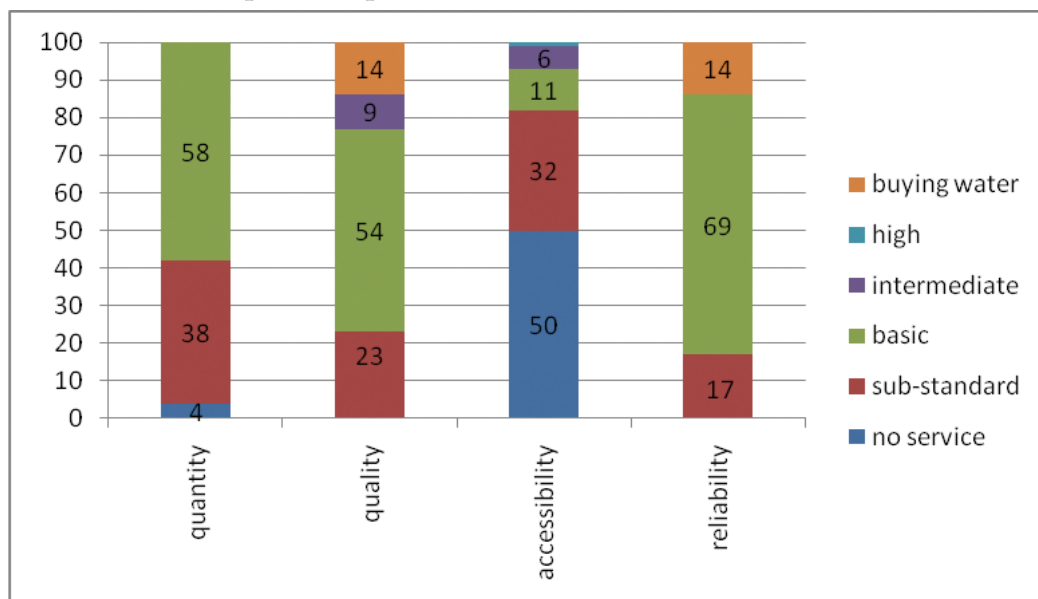
At the aggregate (state) level, it is observed that during summer majority of the households scored above basic services in terms of quality (77 %) and reliability (83 %) while only few households scored above basic services in terms of accessibility (16 %). In case of quantity, we do not find any household which scored above basic service levels. Even during non-summer, it is clearly seen that there is no improvement in water service delivery in terms of quantity, quality, accessibility and reliability.

V. Peri-Urban Sanitation:

The onus is largely on households...

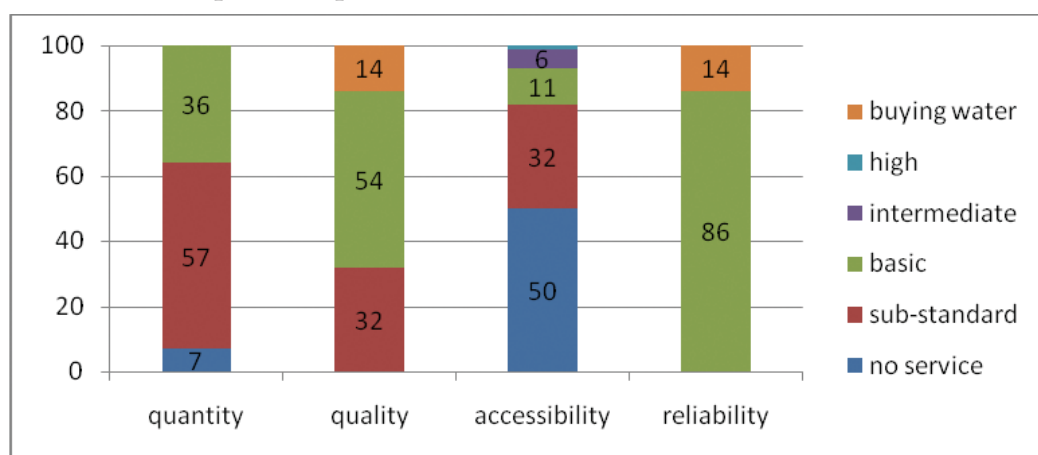
In the peri-urban context, sanitation and hygiene includes construction of toilets / urinals at the community level, subsidy on individual toilets, provision of drainage facilities (sewer lines, etc), solid waste management, insect and disease control. Sanitation coverage in these areas is not as equitable as drinking water. It was observed that the expenditure on sanitation in the peri-urban areas is a combination of public and private investments. Unlike in the case of drinking water, in sanitation, there may not be any service in the absence of household

Water quantity, quality, accessibility and reliability (summer)



Source : Based on WASHCost (India) field survey (2011)

Water quantity, quality, accessibility and reliability (non-summer)



Source: Based on WASHCost (India) field survey (2011)

investments. As the government is providing subsidy to construct individual toilets for the below poverty line households only, the proportion of households getting subsidy is much less in the peri-urban locations when compared to rural areas. It was observed that only 20 percent of the households owning toilets have received subsidy in the sample locations. It was also found out that:

Per capita public cost of sanitation in the peri-urban locations is US\$ 31 at the state level. The unit costs range between US\$ 5 in Bodhan and US\$ 99 in Peddapuram. When annualised, these costs range between US\$ 0.2 in Miryalguda to US\$ 7 in Peddapuram.

Households on their part, spend more than their required contribution, as the amounts fixed for ISL (unit) cost is often less than the market price. Households also spend extra money for improved facilities like tiles, etc. However, such additional investments are done by economically better off households. Thus, at the state level households spend about US\$ 20 on an average.

Major expenditure in the recurring costs is on operation and maintenance, while the other components are negligible. On an average, at the state level US\$ 1.55 is spent on recurring costs by the government, of this US\$ 1.5 is spent on O&M.

Relative shares of various components indicate that CapExHard accounts for 60 percent of the cost at the state level while recurrent costs account for 40 percent. There are wide variations across the peri-urban locations

VI. Peri-Urban Sanitation Service Levels

Mostly in-sufficient ...

Service levels are assessed using the service ladder approach where household's perceptions on four indicators of sanitation viz., access; use; reliability and environmental protection are recorded on four service level indicators i.e., no service, limited / sub-standard, basic, and improved. It was observed that; Vikarabad has the highest proportion (79 %) of households owning toilets, across all the sample locations, while Bodhan has the least percentage of households owning toilet (around 31 %)

At the state level, it was found that 27 per cent of the BC households own toilets, while it is 10 percent for the SC households and 11 percent for the OC households.

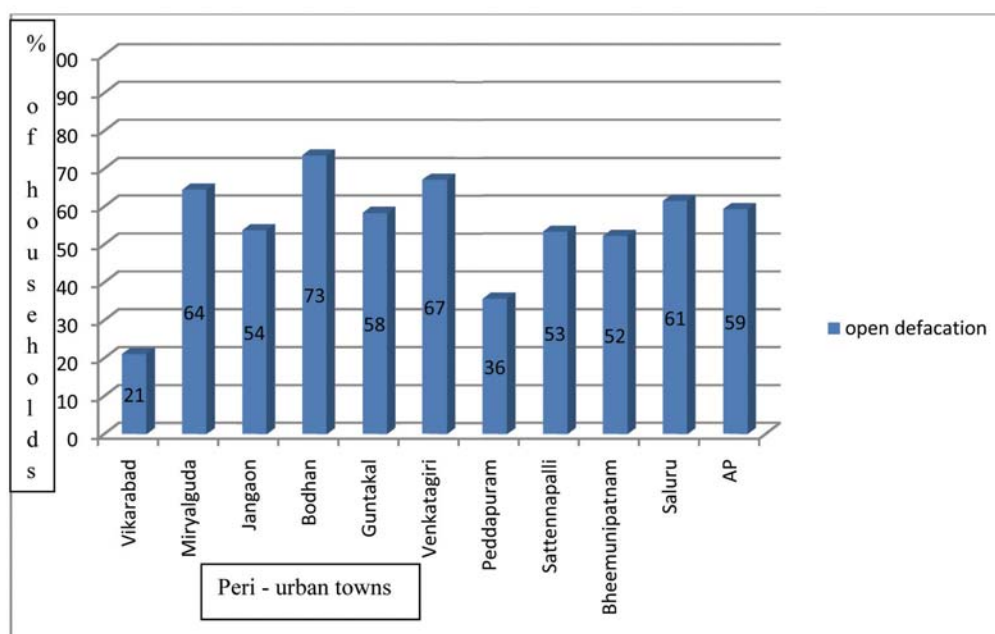
Looking at the usage of the toilets, it is mostly women and adolescent girls who use the toilets, while men and children resort to open defecation. Open defecation takes place in bushes or open places followed by roadside. In some places like Miryalguda, 95 percent of the individuals go for open defecation in bushes or open places.

On the service ladder, all the indicators except access which is scored as basic, at the aggregate level, we observe limited or no service with respect to use, reliability and environmental protection.

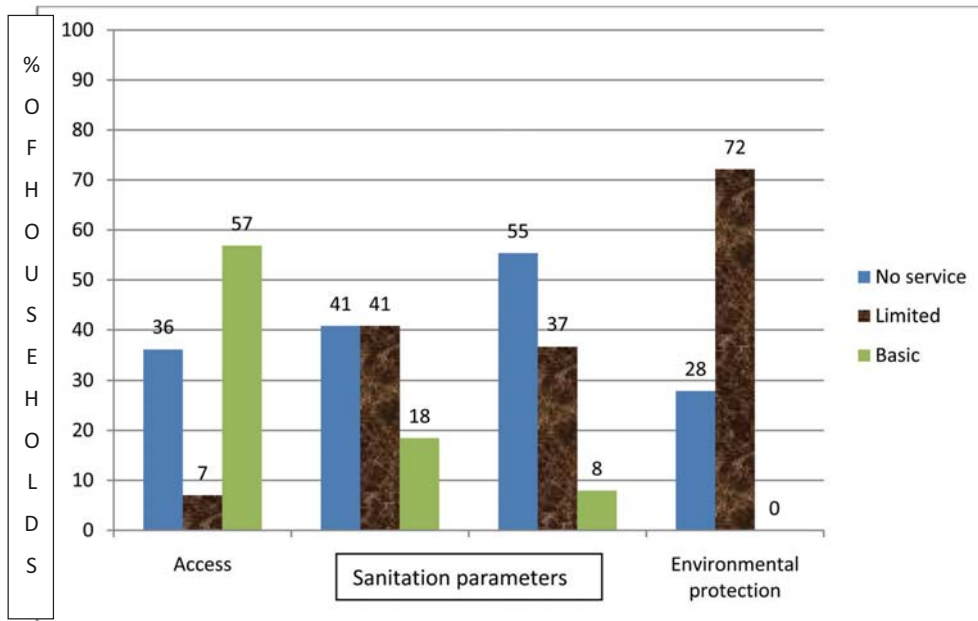


Open defecation (percent)

Percentage of Households going for open defecation in peri-urban towns



Sanitation Service levels in peri-urban locations of Andhra Pradesh



References

- Fonseca, C. et al., 2011. Life-Cycle Costs Approach. Costing Sustainable Services. 1a Briefing Note 1, IRC International Water and Sanitation Centre, The Hague, The Netherlands.
- Scott CA, N.I. Faruqui and L. Raschid-Sally (2004), "Wastewater Use in Irrigated Agriculture: Management Challenges in Developing Countries" In Wastewater Use in Irrigated Agriculture (eds C.A. Scott, N.I. Faruqui and L. Raschid-Sally) 11 © CAB International.



Briefing Note Drafted by WASHCost (India) Project Team
 WASHCost (India) Project (www.washcost.info)
 Centre for Economic and Social Studies (CESS)
 Nizamiah Observatory Campus, Begumpet, Hyderabad 500 016
 Phone: 040 - 23416610
 Weblink: www.cess.ac.in
 For details of WASHCost (India) Project contact
 Dr. M. Snehalatha at countrycoordinator@cess.ac.in

