

**Report on Measures Required for Providing
Better Sanitation in Karnataka**

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Comments by the Faculty

In the development of our country's standard of living the provision of adequate sanitation facilities constitutes a very important facet. Although we have a number of Governmental organization and NGOs working towards these objectives the results have not been fast enough.

Kopparapu Srivatsa's project is aimed at setting an exposure to the magnitude of issues involved and progress made in the revolution of these. I am glad that he got a fair understanding of the nature of the problem first hand.

iDeCK has been doing a good job in surmounting this huge issue. The study by Srivatsa throws light on some critical issues. It is to be hoped that in the days to come progress will be fast, and that the country will move to total sanitation shortly. As Srivatsa's study discovered data collection is not easy. The reliability of the data gathered needs to be verified before analysis. Data interpretation is also a matter of details.

We require detailed academic studies on the phenomena – both on the success and failure sides. Srivatsa's study can be enhanced for this end in the future.

N R Parasuraman

A Report on Measures Required for Providing Better Sanitation in Karnataka

Good sanitation should be a birthright of every citizen...

Dr. Manmohan Singh, Hon'ble PM of India

Millennium Development Goal

Increasing urbanization has resulted in greater pressure on the existing urban water supply and sanitation is often called the “Orphan MDG,” and India is among the worst countries in the world in terms of access to sanitation.¹ While the 7th MDG goal is to halve by 2015 the proportion of population without access to sanitation, the efforts to achieve these international targets have been insufficient and ineffective in India.

My SIP at iDeCK gave me a chance to find out the actual status of the sanitation in State of Karnataka, effectiveness of the plans being implemented to provide better sanitation.

Present Sanitation Situation

We have government funded mass programs targeted at improving access to sanitation, but largely focused on rural areas.² Coupled with this, we have rapidly urbanizing cities suffering from an acute shortage of water and sanitation, cities which have not seen as many targeted programs in spite of the evident need. Finally, a flagship program called the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) in December 2005 has come to recognize the growing needs of major cities. Its pro-poor mandate and inclusive design won itself a lot of supporters. However, even after seven years of the program, there seems to have been little progress in the condition of the urban poor. Many continue to live in slums without basic infrastructure and civic amenities.

Access to sanitation also has implications on education. The Annual Status of Education Report (ASER) shows that usable toilets could be found only in around 50 % of government schools in India. Four out of ten government primary schools do not have separate toilets for girls. Their data also suggests higher dropout rates, especially of girls, in cities with inadequate sanitation facilities at schools³. This is a major cause of concern, and better sanitation facilities at the school might be one of the targeted ways of reducing school dropout rates.

Recently, the India Human Development Report 2011 regarded open defecation as a serious threat to the health and nutritional status of India. India constitutes one-fourth of the infant deaths that occur globally due to acute diarrhea.

¹MDG refers to the Millennium Development Goals defined by the United Nations Millennium Declaration, wherein 8 international development goals, including access to improved sanitation, were sought to be achieved by 2015.

² The more recent ones were the Total Sanitation Campaign launched in 1999 and the Nirmal Gram Puraskar in 2005 and even the success of these is disputable.

³ASER is survey of schools in rural areas, but the findings of the report can be generalized for urban areas as well.
<http://www.asercentre.org/ngo-education-india.php?p=Download+ASER+reports>

About iDeCK

Infrastructure Development Corporation (Karnataka) Limited (iDeCK), was incorporated on June 30, 2000, as a joint venture between the Government of Karnataka (GoK), Infrastructure Development Finance Company Limited (IDFC), and Housing Development Finance Corporation Limited (HDFC). The creation of iDeCK stands as a testimony to the promoters' commitment to provide a strong, credible and proactive institutional mechanism for leveraging private sector initiatives in infrastructure development.

iDeCK's mission is to deliver superior results for the client, through professional service delivery, based on teamwork and innovation. Team iDeCK comprises professionally qualified staff having financial, commercial, legal, technical and planning skills related to the infrastructure domain. iDeCK believes in providing value to its client by engaging with them continuously and adopting state of the art practices. It also helps to channelize GoK funds earmarked for project development activities and making direct investments of debt and equity in projects.

About the Project

During my Summer Internship with the company, a detailed report on sanitation levels in state of Karnataka was the main assignment. iDeCK had to find out the neediest Urban Local Body (ULB) for the same. Hence the consultant (iDeCK) has to analyze the sanitation status of Karnataka on a whole and find out the ULBs in which the penetration of sanitation facilities are meager and the need to enhance them is substantially high. We should also find out ways in which better sanitation levels can be provided to the local bodies.

This report explains the details of how the project was executed, the ways in which such data was collected, the different departments we contacted to collect the data and the statistical analysis we have come up with to find out the Urban local bodies (ULB) which are in a dire need of sanitation measures for adoption.

Data Collection

The data collection for the project required collection of information for the whole of Karnataka. Majority of data was obtained from the Census Department. As the census is conducted once in every 10 years, we had the privilege of getting the data of 2011 census. Census department publishes the population details of every division of the country at every detail. Usually the major or broad details of the population are available over the internet. But if we need the population details at village level or ULB level we need to purchase the information in the form of CD's from the department. Census Department has data related to population, households having facilities like bathrooms, toilets, drainage system etc. The data available on websites are comprehensive. This helped a lot in getting first hand authorized information for starting the project. Also data from the different departments like slum board, water and sanitation department etc. was also of great help.

About Karnataka

Karnataka state covers an area of 191,976 square kilometers. With over 61 million inhabitants (2011), Karnataka is the ninth largest state by population. It has 8 City Corporations including

BBMP (Bruhath Bengaluru Mahanagara Palike), 44 City Municipal Councils, 94 Town Municipal Councils, 68 Town Panchayats and 5 Notified Area Committees based on the population. Bangalore Water Supply and Sewerage Board was formed during 1974 with the aim of supplying potable water to the citizens and to collect, convey and treat the wastewater generated in the Bangalore city. BWSSB has to maintain about 7900 Kms of sewerage pipes. There are around 169,406 septic tanks and 325,175 pit toilets in Bangalore according to census 2011. Another 113 million rural households and 14 million urban households will build toilets and mostly pit toilets in the future. This represents a massive sludge management challenge.

The Karnataka Urban Water Supply & Drainage Board (KUWS&DB) is responsible for providing adequate Water Supply from assured and safe sources of supply and also proper sanitation to all the urban local bodies of the state. In Karnataka, 60.7% of the households have drainage connectivity with 34.6% having the open drainage and 26.1% having the closed drainage systems, 51.2% of the households have latrine facility within premises with 36.9% households having water closet and 13.6% households having pit latrine. Most ULBs spend nearly 60%-70% of their total overall budgetary allocation on collection, another 20%-30% on transportation, and often less than 10% on the treatment and final disposal of Municipal solid waste.

Analysis & Grouping

The next step was finding out which ULBs are self-sufficient and saturated in terms of available sanitation facilities. Our research on census data gave insights into these areas. We used statistical techniques like cluster analysis, correlation techniques etc., to find out which ULBs were good at providing clean drinking water facilities, toilets to majority population, under- ground drainage system, storm water drainage systems, etc. Then we divided the ULBs into different groups based on the statistical analysis. This was one of the important tasks of the whole project as this will form the base for the further development and execution of the project.

Also the Census Department does not provide data about the sanitation facilities on a person to person basis. It only gives details according to households, i.e., number of houses having these facilities. Hence we had to use numerical methods to find out the average population of each household and proceed with our analysis. The average population at each household was calculated as 5. The ULBs having population more than 100,000 were given more weightage as the programs to be implemented need contribution from the local administration also. This will be viable to the ULB only when the population is above a significant number. After a lot of thought and consultations based on previous experiences we found out that ULBs with population more than 100,000 will be able to support the initiative of the authorities and also the residents should be willing to pay any installation charges if needed. This would be possible only for few ULBs based on the demographics and employment levels of the area. For example, Hubli-Dharwar district is credited with the 24X7 water supply implementation. This project needed the households to provide an initial payment of Rs 1000 for the water meter installation, pipe line laying works, etc. Also the municipal corporation has to contribute its share. This will be possible only when there is sufficient population who can contribute to the revenues of the ULB.

The grouping was done on the basis of parameters like dire need of sanitation facilities, number of slums in each ULB, population without covered toilets, lack of potable and treated drinking water, etc.

These parameters were given variable weights based on the importance of each attribute and each ULB was rated based on the data collected. Then the scores were arranged based on descending order to find out which ULB is in utmost need of assistance for sanitation facilities. The scoring was done in such a way that the ULB with less facility has the highest score. These ULBs are divided into four groups, namely, I, II, III, and IV where group I needing the highest assistance and so on.

Financial Analysis

Each ULB had a website in which they had to upload the budget allocations, year plan, balance sheet and P/L statement of that particular ULB regularly. The Government of Karnataka should be appreciated for bringing up the corporate governance at ULB level, which made the financial data available and facilitated in procuring the above data. These financial statements helped us in grouping ULBs on the basis of their cash reserves and their ability to fund the sanitation projects offered. The sources of revenues for ULBs are the taxes the residents pay like house tax, water tax, etc. These, in addition to the development grants they receive from state and central level will help in funding any of the infrastructure projects proposed for the ULB. After finding out the neediest ULBs through the statistical processes we went on finding out ways to implement the sanitation programs and instruments useful in accomplishing this task.

Sanitation Planning

As we know Sulabh International is one of the major NGO which builds, operates and manages majority of the community toilets in India. They also have a research center dedicated for the development of models for better sanitation facilities across the world. We held consultations with the state level managers of the organization extensively and collected a huge amount of inputs for sanitation development models. Their 2-pit toilet model is proven to be superior and most convenient in slum areas. Their bio-gas production technology from human and animal excreta has won many laurels in the area of technology usage for sanitation purposes. Sulabh solid waste management technologies are impressive models which can be used extensively in apartment complexes and large industrial estates.

We also spoke to other NGO'S like DASRA, Society for promotion of Area resource centers (SPARC), Bharat Integrated Social Welfare Association (BISWA) and their work in Karnataka. In depth consultations with them resulted in valuable suggestions like implementation of Decentralized waste water treatment system (DEWATS), providing loans to self-help groups (SHG) women in rural areas to bring them above poverty line so that they will think of better sanitation and increasing the awareness of sanitation in rural areas of Karnataka. Organizations like Eco-San, ERAM Scientific were also into this cause with a business model. They have come up with an e-toilet model which signifies a revenue model to the people who maintain it. Our calculation revealed that it provides an IRR of 16% over a period of 4 years. We have also gone through the work done by other state governments like that of Gujarat and Tamil Nadu in making similar reports on the status of sanitation in their states.

Center for Environmental Planning and Technology(CEPT), Mahila Housing SEWA Trust, NIDAN, Shelter Associates, Water Sanitation and Hygiene Institute (WASHi) were the premier organizations who are working in increasing the awareness of better sanitation and formulating campaigns for the same. They are also involved in R&D work to come up with innovative and viable solutions for the urban sanitation improvement and sludge treatment. Sarva Siksha Abhiyan (SSA) is one of the flagship programs by GOI for providing school education to children in India.

The next source of information was the Government departments which are also working for the cause of community sanitation. The Karnataka slum development board, KUWS &DB, etc. gave us information about how the present sanitation development program is progressing in the state and areas where it can be improved with the use of external resources. We have also undertaken field trips to ULBs and government departments to know the authenticity of the information. We also had a look at the World Bank reports on sanitation across the country.

By combining the data and the analysis performed on the procured data we have come up with sanitation report of Karnataka and roadmap for providing improved sanitation facilities in the state. We have also come up with a checklist for the ULBs to follow so that the various accidents happening during sewer maintenance can be avoided and problems faced by them will be addressed.

Safety Checklist for Sewage Treatment Procedures

Personnel involved in operation & maintenance of sewerage systems are often exposed to various types of occupational hazards like physical injuries, injuries by chemicals and radioactive waste, infections caused by pathogens ,exposure to explosive or obnoxious gases, and oxygen deficiency.

Responsibilities of Urban Local Bodies (ULB) in Maintenance of Sewers

The Worker - any worker entering a sewer must be trained and is aware of possible hazards & emergency remedial measures. They should ensure that all equipment necessary to protect the health and safety of workers is available at work site and are in good working condition. Training should be given to the workers about the correct usage, maintenance. ULB shall ensure that the proper assessment of the hazard is made and remedial action has been made before allowing any worker to enter the sewerage system and shall ensure that all the precautionary measures are taken as per the norms.

Measures for Providing Better Sanitation

Sanitation can be properly achieved in slum areas by outsourcing it to world known Sulabh International which has vast experience in building and maintenance of Community toilets. These can be built in highly populated areas like highly populated slums and where place is a huge constrain.

Large housing complexes and apartment buildings should be encouraged to set up sewage treatment plants based on models like DEWATS and Sulabh Solid waste management system. Subsidies and grants can be provided where ever needed.

Community biogas plants can be built in Panchayat lands and the gas produced can be sold to the villagers. This can be accomplished with the help of Sulabh Bio gas technology which is comparatively cheap and effective. The operations and maintenance can be handed over to self-help group women which will in-turn help in bringing up their lives.

NGO's like WASHi and CEPT can be funded and made to conduct sanitation awareness programs in slum areas, rural areas, and tribal areas where the sanitation levels are at a very low level. Companies like ERAM scientific can be encouraged to come up with low cost toilet models to cater to the increasing need of toilet complexes.

The safety check-list documented above should be mandated and made compulsory when any repair work is being undertaken. This will be possible only when proper awareness is generated among the workers and employees.

Safety equipment needed for the sewer maintenance work should be provided to all the ULBs and panchayats to mitigate occurrence of accidents.

The present systems of collecting and depositing garbage by self-help group workers can be strengthened by providing them good working conditions and increasing their wages.

The above measures could be implemented in the recommended ULBs to derive the maximum benefit of the investment done. Finally sanitation is an issue which is of national and personal concern. Awareness and training at every stage of the society will reap enormous results.

The above report provides some of the best practices that can be followed and check lists that can be used to provide better sanitation facilities and mitigate the occurrence of accidents.

Learning

This project gave me ample opportunity to use my conceptual knowledge in the practical situations and possibly for a noble cause. The data collection and analysis needed the concepts of quantitative methods and models to be used for drawing inferences and bring out usable data from large chunk of data. The concepts of segmentation and positioning were used in finding out which are proper parameters for grouping the ULBs. The concepts of financial accounting were very useful in collating the financial data of the ULB for finding out the extent to which it can fund the projects.

The team dynamics and the way different activities of a given assignment are carried out at iDeCK gave me a chance to learn them. Bid evaluation and tender document preparation gave me a lot of knowledge about the topics which I always wanted to know. The open door policy at

iDeCK made me understand that miracles can happen when top management works in tandem with the employees. The training classes at iDeCK were a source of exemplary knowledge. Sessions on Bangalore elevated expressway, Karnataka 24x7 water supply, new land acquisition policy, Sexual harassment bill, Kolkata port trust etc. really extended my horizon.

The marketing calls for the projects tendered by Government of Karnataka gave a real feel of how the contracts get executed and what are the areas to be considered and taken care while performing the same. Finally the knowledge gained on RFP, RFQ, PPP projects, need for private enterprises entry into infrastructure development, service and maintenance etc. from colleagues will really help me in my future endeavors. Finally the whole process of making this report has enhanced my understanding of corporate culture, its nuances , responsibilities and also the ultimate use of subject knowledge in professional life.

