

IPT ROUND TABLE DISCUSSION



Plumbing Scenario in Bengaluru

IPT continually seeks views from a wide cross section of professionals on plumbing related matters. IPT Round Table is one such endeavour where a panel of experts respond to a series of questions on a variety of topics pertinent to the profession. The purpose is to obtain different perspectives relating to matters of topical interest. The views expressed by the respondents are their own and IPT assumes no responsibilities for them. The contributors may be contacted at their respective mail id's furnished at the end of the article.

THE PANELISTS



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What is the total quantum of potable water requirement in Bengaluru and how much is currently distributed?

BSAN: Bengaluru is getting water from River Cauvery and the tapping point is around 135 kms. from the city. At present, the daily demand is 1500 MLD and Cauvery can supply only upto 1133 MLD, with 4th stage of piping. Huge cost is involved in pumping of the same.

PVG: Currently Bengaluru gets around 1400 MLD of Cauvery water from BWSSB including the latest 4th stage 2nd phase supply of 500 MLD, whereas the current demand itself is around 1700 MLD. That means there is a deficit of around 300 MLD even after 4th Stage 2nd phase commissioning.

BM: At the historical 4% population growth rate of Bengaluru, over the past fifty years, the population of Bengaluru living in the 772 sq. km. of area under the present BBMP will increase from 85 lakhs in 2011 to one crore by 2016. With Hessarghatta gone and Tippegondahanally drying up, the only reliable water supply to Bengaluru is from Cauvery with a gross of 1,410 MLD. There is no way of increasing withdrawal from Cauvery as the allocation by the Cauvery Water Disputes Tribunal for the entire urban and rural population in Cauvery Basin in Karnataka is only 8.75 TMC. As one TMC (thousand million cubic feet) equals an annual supply of 78 ml per day, Bengaluru city is already drawing more water, (1,400 MLD equals 18 TMC) than the allocation for the entire rural and urban population in Cauvery basin.

VSC: The population of Bengaluru according to 2011 census was 96 lakhs. With the current Cauvery 4th stage, it is possible to supply about 1400 MLD of water, which if distributed without any losses, is just enough for the present population of Bengaluru.

The water requirement of Bengaluru by the year 2020 is expected to be 2500 MLD as Bengaluru is growing at a rate of 45% as per the census of 2011.

Currently, with 30% distribution losses, average water supplied is 925 MLD at an average of 90 lpcd. With the increase in population, the per capita availability is further expected to reduce to 75 lpcd.

Rain water harvesting has been made mandatory in Bengaluru. How far has the implementation been successful?

BSAN: Yes, rainwater harvesting is made mandatory in Bengaluru even to the smallest plots measuring 30 feet X 40 feet. Several working models are made on locations to educate people with relevant data available. Unfortunately, without strict supervision, ordinary masons/ labourers install it and get it approved by the authority.

PVG: The implementation at ground level, especially for individual houses has been only symbolic which is due to lack of knowledge from the plumbers and lack of conviction from authorities. It is estimated that only one in forty houses are today equipped with Rainwater Harvesting System which is meaningless.

Bengaluru has a potential of receiving 3000 MLD of rainfall. If we are able to recharge at least 50% of it, we can sustainably get 1500 MLD of ground water which meets our requirement till 2030.

More importantly, all the storm water drains need to be cleaned and no sewage should be allowed to flow in the storm water drains. To get this desired result, entire city of Bengaluru should have proper underground sewage network.

All the lakes in and around Bengaluru should be rejuvenated. Restoration of lakes will also help in ground water recharge.

BM: Rainwater harvesting that presently covers only 44,000 houses out of some 18 lakh properties has no meaning. Only 40% of the area of Bengaluru is covered by roofs. For rainwater harvesting to be effective, it should be done on a geographical basis covering the entire four basins of Bengaluru as done in Singapore. What is done in Bengaluru now, can only be termed 'sloganeering'.

The problem being huge must be solved in an integrated and comprehensive manner if Bengaluru has to survive. What the BWSSB is doing is tokenism on a piece-meal, ad-hoc and "on pilot" basis. A comprehensive plan including all the above components with genuine restoration of lakes, leakage plugging, effective STPs and TTPs, Rainwater Harvesting involving civil society organizations can solve the crisis that Bengaluru is facing. It also requires a sizeable investment.

VSC: Rain water harvesting implementation in Bengaluru has been symbolic and in no way addresses the underlying serious issues. The storm water drainage system in Bengaluru was very efficient with the network of main channels (Raja Kaluve) and lakes. With the filling up of lakes and main channels, rain water drainage has been hampered. The storage of water and thereby, the recharge of ground water has been severely affected. Bengaluru is also blessed with natural valleys, which can be used for the storm water drainage and collection.

Efficient use of STPs with tertiary treatment facilities should be implemented and treated water can be discharged into the valleys.

What extent of the city is covered by the Sewage Treatment Plants operated by BWSSB? What is done with the treated effluent?

BSAN: There are three major valleys in Bengaluru and the ground is sloping towards the valleys. As per the master plan of BWSSB, it wants to cover the entire Bengaluru city with a minimum of fifteen Sewage Treatment Plants. At present, four plants are completed and working in full capacity. The remaining STPs are under execution and once all fifteen are completed, nearly 85 - 90% of the city will be covered.

PVG: Including the under completion works of STPs, Bengaluru has around 1100 MLD of treatment capacity wherein today, less than 25% of STP is utilized. The reason for this being, no proper sewage networks in place. The investment gone in to STPs has become waste. The excess treated sewage is either discharged to water bodies or supplied to Industries.

BM: The existing 14 secondary treatment plants, 4 tertiary treatment plants and 10 more STPs under construction will together have a capacity to treat 1,133 MLD. However, the existing STPs hardly treat 30% of the sewage because of the latter not flowing into the STPs (but into the lakes) and due to poor maintenance by contractors to save electricity and lack of supervision.

If the STPs with huge investments already made are effectively used to treat the sewage and more are converted to TTPs, the recovered water can be re-used at least for non-potable purposes to start with. Unless the sewage is diverted and the Raja Kaluves are cleared of encroachments to carry surplus rainwater to the succession of lakes, all the water bodies in Bengaluru will become sewage cesspools causing immense health hazards.

Restoration of lakes done by BBMP with "soup-bowl" technology, decorative bird-islands, paved jogging paths and Chain Link Fences without attending to the primary task of diversion of sewage away from the lakes, helps only the contractors and their patrons.

VSC: BWSSB has established 14 STPs so far with only 4 equipped with tertiary treatment facility having a total



capacity of 721 MLD. Additional 11 STPs are under execution which will add additional 339 MLD capacity.

There is no dual piping provided except to bulk consumers like large scale industries to utilize the treated water. BWSSB has installed one tertiary treatment plant in Cubbon Park for irrigating the Cubbon Park and golf course based on MBR Technology.

Is there any monitoring mechanism for STPs owned and operated in private properties?

BSAN: Generally it is monitored by Karnataka State Pollution Control Board (KSPCB). But it is not strictly implemented. Stringent laws are required to punish those who do not maintain the STPs.

PVG: KSPCB (Karnataka State Pollution Control Board) issues CFO (Consent for Operation) after completion of the project in which they would check for the correctness of Installation and time to time the CFO is renewed based on the performance of the STP. Recently in many cases, KSPCB has issued show-cause notices to various occupiers on non-performance of STPs as per the requirements.

The Apartment Associations also have a problem of getting access to Quality STP Maintenance Contractors. KSPCB has to approve Maintenance Contractors and update the details on their website so that the Apartment Associations can get the information immediately.

BM: In the last few months, many apartments in the city were pulled up for not operating their Sewage Treatment Plants (STPs) according to standards. Apartment associations had complained that the standards set for STPs were too stringent and that officials did not follow clear guidelines during inspection.

A guidebook released by the Karnataka State Pollution Control Board (KSPCB) on November 1st addresses these issues. The guide clearly defines the STP parameters set by the Board. It also gives a checklist that the Board officials can follow during their inspection, which can possibly make inspections more accountable. Currently, inspections are mostly based on visual checking of the system rather than tests or measurements. The guide gives four methods - visual, physical measurements, performance tests and documentation check - to assess the engineering and operational efficiency of STPs.

VSC: The monitoring of the STP installed by private properties is undertaken by KSPCB. There are published guidelines which are followed in the monitoring process. The monitoring is restricted to the STP alone, the treated water distribution and its usage is not possible to be monitored by the KSPCB.

Bengaluruans in many part of the city are compelled to depend on bought in water by tankers. Are there any checks/ approvals on the source of water and means of transportations?

BSAN: There is no law or agency to check the quality of the bought in water by tankers. People who buy this water regularly, ideally, should have the mechanism to check the quality of water at source and at delivery point.

PVG: As on today, there are no checks happening on the tanker water supplied even though, the Karnataka Groundwater (Regulation and Control of Development and Management) Act 2011, has formed mandatory guidelines for private water suppliers including price fixation, mandatory lab test to

ensure quality, trade license, revealing source of water and specification of quantity of water. There is no standardization in terms of the quality of tanks itself, which can be cause for various health hazards.

BM: Private Water tankers in Bengaluru are exploiting the situation that desperately demands their service and there is no authority to monitor them.

The Ground Water Authority was formed in the year 2011, under Karnataka Groundwater (Regulation and Control of Development and Management) Act, 2011. The Authority, held a meeting at Khanija Bhavan in the beginning of the year to form mandatory guidelines for private water suppliers including price fixation, mandatory lab test to ensure quality, trade licence, revealing source of water and specification of quantity of water.

There was also a decision to identify engineers to monitor private water suppliers.

The committee took a decision to enroll BWSSB ward Executive Engineers to monitor water tankers in their concerned areas. Following this, on July 12, 2012, State Government (Minor Irrigation Department) gave the notification. Unfortunately so far no such monitoring system is in force.

VSC: Currently, there is no separate agency to check the quality of water supplied by the tankers. The local authorities themselves have been checking the quality of water supplied by tankers. However, the rising demand and shortage throws challenges at them. There are times when they have been forced to buy water from tankers who are ready to supply rather than relying only on the regular suppliers.

In a city constantly facing shortage of water, millions of liters of dead storage are provided in buildings as mandatory requirement for fire fighting. How can this be addressed?

BSAN: In the absence of the continuous source of water, either domestic or treated STP water with pressure, fire water reserves in the building are the only source of water, in case of fire.

The availability of guaranteed quality and quantity of treated water from STPs at required pressure and separate piping are the only alternatives for fire fighting and also to reduce the unnecessary storage of fresh water.

PVG: Townships and group housing has become common in urban cities today. Even for group housing, the volume of storage for firefighting is not considered logically, but authorities insist in having the cumulative volumes, considering the no. of blocks in the same facility. The revisiting of NBC part IV is very important.

BM: Most of the plumbing and fire services consultants are part of IPA and hence, IPA can play a major role in approaching the local fire departments along with the comparison on the standard practices followed globally.

If there are any grievances found in civil and construction industry; immediately builders association, CREDAI takes the initiative to approach the concerned authorities' to resolve the issues in favour of the industry.

VSC: Fire water reserves in the buildings are the only source of water in the event of a fire in a water scarce city. During the recent fires in the city, it was found that the fire sumps were dry and fire department was forced to truck in water and use the services of water tankers for water supply.



A credible and continuous water supply using the treated water from the STPs, upgradation of all STPs to tertiary treatment and ensuring good water quality is the only alternative for BBMP and Bengaluruans in future.

While Fire-fighting installations in buildings are strictly monitored by Government, no such overview exists for Plumbing systems. How to create awareness on the dangers posed by unsafe plumbing installation?

BSAN: There is neither strict licensing system for plumbing system installers nor training / courses adopted by any government agencies.

Like elsewhere in the world, the installed plumbing system should be checked by authorities before it is commissioned. Only then, seriousness will be created to do 'good plumbing'.

IPA along with IAPMO (India), has undertaken to propagate plumbing education to employment programmes to create awareness for good and safe plumbing.

PVG: Only 15 % of the plumbing works done in the country are from the organized sector and balance 85% is from the unorganized sector.

Government should make it mandatory that all the plumbers should be certified from institution like IPA which emphasizes on UPC-I.

IPA has to play a major role in training the plumbers in India. Finally, authorities also should get trained on UPC-I and start enforcing the same on each building that is constructed irrespective of the size of the building.

BM: It is practiced in some places like Delhi; but it has to percolate to the others states as well. IPA can play a major role in co-ordination with WPC to bring in more awareness programs which can reach concerned authorities along with the public.

VSC: Awareness (In Bengaluru) on the plumbing system installation has to be first taken up by the BWSSB. The current licensing system has to be replaced with a system of training and licensing only trained persons for installation.

The installation of proper plumbing system should be inspected before granting permission for connections to the properties. Licensing plumbers and consultants will also have to be undertaken to bring in knowledgeable professionals.

IPA has published modern plumbing codes of current international standards. Can BWSSB mandate code based plumbing installations?

BSAN: The copies of the plumbing codes are submitted to BWSSB and results are awaited.

PVG: Of course yes. But this can't happen overnight. Knowledge sharing should happen from IPA / IAPMO to BWSSB. Any queries related to implementation by BWSSB on the same should be positively looked at by IPA.

BM: It's a big task for IPA Bengaluru chapter but I'm sure it will be a huge advantage for the Bengaluruans!

VSC: The code based installations will have to be made mandatory and also a mechanism has to be put into place by the BWSSB to train the existing plumbers to install the plumbing system based on the code. The system of preparing a drawing and approval of the same should be put into place similar to the firefighting system; this will ensure documentation in the first place and give owners a brief idea about the plumbing system.

IPA along with construction trade bodies such as CREDAI and BAI should promote the installation of code based plumbing in the organized construction sector. IPA can also as part of the activities take up a certification programmer to certify the proper installation of plumbing system.

Are there any plans to license plumbing consultants, contractors and plumbers in Bengaluru?

BSAN: BWSSB is currently issuing license to plumbers and plumbing contractors without going through proper tests/ exams or training. There is no license required to practice as plumbing consultants at present.

PVG: License as Consulting Engineers is available for Graduate Engineers and Master degree holders in Engineering but no guidelines / examinations for them to become Consultants. Certification programs like PSD and PSM from IAPMO can be a tool for licensing consultants and contractors.

BM: In India, Engineers with BE/ BTech/ ME/ MTech degree from University are allowed to practice, as Consulting Engineers. There is License or Registration with local City Municipal Corp. Same is the case with contractors; but there are no such specifications/ practices for plumbers. IPA and IAPMO working together, should work towards providing training and license to the plumbers.

VSC: Currently BWSSB follows licensing contractors only, the license is issued based on experience and has no technical and practical examination conducted. A process for qualification and continued education programs have to be built to make it more meaningful.

It is well known that numerous illnesses caused by unsafe water and sanitation routinely put the lives of citizens at risk. What can be done to avert such controllable calamities?

BSAN: The only answer is availability of safe clean drinking water, sanitation facilities and hygienic living conditions.

PVG: India's GDP growth is expected between 6 to 8 % every year. This can be doubled just by addressing issues like potable and safe drinking water facilities and safe sanitation methods to every part of the country. More importantly, awareness related to safe water usage and sanitation methods would help a lot in bringing down the numerous illness problems.

BM: Access to safe water, adequate sanitation, and proper hygiene education can reduce illness and death from disease, leading to improved health, poverty reduction, and socio-economic development. However, many countries are challenged to provide these basic necessities to their populations, leaving people at risk for water, sanitation, and hygiene-related diseases. Safe Water System can empower communities to improve the quality of water by using household treatment options.



VSC: Awareness regarding the illnesses caused is very evident with the number of people taking to packaged water culture. The question that remains is, 'affordability'. Availability of safe drinking water, sanitation facilities and hygienic living conditions can only prevent spread of diseases.

Additionally proper public conveniences and their availability play an important role in the health of the cities.

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