

## Bengaluru tanker-based water distribution system co-creation workshop

*With participation of team members from Eureka Forbes, JustPaani, inno TSD, University of Exeter, AUTARCON, Tata Institute of Social Science and Indian Institute of Technology Guwahati*

In Bengaluru, the issue of water quality is entangled with the issue of water quantity. Water is supplied by the Bangalore water board to around 10 lakh households and commercial establishments, which still fall short of water. Water tankers meet a third of city's water needs, especially in the outskirts. Bengaluru undergoes water shortages because the demand exceeds the available resources. This is particularly true in summer. Demand for water tanker explodes as individual groundwater sources usually dry up. As a participant at the dedicated co-creation workshop explained: "Digging wells has become a gamble game".

As a result, people dig deeper and deeper to find water. And in many cases, people still do not find water. Tankers are supposed to refill from groundwater, considered as clean. In practice, they also refill from surface water when groundwater is too scarce or mix the two water sources within the same tank. In Bengaluru, surface water is more contaminated than groundwater.

Tanker water is used mainly for non-drinking purposes. For drinkable water, people who can afford it choose bottled water. Moreover, tanker water is re-treated before being used for drinking and cooking. People use reverse osmosis (RO) to clean the water or Ultraviolet rays (UV). RO is a costly process that requires a lot of

energy. Only 30% of the water that is treated remains at the end of the process. And RO has limits: if the water comes from a source that is too highly polluted, it is not sufficient to make the water pure and safe.

The LOTUS solution will be deployed in 1-2 tankers of the JustPaani company. An Onsite Chlorine Generation system will be installed at an existing borewell/water filling station. The chlorine will be dosed during water filling into the tanker. The LOTUS sensor will enable monitoring of the water quality in the trucks. Sensors will be linked to an automatic chlorine dosing system attached to the tanker, which will ensure pathogen free water conditions, as soon as the required residual chlorine level in the water is not met anymore.



Figure 1: Participants at the LOTUS co-creation workshop

In Bengaluru, participants to the workshops were the customers of JustPaani, as for example a start-up that proposes an application to better follow-up the water delivery system, or people directing companies, who recharge their buildings using tankers. Majority of the participants are people from banking, educational institutions, hotels, software companies, etc. and use water tankers on a regular basis, especially in summer.

The participants expressed their interest in knowing whether the water was safe or not. If they were told the water is contaminated, they would accept the tanker but use the water for a different purpose, for gardening instead of cooking for instance. Water does not need to be drinkable as most tanker water is used for purposes other than drinking. This being said, knowing about potential bacterial contamination is still important.

Trust is also at the heart of the water quality issue. Trust in tanker water systems is low. Indeed, the level of trust depends on the vendors rather than the water's source. Therefore, a rating system is needed. Sometimes, even municipal tankers are sent back due to unacceptable water quality. The main parameters used by consumers are colour and odour. Consumers generally do not know about the source of water.

There is a real need to build trust. If the water was certified by credible actors, users would trust the water quality. A certification from reliable NABL certified private or government lab could be trusted by the consumers.

Corporate users are not interested in a complex mobile application as they have a yearly contract with the tanker operators. Instead, they would like to have SMS notifications indicating the amount, the quality, and the source of the water received. If they are informed the water is of low quality, they can decide to use for a purpose that does not need clean water. Moreover, they can decide to change the vendor if the water is repeatedly of low quality. Individual household

customers prefer to have a mobile application, which would give information on the availability, quality and price of tanker water in the nearby areas.



Figure 3: Florian Benz (Autarcom) in front of a JustPaani truck

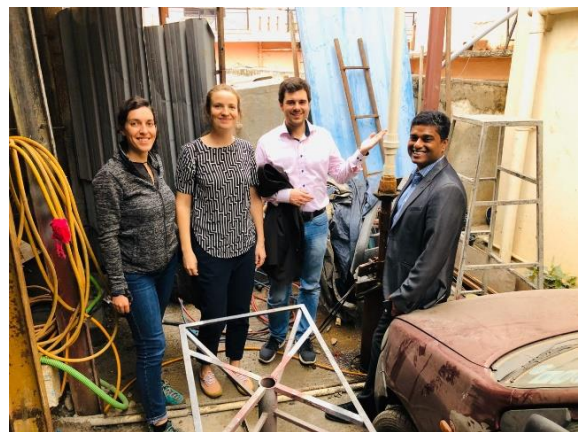


Figure 2: The LOTUS team in front of the refilling station

In order to fix the price, customers need to know how often the tankers are cleaned. They must be drained and chlorinated daily and the inside must be made of stainless steel. The increased costs must be compensated by the savings done on local treatments, such as UV or RO. Savings can also be done on the costs of re-testing the water. Bengaluru participants agreed on a 5% water price increase.

The Bengaluru workshop was particularly interesting as the participants were already customers of the use case owners and showed interest and willingness to use the LOTUS solutions to better meet their water quality needs.



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