Project components:

Phase I: Community Context Analysis (CCA) to understand the current situation and needs of various communities.

Phase II: Development of tools and methods for assessment of available resources and Technology options

Phase III: Community level interventions

Phase IV: Harvesting lessons and fine-tuning methods

Phase V: Engaging and mainstreaming the concept in the municipal system

Implementing Approach:

Six communities were selected for CCA. Through this, the evaluation of current resources, demand and supply was understood. Detailed study of these communities and current available technologies was undertaken. Training tool kits and IEC material were developed for awareness generation about water issues. Four communities were selected for further interventions. Based on their needs, technology options were identified. Pilot projects were implemented in four communities to demonstrate a decentralised model for water management. Documentation of the process was done and publicity material was prepared. Meetings with other communities took place to share the learning of the projects. Meetings and workshops with the IMC, state level organisations and NGOs are taking place to ensure mainstreaming of the project into the municipal system. Publications and workbooks developed will help assist the same.

Key achievements:

1. Community level interventions in Rahul Gandhi Nagar, Devshree Nagar, Narwal Kankad and Ganesh Nagar have ensured water quality and availability even during summers.
2. Rain water harvesting in Ganesh Nagar and Devshree Nagar raised the water table of the area.
3. Community storage tank installed in Devshree Nagar has helped in more equitable water distribution.
4. Households and communities have contributed land and partial costs as well as taken responsibility in management of interventions.
5. IMC has taken an active interest in this project and has provided support.

Lessons Learnt:

1. CWM approach can improve water availability for household and community level, especially for poor and in peri-urban areas.
2. Social cohesion is important and a prerequisite for new interventions.
3. Household level interventions and bottom up approaches can reduce the time and effort taken to manage local resources and are especially relevant to the poor and vulnerable communities.
4. Decentralised water related technological options can help reduce stress and also increase the control of user communities over these resources.

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The NGO **Seva Surbhi** has worked extensively on water management issues, especially awareness raising and promoting water conservation at the community level. They have experience in capacity building and water issues, including managing a Water Resource Centre that develops IEC materials, training manuals and documentation on water-related issues.

Conjunctive Water Management

(2011 to 2014) (Ongoing)

Lead Institution:
TARU Leading Edge Pvt. Ltd.

Partner Institutions:
Indore Municipal Corporation, Aim for Awareness of Society , Seva Surbhi

Water Challenges

Community Consultation

HH survey

Data Collection by PGIS

CWM Intervention Tools

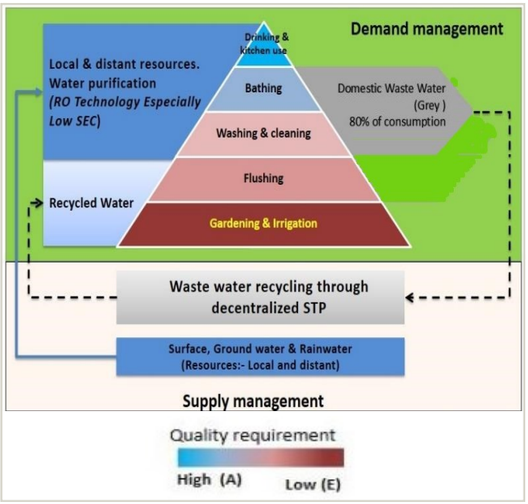
Community Storage tank

Rain Water Harvesting

Individual Storage Tank

Amrut RO Plant

Project Summary:



Conjunctive Water Management (CWM) of local and distant sources is necessary to manage the ever growing crisis of urban water supplies. CWM emphasises understanding the demand and meeting it through a judicious mix of the local as well as distant sources based on quality, availability and cost. The CWM framework further emphasizes demand focused end use of water (low quality water used for low end uses whereas high quality water for high end uses).

The population of Indore is about 2.5 million. It gets 90% of its public water supply from surface water and 10% from groundwater. It depends on a distant source, Narmada River, situated 70km away, for its water needs. This leads to high energy costs. Also, high quality water is being used for low end uses. A significant proportion of slums and peri-urban areas are served by groundwater, but the groundwater level has decreased and it is scarce during summer seasons. The main issues faced with groundwater in slums and poor communities are that of availability and quality.

Presently, the per capita water is less (~100 lpcd) as compared to national norms (~135 lpcd) (CPHEEO). Recurrent water crisis, deteriorating infrastructure, high distributions losses, poor revenues and growing population have all contributed to this. Climate change uncertainties will increase the vulnerability of people in terms of water scarcity. The centralised water supply has been unable to meet demands and local sources have the potential to meet some of the demands to build resilience of communities, especially the poor. The socio-economic situation of the communities as to focus interventions and ensure sustainability.

Project components:

1. Community mobilization and awareness generation
2. Implementation of RWH and recharging technology
3. Harvesting and mainstreaming lessons

Implementing Approach:

After CCA in Ganesh Nagar, the issue of water scarcity and quality was identified. Community mobilization and awareness generation through street plays, video show and distribution of IEC materials was carried out. Two methods for RWH and recharging were identified, namely, drum filter method and trenching method. After identification, the technology was implemented in two households. Ownership of residents was ensured through partial contribution. The team was approached by other residents to implement in same in their households. Periodic monitoring of water quality is being done. Water availability from borewells has improves and energy bills for motor pumps have reduced and quality of groundwater has also improved.

Key achievements:

1. Ensured year-round water availability from bore wells that otherwise would go dry by February or March.
2. Groundwater level has increased and its quality has improved.
3. Stored roof water is also being used for low end uses such as washing, flushing, gardening etc.

Success Story:

Mr. Poonam Chand Raghuvanshi of Ganesh Nagar uses his private bore well to distribute water to neighbouring households. He used to distribute water once a day but due to rain water harvesting, the water level in his bore well has increased and now he can distribute water multiple times a day.

Lessons Learnt:

1. Mobilization in middle socio economic communities is especially challenging as they are used to arranging alternate water sources during scarcity months and do not fully understand the benefit from these technologies.
2. Since no direct benefit of this technology can be seen, it is challenging to engage the community and increase interest towards the same.
3. Due to these technologies being new in nature, post installation training and monitoring is essential.

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Case Study: 1

Community Managed RO Plant

Lead Institution:

TARU Leading Edge Pvt. Ltd.
Basti Vikas Samiti - Rahul Gandhi Nagar, Indore Municipal Corporation (IMC)

Partner Institutions:

Aim for Awareness of Society (AAS)

Rahul Gandhi Nagar- Community Managed RO plant

Community Consultation

IEC

RO Inauguration

Amrut (RO) Water Supply System

Cleaning

Filling

Loading

Distribution

Background:

Rahul Gandhi Nagar is a notified slum located on the edge of the IMC limits, located near Dewas Naka. It has 850 households with a population of 5,000 persons. Under MPUSP programme. concrete streets, sewer lines, street lighting as well as bore well based water supply system was commissioned.

Although Rahul Gandhi Nagar does face water scarcity, poor water quality due to high dissolved solids (600-800 ppm) and faecal contamination (E. coli of 25MPN/100 ml) of bore well water is a major issue. Cases of water borne diseases (diarrhoea, dysentery etc.) are quite common. Poor sanitation is the main challenge, which lead to faecal contamination of aquifers. This colony has two clinics and a medical shop, which indicates the status of health issues.

Not only does access to safe drinking water need to be ensured but hygienic water handling practices must be instilled to avoid contamination at the household level.

The challenge in planning an intervention, especially in a slum community is mobilization and awareness generation. This slum already had an organisation, Basti Vikas Samiti (BVS), formed under MPSUP, which helped in getting the community to work together. After a detailed assessment of the water resources and needs of the community, a community level water purification facility was proposed. The idea was accepted by the community and "Amrut Pey Jal" scheme was launched.

Objective:

To mainstream a decentralised urban water management model based on local resources

Project components:

1. Community awareness and mobilization on water related issues.
2. Installation of RO plant with UV filter and ozonator to avoid post treatment contamination(at the household level).
3. Water supply management
4. Harvesting and mainstreaming lessons

Implementing Approach:

Once the water quality issue was identified for Rahul Gandhi Nagar. Community mobilization and awareness generation was carried out through street plays and community meetings. IEC material was prepared and distributed. The BVS was strengthened through various financial and management trainings, exposure visits and discussions on various examples and best practices. A sub-committee was formed under BVS for fund collection from the community. Permissions were taken from government offices for land, electricity etc. Involvement of different agencies in project implementation and O&M was facilitated.

MoU was signed between BVS, AAS and TARU. It laid down clear roles and responsibilities of partners, contributions, logistic support, O&M responsibilities and tariff collection. After all the necessary agreements and permissions were obtained, the RO plant was set up in the community. The plant has a capacity of 3,000 lts/hour. UV filtration is done to further improve the quality of treated water. Ozonization is then done to increase the shelf life of RO water and prevent contamination at household level. Waste water generated is being used for flushing community and individual toilets in the neighbourhood. Since the RO plant was a high technology intervention, AMC was signed with the vendor and staff trainings were carried out. A bank account was opened for the BVS to manage the revenue generated and manage cost of running the plant. A system for the door-to-door distribution of water was set up.

250 households are direct beneficiaries for RO water and buy water @ Rs.5 per 20lts. A plant operator has been hired from within the community and is responsible for the maintenance of books and registers related to the plant (accounts, attendance, running log etc). Periodic water quality monitoring is done and a complaint redress system has been established. Regular meetings with BVS take place to monitor the day to day running, progress and address issues as well as enable hand over of the plant over next few months. Initially people did not like the taste of the low TDS RO water and slowly most of them started linking the taste. Also, since the local water resource is free, some residents are not keen to pay Rs. 5 for every 20 lts of germ free water.

Key achievements:

1. Ensured pure and safe drinking water to the residents of Rahul Gandhi Nagar and in turn reduced the cases of water borne diseases.
2. Waste water generated is being used for flushing in community/individual toilets and other low end uses.
3. IMC showed interest and support by providing the land, permissions as well as subsidy for electricity connection.
4. The plant has generated employment for three people within the community.

Success Story:

After the using RO water for three months, Mrs. Kanchan Paswan noticed that the instances of water borne diseases in her family has reduced, which has reduced the medical expenses. Also, door-to-door distribution of drinking water has ensured availability of treated drinking water and she no longer needs to go out to collect drinking water during heavy rains and water logging. Other users also report significant reduction in waterborne diseases. The local doctor also uses and promotes use of RO water.

Lessons Learnt:

1. Economically weaker sections are ready to pay for services if these are made available to them as per their requirement.
2. For interventions requiring higher technologies as well as user charge collection, separation of operations, maintenance and financial management is necessary to ensure sustenance.
3. To prevent wastage of water, it is necessary to identify options for the use of waste water generated.

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Case Study: 4

Rain Water Harvesting and Recharging

Lead Institution:

TARU Leading Edge Pvt. Ltd.
Indore Municipal Corporation (IMC)

Partner Institutions:

Seva Surbhi, Indore

Ganesh Nagar- Rain Water Harvesting and Recharging

Background:

Ganesh Nagar is a 20 year old lower middle class settlement located in ward number 41 of IMC. It has about 300 households and a population of 2000 persons. Houses are small in size ranging from 300 to 800 ft^2 and all houses have brick walls and RCC roofs. People are mostly engaged in informal skilled and unskilled occupations, with a few working in the private sector. At present, Ganesh Nagar depends only on groundwater. There are four community bore wells that meet the water requirement through a piped supply network. The colony also has 23 private bore wells. The depth of bore wells range between 400 and 500 ft. During summer seasons, most bore wells dry up, restricting the water availability to 8 to 10 months a year. IMC as well as private water tankers need to be arranged to meet the water demand in summers.

The water quality pathogen counts and hardness) has deteriorated over the years. The settlement has no proper drainage system and water logging can be seen in many parts of the settlement even during summers. This has also led to the groundwater contamination. There were two open wells in the settlement which have now become defunct and are used for disposal or solid and liquid waste. To overcome this scarcity, roof top rain water harvesting (RWH) and recharging pits can be implemented. RWH at the community as well as household level can recharge the aquifers and reduce the extent of over extraction of groundwater. Being a low-cost decentralized technology, RWH can be implemented and managed easily at the household level and therefore can be adopted easily.

Objective:

Improve water availability through groundwater recharge.

Project components:

1. Community mobilization and awareness generation
2. Installation of storage tank
3. Documentation of process
4. Harvesting and mainstreaming the lessons

Implementing Approach:

Community mobilization and awareness generation was done through a video show and distribution of various IEC materials. Community meetings and discussions were held to identify the needs of the community. After these discussions, the community decided to opt for community storage tanks at both bore wells. The storage capacity was decided as 2000 lts and 3000 lts. Buy in by residents was ensured through community contribution. Both storage tanks were installed in the community. This has ensured water availability throughout the year and reduction in conflicts related to water collection.

Key achievements:

1. Ensured regular availability of water in Devshree Nagar and minimized wastage thus reducing the vulnerability of the community to water scarcity.
2. Provided buffer stock of water, ensuring equitable distribution of water to the community and reducing time and effort of residents.

Success Story:

Mr. Hari Sankar Patel, a resident of Devshree Nagar, said that due to installation of storage tank, the electricity bills for the motor have reduced. Also, fights related to water have been minimised as everyone gets sufficient water. Family members no longer spend too much time collecting water and can go to work, while children can go to school in time.

Lessons Learnt:

1. Adequate water storage facility is an essential requirement in systems with intermittent supply.
2. Economically weaker sections are willing to pay for services if their needs are met.

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Case Study: 2

Individual Water Storage Tank

Lead Institution:

TARU Leading Edge Pvt. Ltd.
Basti Vikas Samiti - Narwal Kankad, Indore Municipal Corporation (IMC)

Partner Institutions:

Aim for Awareness of Society (AAS)

Narwal Kankad- Individual Water Storage Tank

Distant source Water Collection

Space constraint

Limited Water Storage Facility

Individual Water Storage Tank

Background:

Narwal Kankad is a 30 year old slum located in ward 7 of IMC. Most inhabitants work as labourers in the neighbouring small scale industries. There are approximately 250 houses with brick walls and tin roofs. This slum was developed under MPUSP programme with concrete streets and drainage lines and bore well based for water supply.

The settlement is mainly dependent on groundwater and both community as well as private bore wells are used. Water availability in the area is low and water is also collected from distant sources. About 3 hours a day are spent by most households in water collection.

Since slum settlements have space constraints and limited storage facilities, each household stores only about 100 to 150 lts of water in medium sized drums, cans and other utensils. These vessels are kept in the kitchen or the sit-out benches outside the house. Insufficient storage facilities lead to the reduced water use resulting in poor hygiene. Also, time taken for water collection also leads to opportunity loss for working women and children have to compromise on their studies.

Readily available storage tanks are commonly used by poor communities to store water for low end uses like washing, bathing etc. However, in these open tanks, contamination of water and breeding of mosquitoes are common issues.

Objective:

Creating a buffer stock of water for daily use and reducing the time and energy wasted in water collection.

Project components:

1. Community mobilization and awareness generation
2. Modification of storage tank design
3. Installation of individual household tanks
4. Harvesting lessons

Implementing Approach:

Community mobilization was done through a video show and the distribution of various IEC materials. seberal rounds of discussions were held with the community to identify their needs and finalise the intervention. Individual storage tanks were identified as the need of the households.

The readily available tanks were modified with a concrete cover and a top lid, a tap and drainage outlet at the base. These tanks have a volume of about 500 lts and costs about Rs.4000 including installation costs. The tanks can be installed either in the kitchen or at the veranda. Cement tanks are cheaper and more durable options for low SEC and poor settlements as they cannot be stolen. Tanks were installed at the household level and now they can store water during weekly holidays and do not need to spend multiple hours a day on water collection.

Key achievements:

1. Ensured sufficient water at household level and buffer stock of water to last a week.
2. Reduction in time and effort of women and children collecting water. This time can now be used for economic or educational activities.

Success Story:

Mr. Sankar Solanki, a resident of Narwal Kankad for the past 25 years, said that after installation of the storage tank, the time taken for water collection has significantly reduced. His family members can go to work and school on time. Also, fights over water have reduced and availability has increased as water can now be stored at the household level.

Lessons Learnt:

1. Economically weaker sections are ready to pay for storage if they meet their perceived needs.
2. Options like storage tanks and mini hand pumps are easily available in the market and can be easily modified to meet the requirements of the community.

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Case Study: 3

Community Water Storage Tank

Lead Institution:

TARU Leading Edge Pvt. Ltd.
Basti Vikas Samiti - Devshree Nagar, Indore Municipal Corporation (IMC)

Partner Institutions:

Aim for Awareness of Society (AAS)

Devshree Nagar - Community Water Storage Tank

Water Resource

Community Consultation

Community Storage Tank

Background:

Devshree Nagar is an MPUSP slum under ward number 23 of IMC. The settlement is located near an industrial area. The Khan River runs along the eastern edge of the settlement. This community is formed of migrant workers that settled here to work in the nearby factories. It consists of 122 houses and has an estimated population of 600.

Under the MPUSP programme, IMC drilled two bore wells in the settlement. Stand posts were installed at both bore wells with a number of outlets but without taps. The stand posts were also not equipped with storage tanks and the community had to switch on the bore well every time water was to be collected. This led to a lot of wastage of water and also scarcity during power cuts, which are quite common. Poor storage facility at the household as well as community level has resulted in water scarcity. The situation has been further affected by electricity power cuts and frequent breakdowns of bore wells pumps.

A community managed storage facility can ease the water scarcity as well as reduce conflicts over water collection. It can also ensure regular availability of water and minimize water wastage. This facility combined with tanker supply can help ensure water even during emergencies.

Objective:

To ensure equitable distribution of water, reduce water conflicts and minimize water wastage.