



Swachha Sundara, Namma Bidar; Waste Management project in the Karez of Naubad

Abstract:

The Karez of Naubad are more than 7 century old historical underground water channel system in the Bidar district of Karnataka, India. This project started in January 2018, was to restore the Karez of Naubad, to facilitate a cleaner environment and to enable energy recovery from non-recyclable dry waste.

The project is nearly 3 years old, and nearly 286 MT of waste has been handled, out of which nearly 70 MT of non-recyclable dry waste has been sent to cement industry for co-processing, where dry waste is used as a source of energy in the cement kilns and it partially replaces coal, which is still commonly used in India.

Therefore the waste management project at the historical Karez area is both environment friendly, by preventing open burning and dumping of waste, and energy friendly by making optimal use of alternative energy sources for the cement industry. Thereby it is helping preserve the heritage site for the future generations. The project also helped in creating local entrepreneurs who now handle waste on their own, generate revenue by the sale of compost and recyclable materials, and facilitate transport of non-recyclable part of dry waste to cement industries, thus helping in energy recovery from waste. Circular economy of waste is thus achieved through the implementation of this project.

1. Project inception

Deccan Heritage Foundation India (DHFI) has been working on restoration of ancient Karez system in Naubad area of Bidar. The Karez extends for nearly 2 km, starting from its mouth near Siddeshawara temple to the mother well in the agricultural fields. The initial 1.5 km of the Karez has thick habitation and the rest is mostly agricultural land. There was rampant littering happening around the wells of the Karez, which appear at every 75 Mt along the stretch.



Picture 2: A well in the Karez system

Thus, to prevent further waste from falling into the Karez and to provide for a waste management system for the Naubad area adjoining the Karez, DHFI approached Saahas to provide for a proper waste management system to the residents and shops around the Karez area of Naubad.

Thus, Saahas started the waste management project **Swachha Sundara, Namma Bidar** in Jan 2018 with funding from DHFI and Nestle.



Picture 1: Karez system in Naubad, Bidar

Due to littering and a higher population density around the Karez area, a lot of plastic waste was seen around the Karez and in the water flowing inside the Karez, even after restoration of Karez by DHFI.

As there was no waste collection happening in the localities around the Karez, people were disposing their waste at street corners or open grounds which was eventually falling into the Karez wells, and thus polluting the underground water body.



Picture 3: DHFI Trustees visiting the mouth of Karez, near the Siddeshawara temple

2. Key Issues

The main issues in the area around the Karez were:

- No waste collection system existed in Naubad area of Bidar. Waste was either thrown on the streets or burnt in open.
- Drains were clogged with waste, mostly plastic waste.



Picture 4: Open dumping of waste



Picture 5: Clogged drain in Naubad area

- Lack of waste collection mechanism had led to a behavioural tendency to dump garbage at the black spots, empty plots and at public places nearby the Karez area.
- The black spots, dumping sites and the drains are close to the Karez system and was causing the land and water to be polluted.



Picture 6 and 7: Open dumping of waste at the wells of the Karez area

- Wet waste disposal was also an issue in this area, as Naubad area lies in the city limits of Bidar, and is not a rural setting.
- There was no awareness among the residents about the ill-effects of burning or dumping waste.

3. Karez in Naubad, Bidar

Karez is a historic underground water supply system that originated in modern-day Iran-Persia region. The historic Karez system is found in nearly 38 countries of the world. Karez is a network of underground canals, built across underground water streams to provide for water to civilian establishments.



Picture 8: Illustration of a Karez system



Picture 9: Bidar-Naubad Karez

The Karez system basically taps into the ground water sources or natural springs, and transports it through an underground tunnel, to the settlements for various household uses and irrigation purposes. Naubad Karez is estimated to have been constructed during Bahmani (1347-1518 AD) Period. The Karez was adopted to suit the local climate and geology of Bidar. Unfortunately years of neglect and lack of effective protection has led to the degradation of the Karez water system.



Picture 10: A view of the end of the Karez, near the Siddeshawara temple

4. Objectives of the project

The main objectives of the Swachha Sundara, Namma Bidar: Waste Management project is as below:

- To reduce waste in the public places in and around the Karez area, in order to prevent waste from choking the drains, entering the Karez wells and canals.
- To bring about behavioural change among residents to inculcate practices of source segregation and anti-littering.
- To spread awareness about pollution caused by open burning and dumping of plastic/other waste.
- To facilitate door-to-door collection of waste; weekly collection of wet waste and dry waste using an electric vehicle.
- To setup infrastructure for wet waste composting and dry waste sorting.
- To ensure that, recyclable dry waste materials are sent for recycling and the non-recyclable low grade waste is sent to cement factories for co-processing, for energy recovery.

5. Steps taken in implementation of the project

The main steps taken in project implementation are as below:

- DHFI approached Saahas to implement a waste management system in the Karez region.
- The Saahas team did a preliminary site visit and also met different stakeholders of the Bidar municipality, local youth groups, Naubad area residents and the DHFI officials.
- A preliminary survey of the residents in the Karez area of Naubad, Bidar was carried out, to gather information regarding waste generation from houses and shops.

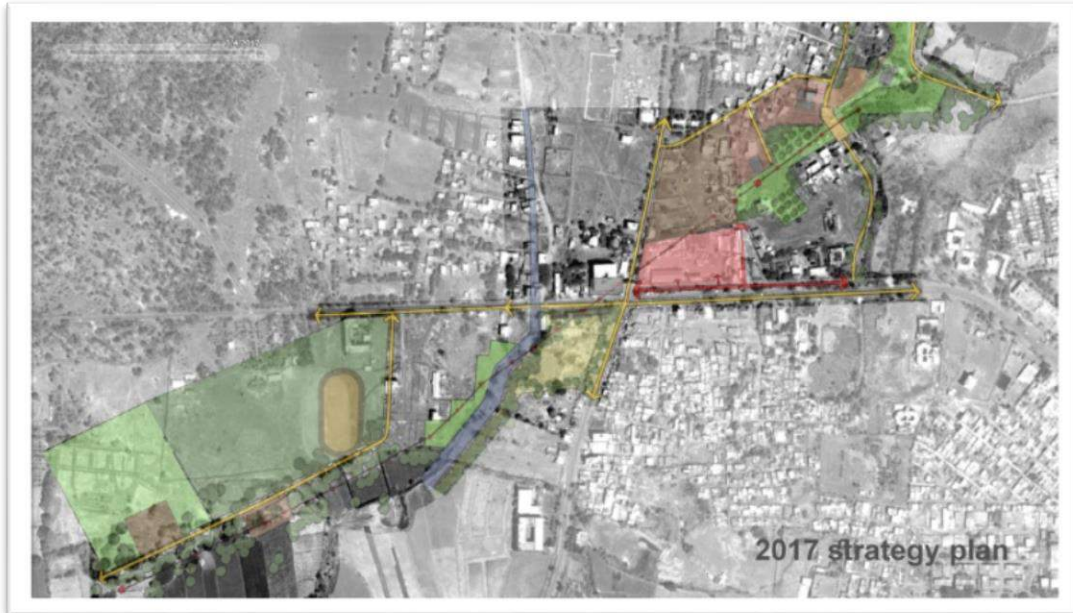


Picture 11: Human settlements around a Karez well



Picture 12: Survey of the residents

- Target area was decided and houses/establishments, 200 m on both sides of the entire stretch of the Karez came under the project area.
 - Houses: 650(Lumbini Khadri Nagar; KIADB; Buddha Siddeswara Raghavendra Colony)
 - Shops: 105; Schools and Colleges: 7; Sunday Market: 1



Picture 13: Map of the Karez area

- Waste Processing Unit was identified using the master plan for development of the Karez area.
- Submitted all required documents to the City Municipality Commissioner (CMC) Bidar and the Commissioner approved the project on 22nd Feb 2018. The MoU was signed with the Commissioner.
- A temporary shed was identified in the Karez area, for storing dry waste, as the construction of waste processing unit had been delayed indiscriminately by the CMC.
- Blue bag distribution to households for storing dry waste separately, started on 20th March 2018. An electric vehicle is being used for segregated waste collection.



Picture 14: Temporary shed near the Karez



Picture 15: Bag distribution in the Karez area



Picture 16: E-vehicle for waste collection

- First round of waste collection in the Karez area started from the 27th of March 2018. Nearly 400 households were covered.
- Dry waste is collected in white bags and wet waste in blue drums. Dry waste is sorted and stored in the temporary shed, whereas for handling wet waste, mesh composters are installed, as shown in the picture below.



Picture 17: Waste collection in the Karez area



Picture 18: Human settlements around a Karez well

- Dry waste is sorted in recyclables and non-recyclables. Recyclables are sold in the local market.
- The non-recyclables are sent to cement factories for co-processing, as an energy source.

6. Awareness Campaigns

Awareness to people forms a very significant part of the project. Various awareness campaigns are being conducted to the general public, shops and households in the Karez area. A preliminary survey was conducted during the initial stages of the project, followed by a door to door awareness campaign. Street plays have been conducted, and regular awareness to the public, schools and residents, have been conducted throughout the duration of the project.

- 1) Initial survey and project awareness to shops and residents: Saahas team, conducted survey of shops and households in the Karez area.
- 2) Door to Door awareness campaign: Introduction on waste categories and proper waste management practices. Basic information on the need for waste segregation at source and to hand over segregated waste to the collection staff.
- 3) Jaatha and Street plays: Saahas team also conducted Jaatha and street plays to reach out to the general public, children, shops and residents of Karez area.



Picture 19, 20, and 21: Awareness sessions with the community, school children and street rally, respectively

7. Waste quantity

Segregated waste, collected from houses and shops, are stored in the unit. Wet waste is composted. Dry waste is further sorted. Sorted waste is then transported to its respective destinations for recycling or co-processing.

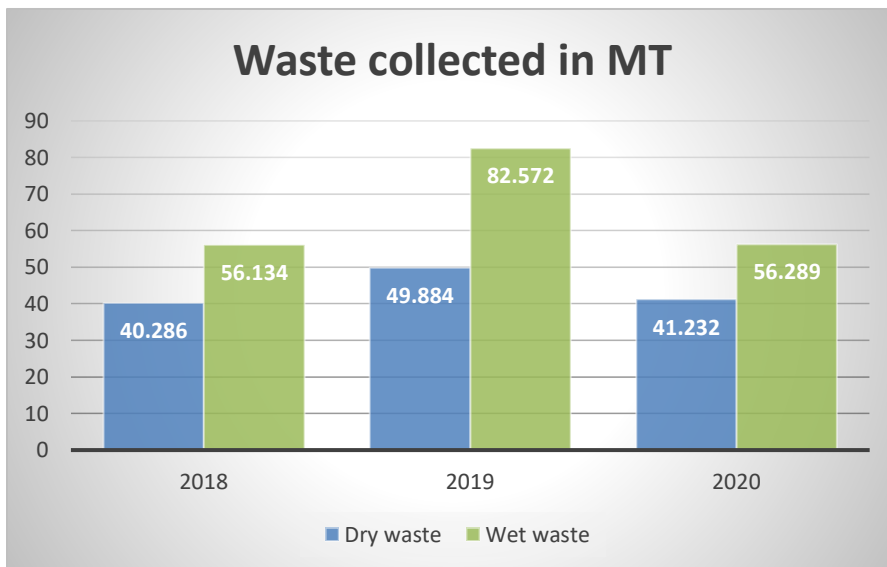


Chart 1: Dry waste and Wet waste Collected per year

Table 1: Waste Collected per year

Year	Dry waste	Wet waste
2018	40.286	56.134
2019	49.884	82.572
2020	41.232	56.289
Total	131.402	194.995

8. Sustainability

The project which was initially funded by a developmental agency, has been sustainable from the past 10 months. The staff who was working for the project has been come an entrepreneur and is handling the waste management project and the infrastructure created from the project, in a very efficient manner.

It has created employment for 4 people in total and revenue is generated in two ways. One, a service fees is levied on the residents and commercial establishments, who are more than willing to pay a nominal service fee, for handling waste in an efficient and environmental friendly manner. Two, from the revenue generated from the sale of recyclable dry waste.

9. Project Impact

- An historical site on the verge of getting ruined and lost in history has been restored with community involvement
- As on Jan 2021, 326 MT of waste has been handled from January 2018, thus diverting it from open burning or open dumping, leading to a better environment and cleaner surroundings.
- Around 80 MT non-recyclable dry waste has been sent to cement industry for co-processing, thus enabling waste to energy. It is partially replacing coal, and thus an environmental friendly option than just using coal in cement production.



Picture 22: An after and before image of the project area



Picture 23: Community involvement in the project

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