A Sustainable solution for water crisis – "Khambati Well" (Water Recharging Well)

An Initiative of Varun Beverages Ltd and FEEST

ABOUT FEEST (Foundation for Ecological and Environmental Sustainability Trust)

FEEST was established with the aim of ground level development in which Mr. Virendra Kumar Choubisa and like-minded developmental professional come together to shape their vision in form of establishing the trust with the aim of improving the living standards of people through rural development, environment management, natural resource management, capacity building and skill enhancement, livelihood enhancement etc. Presently we reach to 50,000+ families in Rajasthan, Gujrat and Uttar Pradesh. FEEST harvested 27.6 MCFT rain / surface water through checkdam, pond and 100.35 MCFT ground water recharging by checkdam, pond, Khambati well etc work.

Global and Indian Water Scenario

Many of us have an image of the world as a blue planet as 71 percent of the earth's surface is covered with water. But in reality, 97 % of the total earth water is saline and only 3 % water is sweet and fresh. About 77 percent of this fresh water is locked up in glaciers and permanent snow and 11 percent is considered to occur at depths exceeding 800m below the ground, which cannot be extracted economically with the technology available today. The clean water crisis is an emerging global crisis affecting approximately 785 million people around the world. 1.1 billion people lack access to water and 2.7 billion experience water scarcity at least one month in a year. When waters run dry, people can't get enough to drink, wash, or feed crops, and economic decline may occur. In addition, inadequate sanitation—a problem for 2.4 billion people—can lead to deadly diarrheal diseases, including cholera and typhoid fever, and other water-borne illnesses. Hence, only 0.03 percent of total fresh water is available for use by living beings. This reserve of water is gradually decreasing with time, the main reason for this is overexploitation of water.



Water Situation in Rajasthan

Rajasthan has 10% of the total land area of India but has only 1.16 % of the fresh surface water and 1.70 % of the underground water reserves of the country which is comparatively very less. Due to the highest use of surface water and overexploitation of underground water, almost the entire state has been brought into the red zone. If this pattern of overexploitation continues and measures are not taken to save water, then by 2050, the problem of drinking water in Rajasthan will also emerge in a severe form. Efforts to save water are being made by the GoI and GoR at their level, in which water is saved using various techniques and keeping in mind the increasing population in the coming time, the water supply system is being strengthened. In this series, along with the government, many voluntary organizations and companies are also coming forward under CSR for water management.

Mr. Varun Jaipuria, Executive Vice Chairman of Varun Beverages Limited (R.J. Foundation), a philanthropist, looking at the current scenario of water and environmental conservation, emphasized on the use of traditional knowledge and technology with innovation in the work being done in the CSR of the company to increase the underground water resources in Rajasthan. In accordance, Mr. S.N. Bhatt and Mr. Saurabh Sharma from company has play an important and brought the model of "Khambati Kua" development for the first time in Rajasthan for ground water recharging. The work of bringing it to the ground is being done by Foundation for Ecological and Environmental Sustainability Trust Udaipur (FEEST) along with the technical support.

To implement the model in Rajasthan, FEEST team had a meeting with the Honourable Dy. CM Dr. Premchand Bairwa. With his inspiration Khambati Kua work has been started, first time in Rajasthan which have similar underground geology as Khambat area. Here water is salty with high TDS and layered rocks. Presently, 20 Khambati wells have been developed in 15 villages.

There are many reasons behind increasing the ground water resources, the main ones being-

- Underground storage space is available free of cost and flooding is avoided.

• Loss due to evaporation is negligible.
• Biological purity is high.
• This water is accessible to the general public.
• It has no adverse social impacts such as displacement of population, loss of agricultural land etc.
• Variations in water temperature are minimal.
• It is environmentally friendly; controls soil erosion and flooding and provides adequate moisture to the soil even during summer months.
• Water stored underground is relatively safe from natural and man-made disasters.

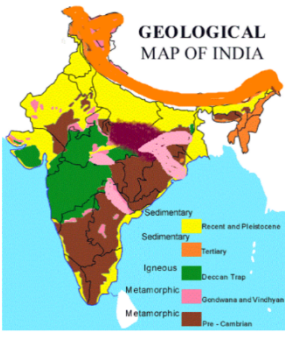
Groundwater resource development will bring the following benefits:
1. Improved water security for the local community.
2. Enhanced livelihood and food security through increased agricultural productivity.
3. Conservation of traditional architecture and cultural heritage.
4. Promoting sustainable water management practices and community participation.
5. “Groundwater recharge” Wells help recharge groundwater, maintain water levels.
6. Water security: Wells provide a reliable source of water for drinking, agriculture and livestock, ensuring water security for local communities.
7. Livelihood support: By providing water for irrigation, wells support local agriculture and livestock, contributing to the livelihoods of farmers and herders.
8. Better water quality: Wells provide a natural purification of water, improving water quality and reducing the risk of water-borne diseases.

The **Khambati well** model is basically a Gujarati model, which was prevalent in the Khambat region during the time of Solanki dynasty in the 12th century. Where it was built to increase the underground water source, to reduce the salinity of water. Surface running water is channelized in these wells which pumps 25000 to 50000 liters of water underground per hour. Construction of such wells has increased the ground water level in Ahmedabad and the TDS has come down to less than 700 in places where the TDS was above 1700. These are basically water storage and water table raising well that helps raise water level by allowing seepage into the ground due to its honeycomb design. Khambati wells could be of varying sizes. A typical well of 15 ft diameter and 30 ft depth can hold 25000 litres of water. This water will take about two days to percolate down in sandy soil. The secret lies in its ability to facilitate massive water percolation, that helps recharge aquifers and prevent flooding simultaneously.

In Ahmedabad, the implementation of Khambati Kuva has been remarkable. In one society, the installation of seven Khambati Kuvas brought down the Total Dissolved Solids (TDS) levels in the water from 1,700 to 1,000 in just three monsoons. This impressive improvement not only enhances the quality of drinking water but also suggests a future free from RO filters within a decade. Over the past three years, more than 100 Khambati Kuvas have been constructed across Ahmedabad, with widespread support from both the public and the government.

Geological structure of India where Khambati well can be developed :-

The geological structure of Ahmedabad, India is made up of sedimentary layers, including the Deccan Trap, the Olpad Formation, and the Cambay Shale. The city is located in the western part of the South Cambay basin. Other places in India where such geological structures are found can be used for developing wells. A map of India is attached here in which yellow colour indicates the areas where such sedimentary rocks are found in which water can be easily infiltrated underground.



Potential Area for ground water recharging through Khambati Kua are – Punjab, Haryana, New Delhi, Rajasthan, Gujrat, Uttar Pradesh, Bihar, West Bengal, Assam, Eastern coastal area