

Surangas – An unfamiliar practice in water management

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Introduction

Water, chemically H₂O, a non-renewable natural resource, is one among the most important substances on Earth. Its unique density, high specific heat, adhesion and cohesion, universal solvent abilities make Earth suitable for life. Though 71% of Earth's surface is covered by water, only 0.3% is useable by humans. It is one among the vital natural resources that is over exploited by humans. As the population grew, the need for water also increased. The underground water in wells and ponds were injudiciously exploited. Then they have turned to tube wells, water in deep aquifers are being pumped and used. These circumstances have created a threatening situation for water resources on Earth. Due to its importance, UN has included clean water and sanitation among its 17 Sustainable Development Goals of 1930. One such measure to protect water sources is the conservation of conventional water resources like wells, ponds, rivers etc. One among such conventional practices that existed is the surangas.

'SURANGA/THURANGAM' (tunnel well) is an age old water management practice that exists in the southern parts of Karnataka state and some parts of the Kasargod district of Kerala. It is a sustainable source of water for household as well as agricultural irrigation purposes. The structure of these tunnels resembles to that of the Qantas that existed in Iran and Persia. They are economically feasible than the vertical wells and bore wells, which need heavy capital and labour.

These are horizontal wells constructed on the slopes of the hills, where the water table could be reached horizontally. The tunnel has a height of about 1.8 to 2m, width 0.5 to 1m, and the length depends on the water table from 10 m to a maximum of 50m. Since major portion of water that is obtained is contributed by the water table and by the percolating water, the water is

extremely pure. So we could rely on it throughout the year. But in certain places it gets dried up by the end of the summer due to the climatic factors.



The construction of these wells are done by the laborers in the villages who are experienced and skilled in detection of underground water flow. The detection is done by examining the slope and elevation, growth of some hydrophilic plants like *Vateria indica* (dhoopada mara), *Ficus virens* (basari mara) and *Macraga indica* (uppalige mara), termite mounts and texture of soil. Once the water is obtained, the soil is dug till the water is obtained. This process is mainly carried out in the summer season. While digging, the elevation is kept towards inside so that the water could flow through it. If there are chances of collapse inside, supports are given. Outside the tunnel, a collecting container or a pond is built so as to collect the running water from tunnel. The collected water in the vessel is taken for the household uses. In case of irrigation, the suranga is made at a higher height than that of the field. The water is collected in large ponds and this water is carried to fields through pipes. This practice does not require pumps since the water is at higher potential difference than the field.

The main advantages of this practice are

- It does not require power since there is no use of water pump to carry water to the surface.
- The construction is cheap and requires less labour as compared to that of wells.
- In the hilly areas, where the water scarcity is a major problem, the surangas would be a helping hand in solving their problem.
- Maintenance costs of surangas are less.

- It is a sustainable source of water.

Drawbacks of this practice are

- It may lead to the wastage of water. The flow of water continues till the underground water available stops. If the water level in the storage pond is not properly maintained, it can leads to wastage of water. A measure introduced to prevent this loss is the construction of a semi wall and a valve in the mouth of the tunnel so as to control flow of water to pond.
- They may get dried up earlier.
- It cannot be relied for large area irrigation.
- There are chances of collapsing of tunnel.
- Water may not be available throughout the year.

As the need of water increased, new technologies has been emerged with time for managing the water scarcity. But the same technology has led to the decline of many conventional sources. The presence of tube wells is almost everywhere in our locality. Tube wells have led to the deterioration of ground water available in water table which dried up many of surangas and wells. The consumption of water has also risen drastically. The problems associated with tube wells may not be felt today, but surely in the future. The best way to prevent this catastrophic situation in future is to discourage the tube well systems and to encourage the conventional sources. While comparing the quality of water obtained by these methods, the water from surangas and wells are extremely pure and good for health, whereas in tube wells the water may have the concentration of toxic substances like lead and arsenic, which causes health hazards. Due to the fact that the water quantity is limited, the need to protect the sustainable and conventional sources is getting importance in the modern era.