Indigenous water management knowledge: From traditional to modern technology

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Extended Abstract

Indigenous knowledge is the accumulated experience of local communities indigenous to a particular area and conditions. It is unique to a society and has ever been a solid basis for its decision-making. It constitutes the major component of the social capital of the poor and often the only asset they control. Since the poor are very familiar with indigenous knowledge, building on it can be particularly effective in reaching the poor and efficiently improving source of management of their resources. Although indigenous knowledge is a continuous source of innovative ideas, which are developed into technologies and practices, these may not be suitable under all conditions.

The dry areas are very rich in traditional water management systems. Indigenous knowledge must have been behind all these successes. Especially where water is scarce, sustainable technical and socioeconomic solutions require the utilization of traditional knowledge to develop new practices or improve the efficiency of existing ones.

For example, the use of ceramic pots buried in the soil to provide continuous slow flow of water to the root zone of trees has been an age-old practice followed by desert communities. In the modern agriculture it is not practical for commercial exploitation.
However through application of new technologies developments, the knowledge has been exploited to produce underground irrigation systems using synthetic material that have permitted growing date palms and other crops in the desert areas with excellent water-use efficiency. Similarly, it was an old practice by people living in dry areas to use concave rocks to capture water from dew condensation and let it get released in drops to the trees. This knowledge has been now exploited to develop drip irrigation system using plastic pipes and various kinds of drip nozzles to release water slowly to the plants.

Another example of using the traditional knowledge in modern commercial agriculture is the concept of land leveling for efficient water use. Farmers have used submerged land leveling for rice production for ages, where the farmer guides the oxen driving the plank for land leveling. In the modern farming the same is achieved by tractors equipped with laser devise for guiding land leveling.

Use of gravitational head for bringing water from aquifers to the surface of irrigated lands was a traditional knowledge used extensively by farmers in West Asia in the form of canat system, which permitted the water to become available at long distances with little loss through evaporation. Some of these canats are still in use in the Middle East. The modern technology has made use of this knowledge of the need for energy to bring water from aquifer to surface by using various kinds of pumps, operated using fuel or other source of energy.

In the dry areas, it was a traditional knowledge that concentrating rain water in small areas could make it more useful for agriculture. As a result they devised methods of water harvesting in the form of cisterns, contour ridges and bunds, and used their common sense in assessing site for water harvesting. Modern scientific developments have permitted improvement in efficiency of water harvesting through increase in the catchment efficiency, increasing the capacity of cisterns to store water, and reducing the cost of making the cisterns. Practices such as making contour ridges with laser guided tractors, developing various kinds of micro-and macro-catchments using appropriate equipment, and using remotely sensed data and GIS in identifying catchment

areas have enhanced the efficacy of water harvesting.

These are some examples of successful traditional and modern management technologies and practices with proper linkage to the source of indigenous knowledge. It shows tat traditional technologies and practices are not necessarily suitable or are not the most efficient in the modern times but that indigenous knowledge can always be utilized to generate modern technologies suitable fir the present conditions. It is important to continue documenting and utilizing indigenous knowledge for developing modern solutions to the water management problems that also benefit from the current advancements in science and technology.