

Possible solutions to drinking water crisis

Humans cannot survive without water. We can survive without food for a couple of weeks, but water is the most essential ingredient of life-- just like oxygen and we cannot survive for more than a few days without it.

All our activities have water embedded in them. Whether agriculture, industry or anything else, water is an important part of all products and processes. [Water covers about 71% of earth's surface.](#)

I feel, adequate supply of good quality water to rural areas and poor regions of the world is a much bigger challenge than even energy availability. This is an area where engineers and technologists can play an important role and thus there is a big scope for infrastructure development in water-related issues.

With the coming of the Green Revolution to India in the early 1960s there has been an extensive use of water, resulting in shortages in some parts of the country. [India has the highest rate of ground water usage of any country](#) in the world. Not only is there a water shortage, but lack of clean potable water results in millions of deaths every year due to diarrhea and other diseases. This is despite the fact that there is enough rainfall. Every year India receives ~ 4000 billion cubic meters of rainfall, whereas the present yearly water consumption is only [650 billion cubic meters, or 16% of the total rainfall.](#) Theoretically we have enough clean water, but the rainfall is not evenly distributed over India and it comes in short spells, thereby pointing to the need for rainwater harvesting and storage programs.

The issue of rainwater harvesting and its supply to the communities in rural areas raises a question of who will own the water bodies. This is a touchy issue that quite a few developing countries are grappling with. I feel there is a need for the local governments to develop policies so that rural water

utilities can be set up by private players to harvest the rainwater, store and clean it, and then supply this water to a village throughout the year. These water utilities may also be able to buy water from the government through the existing canal system thus ensuring year round water availability even when the rains fail.

Presently, most of the water utilities in India are owned by the government and this leads to corruption in supply of water and its very inefficient usage. [In 2003, the Government of India passed a revolutionary electricity act](#) allowing for the first time the private players to produce, sell and distribute electricity anywhere in the country. This act has allowed power producers to break free from the clutches of inefficient and corrupt government power utilities. A similar water act may help in the efficient supply of water to rural areas.

However, for this program to move forward there is a need for large scale deployment of qualified engineers and technicians who are trained in rainwater harvesting and other water-related technologies. Rainwater harvesting technology and management should be a compulsory minor in all engineering and agricultural universities and colleges. This will help not only in agriculture but also in watershed development.

All the fresh water supply on earth is ultimately solar-powered. Solar energy evaporates sea water which after condensation in clouds comes down as rain.

Thus mankind has developed technologies which duplicate this process of converting sea water into fresh water via evaporation and then condensing it for drinking and other uses. Middle Eastern countries which are flush with oil use it for desalinating sea water. In fact [total desalination capacity installed in the world](#) till today can theoretically supply about 13% of world's population with all their drinking water requirements. Presently these desalination units supply water needs of only 1% of world's population.

At our [Institute NARI](#) over a period of time we have developed some innovative [solutions to water crisis](#). They include solar energy powered desalination system; dew condensation for large scale water supply; solar-powered water production from soil for tree plantations, among others.

Near the shoreline the air is very humid and this humid air, if condensed, can produce huge amount of fresh water for the coastal communities residing there. Nature already has evaporated the sea water so that the energy required for evaporation can be saved. I feel that [large scale dew condensation](#) on seashore or on floating dew condensation plants in the ocean can provide all the water requirements of these countries.

Supply of clean drinking water using nature's help like rain water harvesting and dew condensation can provide a sustainable solution to water crisis.

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