

# Turn! Turn! Turn!

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A small *hapa* (farm pond) can extend the growing season in the drylands.

## Reducing impact of water shortage in the era of Climate Change

Ardhendu Shekhar Chatterjee writes about the interventions suitable for different terrains already tried by DRCSC in the villages of West Bengal for reducing the crisis of water.

Shortage of water, particularly water, fit for drinking, cooking, and watering household and farm plants, is in short supply in large parts of our country, particularly in metropolitan cities as well as intensively cultivated lands often adjacent to them. This problem is partly due to mismanagement, partly due to short-term visions, and partly because of Global Climate Change, often because of lifestyle changes, often the unjust distribution of natural resources, compounded by profit-centered rather than survival-centered priorities, and choice of techniques and technologies.

We have adequate, even surplus solar energy and long daylight hours. Most plants and animals here grow fast, microorganisms

multiply rapidly. We have diverse cultures and food habits (though we neglect most of them). On the other hand, our rainfall is poorly distributed. Moisture loss, topsoil destruction rate, and biodiversity loss rate, particularly from forests, grasslands, and wetlands, are in the danger zone, resulting in siltation and pollution of rivers, lakes, as well as other reservoirs (manmade as well as natural) and often this destruction, is driven by wrong/misguided choice of cropping & farming system, afforestation species & techniques (as well as inequitable ownership rights) and also inadequate and often outdated data use.

Our development organization, DRCSC, has been working in different eco-regions of West Bengal, with marginal and

small farmers for more than four decades to promote sustainable agriculture and natural resource management through building up low external input cropping and farming systems (mostly based on traditional crops, animals, trees, etc.), revolving credit funds, community-based seed banks & grain stores, etc. [For further information, visit our website at [www.drcsc.org](http://www.drcsc.org) where you find more details of regional, national, and international private & public organizations collaborating with us.]

Here, in brief, we narrate some of our initiatives, directly related to water and its multiple uses:

i) At the household level we try to harvest rainwater and use it to grow nutritious vegetables,

fruits, fodders, etc. as well as use it for mudfish rearing, azolla farming, liquid manure making, etc.

ii) We promote various subsoil and drip irrigation systems using locally available mud pots (and sometimes glass or plastic bottles, bamboo pieces, etc.

iii) We promote small-scale animal/bird/fish rearing, mostly based on local housing & feeding materials. These need much less water and tolerate higher temperatures and supply raw materials for raising the organic matter percentage of garden & farm topsoil, which allows them to increase the absorption capacity and drainage pores in the topsoil.

iv) We promote mainly drought-tolerant species of crops/vegetables that also need little protection from pests and diseases. Amaranth leaves, leaves of sweet potato, ivy gourd, winged bean leaves, and talinum leaves are some examples. These grow for a long time and combat vitamin A & C deficiencies etc.

v) In & around the garden, we encourage and support the planting of trees & shrubs, the leaves of which can be used as food. Drumstick, Sesbania sp., Star gooseberry, and Curry leaf are a few examples.

vi) In the middle upland farm level, we encourage digging of a small farm pond in the lowest corner of the farm and often combine it with a climbing frame with bean or gourd family vine plant





A floating vegetable garden in a backyard pond in Ramganga village under Pathar Pratima block of South 24 Parganas

to reduce evaporation loss (the labour cost is often subsidized by local govt. or MGNREGA schemes implemented through them).

vii) On the bunds of such farms often Roselle, Kenaf, and Pigeon Pea plants are planted which add food, fuel, fibre, etc. to the family basket. Some farmers prefer to plant tall fodder grasses.

viii) At the Group/Community Level where large check dams or wetlands/ponds are available surrounded by a large number of small farmers, we organize a step pond digging or deepening, often with MGNREGA or other development funds, and during rainy season grow climbing

plants around the pond to reduce water loss and produce additional food.

ix) In surrounding farms, we encourage line intercropping of drought-tolerant grains/pulses and oilseeds, fertilized by natural minerals and bio-organic manures & crop residues and, where available, green leaf manures, green manures and encourage the application of micro-biological fertilizers and pest control agents & botanical pest control agents.

x) In community or group-owned barren & degraded lands/grasslands, we plant deep-rooted & drought-tolerant fruit trees such as ber, custard

apple, hog apple, etc. combined with nitrogen-fixing multipurpose trees, such as babool, subabul, cassia Spc. etc. and spread seeds of grasses & forage legumes through seed balls.

xi) In the case of large tracts of degraded lands on the upper part of a sloping land, we have assisted many user groups to form a watershed-level group and approach local govt. authorities to bund & construct check dams and plant multiple-use long and medicinal term trees such as neem, karanj, kend, mango, siris, tamarind & other trees under a long-term agreement on usufruct rights. In the lower part of the watershed, we

encourage the planting of mainly low-water demanding crops around improved water bodies using mainly surface water irrigation.

xii) In saline waterlogged soils, we have tried rice-fish-duck integrated farming, floating vegetable gardens in backyard ponds, etc. as well as home and school gardens with rooftop collection as the rainfall is high but irregular and the soil is more dense with limited pore space; *Acacia nilotica*, *Pongamia glabra*, *Thespesia populnea*, *Lannea coromandelica*, etc. grow much better in these lands.

Thus the choice of soil and microclimate-adapted plants, raising local seedling nurseries of trees and shrubs, raising small-scale animals/birds/fish, etc., promoting roof-water collection systems, recycling gray water, use of nutritious grasses & weeds, promotion of nutritious multipurpose vegetables improving organic matter percentage in topsoil, reducing the use of persistent organic pollutants, reuse of gray water, storing rainwater, etc. all can contribute to improving the water shortage crisis at household & village levels.

## Housewife becomes the breadearner for the family

**Bhasapara, Basanti, South 24 Pgs. :** Haran Halder was a skilled thatcher. When his first wife died, he married Renu and had two sons by her.

They used hybrid seeds and chemical inputs to cultivate vegetables in a small patch of homestead land and paddy in a plot of agricultural land. Over the last few years, the family faced severe cyclonic storms, waterlogging, saline water floods due to river water intrusion, heavy rains, etc.

The cultivable land had become so saline that vegetable cultivation was difficult and paddy production had also become very low. Still, they had to stay back in this place and strive to cultivate their homestead land and the paddy field.

In 2011, through the initiative of DRCSC, Renu got initiated into sustainable agriculture techniques and pest-repellent methods using locally available materials. The organization supported her with com-

post, vermicompost, which she applied in the garden. Renu also collected farm yard manure and put it in the soil before planting seeds. DRCSC also supported her with indigenous seeds. In the paddy field, they applied wood ash and pond slime to remove the salinity in the soil.

In the meantime, Renu and Haran changed the shape of the land. They excavated a pond and drains all around the plot. They used the excavated soil to raise



the land in between the drains and the pond for growing vegetables. Vegetables are grown on trellis erected over the drains. Fish is reared in the pond and the drains.

Last year she got a profit of Rs.5000/- from the sale of vegetables and Rs.5000/- more from the sale of fish.