

# Oases of productivity

## *A case of Small scale watershed development*

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*Small scale watershed development is a viable way to improve degraded ecosystems, create diverse livelihood opportunities for rural people and build stable ecosystems. Aseema trust demonstrated this on a small area of 14 acres in the tribal villages of Maharashtra.*

Photo: Author



*Rainwater impounded in contour trenches*

The monsoons are up once again and the reports in the newspapers are familiar. Heavy rains are flooding some parts of the country and in other areas the rainfall is less than normal and forebodes lower productivity, crop loss and agricultural distress. This state of affairs need not always be the case. One can harvest the rain water and make sure that it percolates into the soil and replenishes ground water. The experience of Aseema trust in Maharashtra demonstrates this.

Aseema Educational Trust, a development organisation, has been working in parts of Maharashtra district focusing on promoting quality education to children from disadvantaged groups. With the intention of reaching children of tribal communities, it established a primary school in Awalkhed village in Nashik district, which is surrounded by six tribal hamlets. The 14-acre school campus has an open well fulfilling the drinking water needs of the communities around. However, communities faced acute drinking water shortages during summer months, even though the region received an annual average rainfall of 3000 – 3500 mm. It was therefore important to keep the well recharged at all times. Our intention was to conserve the plentiful rain water to sustain water availability for drinking as well as for irrigation purposes. The effort was also to demonstrate water conservation in the hope that the villagers could adopt these practices on their own lands.

The work was initiated in the summer of 2008. The entire plot was surveyed and a comprehensive rain-water harvesting plan was drawn up. This was done by walking around and deciding on appropriate places where run-off rainwater could be harvested. Since the topography is undulating and the hill sides are steep, contour lines were marked and trenches/ bunds were dug along them. The bunding was done starting from the ridge to the valley. This ensured that the rainwater was harvested where it fell, and the run-off, if any, did not acquire erosive force to wash the top soil away. In the valleys between the hillocks, a series of check

dams were constructed to slow down the run-off water and give it a chance to percolate into the ground.

All the basic soil and moisture conservation measures (trenches and bunds and small gully plugs) were completed before the monsoon of 2008. Some portion of the work was done with the help of the villagers from the surrounding villages. Since the work was done in the summer months when their fields were fallow (as agriculture in the area is rain dependent) they got employment locally and prevented out migration.

As of now the technologies are slowly being taken up. Along with the basic work of soil and moisture conservation, bund stabilisation work - vegetative stabilisation has also taken place. Small scale plantation with nitrogen fixing species has also been done.

The crop growing has not started yet, as the Aseema Trust is busy in getting the school building completed and conducting classes for tribal children in temporary structures. Once the school building is completed, the work on creating a kitchen garden will be initiated. Also an area of about 3000 square meters has been identified where cereals (coarse millets) and pulses (red gram, green gram, black gram) can be grown.

### **Emerging positive results**

The impact of the soil and moisture conservation work is already becoming evident as one can see water collecting in the trenches. If the trenches were not there this water would have just flowed off and been lost. Similarly, the water in the cascading gully plugs also demonstrates that small, low cost structures appropriately located, can harvest run-off rainwater which would otherwise be lost. In addition to harvesting rain-water which is a very valuable resource, the structures also prevent valuable fertile top-soil from being washed away. The idea is to make the water “walk” not “run”. Holding the water in trenches encourages infiltration of

water and promotes recharge of underground aquifers. Also more moisture in the sub-surface soil regime will promote better growth of vegetation without the need for supplemental irrigation.

The larger check dams are also holding copious amounts of water. Underground stream flows have restarted - this is evident by looking into the well. Clear water flows into the well long after the rains have stopped, thus keeping water in the well at all times.

The fruit species plantation has started on a modest scale - jamun, mango, guava, sitaphal have already been planted. Lot more needs to be done - this will be taken up after the construction is complete. Similarly, greater numbers of multi-purpose and nitrogen fixing tree species will be incorporated into the ecosystem - these will provide for fodder, fertilizer (green manuring from nitrogen fixers/ leaf fall), fuel-wood, timber and fibre. As the ecosystem evolves, there will be birds, reptiles, insects, which will increase biodiversity and improve the stability and resilience of the ecosystem.

**Rainwater harvesting is easily accomplished if one follows the ABC's of watershed management which are:**

**A: Agricultural Practices**

- ploughing across the slope, to help rainwater infiltrate into the soil
- planting a diversity of crops and creating layers in the field to intercept rainfall and reduce the impact of rain on the ground
- Mulching to cover the soil and prevent evaporation
- Organic practices like composting, to improve the tilth of the soil
- Growing crops appropriate to the agro-ecological zone
- Planting more trees in agricultural ecosystems to serve multiple functions – windbreaks, nitrogen fixing, fuel wood, habitat for birds and reptiles, timber, etc.

**B: Bunding**

- Trenches/bunds to harvest rainwater and conserve top soil
- Contour/field bunds even on seemingly flat land to prevent water from running off.

**C: Check Dams**

- Made at appropriate places from ridge to valley to ensure that the water “walks” and does not run off from the hill sides.
- Vegetative stabilization is necessary on the upstream side of each check dam so that the pressure of the flowing water does not damage the new construction. Bamboo rhizomes and other grasses are excellent for this.
- Check dams can be constructed entirely from materials available at the site.
- Large check dams with spillways to drain off excess water may be placed at wider ends of large gullies.



Photo: Author

*Digging of trenches along contour lines*

All this has been accomplished in less than two years. As the ecosystem evolves and gets more complex, it will produce a diversity of food, fodder for livestock and serve as a habitat for birds, reptiles and insects.

**Hope for the future**

Small scale watershed development is a viable way to improve degraded ecosystems, create diverse livelihood opportunities for rural people and build stable ecosystems based on the pillars of water, soil and biodiversity. This demonstration disproves the GOI guidelines that a watershed area should be a minimum of 500 hectares to make an impact. At the same time, this initiative which was accomplished with the participation of the local communities will encourage people in the surrounding villages in adopting similar approaches on their lands. Similar work can be accomplished in all the vastly degraded areas of our country. With a little effort we can convert unproductive lands into oases of productivity - a mission for a greener, food and water secure India!

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