

Building Resilience in Rural Landscapes of Rainfed India

Marcella D'Souza

Watershed Organisation Trust & WOTR Centre for Resilience Studies









The WOTR Approach ...

- Agriculture Productivity
- Soil Health Management
- Water Efficient Agriculture
- Agro-meteorology
- Market Linkages



A Watershed is a socio-ecological unit







Ownership & Local Governance for 'Integrated Watershed Development':



- **Inclusive representative bodies** to regenerate and manage their natural resource assets
- Soil and water conservation measures
- Afforestation to bring barren lands under tree and grass cover
- Promote & protect biodiversity as and where applicable
 - Improve degraded soils



Sustainable land management interventions







b. Water Resources Management





Through "Water Stewardship" and Water Governance, rural communities are guided to:



Understand 'water' as an ecosystem and as an ecosystem service



- Establish rules for water management, including equitable water use, water saving
- \checkmark
- Community-based Water Budgeting for domestic use, livestock & wildlife, and crop planning with water use optimization



Undertake aquifer management by a village or a cluster of villages as applicable



c. Adaptive Sustainable Agriculture





Enhance the productivity, profitability and sustainability of farming:

- Improve Soil Health, integrated nutrient and pest management
- Optimum water use and water sharing
- Improved package of practices for improved production
- Locale specific crop weather advisories
 - Promotion of horticulture & household forestry & multilayer farming
- \checkmark
- Market linkage through Farmer Producer Companies



The Transformation of Bhojdari (in 1998)

Bhojdhari - Sangamner Block, Ahmednagar District, Maharashtra

203

Households

1082 Population 1145 ha

Watershed Area

Lies in the rain-shadow belt of Maharashtra, on a drought-prone, rainfed plateau

No river, dam or canal nearby

 \checkmark

- Land is barren, hard, and rainwater simply flows off it during the rains
 - Frequent droughts, acute water shortages and stress in summer,
 - Repeated crop failures, loss of cattle and livestock resulting in large scale distress migration.
 - Extreme weather related events played further havoc worsening losses

The Result...





37% increase in income from agriculture



families grow a 2nd crop



Food shortages reduced by **50%**



The types of crops increased from **3 to 15+**



Surface water storage capacity increased by **87%**

Through water budgeting, **50%**



100% reduction in distress migration



BEMBRIO

Changes in Agriculture Productivity in the Plateau Dryland Villages



Plateau Area- Percentage change in the crop productivity in Drought year 2018-19

as compared to the baseline value



Plateau Area- percentage change in the crop productivity in <u>Normal rainfall year 2017-18</u> as compared to the baseline value



Ref: Economics of Climate Change Adaptation in Ahmednagar District, Maharashtra https://wotr.org/publication/economics-cca-ahmednagar-district-maharashtra/

Net Present Value from Agriculture & Water for Domestic Use



Benefits not included are from (a) livestock rearing, (b) fisheries, (c) forest and others



The Urban – Rural Linkage





Urban

Water: Piped for domestic & also luxury needs

Waste water (if not treated) with chemical & bio waste flows back to rivers

 Food: Grain & fresh produce obtained from super markets and urban vendors; processed foods from stores

Food wastage into the bio waste heaps and back into the water ways

• Bio Fuels: for the ever increasing number of vehicles

Rural

• Water: Dams located at a distance in rural areas

Water from rivers used for human and livestock consumption and agriculture & pisci-culture

• Food: Urban choices of grain and food produce drives cultivation, not local agrobiodiversity

Pressure to cultivate in excess, pressure on land and water

• **Bio-fuels:** Increasing pressure on land for cultivation of bio-fuel crops besides food and fiber crops; changes in land use land cover

WOTR's Footprint









Thank You!

www.wotr.org











Landscape Management for Building Resilience

Main problems of the region:

- Poverty
- Hunger & food insecurity
- Degraded land due to soil erosion
- Water scarcity
- Climate events & climate change (drought & drought like situation, high intensity short duration rainfall; unseasonal rainfall, long summers and higher winter temperature...)
- Distress Migration

Response to the problems:

- Restoration of the degraded lands (Ecosystem restoration) for soil and water conservation
- Water use management
- Adaptive sustainable agriculture
- Create local livelihood opportunities
- Community empowerment to regenerate and maintain their landscape
- A cluster of villages come together to manage their restored landscape through Partnerships

Darewadi 1996







Darewadi 2009

Rejuvenates & Diversifies Natural Resources

Revitalizes Local Economies

Strengthens Relationships

Community Management of their development process







FarmPrecise – Farm friendly Agro-met advisories







A mobile application which generates dynamic weather-based, crop management advisories tailored to crop and farm specific conditions. It is participatory - the farmer is co-creator of the advisory It generates weather responsive, crop-and-farm specific farming advisories It is dynamic – it responds to likely changes in weather conditions and provides tailored advisories accordingly.

It provides integrated and holistic solutions and emphasizes **environmentally-friendly** practices.



9+ features for Indian Farmers

> ^{GET IT ON} Google P



25 Crops



4 States

- Maharashtra
- MP
- Tolan
- Telangana
- Odisha



5 languages

- English
- Hindi
- Telugu
- Marathi
- Odia