Collective Visioning for Groundwater Futures through Participatory Modelling

Devnadi River Basin

Shuchi Vora

Global Resilience Partnership
Unpacking “Drought Risks”

- Inequity
- Uncertain Rainfall
- Degrading Ecosystems

Fragile Social-Ecological Systems
INCREASED DROUGHT RISK IN SOUTH ASIA DUE TO CLIMATE CHANGE

1/3rd districts faced more than 4 droughts between 2006 and 2016

57% increase in Drought Prone Areas since 1997

70% of India classified as semi-arid, arid or dry sub-humid – Dryland ecosystems
SMALL LANDHOLDING, LARGE DEPENDENT POPULATIONS

THE GROUNDWATER PARADOX OF INDIA:
“REDUCING INDIVIDUAL ACCESS – INCREASING DEPENDENCE – DEPLETING RESOURCE”

Source: Bhamra, 2015
Drought Mitigation and Externalities

Source: Vora, Negandhi and Mandal (2020)

71% of Maharashtra's Talukas saw more than 3 meters of groundwater depletion in the last 5 years.*

*As per the Groundwater Surveys and Development Agency (GSDA) Report in September 2019.
INDIA IS THE LARGEST GROUNDWATER USER IN THE WORLD

AGRICULTURE WITHDRAWALS ARE THE HIGHEST AT 88% (IDFC Foundation, 2013)

60% OF THE DISTRICTS IN INDIA SHOWING EVIDENCE OF EITHER DEPLETION AND/OR CONTAMINATION (Kulkarni et al, 2015)

Source: Shah et al, 2007
Collective Action

HOW DO WE SHIFT THE STATUS QUO?

Source: Vora, Negandhi and Mandal (2020)
THE DEVNADI RIVER BASIN

• 70 km long river

• Forms the source waters of the Godavari, a 1500 km long iconic river of India (also called the Ganga of the South)

• Spring-fed river
COLLECTIVE VISIONING IN THE DEVNADI BASIN
“There is unlimited water for agriculture.”

“We will capture rains by creating more storage capacity. Not a drop will go waste.”
“Agriculture Water Security critical for improving incomes”
SUB-SYSTEM’S ACTUAL BEHAVIOUR

Water Demand for Agriculture
Surface water accessibility
Fodder Demand
Decision-making (Individual/Collective)
Livestock breed
Livestock Decisions
Fodder cultivation
Fodder Demand
Intensification of Practices
Farming Practices
Input Costs
Income/Profits
Agricultural Yield
Water Scarcity
Water for Irrigation
Water Use
Storage Capacity
Agriculture Water Demands
MSP for crops
Water Demand for Agriculture
Crop choice (Dryland/Cash Crops)
Area under Agriculture
Rainfall

“Groundwater is critical for Agriculture and Drinking Water Security”
“Nature is not as important as agriculture.”

“People are different from nature. Only conservation where areas are fenced and devoid of people is successful.”

“Conservation of rivers requires afforestation.”
Groundwater is critical for Ecosystem Integrity and Human Wellbeing in Semi-arid Regions.

Source: Vora, Negandhi and Mandal (2020)
MENTAL MODEL SHIFT ACHIEVED
REFERENCES


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