Intensification strategies for Ethiopian Watersheds: Incentives, Niches and Policy Implication

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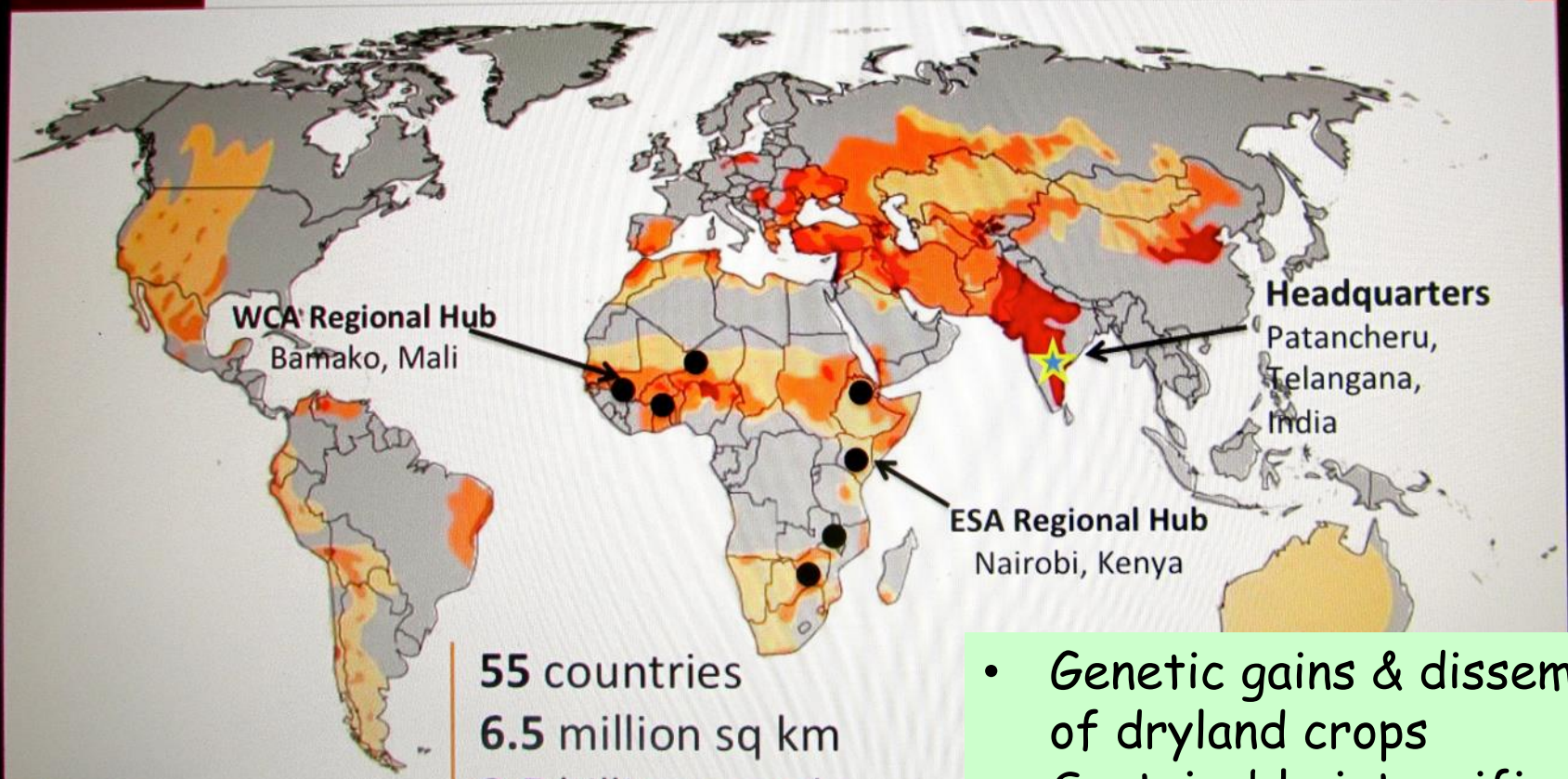
ICRISAT
Science with a human face
International Crops Research Institute for the Semi-Arid Tropics
WOLLO UNIVERSITY
ARARI
CGIAR
RESEARCH PROGRAM ON Water, Land and Ecosystems

ICRISAT Locations
in the Semi-arid Tropics



- Genetic gains & dissemination of dryland crops
- Sustainable intensification
- Climate-resilient strategies
- Agribusiness incubation

Watershed management under changing climates: Different things to different people

For agronomists, it is seen as a means of scaling out technologies, primarily those for soil and water conservation or environmental protection more generally;

For engineers; it is a strategy to protect headwork, weirs, canals from siltation, boulders; A means to increase water quality and quantity for downstream users

For environmentalists; means for enhancing environmental services, improving system productivity emanating and developing CC resilient systems

For social scientists/ Anthropologists

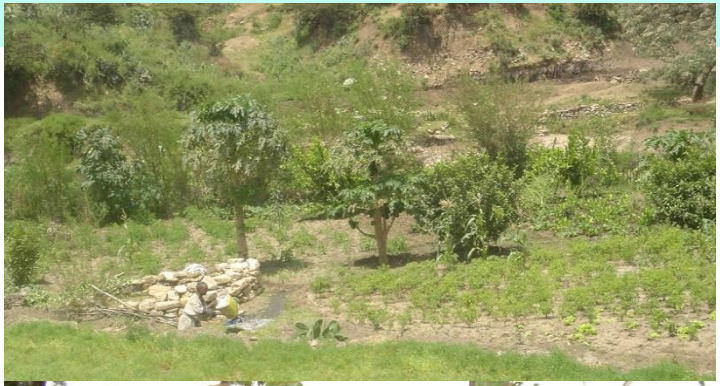
•A way to coordinate cross-boundary cooperation of diverse user groups

• A way to think about NRM issues that cannot be addressed by working with single farmers or plots

• A way to coordinate co-management of common property or public lands

• A way to look at the interface between diverse social and biophysical processes (i.e. water, soil, livestock, crops, pests) on the landscape.

Incentives for managing watershed and roles Of research



✓ Assist local actors to identify marketable enterprises fitting to local conditions (market information, facilitators, processors)

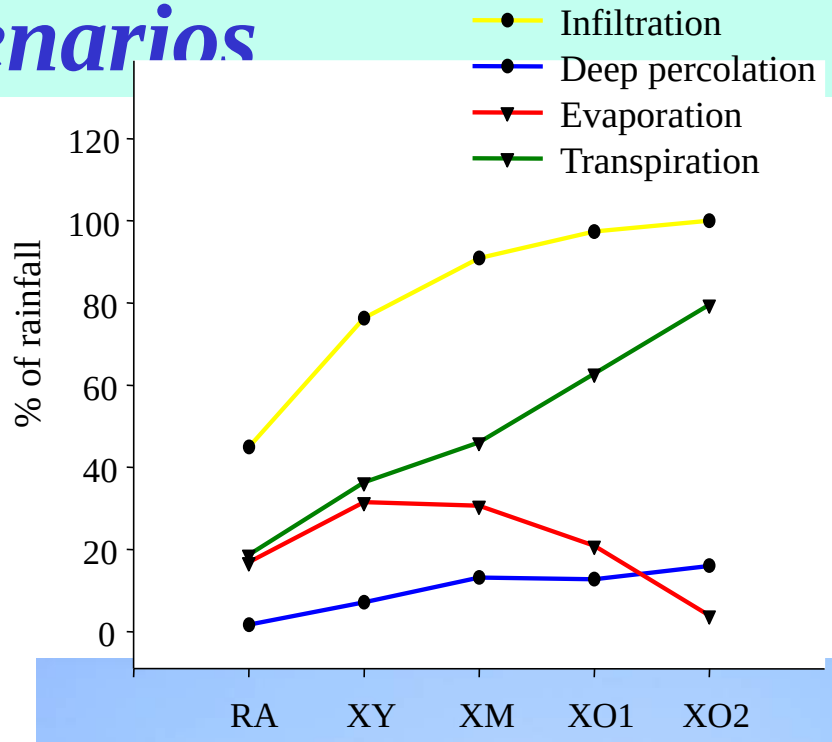
✓Facilitate integration of climate smart options with win-win effects (food, feed, cash, conservation) through policy support

✓Facilitate communities and district officers in identifying niches, what fits best where (guides, tools, methods)

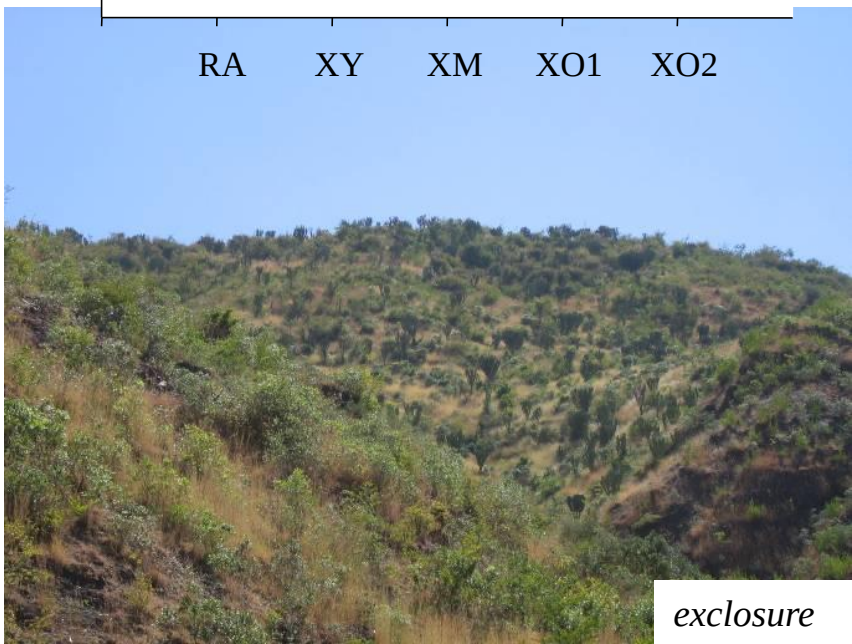
✓Develop policies to combine short term with long term and resilient systems

WSM effect on water flows, Current and future scenarios

- Hay production; cut and carry; high feed quality, woody biomass and fodder trees
- Hay production: 1.2 t DM ha^{-1} upto 3.5 t
- Grazed biomass: 1.6 t DM ha^{-1}



open grazing



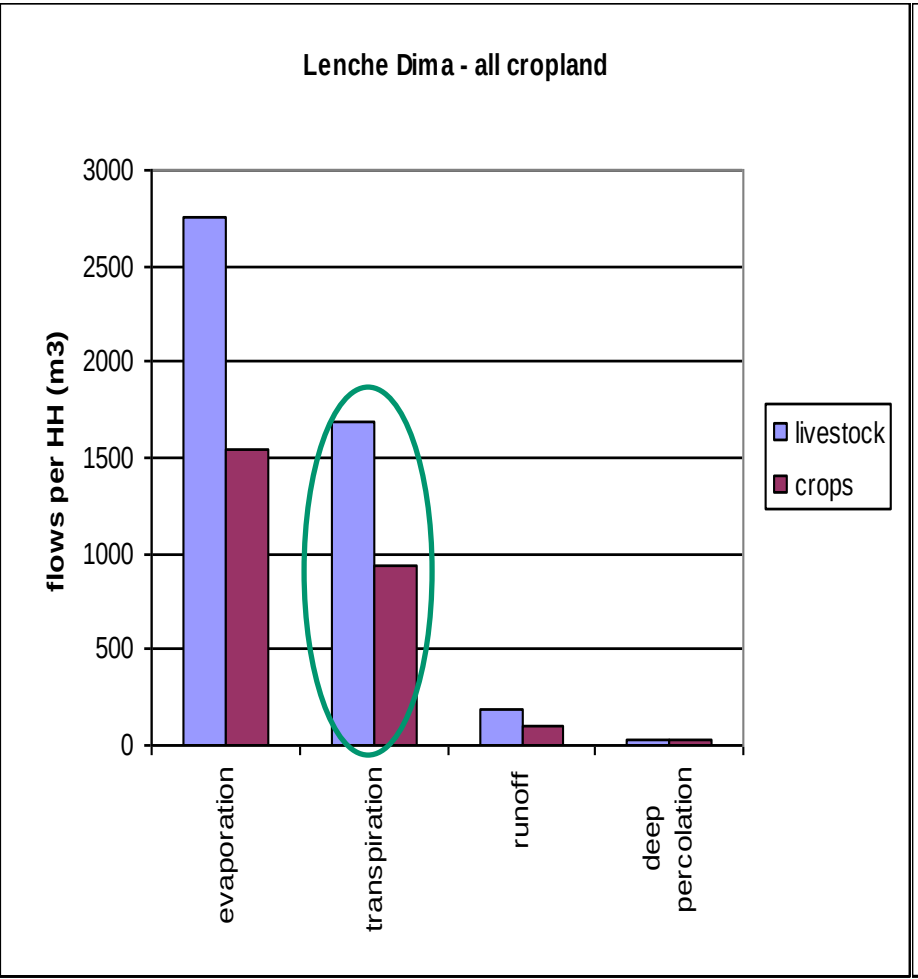
exclosure

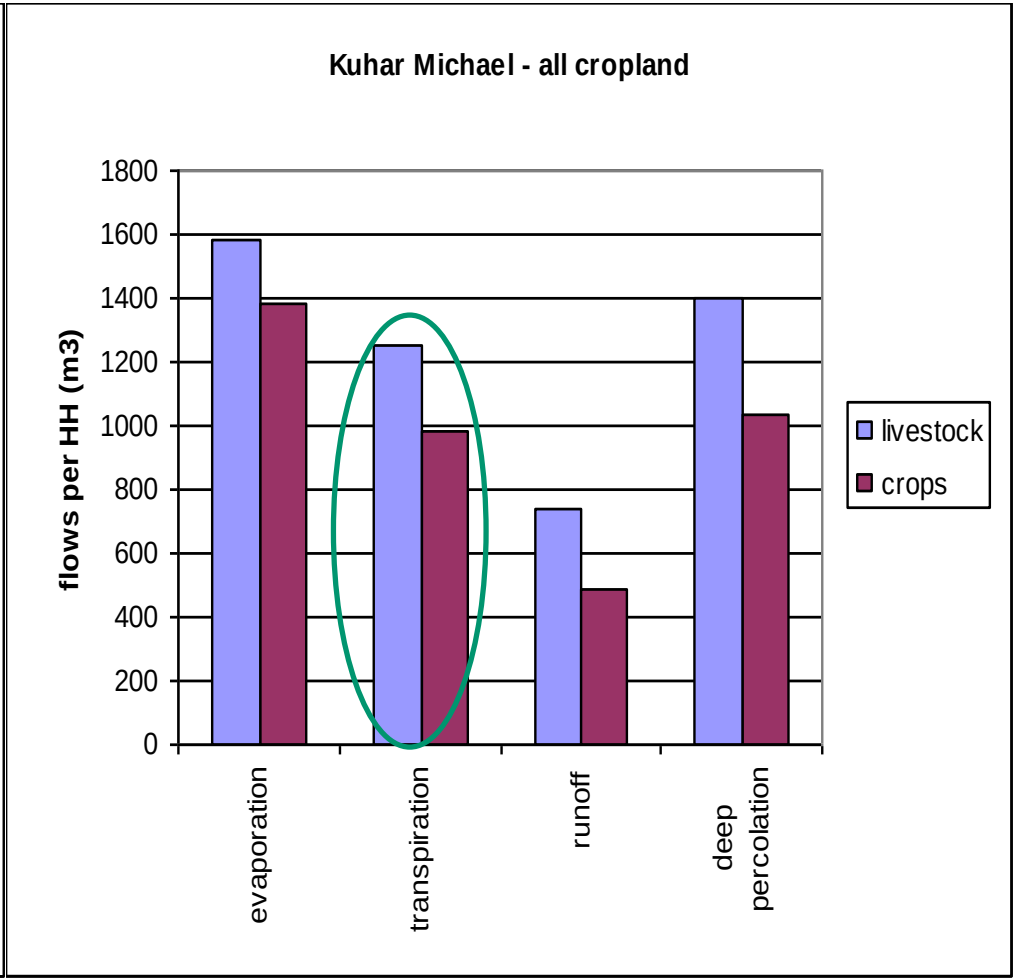
WSM for reducing water loss under changing climates

Canal type	N	Average flow rate (l/s)	Loss (l/s/100m)	% loss per 100m*	% loss/ 100m/30l/s
Main canal	121	43.21[a]	2.58[a]	6.46[a]	4.49[b]
Secondary canal	57	33.03[b]	1.59[b]	4.40[b]	4.00[b]
Field canal	49	2.88[c]	0.39[c]	2.49[c]	25.94[a]

WSM for converting water to productive use

High unproductive water losses = Low system productivity;





Case Study 1: AZGO Watershed

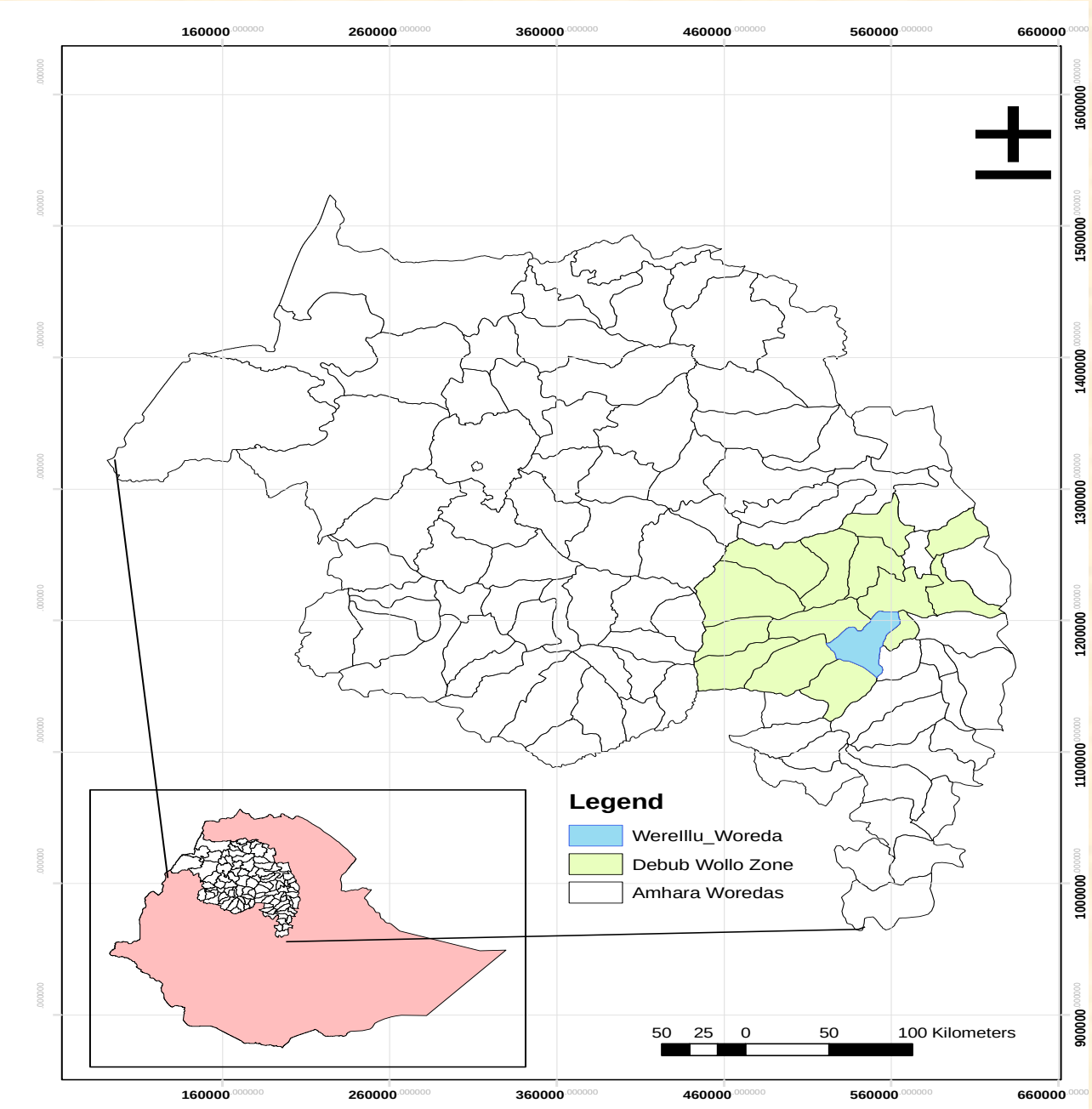
Market Incentives

E.g. Azgo watershed; transformed landscape

Benefits
Average HH net cash income 5400 USD

- Community response to 1984 Ethiopian famine
- Market opportunities; fruits, Chat
- Self developed water harvesting model (Tree shade, careful management of plastics)
- Individually managed but collective marketing
- Community level quality control of products
- Unlike Abrha Atsbeha, less known, little outside support but successful

Case study 2: Yewol Watershed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Werelllu_Woreda
Debub Wollo Zone
Amhara Woredas
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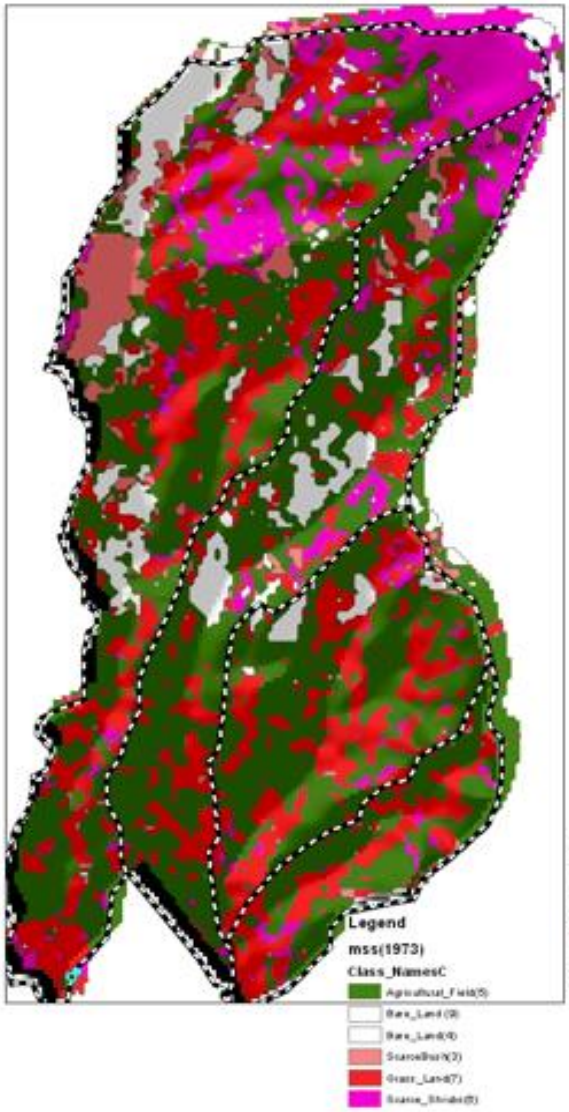
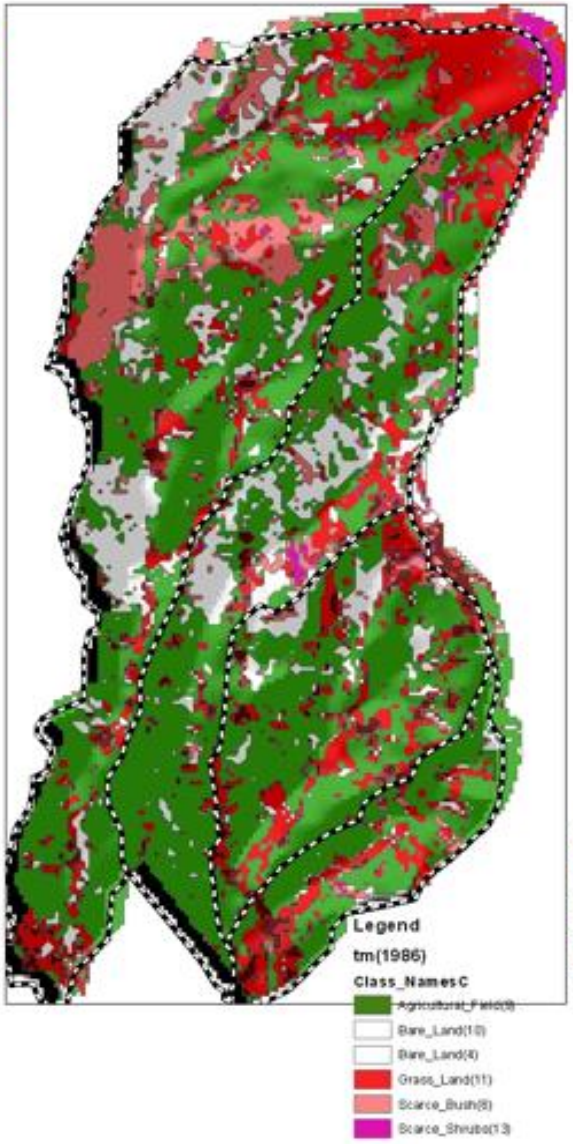
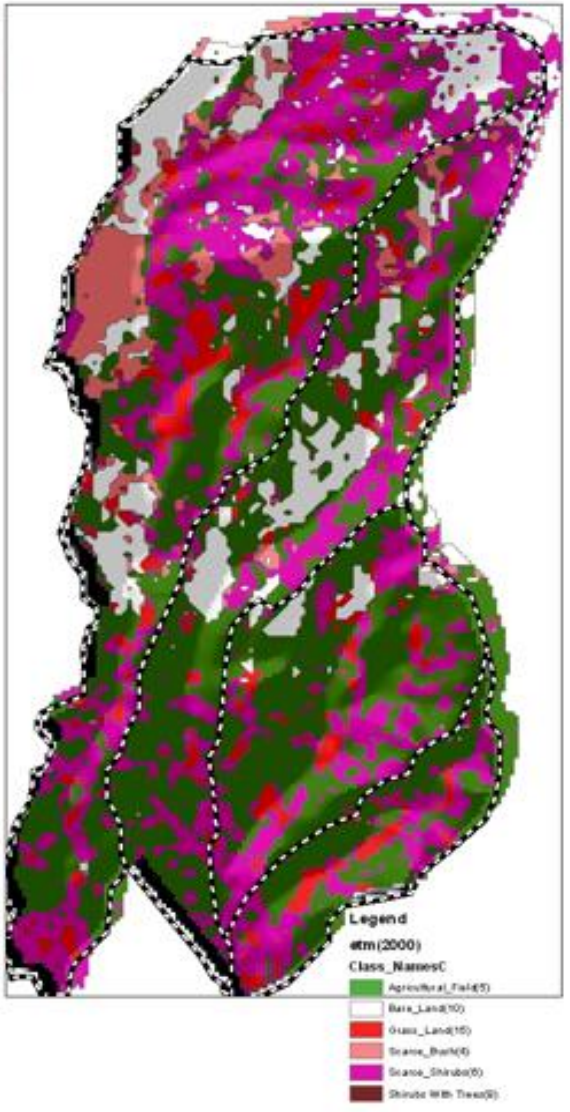
Degraded Landscapes, Extreme Changes (landuse, rainfall and temperature events)



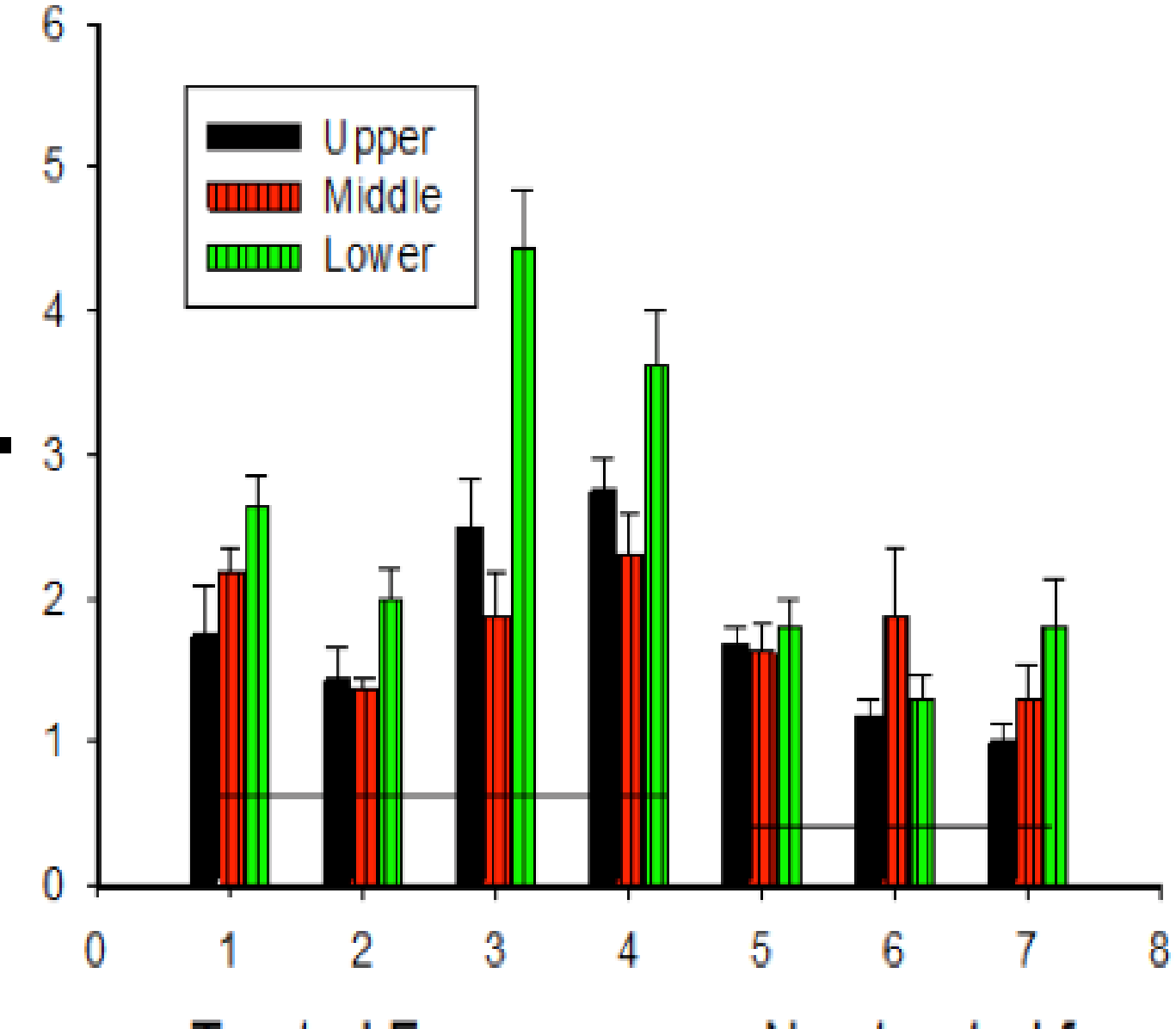




Management Zonation within the Watershed

Capturing and productive use of water

Effect on livestock and crop productivity..

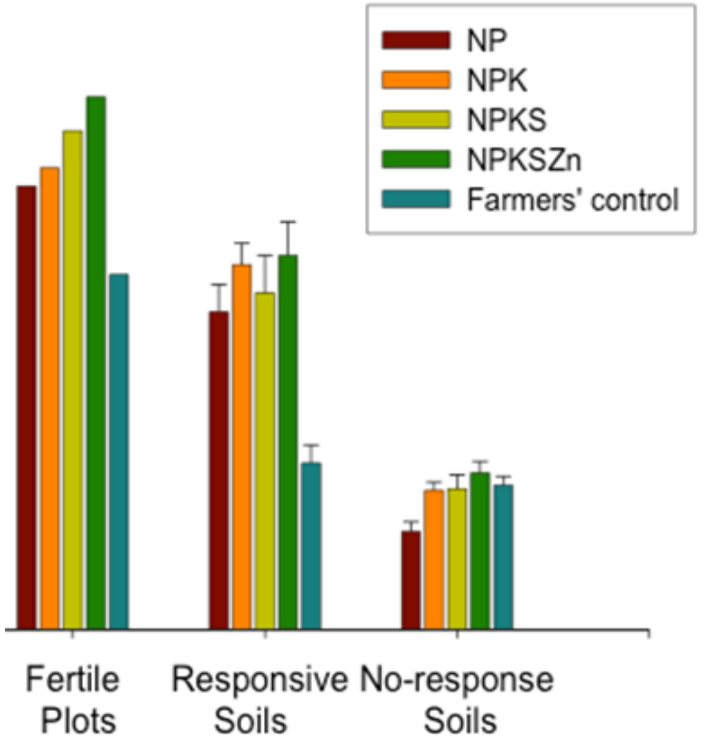


Nutrient Zonation

Footslope

Midslope

Hillslope



Emerging springs and other sources

Home gardens and high value crops

In Foot slopes, access to irrigation increased from 240 ha to 970 ha

Foot slope intensification (e.g. Seed systems)

Economic benefits of watersheds

- Almost every farmer has grown at least two improved crop varieties of some sort
- Crop diversity has increased from three to seven crops in 6 years time;
- Crop yield increased by 30% to 200%
- Mountain irrigation for home gardening & high value
- New sheep breeds, ready for sell two months earlier than the locals
- Getting attention by NGOs, Universities, government.
- Woreda has received 1 million birr to continue with the watershed work;
- Dignitaries visiting the watershed…

Implications

- Moving from ‘Reversing degradation’ as a goal to sustainably improving productivity and livelihoods through integrated watershed management

From a negative to a positive goal

- Integration of landscape components to improve production and productivity;
- Move from fixed ‘packages’ towards a menu of possible interventions and let clients “mix and match” & adapt according to their needs
- Link research to stakeholders needs


Thank you !