



ወ.ሃና ከኅድ ማኅበር  
MINISTRY OF WATER AND ENERGY  
የኢትዮጵያ ልኑወ-አዊ ሥርዴራልያዊ ሪፐብሊክ | Federal Democratic Republic of Ethiopia

# Restoring Catchments: Experiences from Ethiopia

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(WLRC)

[www.wlrc-eth.org](http://www.wlrc-eth.org)

Lecture on IWM for Ethiopian IHE Graduates Attending  
Basin Management Planning Post Graduate Courses

November 6, 2025, Virtual



Co-Funded by  
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Ministry of Foreign Affairs of the  
Netherlands

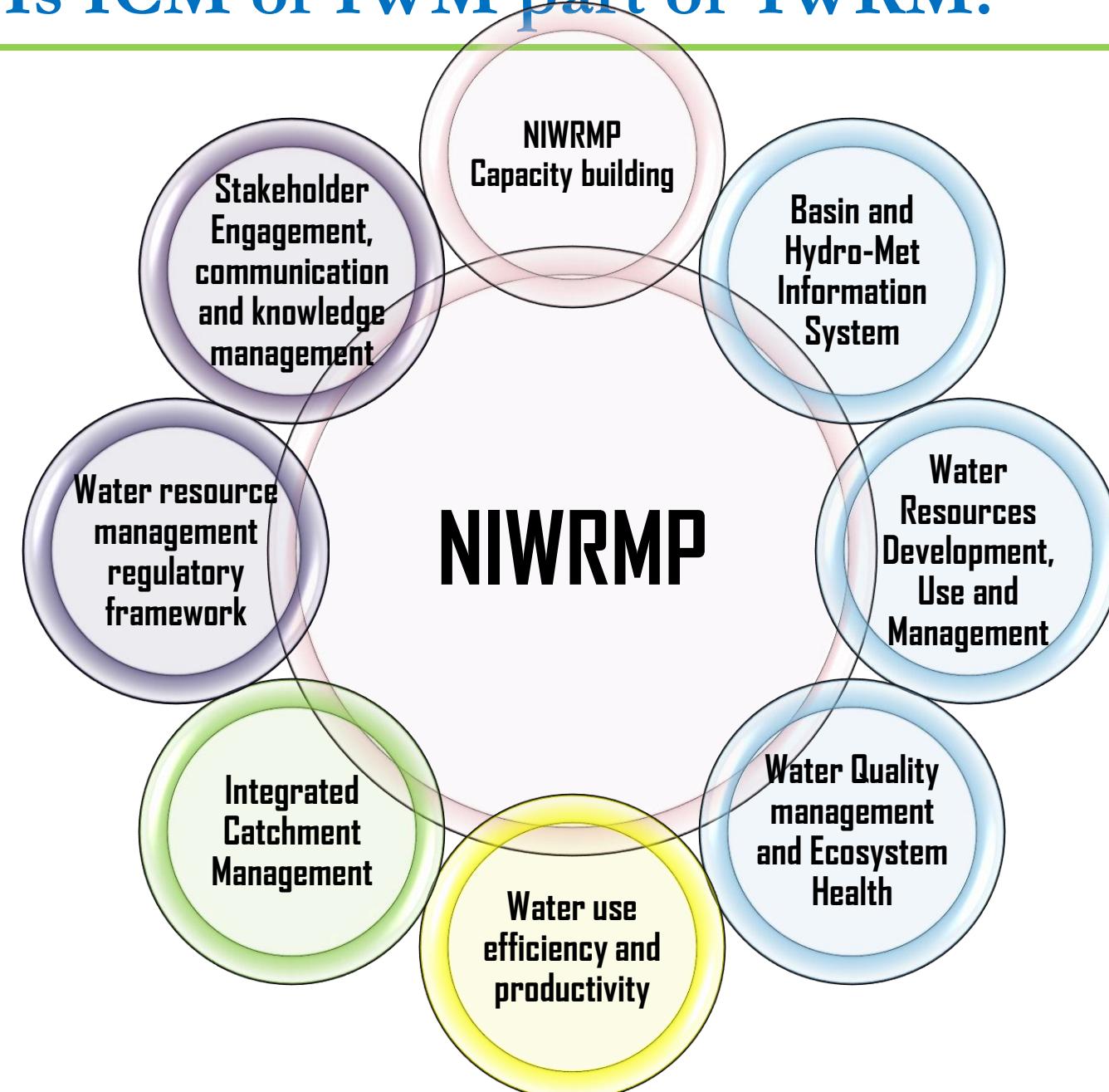
# Content of the Lecture

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1. Introduction – Concepts and Global Contexts
2. Ethiopian NR Contexts and Challenges
3. On-Site and Off-site impacts of poor management of the NRC?
4. Highlights of Efforts and Challenges in Integrated Watershed Management (IWM) in Ethiopia
5. Learning Watersheds as a solution model – Experiences in development and monitoring of impact
6. Tools for SWLRM
7. Monitoring the impact of IWM on WM
8. Concluding Messages
9. Recommendations

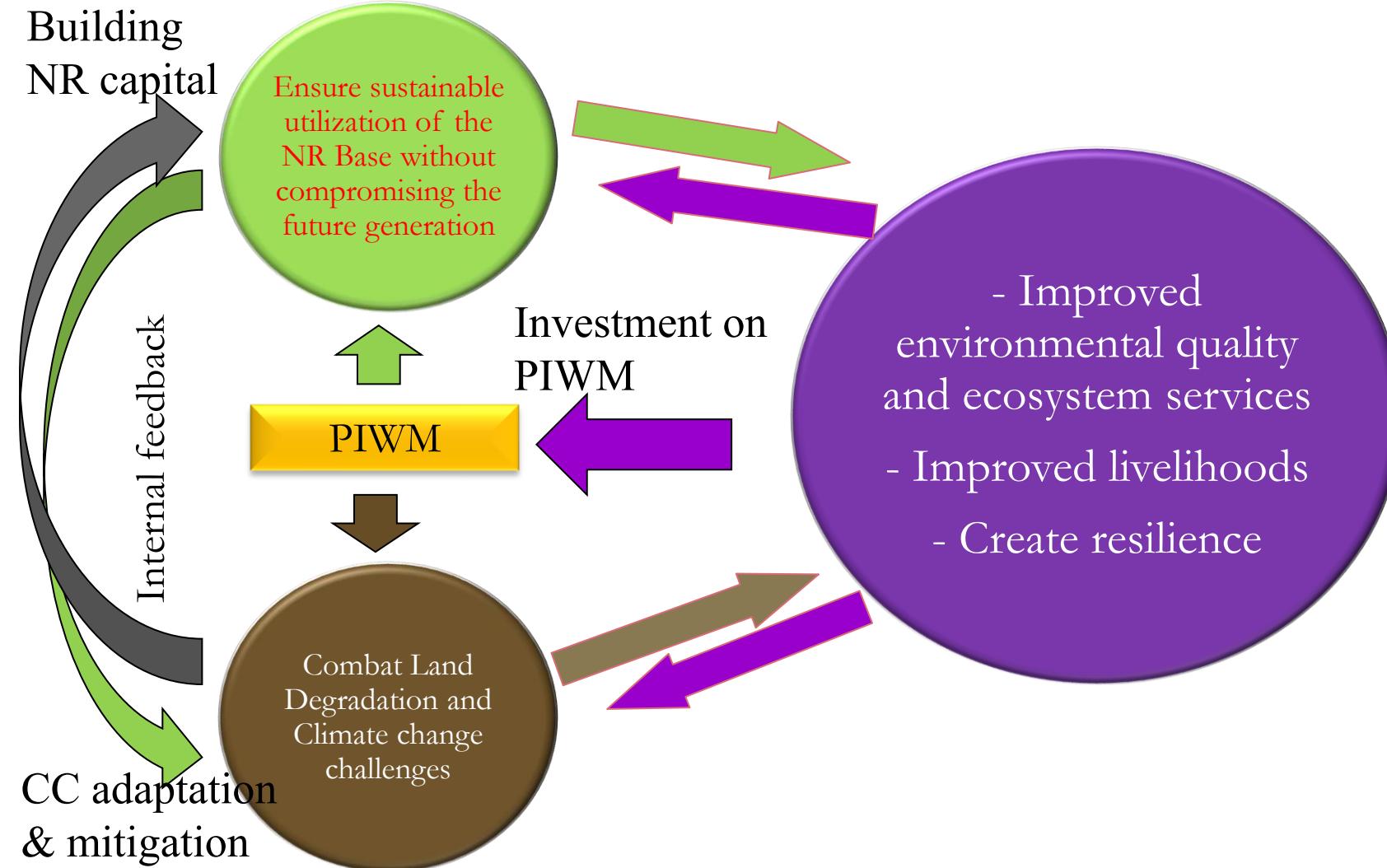
# 1. Introduction - Is ICM or IWM part of IWRM?

- Yes, because water comes from the catchment



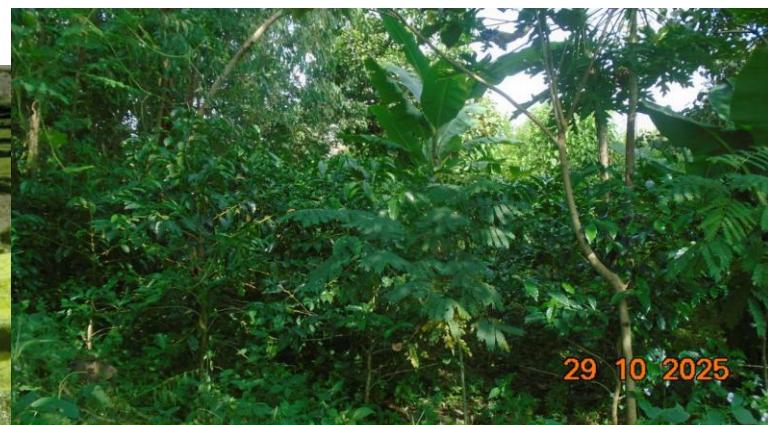
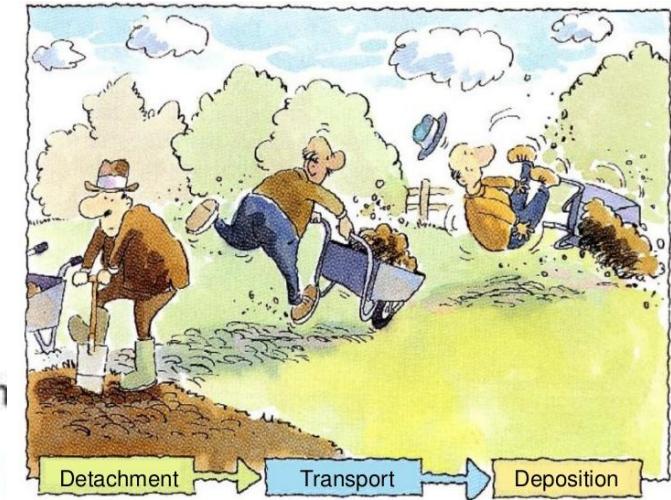
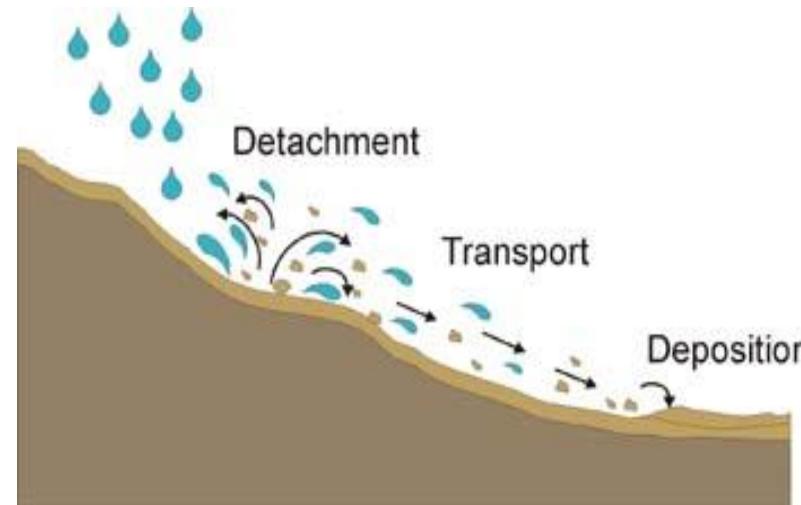
# 1. Introduction ...

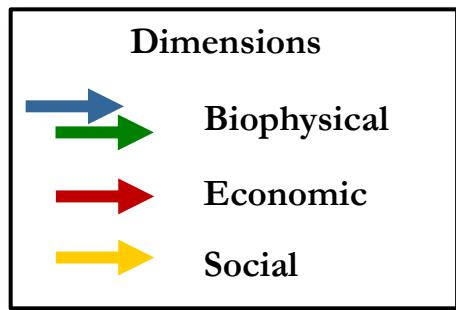
## Why do we do watershed management?



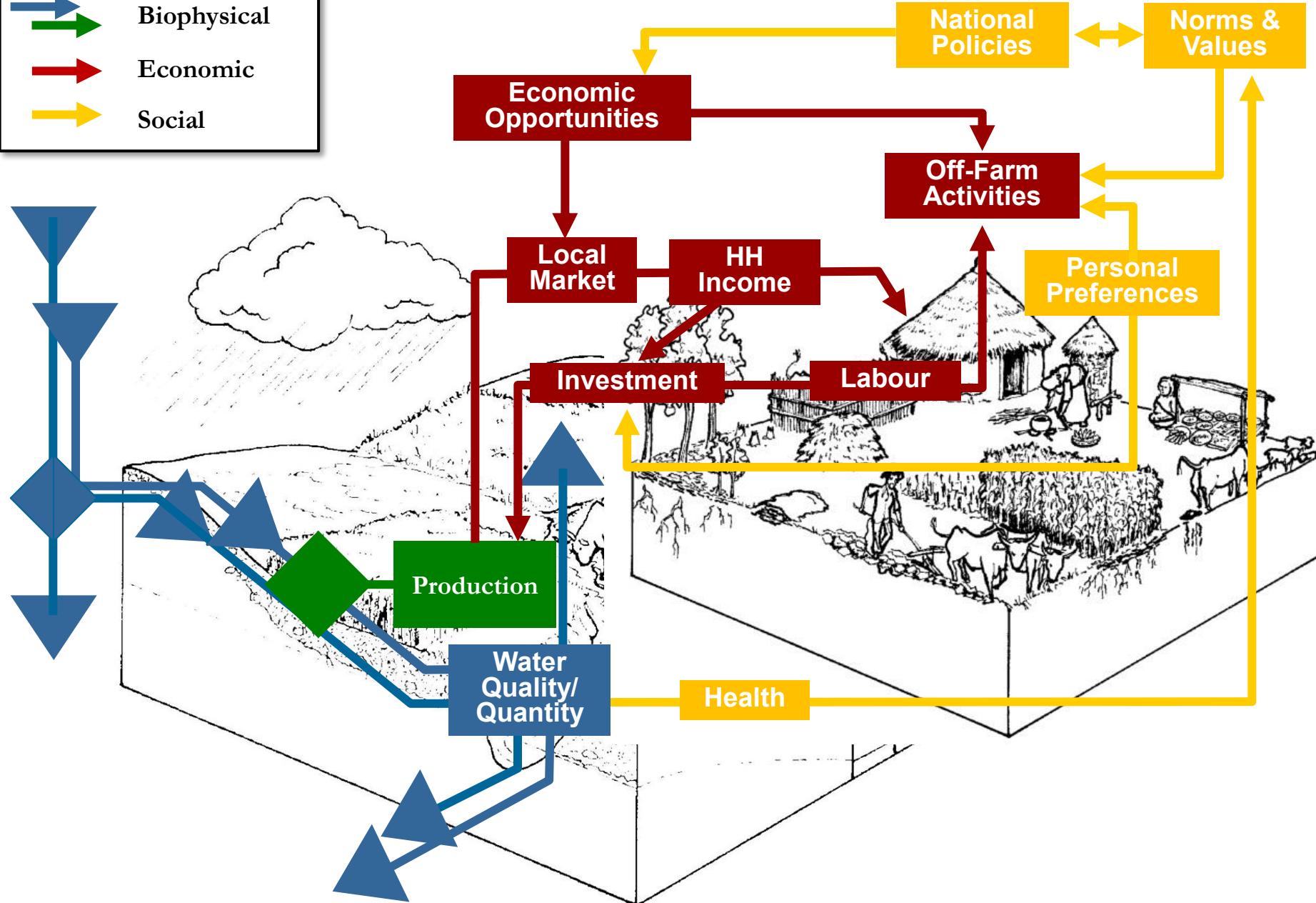
# Introduction .... So what are the must to know aspects?

- Knowledge about Land Degradation
  - Natural
  - Accelerated – Human Induced
  - Causes and Impacts
- Knowledge about Processes of LD
- Knowledge about Measuring LD? How?
- Knowledge about Controlling measures ? Technologies? Approaches?
- Then knowledge how we can make better IWM plans.
- Unless you have better IWM plan – it doesn't matter how much you know about LD or controlling measures!
- Above all knowledge about the biophysical, social and economic aspects of the area or the catchment is a must





# IWM/SLM should fulfil 3 dimensions

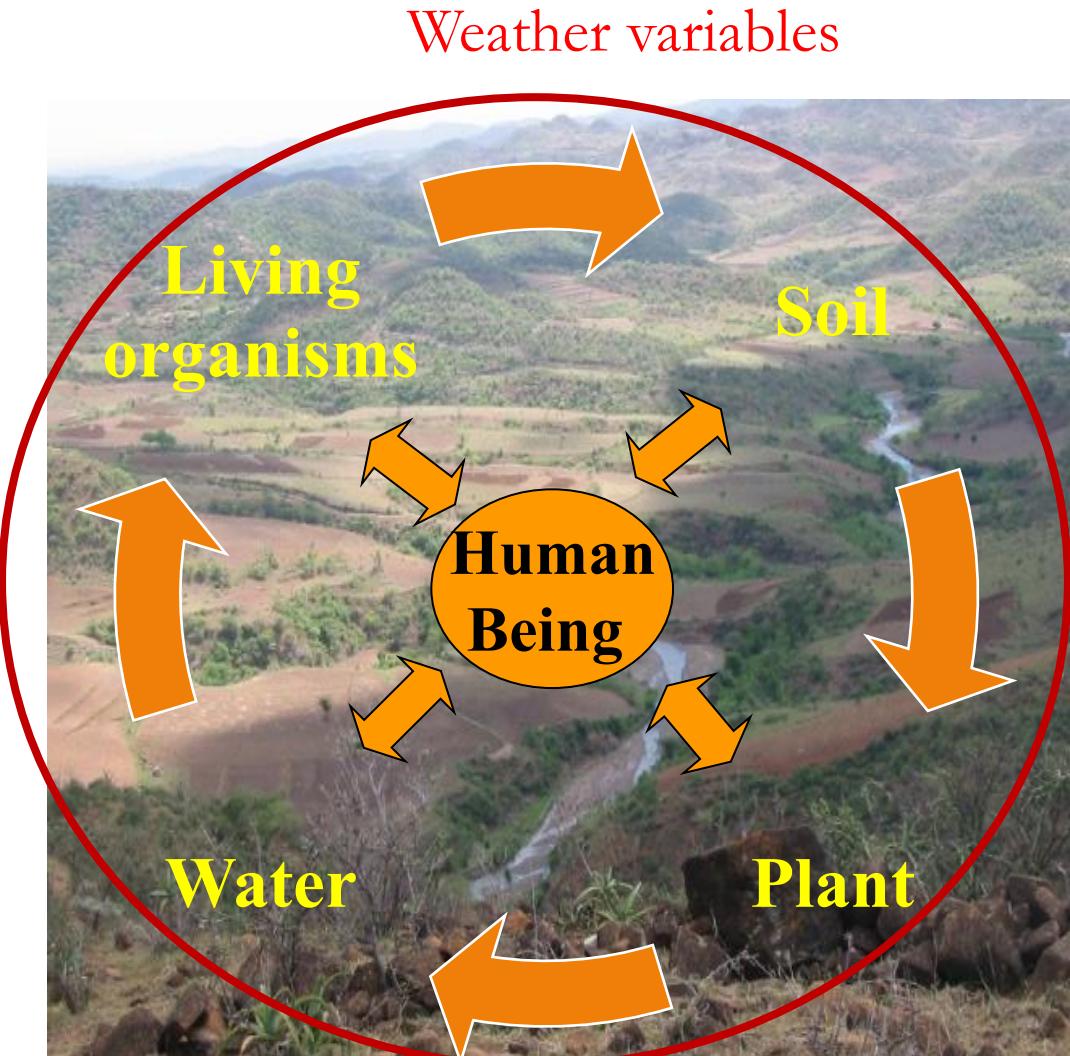


Graph: K. Herweg

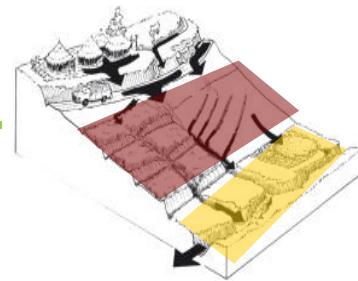
# Introduction.....

## ■ What is land degradation?

- Land productivity at any point is determined by the interaction of these elements (Six)
- Land degradation is the **destruction/negative disturbance** of all or one of these components and their interrelationships either by nature or human intervention



# Introduction....



- **What is land degradation?**  
Cont..
- Land degradation can be defined as a process which lowers the actual and/or potential capacity of the land to produce goods or services or
- It is a reduction in the capability of land to satisfy a particular use
- It is both natural and man-induced (**accelerated degradation**)



# Introduction.....

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«According to the Millennium Ecosystem Assessment (MA 2005):

- The term ‘land’ includes renewable natural resources, i.e. soils (including micro-organisms), water, vegetation and wildlife, in their terrestrial ecosystems.
- Land degradation, in turn, includes all processes that diminish the capacity of land resources to perform essential functions and services in these ecosystems, i.e. **deforestation, loss of biodiversity, soil degradation and disturbance of water cycles**.
- Sustainable land management consists of **technical and institutional measures** initiated by individuals or societies to maintain land productivity and other functions of land resources for present and future generations»

# Introduction ....Types of Land Degradation



W: Soil erosion by water



E: Soil erosion by wind



C: Chemical soil deterioration



P: Physical soil deterioration



B: Biological degradation



H: Water degradation

- Detachment of soil particles and transportation by raindrop and overland flow – sheet, rill, gully, piping and mass moment
- Detachment of soil particles and transportation by wind
- Processes affects chemical property of soil such as leaching of bases, oxidation of organic materials, toxification, salinity, etc.
- Adverse changes in soil physical properties such as SM holding capacity, infiltration rate, structure, density
- The general decline of biological activity in and on the soil (including microbial, loss of vegetation)
- Deterioration of water quality by solid and liquid waste including sediment

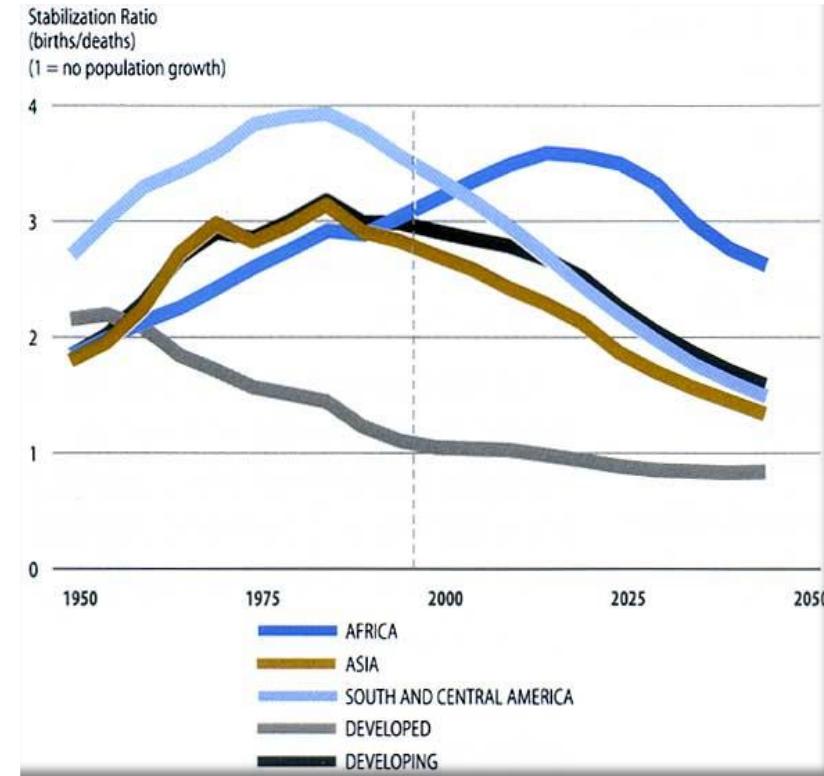
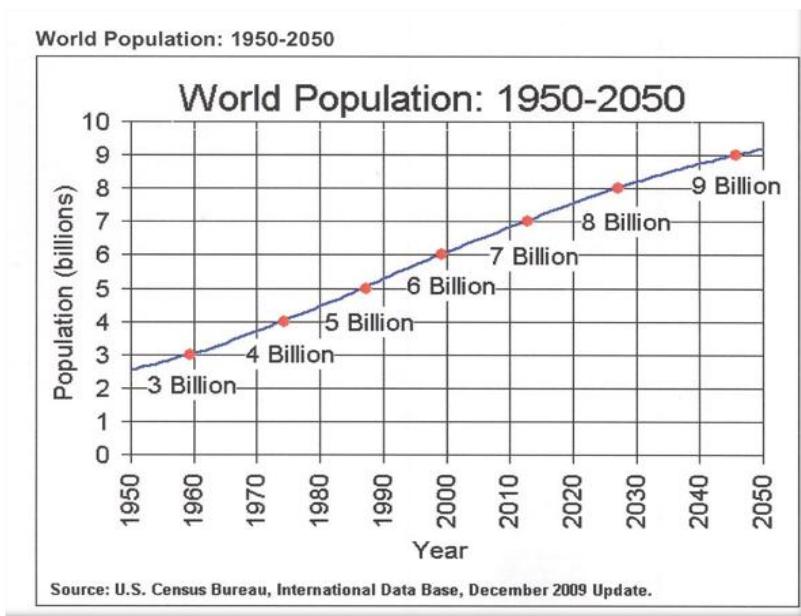
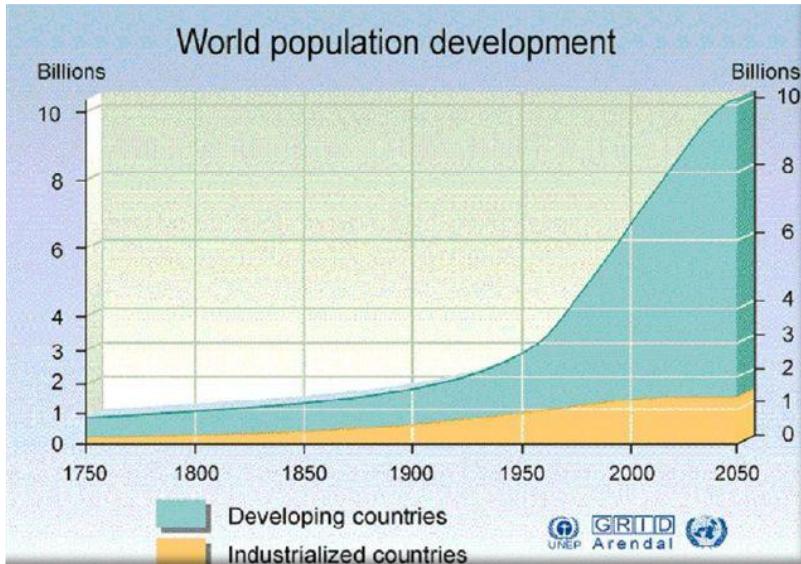
# Introduction ....Status of LD – Global context

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## ■ Key Issues Global-Context

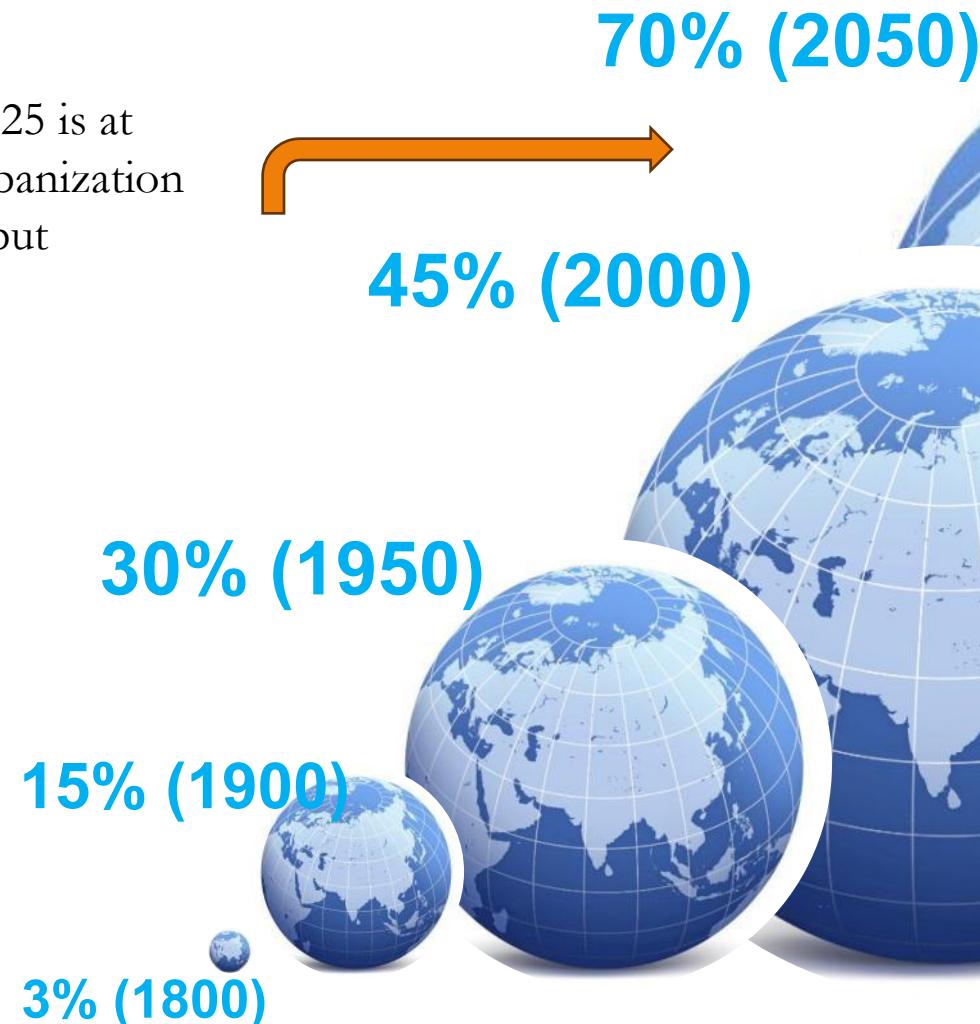
- Population growth and the need to satisfy demand
- Overexploitation of natural resources
- Natural and human induced climate change
- Poverty
- The new globalization and its impact on Africa

# Population Growth and Stabilization



UN Population Division

# SHIFT TO AN URBANIZED WORLD

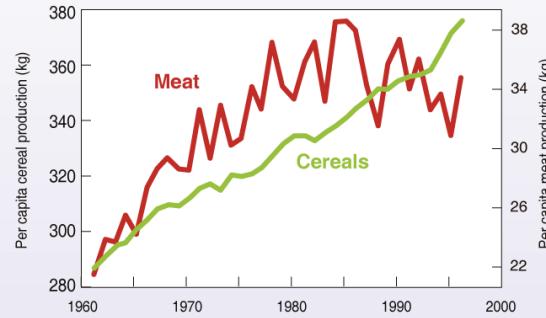


Demand for food, water, and other resources  
will also grow!

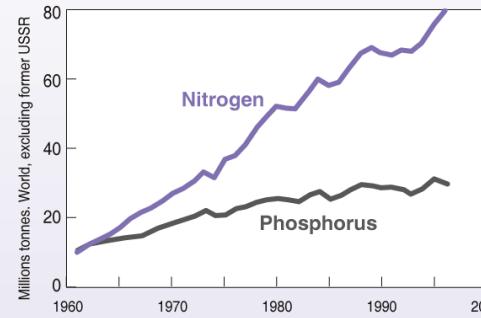
(UN DESA, 2012)

# Global Trends to Satisfy Demand

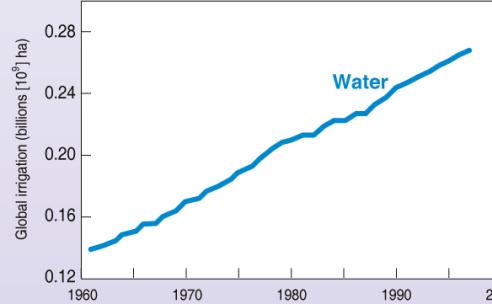
Global trends in cereal and meat production



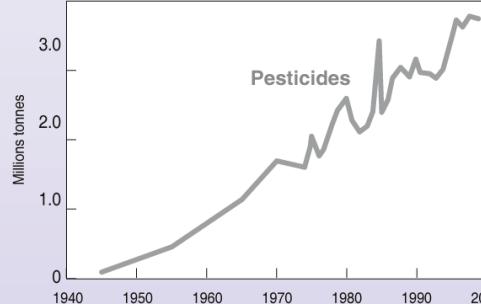
Global total use of nitrogen and phosphorus fertilizers.



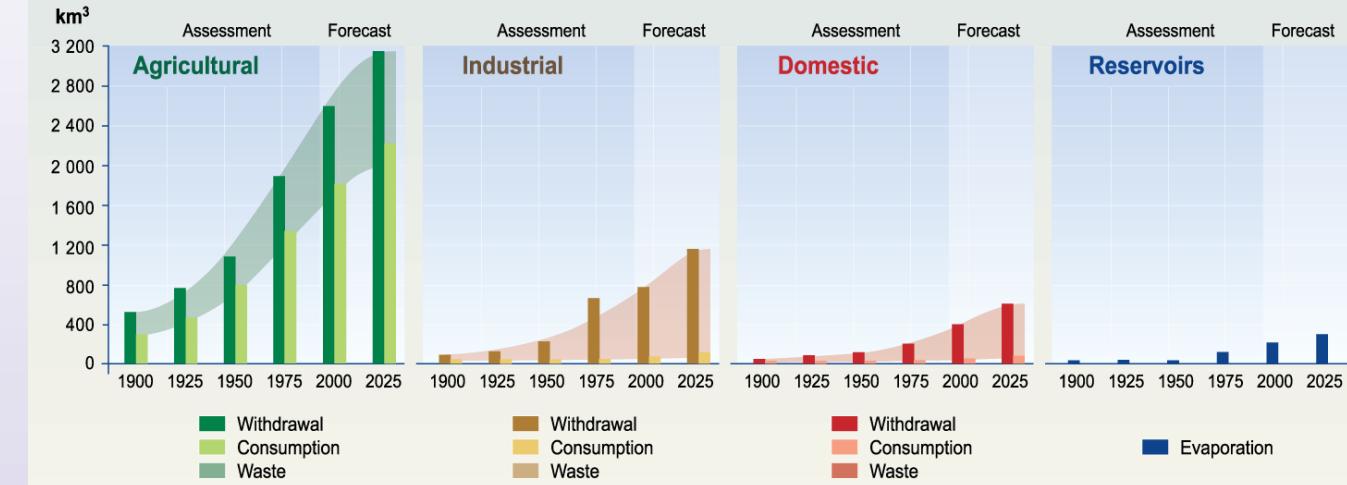
Increased use of irrigation



Total global pesticides production



## Withdrawal and Consumption by Sector



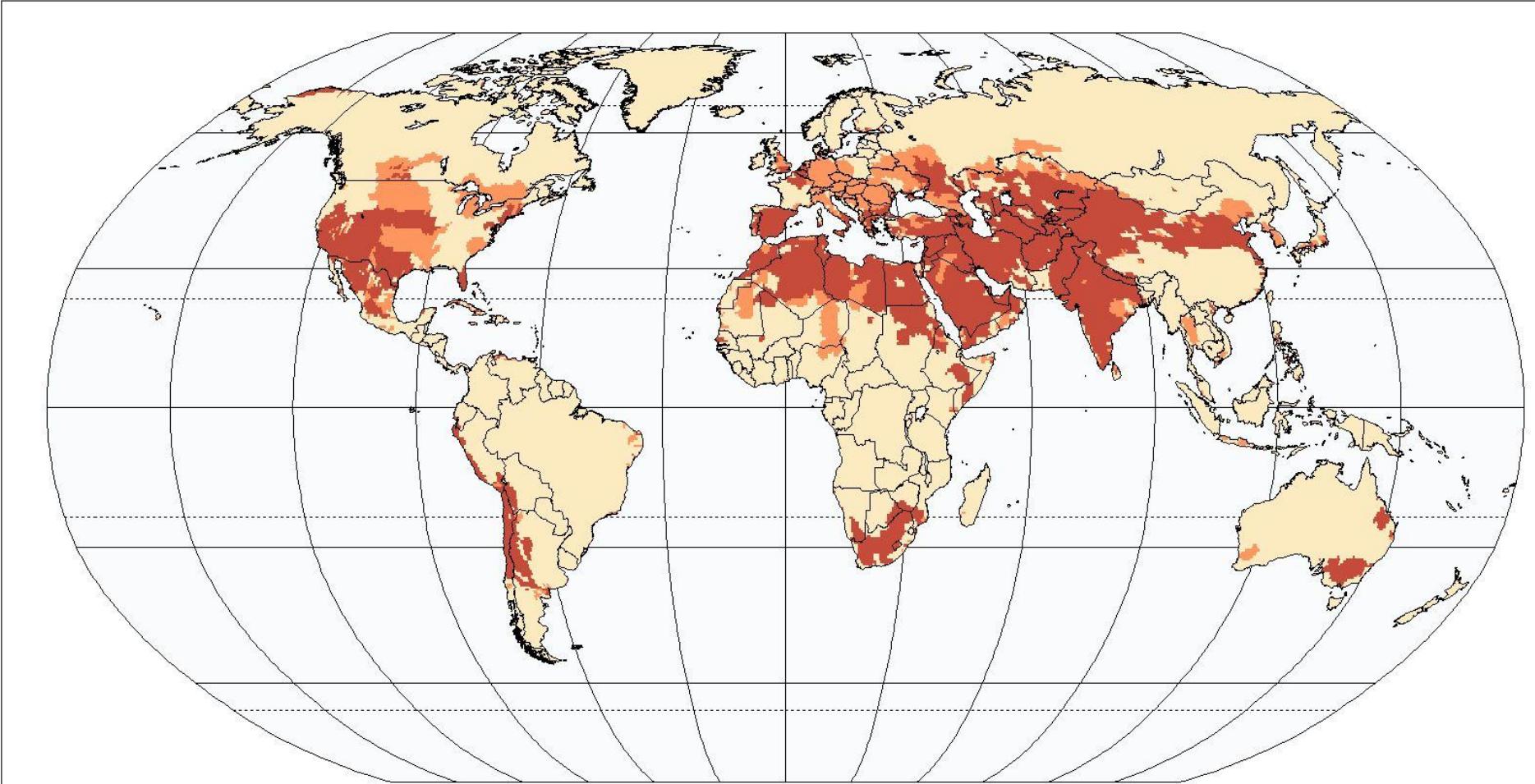
Source: Igor A. Shiklomanov, State Hydrological Institute (SHI, St. Petersburg) and United Nations Educational, Scientific and Cultural Organisation (UNESCO, Paris), 1999.

SOURCE: Tilman et al., 2002

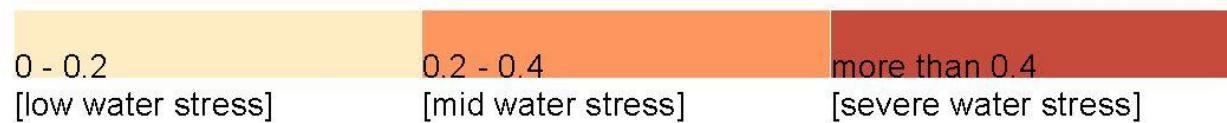
IAASTD/Ketill Berger, UNEP/GRID-Arendal

PHILIPPE REKACEWICZ  
FEBRUARY 2002

# Water Stress



Map 6. Water stress according to drainage basins,  
circa 1995 [withdrawal-to-availability ratio]



(c) Center for Environmental  
Systems Research,  
University of Kassel,  
April 2002- Water GAP 2.1D

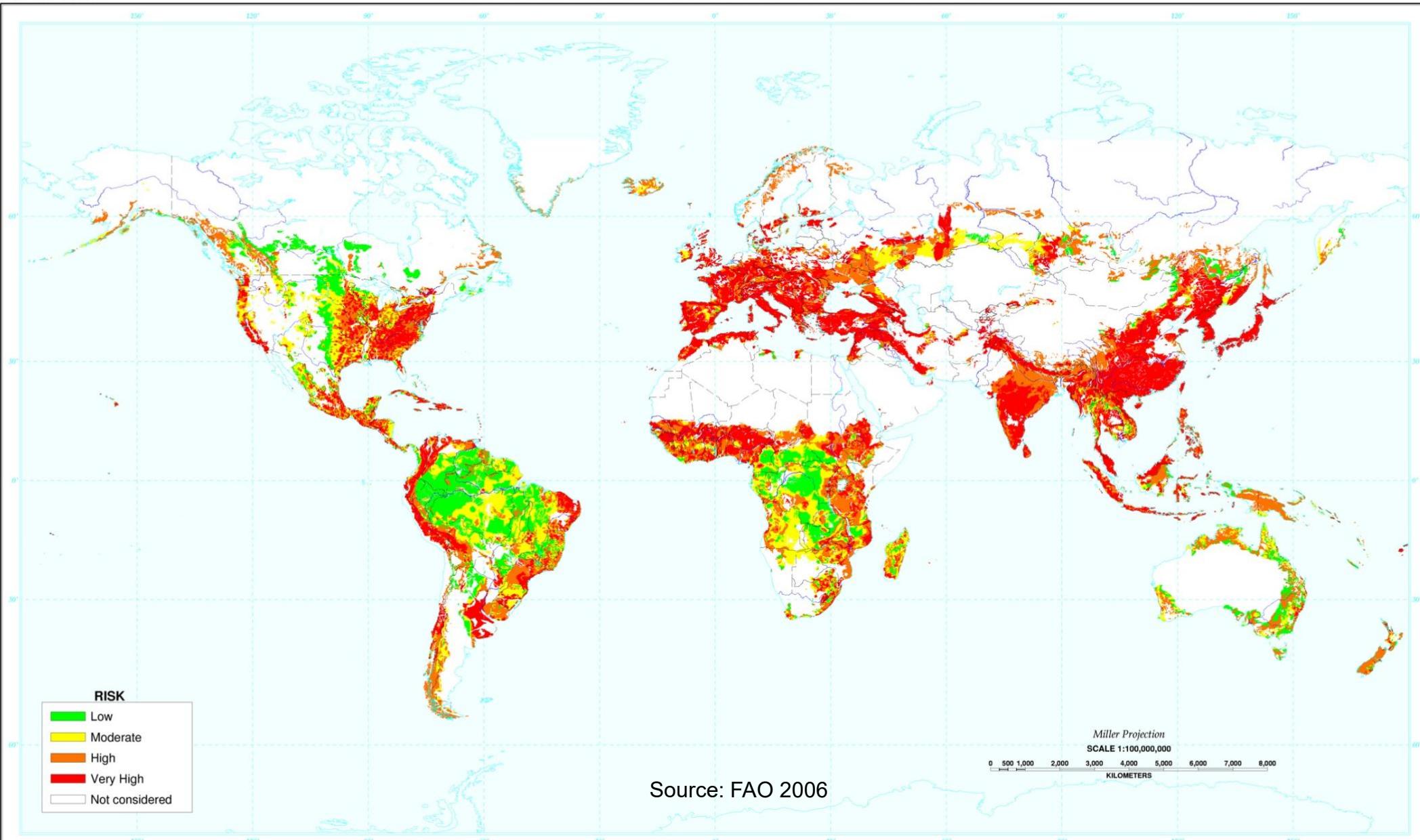
## Examples of Water stress:

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- We only value water when it is scarce!
- In this sense Ethiopia is blessed but how are we managing our resources?



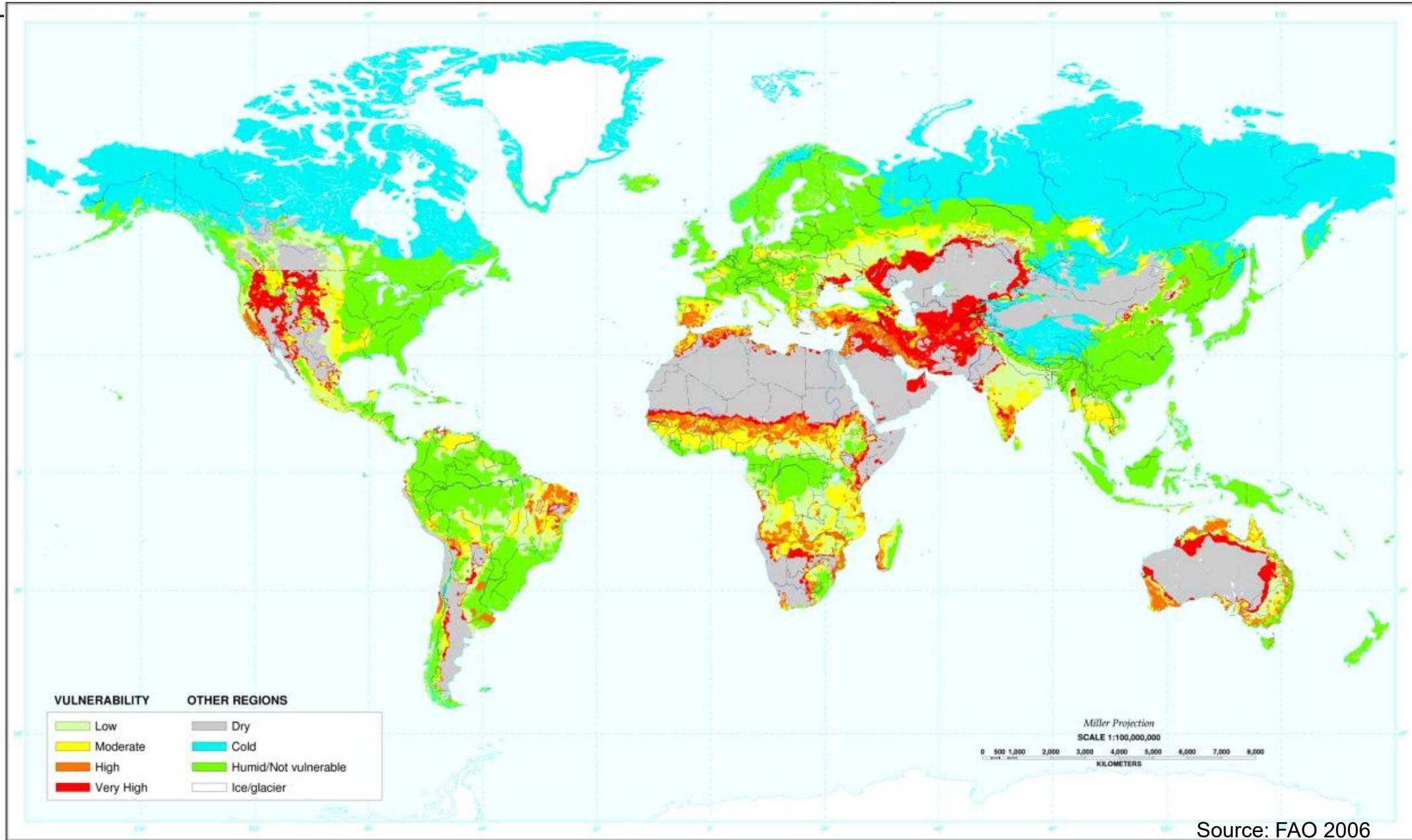
# Results of unwise utilization of resources to satisfy demand: Risk of Human Induced Water Erosion





**Deserts/Wastelands Growing by  
60,000 Sq Km per year**

# Desertification Vulnerability



# Why?

- Net extraction



# Why?

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- Net extraction

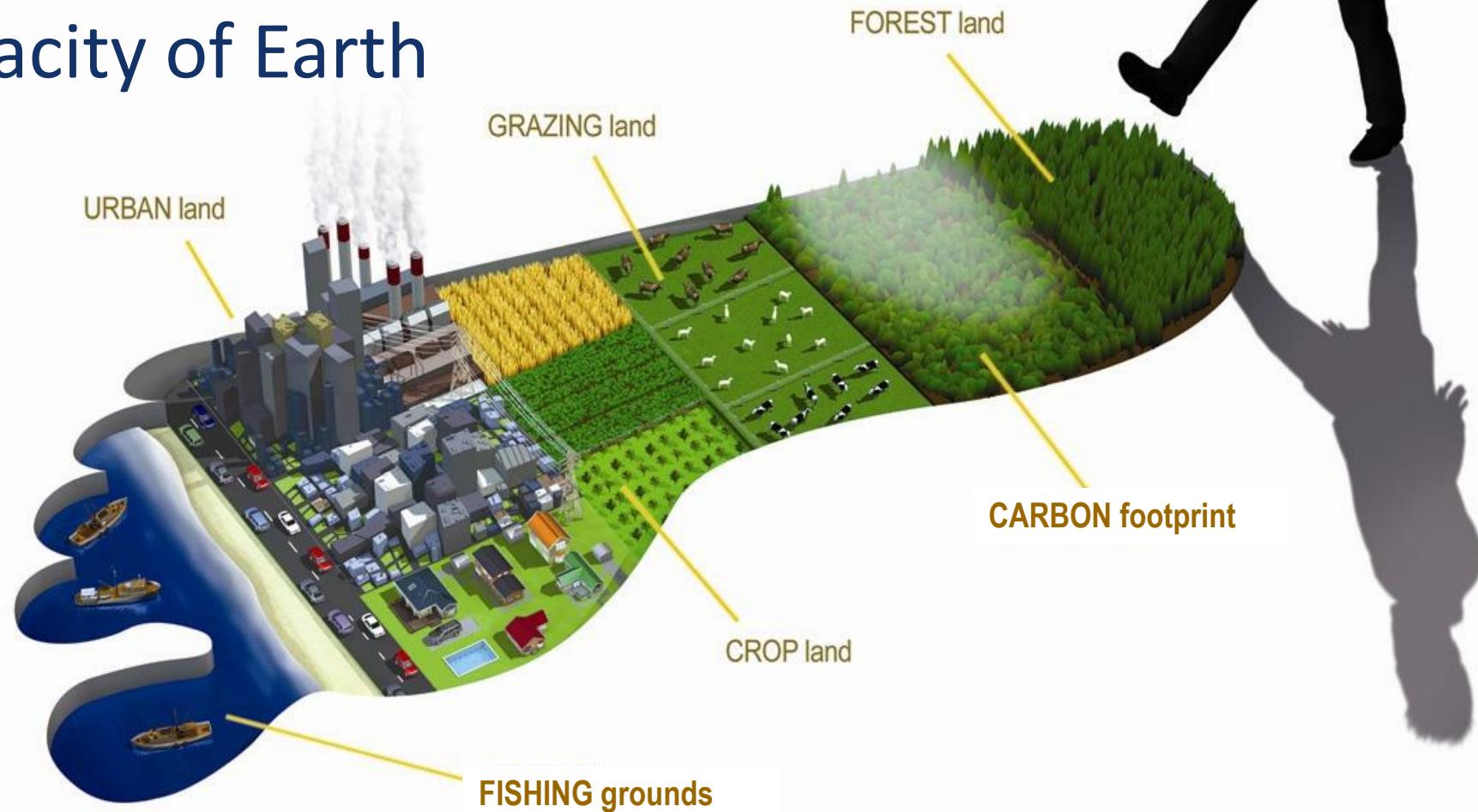


# Why? Overuse and pollution

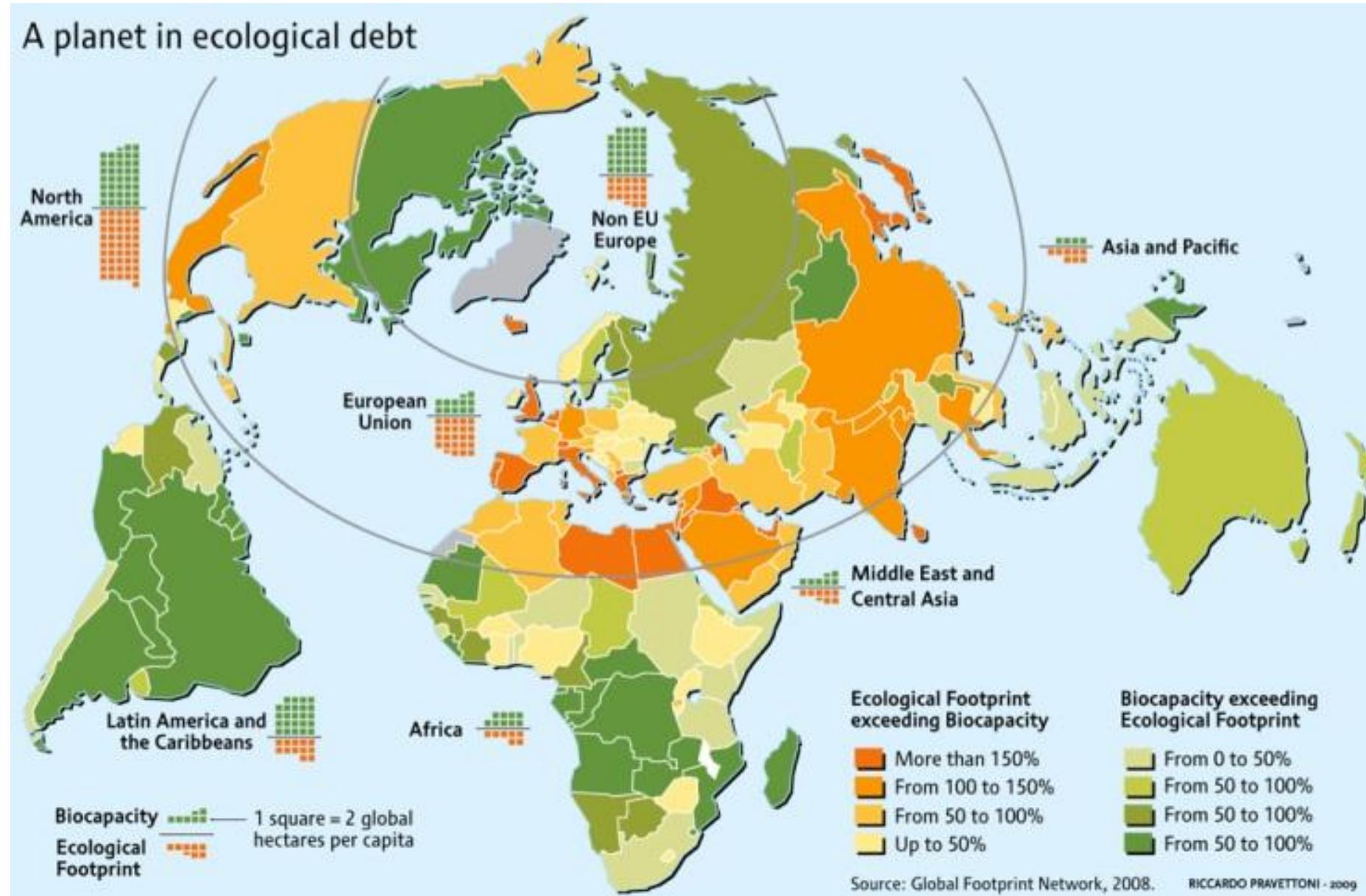


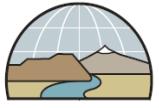
# 1. Introduction....

In some parts of the globe  
Ecological Footprint is surpassing  
bio-capacity of Earth



# Ecological Footprint & Biocapacity





# Macro-Level Trade-Offs

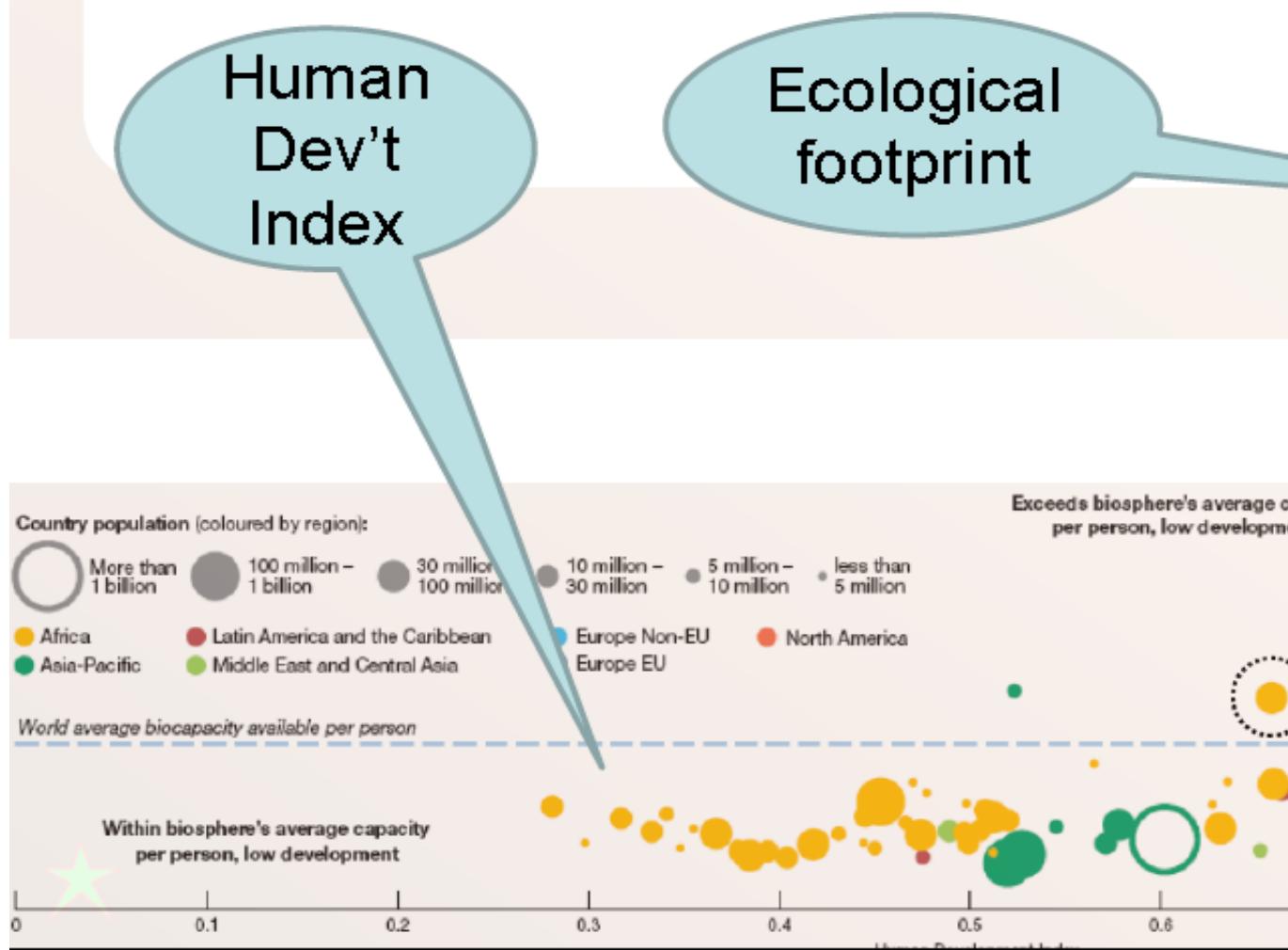
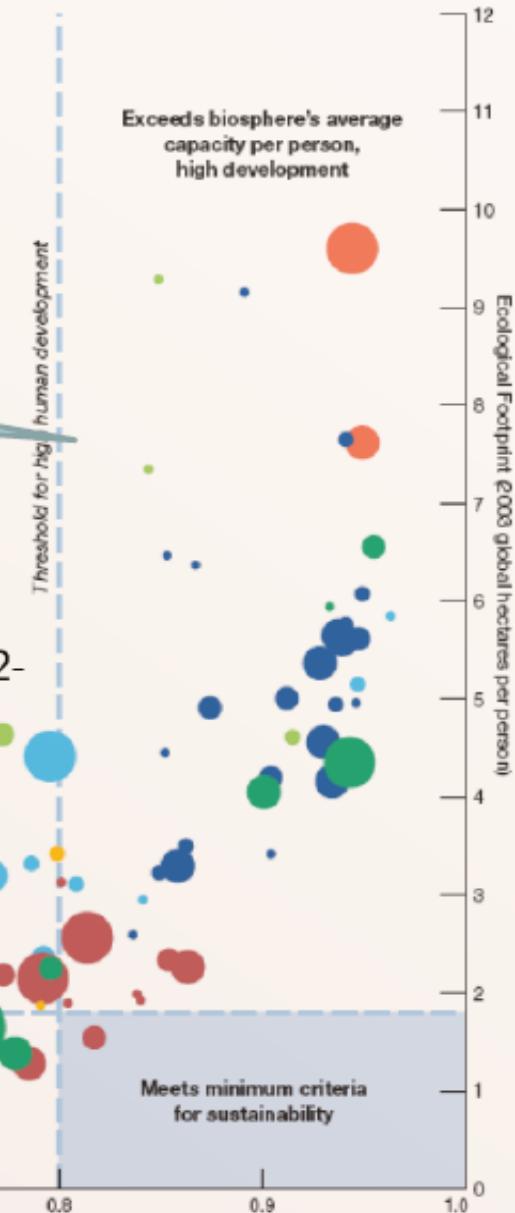
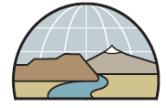


Fig. 8: HUMAN DEVELOPMENT INDEX AND ECOLOGICAL FOOTPRINTS, 2003





How do we  
survive?  
How do  
they mange  
to continue?

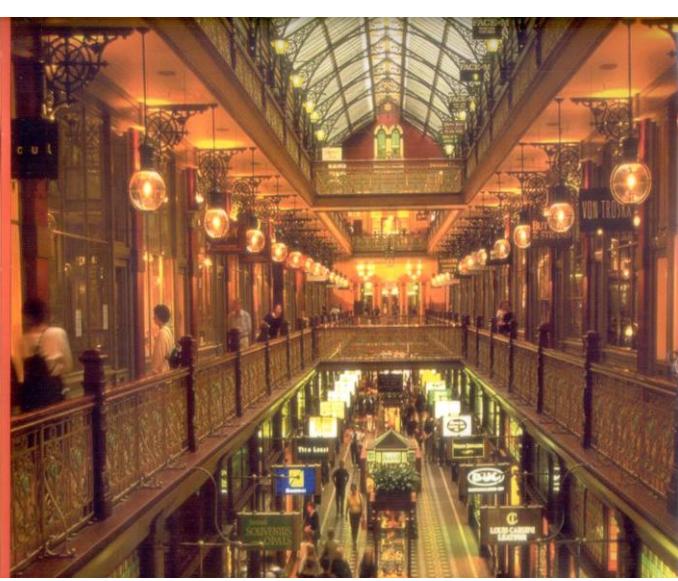




1 Week's Food for a Family in Europe: \$ 342



1 Week's Food for a Family in Africa: \$ 20



# Consumption Society

vs

# Subsistence Society

Shelter



Energy



Food

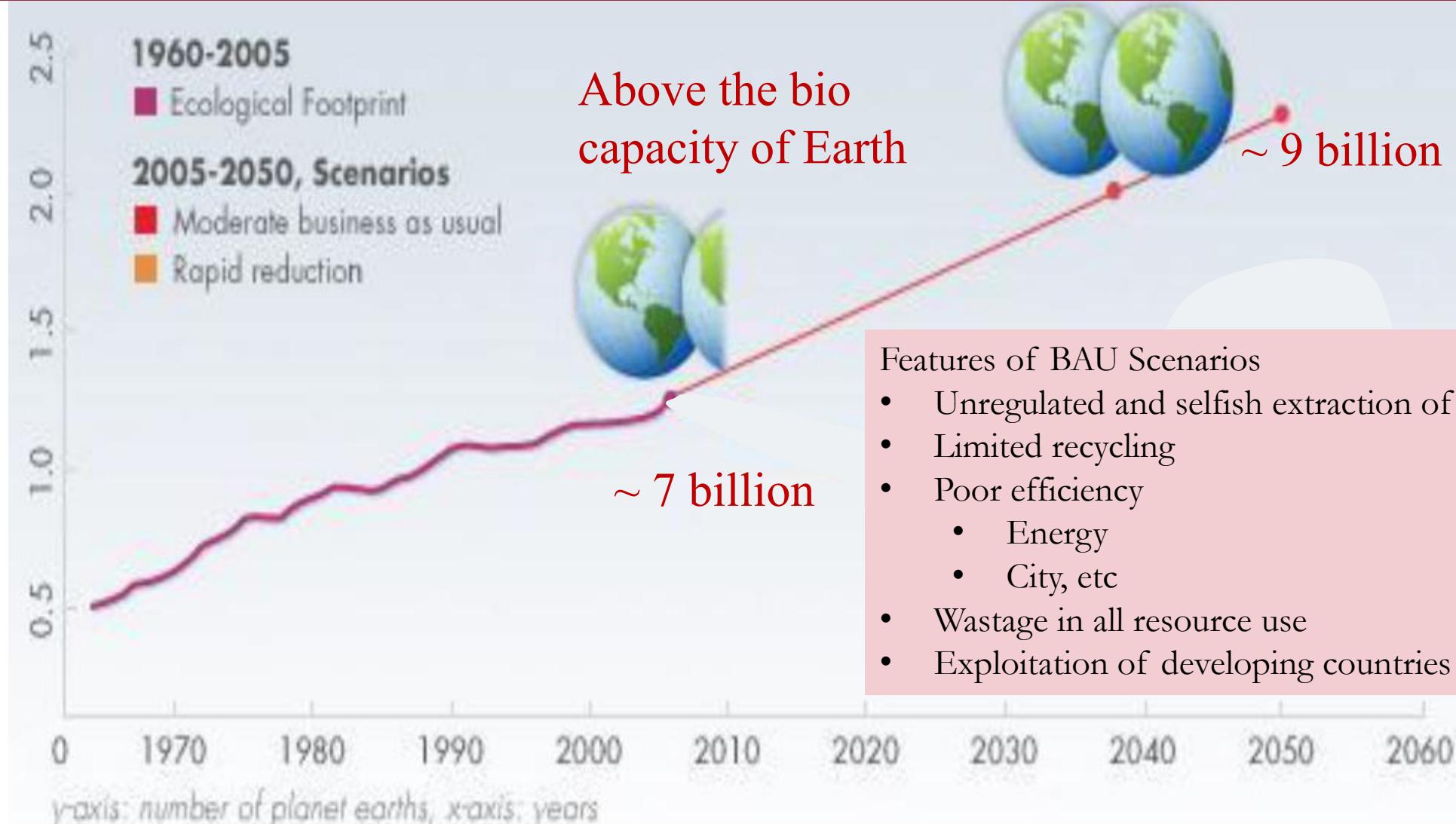


# Main Conclusions on BAUS (of the MEA from the past 60 years)

- Accelerated ecosystem changes with partly irreversible biodiversity losses
- Considerable net gains of few people at the costs of the environment and poor countries
- Increasing vulnerability of large strata of the society, particularly in the South and in arid areas
- Negative scenarios: increasing hazard of non-linear (catastrophic) consequences – the achievement of MDGs is endangered. What about SDG?



# Concluding Remark for the Global Context: The bio-capacity of Earth, resource use scenarios and the fate of humanity - BAUS



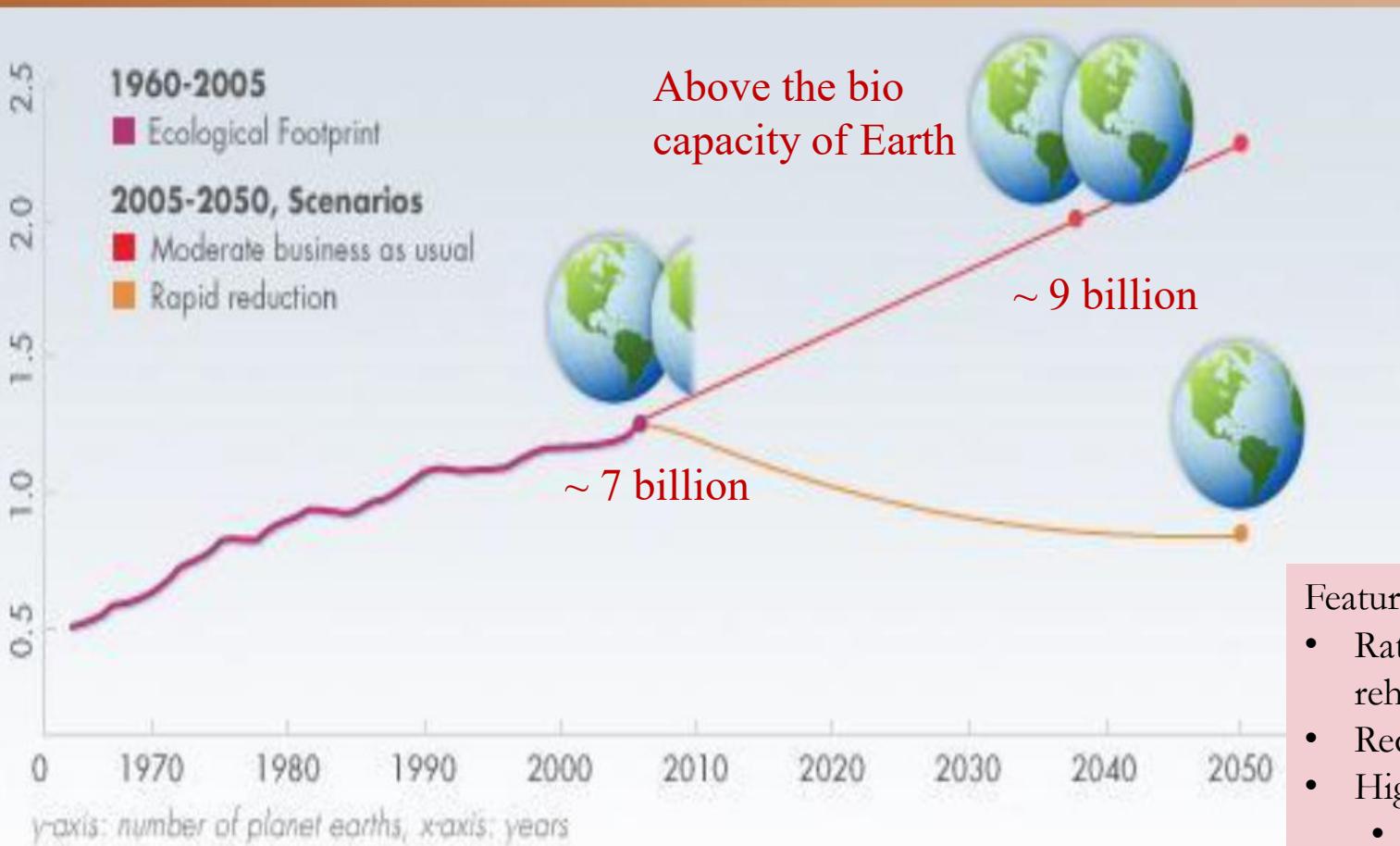
# What is happening now by global super powers?

Captain,  
iceberg ahead!  
What are your  
orders, Sir?



Carbon  
Trading!

# Concluding Remark on the Global Context: The bio-capacity of Earth, can support 9 billion people – How? BUS



## Features of BUS Scenarios

- Rational Use of resources – conservation, protection, rehabilitation
- Recycling
- High efficiency
  - Energy
  - City, etc
- Minimum Wastage in all resource use
- **Faire treatment of Developing Countries**

IWM/ICM

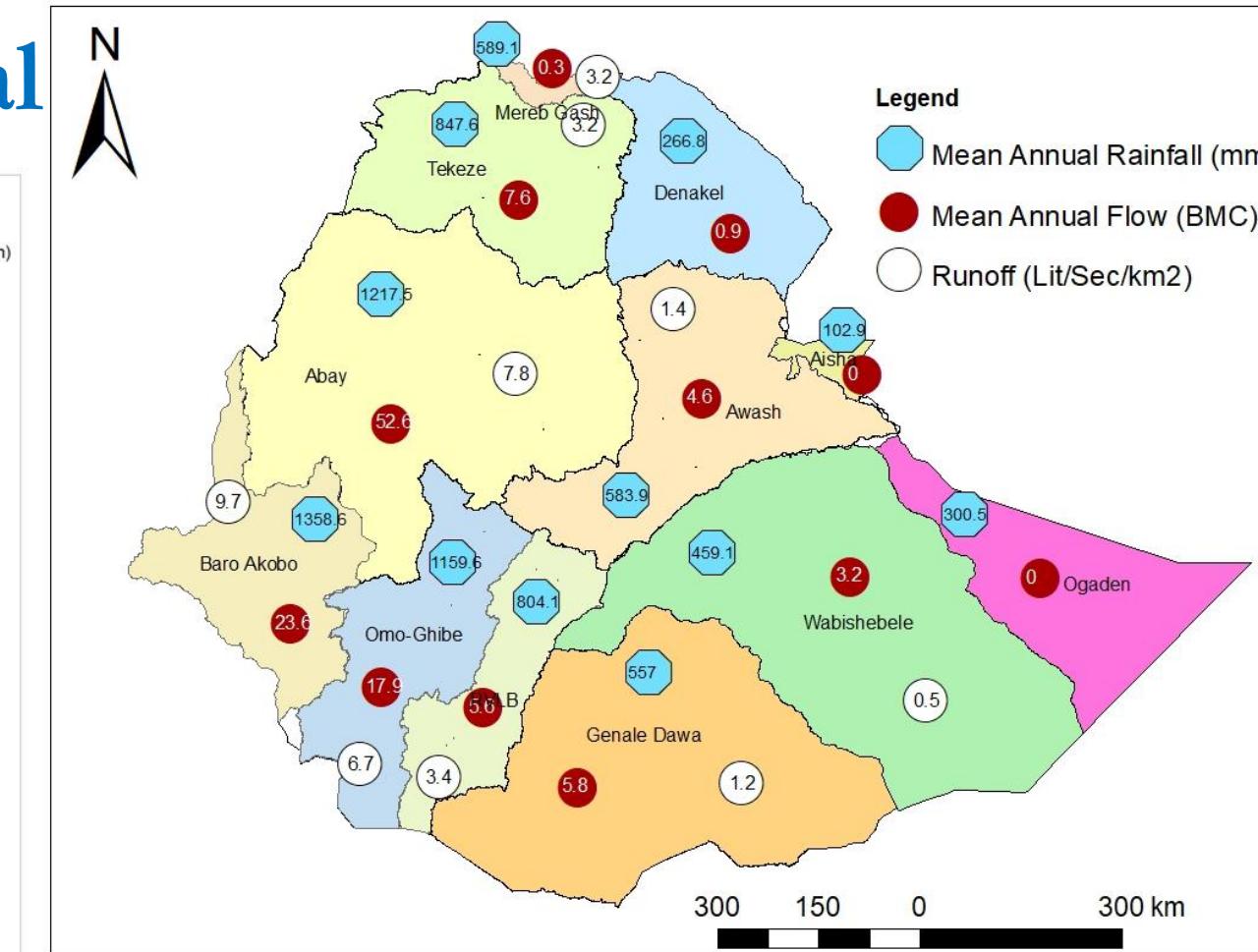
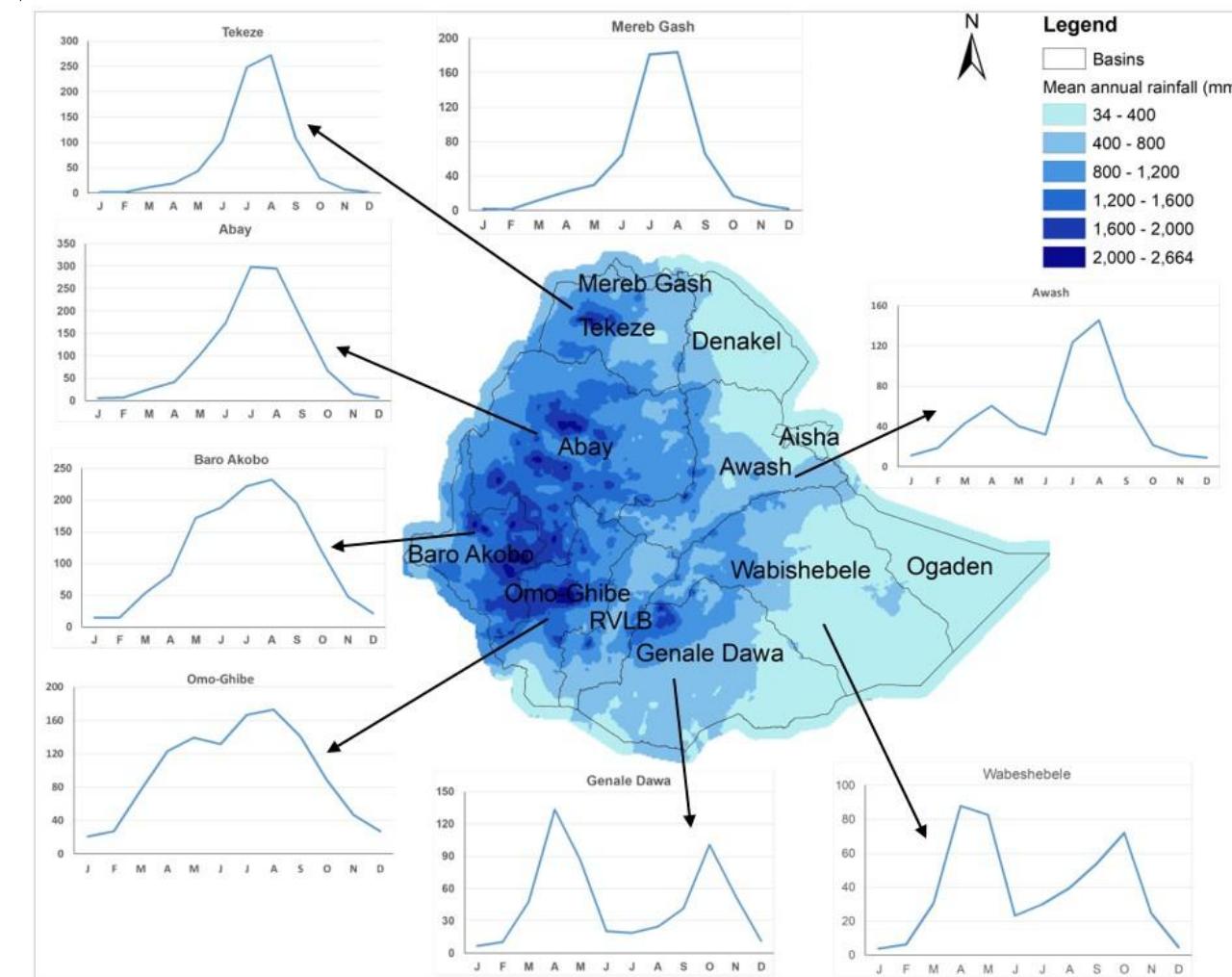
## 2. Ethiopian NR Contexts and Challenges



# Rich Natural Resources Capital

Source: Many, all acknowledged

# Rainfall Runoff Potential



**Total annual flow – 122BMC/year**  
**Abay being the largest with ~52.6BMC/year**

**Average mean annual rainfall (depth):**  
 ~848 mm (0.848 m)  
 ~936 km<sup>3</sup>/y

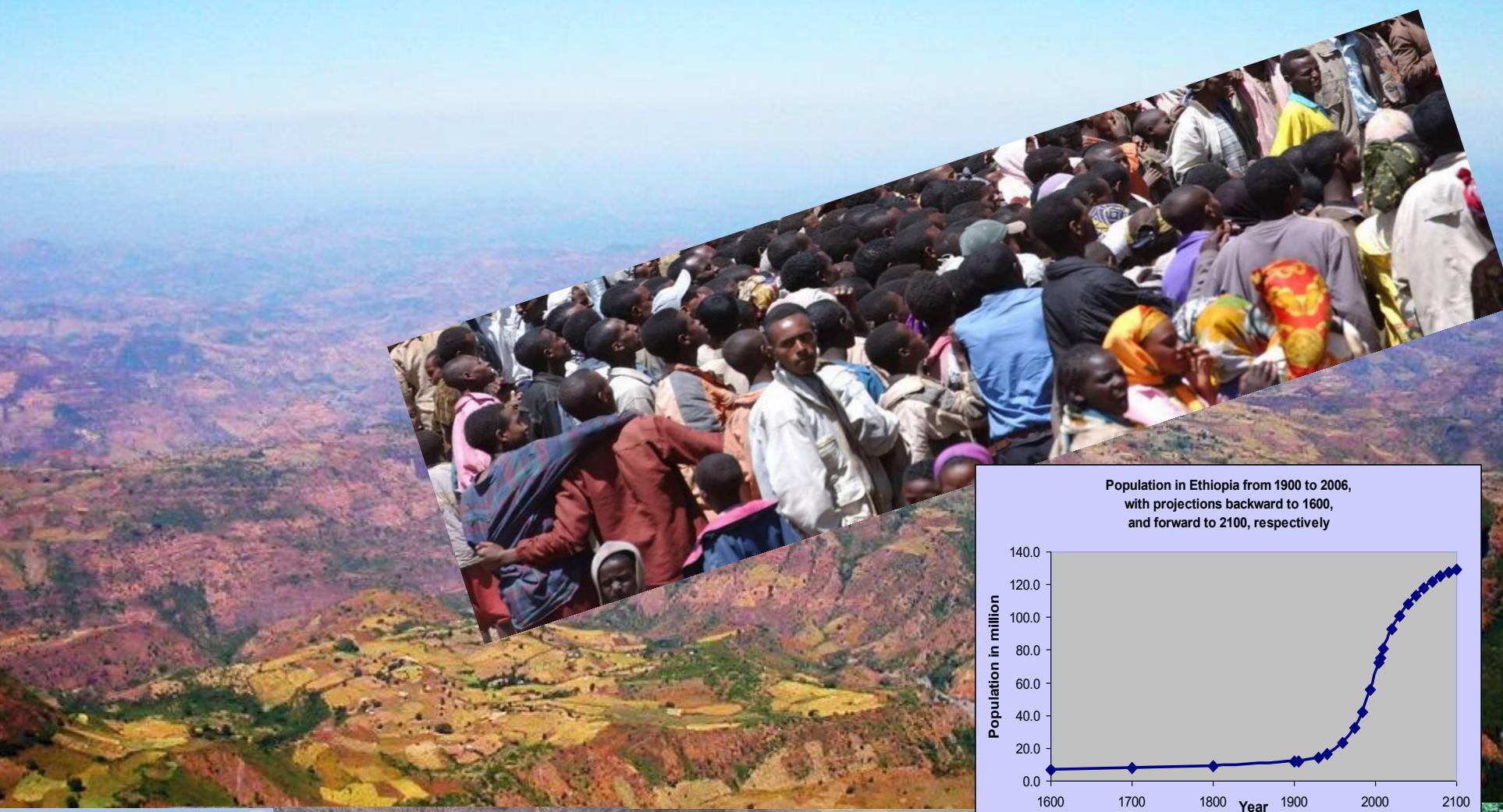
# Institutional Perspectives

- We have sound institutional set-up
  - MoWE
  - MoA
  - EPA
  - MoILL
- Structures upto Kebele Level (MoA) and Woreda level (MoWE)
- There many policies and strategies
- There are many big initiatives on SWLRM

- Instability of institutions (Eg. EPA-MoEFCC, CfEFCC, EPA-EFD)
- Lack of proper integration at different levels
- Weak implementation of policies and strategies – mainly due to:
  - Lack of directives for many policies
  - Poor awareness
  - Very weak enforcement of environmental laws and regulations
  - Lack of proper follow-up

# The rational use of this rich NRC is affected by:

- High population growth
  - ~125 million
- ~80% dependant on highly subsistence Agriculture with poor LM
  - Largely Rainfed
  - Obsolete technologies
  - Huge postharvest losses
  - Major cause of Land & water degradation



# Poor livestock management dominated by Free grazing in Many areas



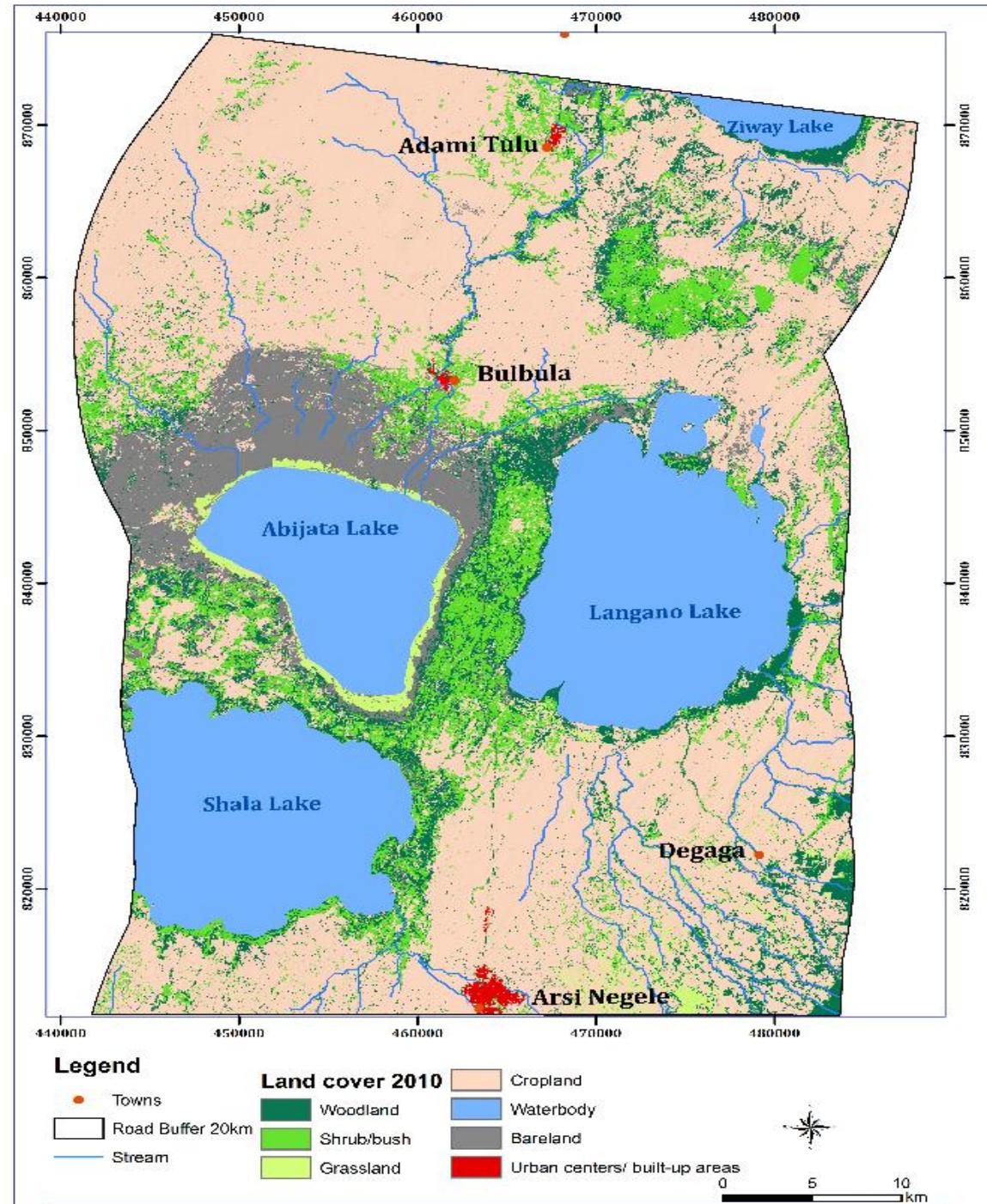
## Expansion of Cultivation and Settlement to marginal lands and sensitive ecosystems (water towers)



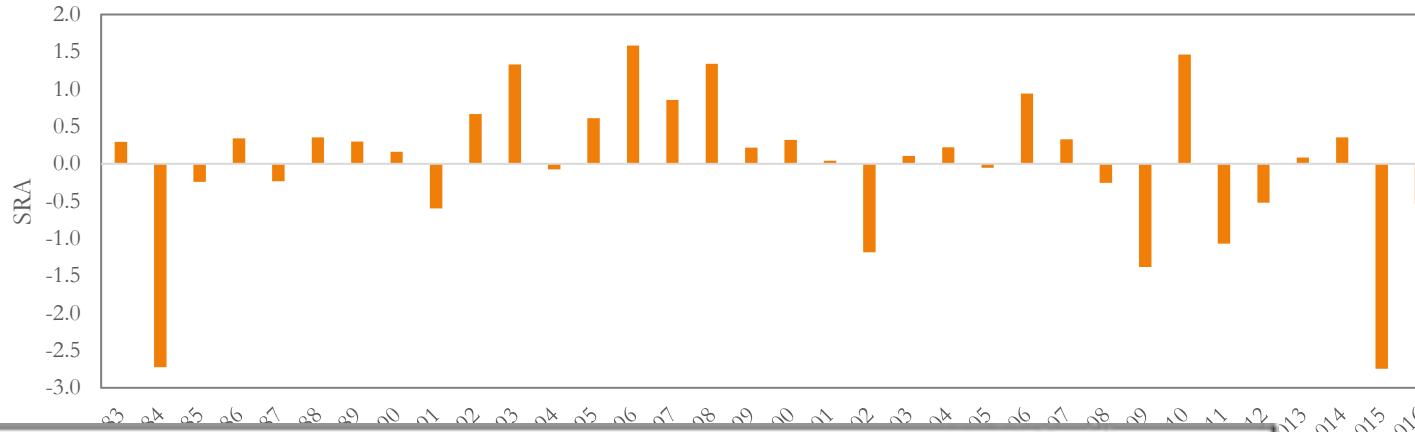
# Unregulated LULCC

- Driven by lack of land use policy and land use plan
- Ex: Unregulated LT in Central rift valley (1973-2010) – within 37 years
  - Acacia wood land reduced by 77%
  - Cultivated land increased by 91%
  - Built-up areas and urban centers increased by 436%
  - Water body reduced by 10%

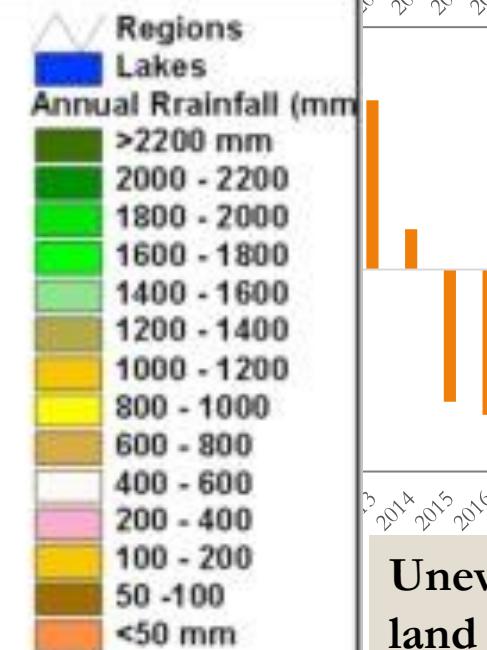
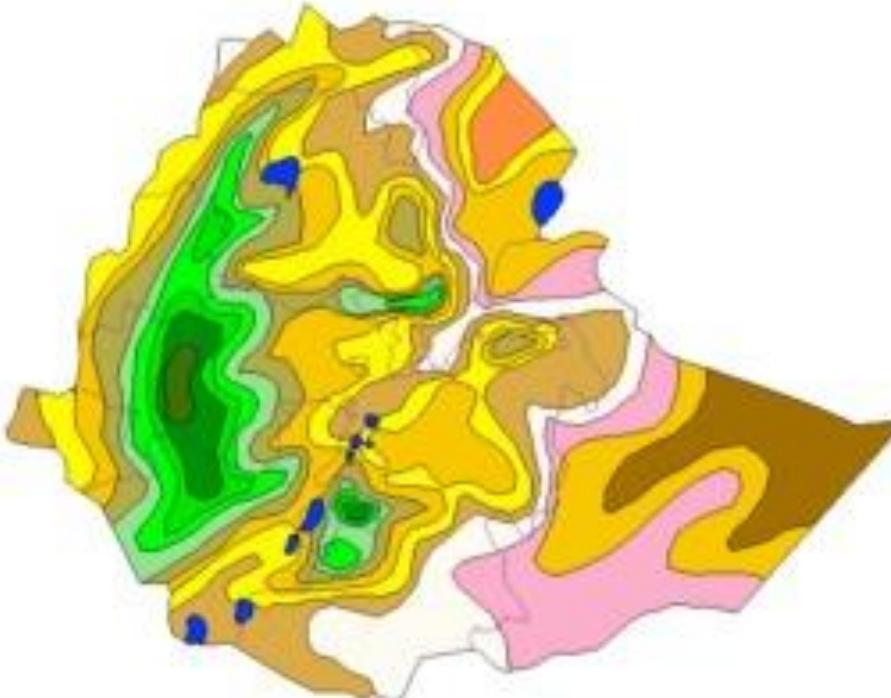
(Gete & Tibebu, 2012)



# Inter-annual Variability of Rainfall & Water Pollution (Quantity/Quality)



Uneven Rainfall distribution

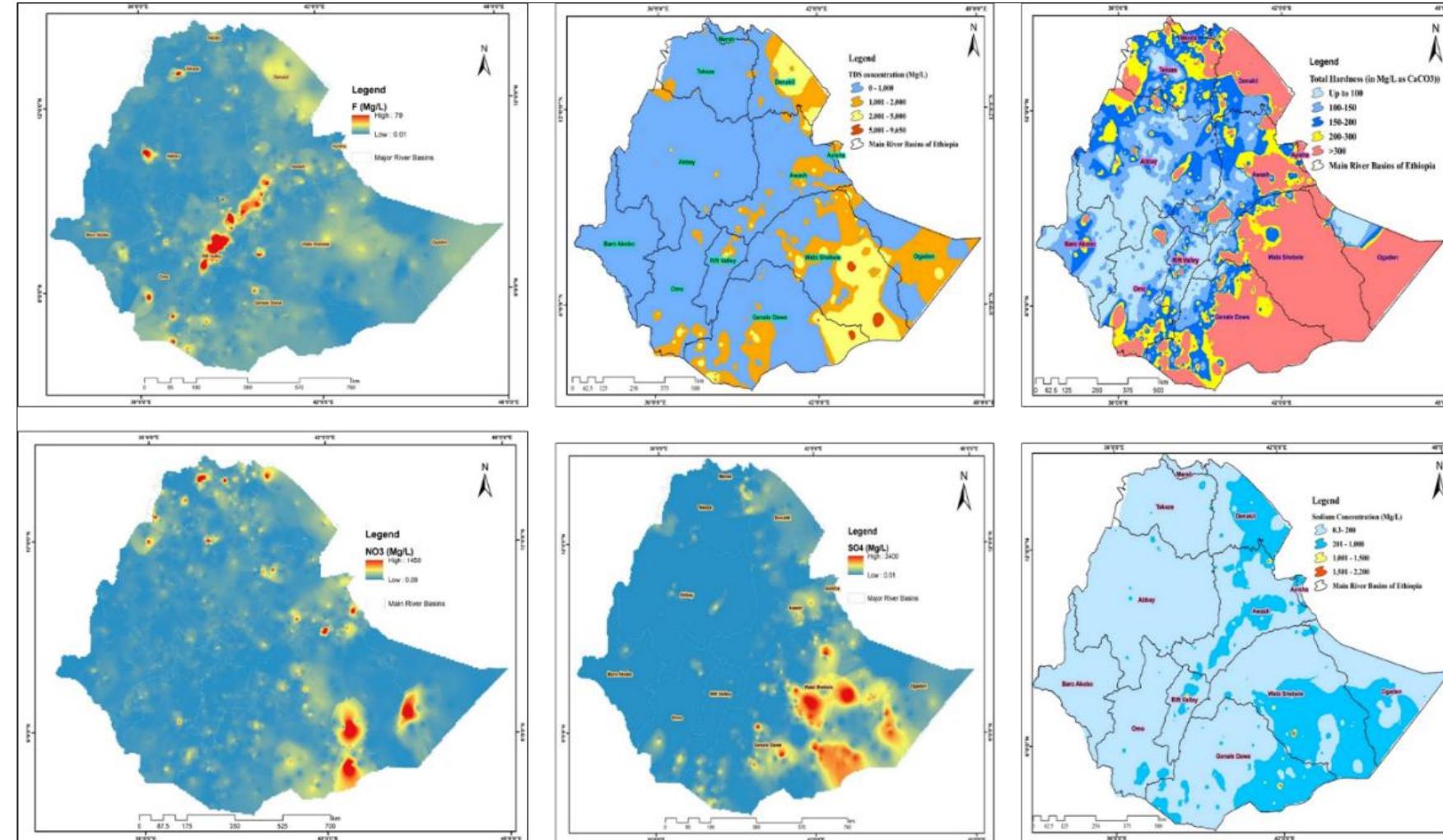


Getachew A., 2018



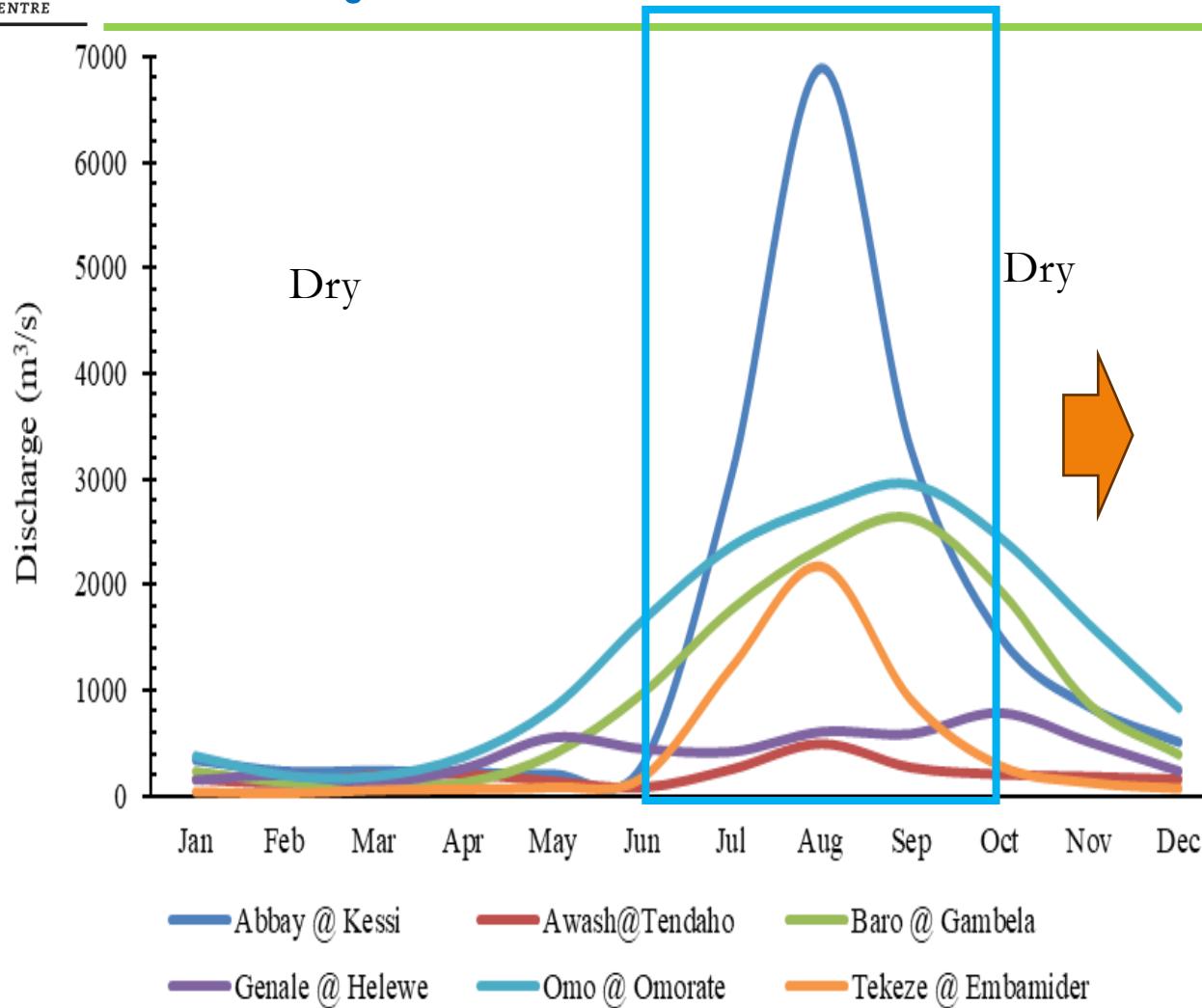
Uneven distribution throughout Ethiopia – 60% of the land mass semi-arid to arid - even the HLLs both rainfall and runoff are concentrated in few months - dry for nearly eight months

# Groundwater Quality Challenges

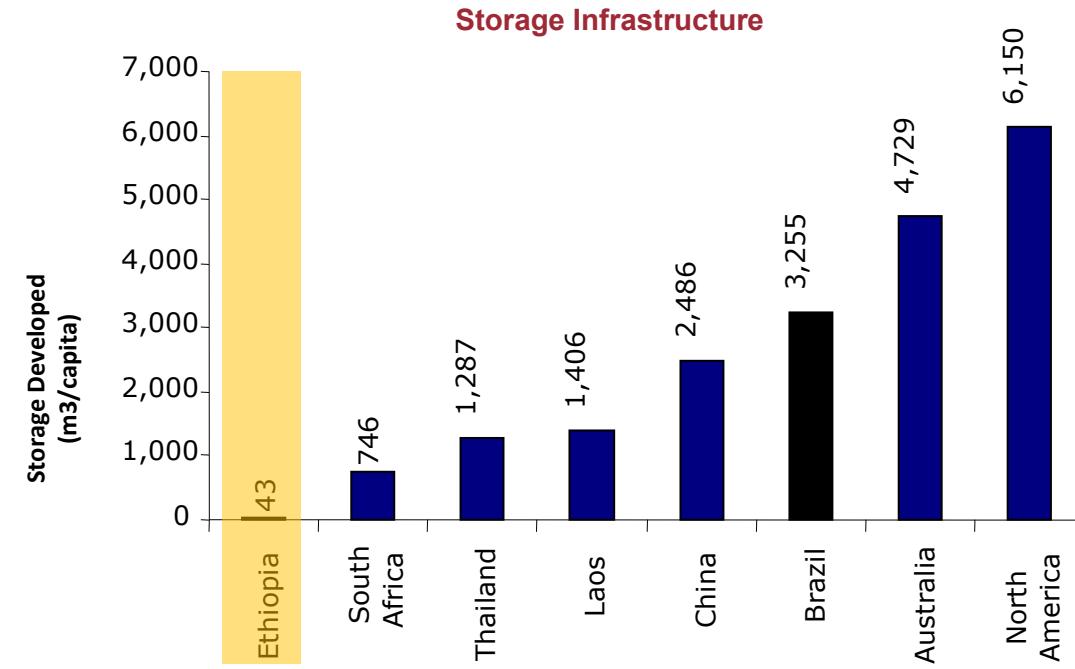


Basins	Quality Challenges
Tekeze	Salinity, Hardness, Anthropogenic pollutants
Abbay	Anthropogenic pollutants
Rift Valley Lakes	Fluoride, Salinity, Hardness, Anthropogenic pollutants
Omo-Gibe	Fluoride, Hardness, Anthropogenic pollutants
Awash	Fluoride, Salinity, Anthropogenic pollutants

# Only Few Wet Months & Little Storage Capacity

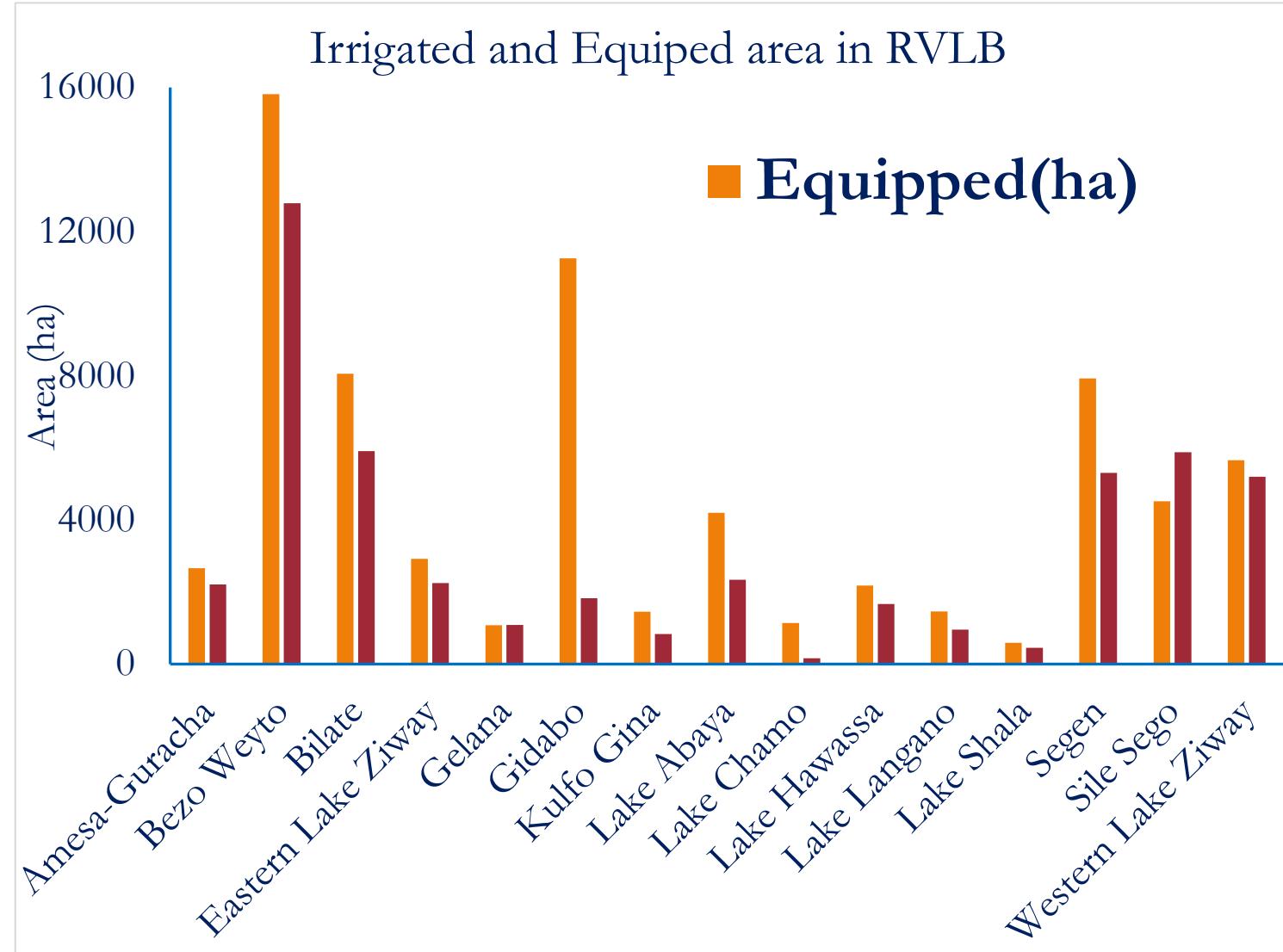


Very weak green water  
productivity - >50% lost as runoff



**Water Poverty Index**  
**-We have little storage capacity**

# Inefficient use of Irrigation Schemes



Source: Tena, 2023

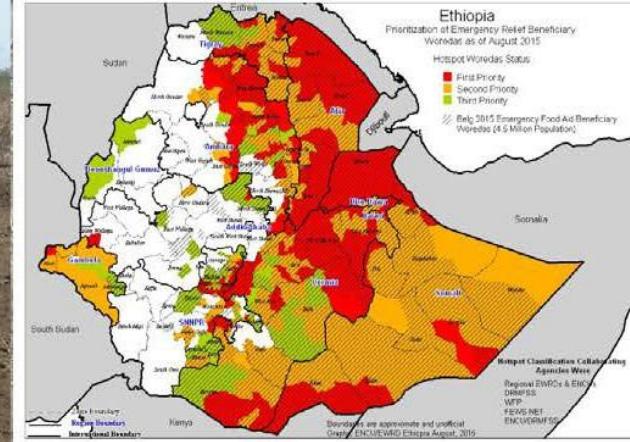


# Weak Local Level Upstream Downstream WM

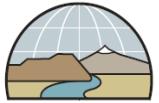


Gumara River, August, 2017  
(wet) and Feb 2015 (dry)

# Climate Extremes – Drought & Flood



This is one of the water security issues facing Ethiopia and the HOA region at large



### 3. What are the impacts of these pressures on the NRC?

- On-site
- Off-Site



## On-site impacts

Driven by the above factors and others the NR Capital is heavily affected by Land degradation thereby livelihoods



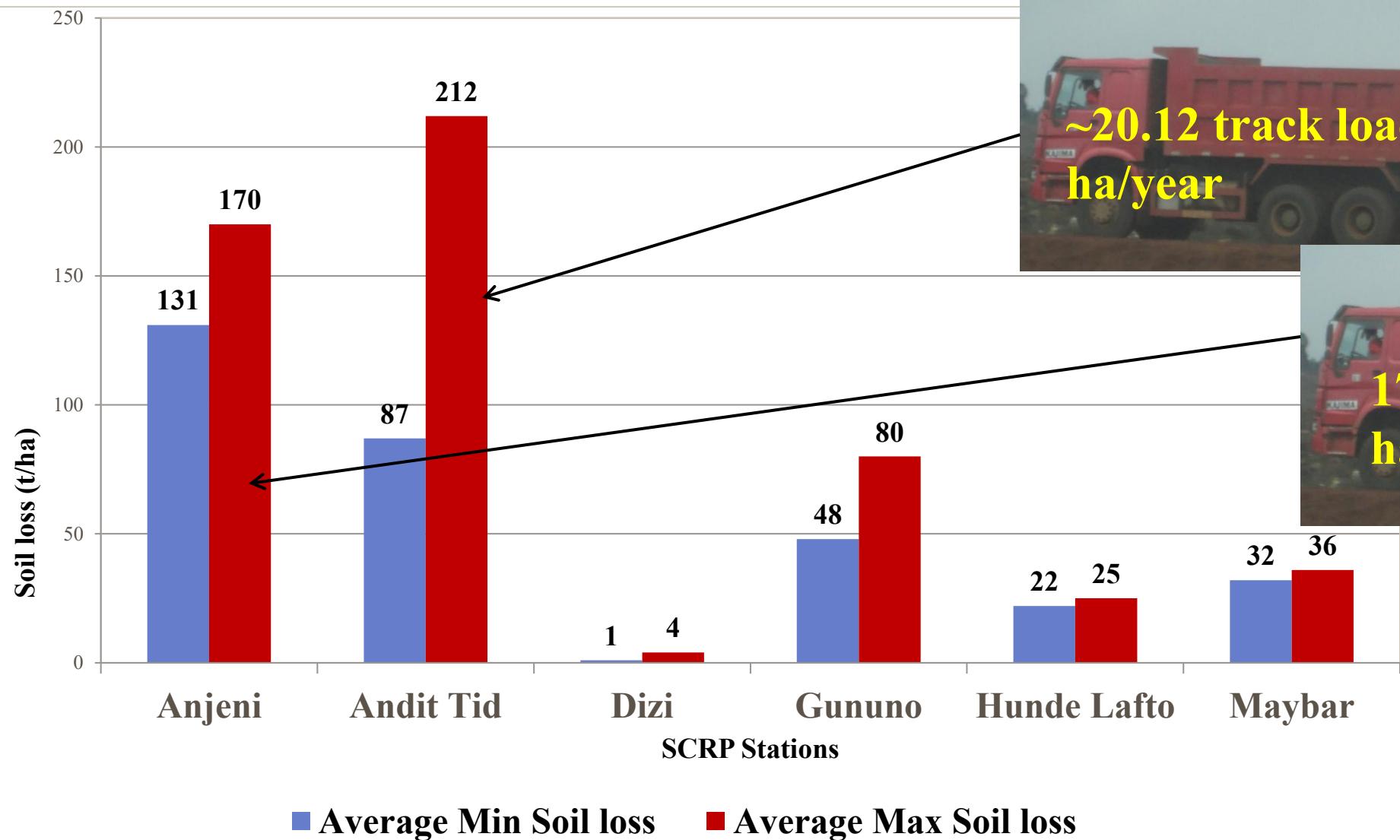
Photo: Gete, 2012



Photo: Tibebu 2020

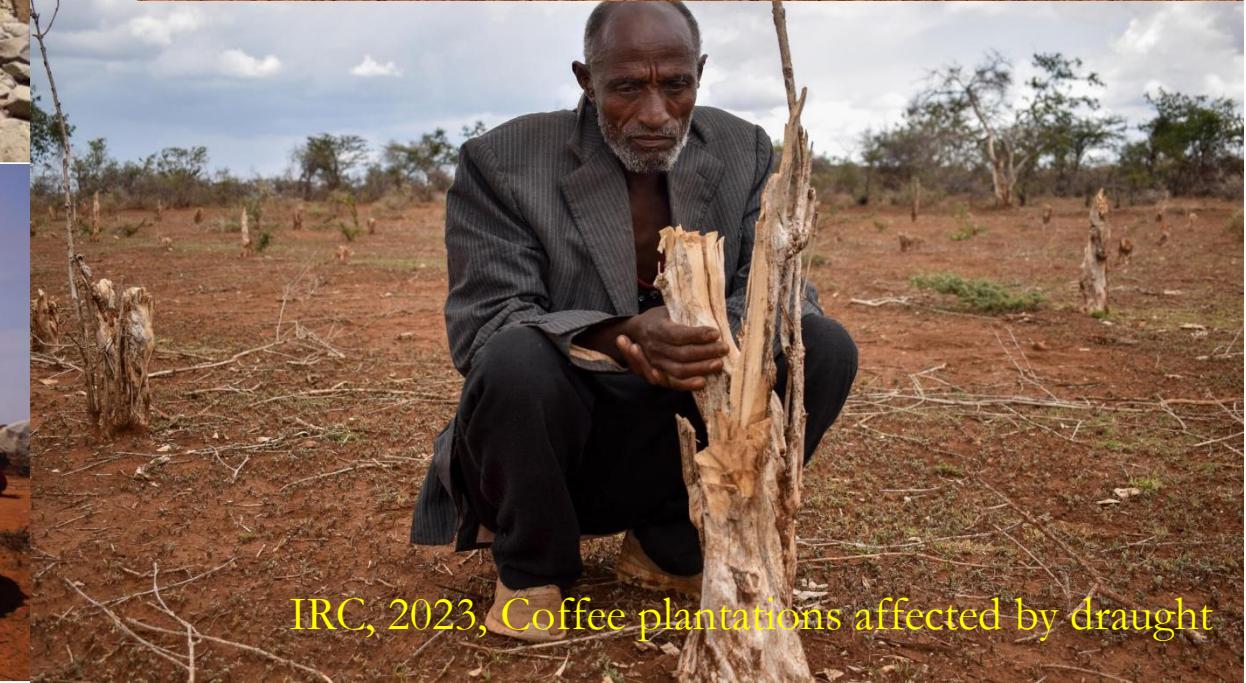


# Long-term Average Soil Loss monitoring results from Cultivated Lands



Loss of soil productivity!

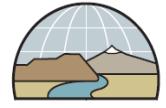
# Recurrent draughts and dry spells



Crop Failed,  
livestock  
parish,  
livelihoods  
destroyed



IRC, 2023, Coffee plantations affected by draught



# Off-site Impacts

- Major part of the eroded sediment ended up in streams, rivers, reservoirs and lakes affecting quality and quantity of Water
- Siltation of Dams and reservoirs – reduction in power, water supply, irrigation water, etc
- Wear and tears of turbines
- Damage to irrigation canals
- Affect our freshwater lakes, wetlands...
- Damage to river course (river bank)

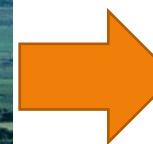


# Siltation of dams – Example 1: Borkena Dam

- Built 1985/86
- Design capacity 6 million M<sup>3</sup>
- Catchment area 46,500ha
- Fully silted-up in 2 years

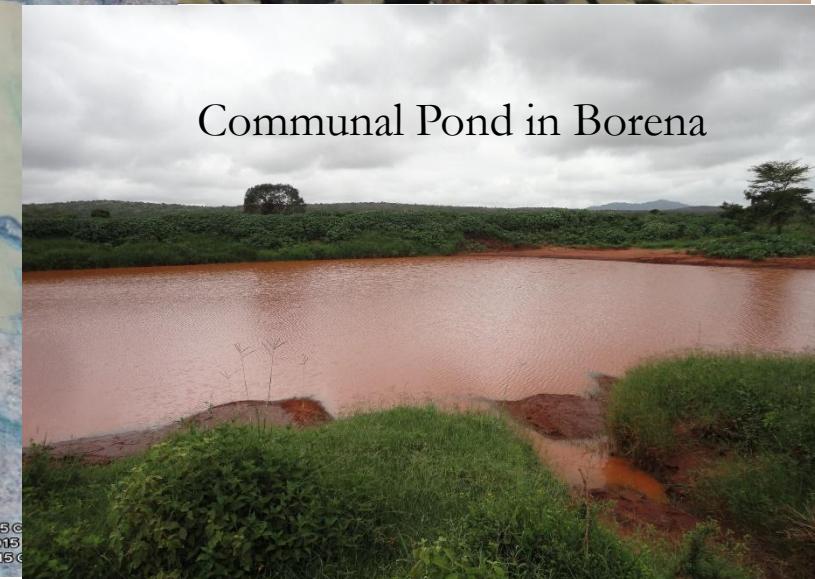
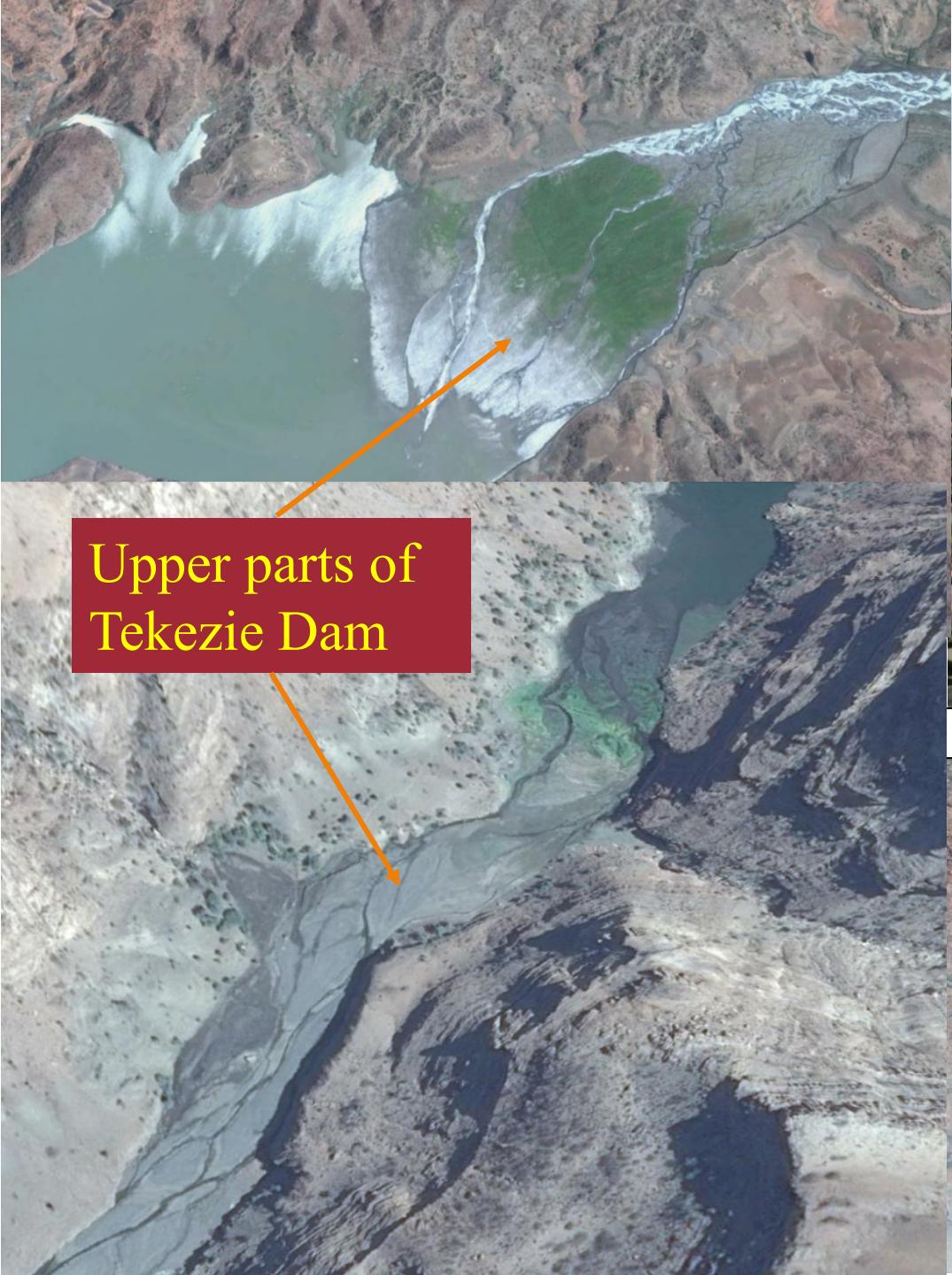


H. Hurni, 17.10.1987



Gete Zeleke, 2012

## Ex.2: Siltation of dams & reservoirs



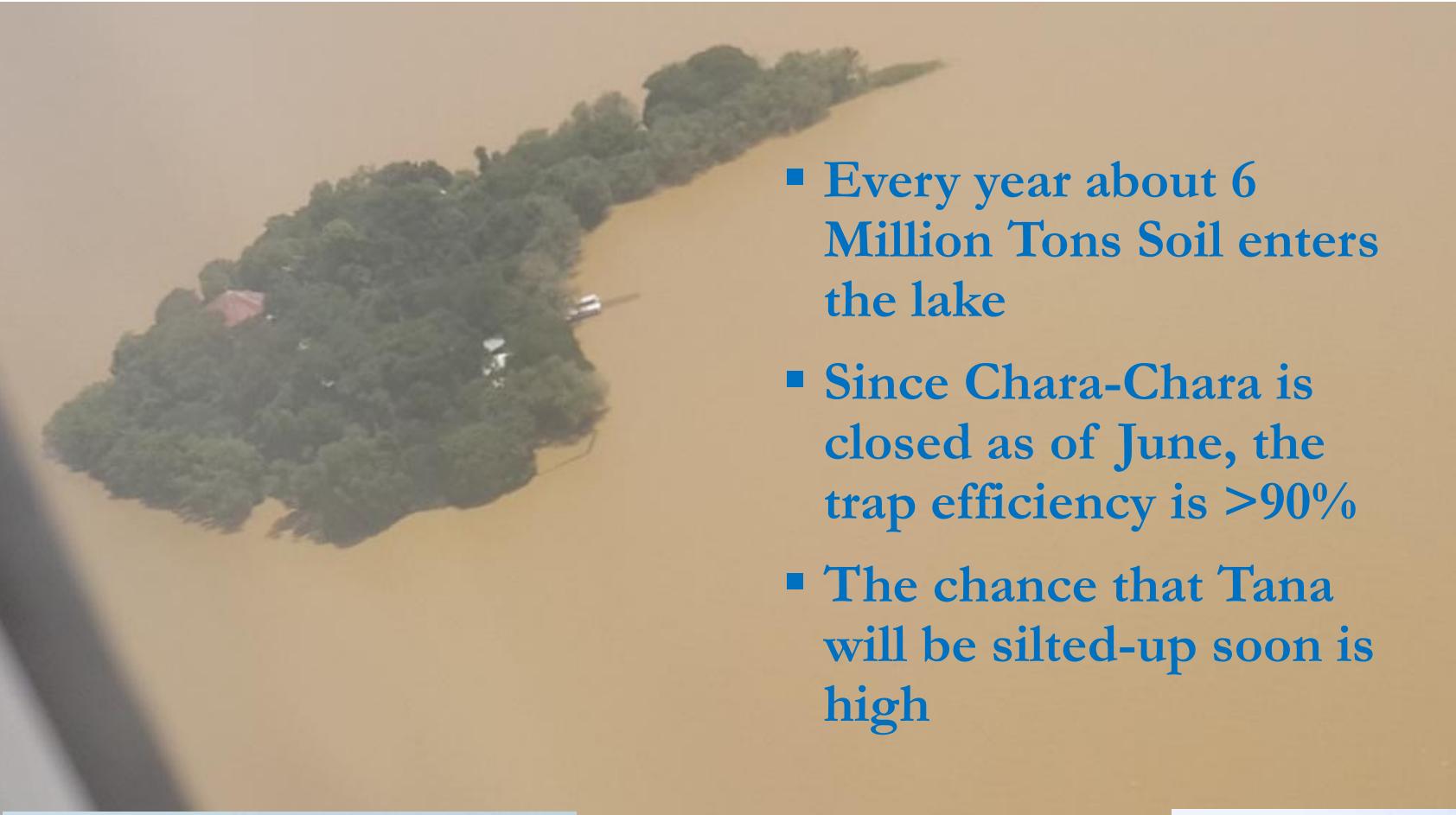
# Abbay close to GERD – laden with huge sediment (it is mud flow)



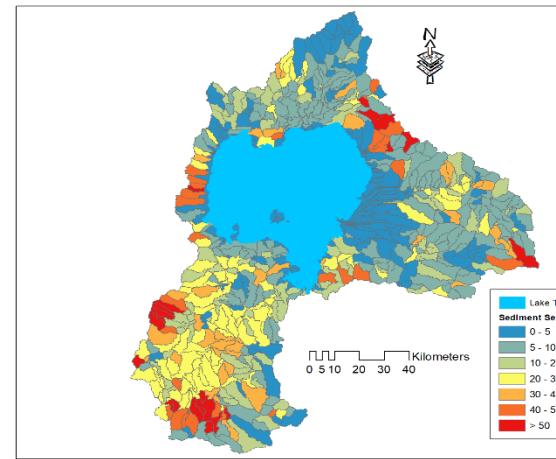
Source: Asfawosen, 2014

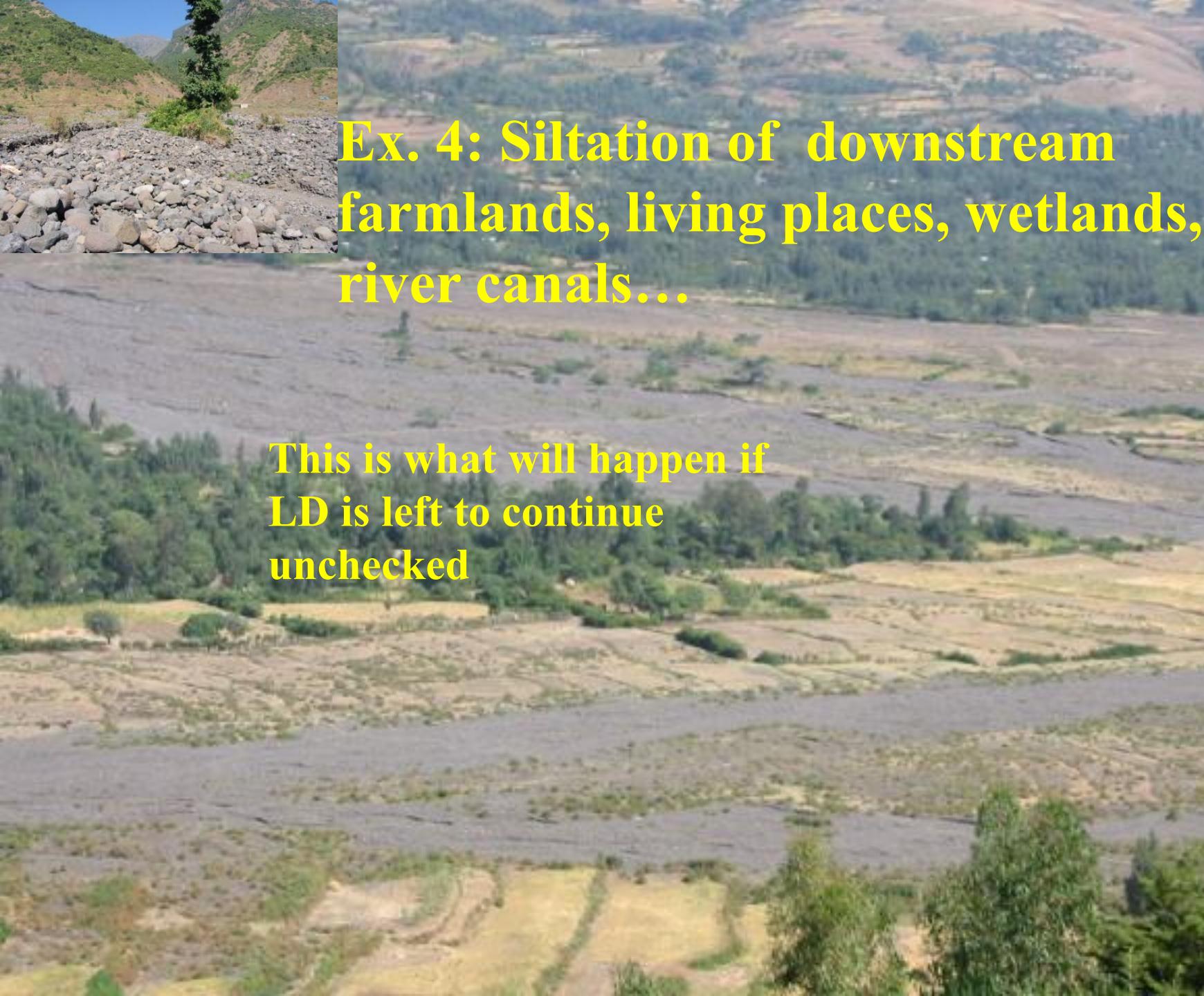
Gete, 2018

# Siltation of Lakes Eg 3: Lake Tana



- Every year about 6 Million Tons Soil enters the lake
- Since Chara-Chara is closed as of June, the trap efficiency is  $>90\%$
- The chance that Tana will be silted-up soon is high





**Ex. 4: Siltation of downstream farmlands, living places, wetlands, river canals...**

**This is what will happen if LD is left to continue unchecked**



**Siltation of wetlands**



# Flood Damage

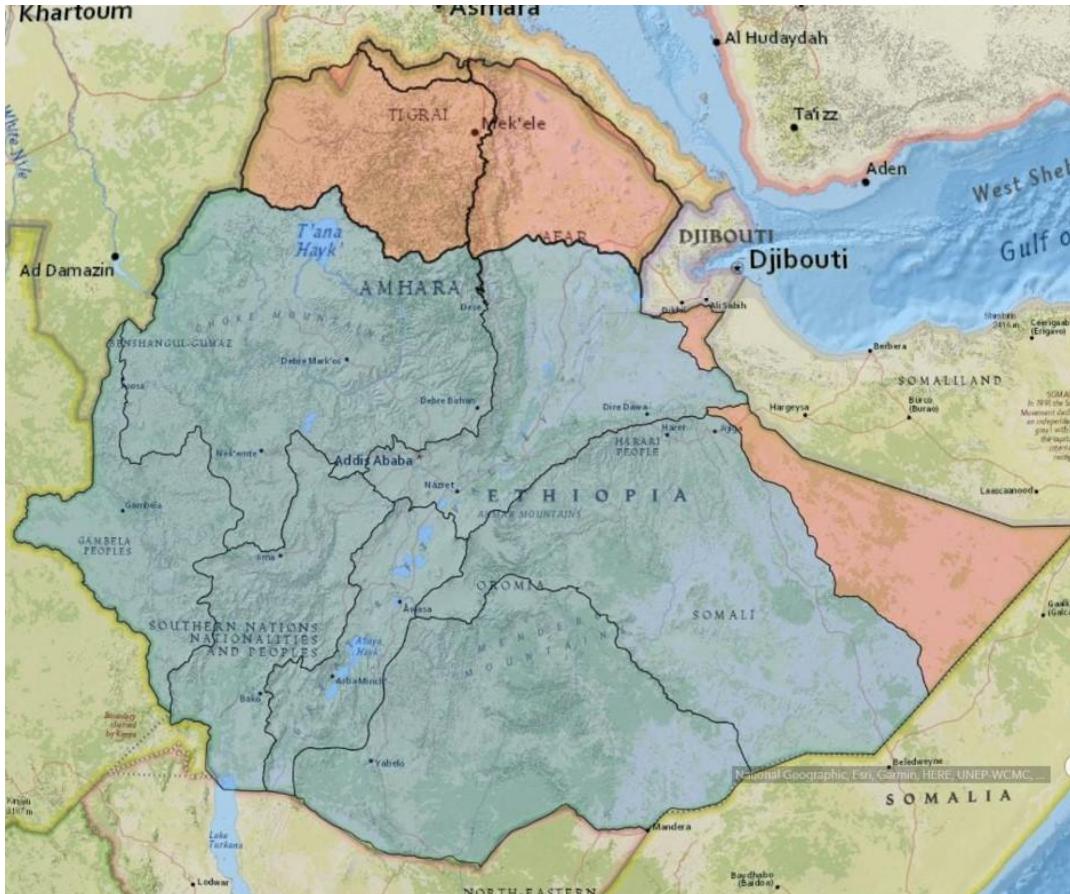
Dykes are not solutions – upstream landscape management is the solution



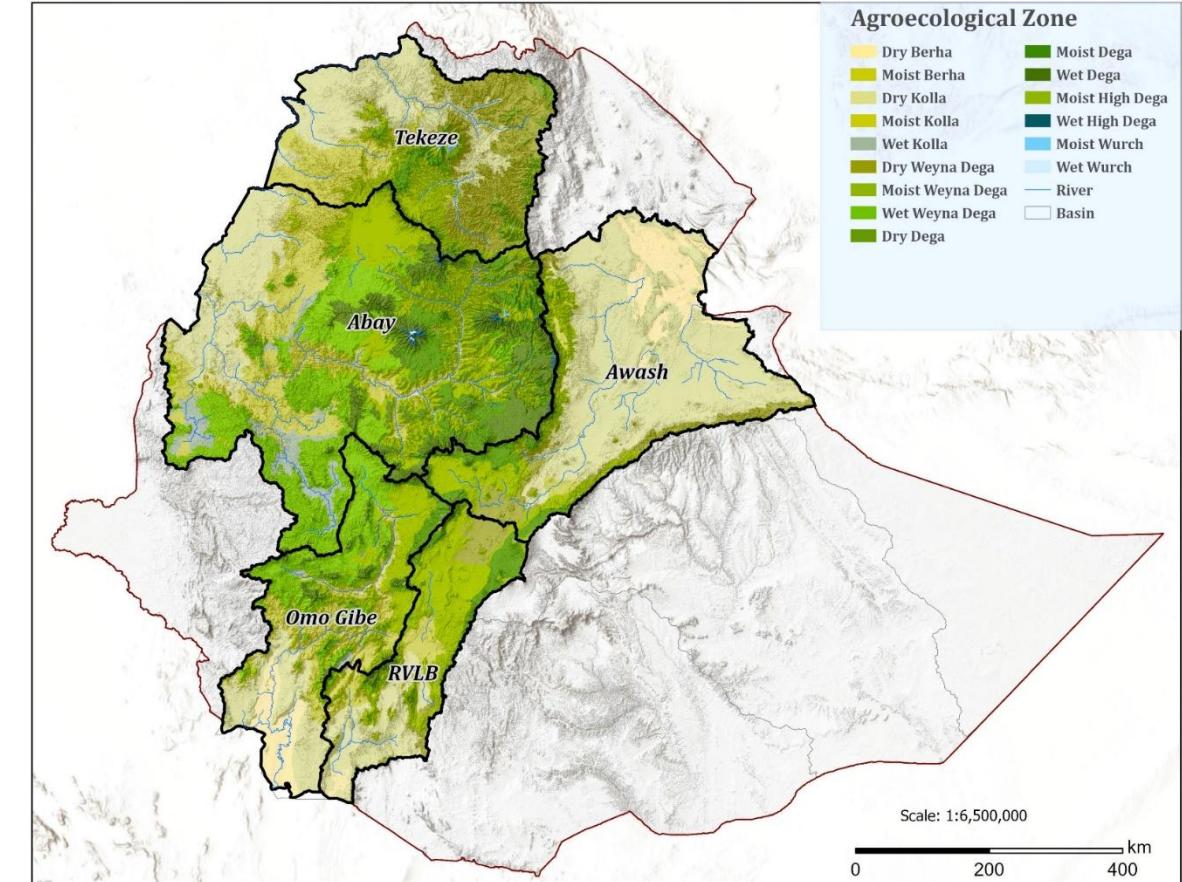
## 4. Efforts and Challenges in Integrated Water and Land Resources Management in Ethiopia

# Bain Management Plans

7 out of 12 basins have basin management plans



Challenge: effective implementation and lack of guidelines for BMP preparation and revision. BRIGHT supports the development of such guideline.

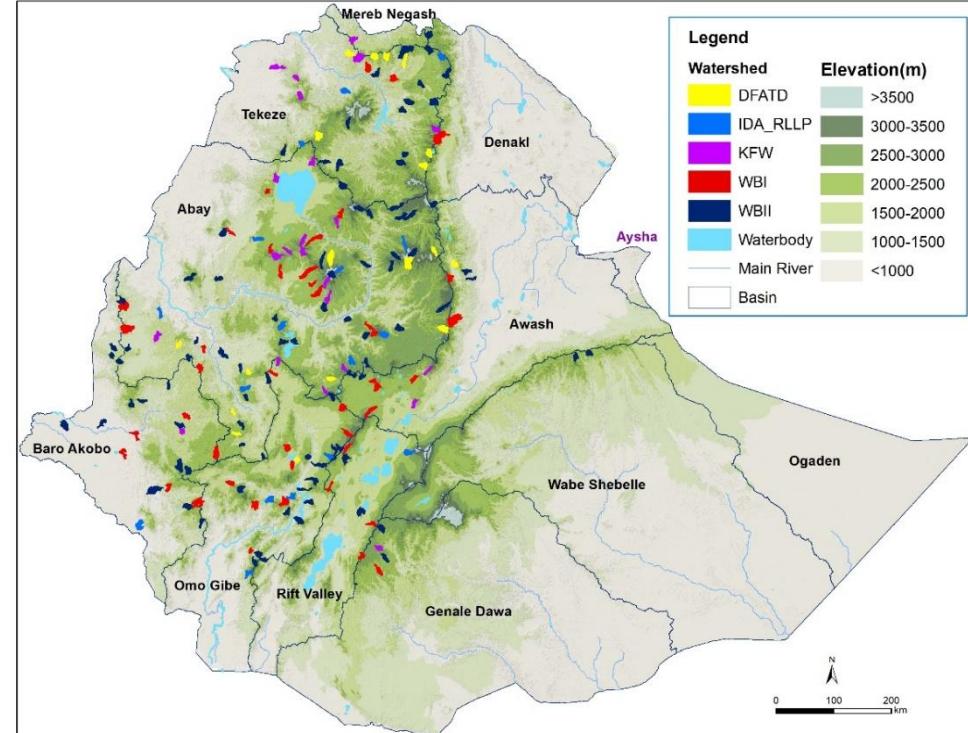


Through BRIGHT we are revising four BMPs (Abbay, Awash, RVLB and OG) and preparing new for Tekezie B. BAsriNET – WabiShebele – Others are also being attended by MoWE

### 3. Efforts & Challenges in IWM

#### ■ Ethiopia's efforts on IWM: three categories

1. Through many national programmes and projects
  - Active: **SLMP-1, SLMP-2, RLLP, KFW, CALM, PSNP, WLRC-LWs and ILMWA, etc**
  - Phased-out projects: **MERET, NBI Fast Track Project on IWM, SUN, and many others**
2. Community mobilization for IWM
  - **Every year communities contribute free labour – upto 60 days → millions of labour days per year**
3. Recently government led special initiatives – **Ethiopian Green Legacy Initiative (EGLI)**

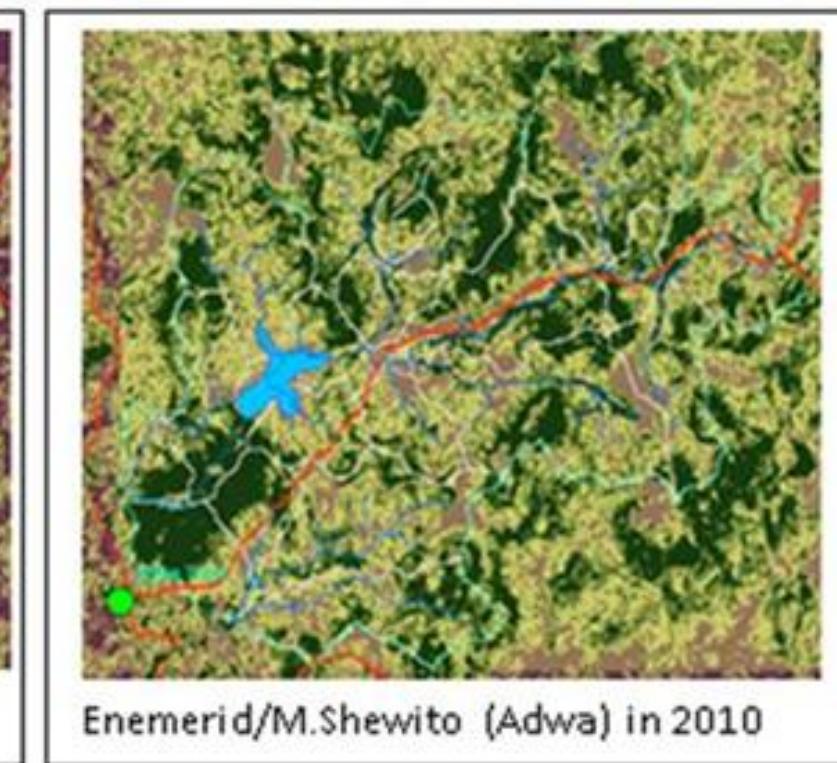
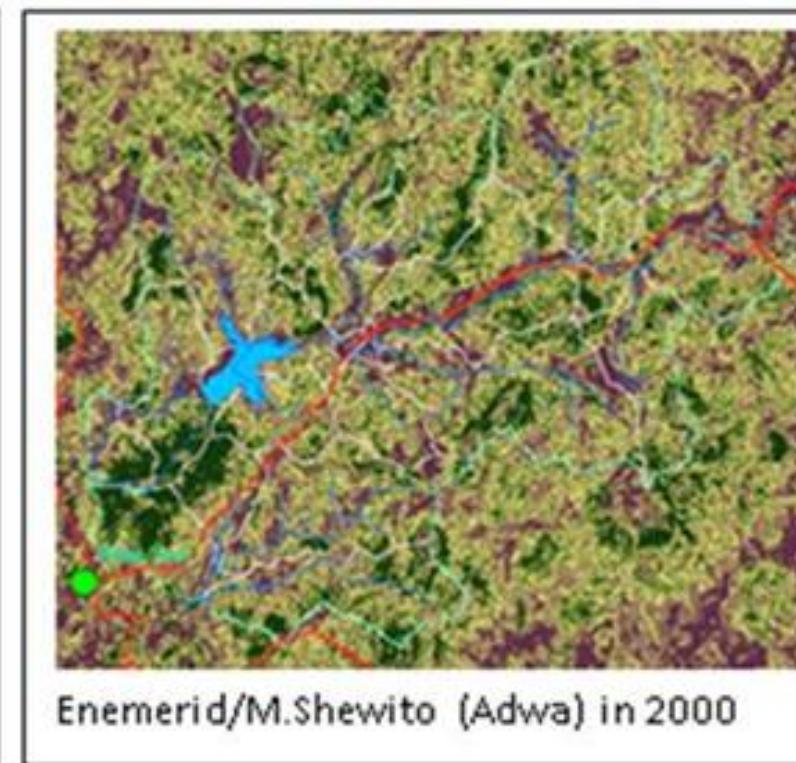
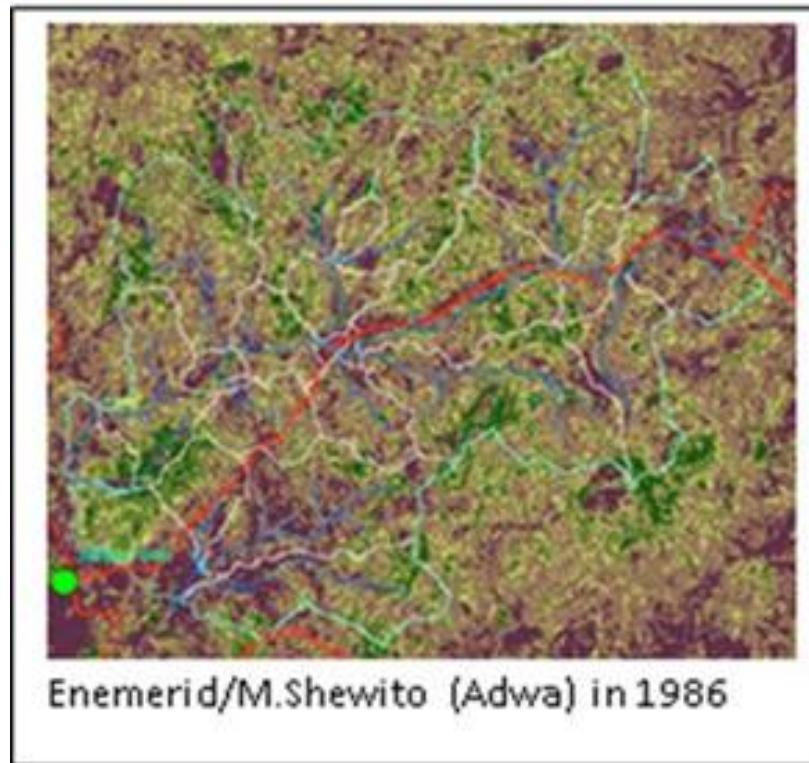


# Success stories



- Community based land restoration efforts showing success results in Northern Ethiopia

# YES – Change is possible and ecosystem functions can be restored and there are success stories in Ethiopia



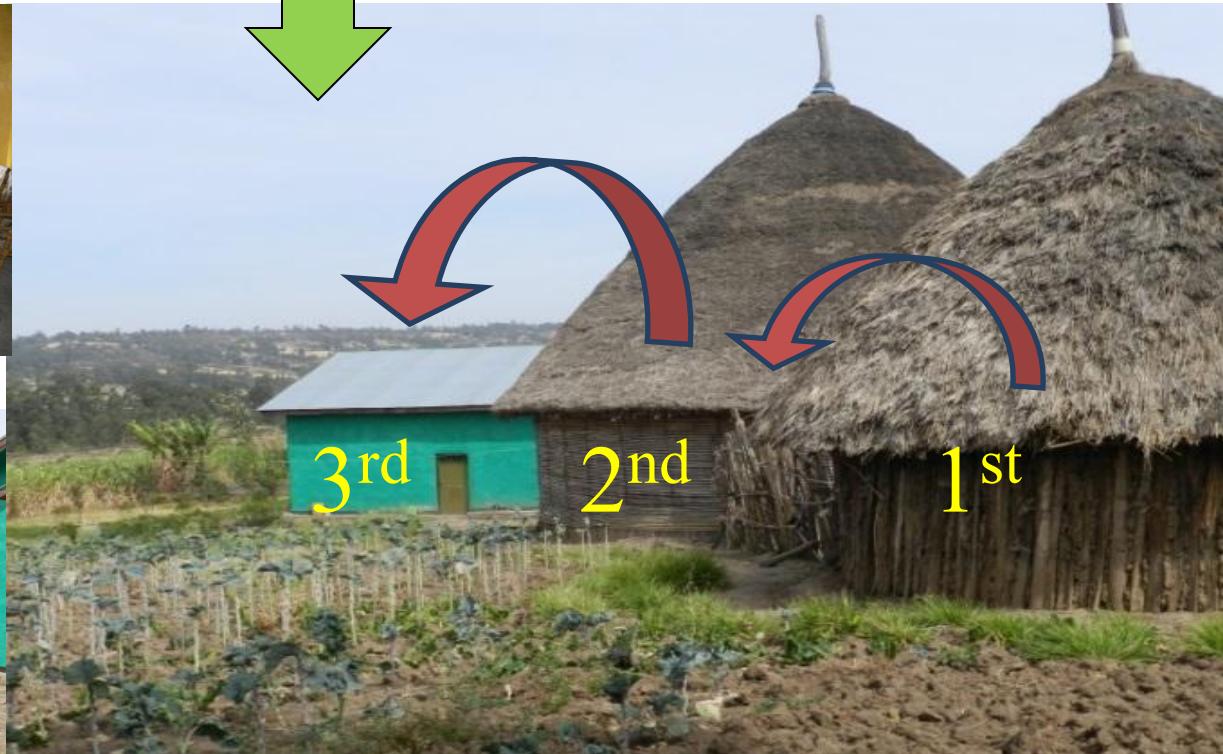
Barenness

Greenness



MERET Project site in Ethiopia, WLRC 2013

# Homestead Development as component of ILM



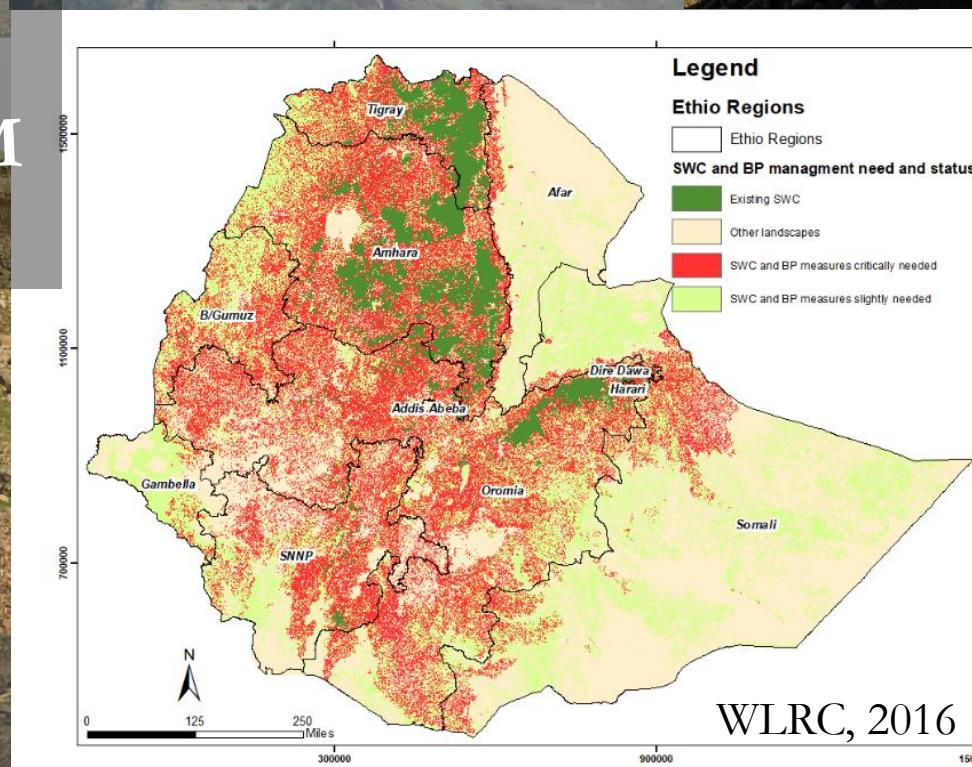
- Eg. One family changed from food insecure to medium rich farmer in less than 10 years

MERET project, Ethiopia supported by WFP and implemented by MoA

MERET was closed by donors in 2013/14



Despite some success stories  
unsustainability of SWC/IWM  
is a major challenge



WLRC, 2016

Over the last 43 years Ethiopia managed to conserve 7.7 million ha by SWC (only 23% of area that need SWC)  
But we constructed much more

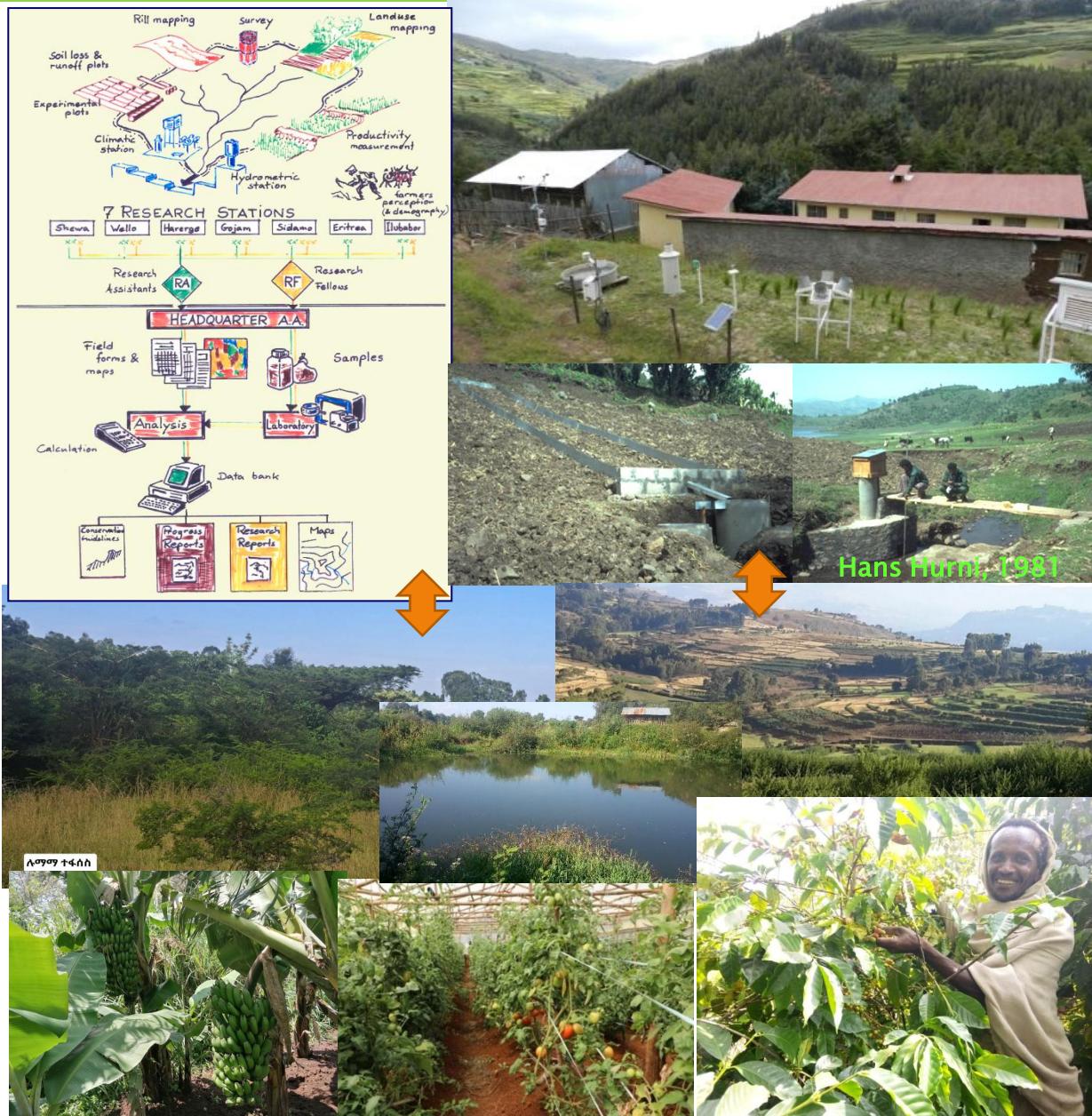
# A persistent push of small-scale agriculture to natural forest areas & unregulated deforestation



## 5. We Design Learning Watersheds (Living Socio-ecological Labs) as Solution Model Cases

# Building a Bridge - LWs

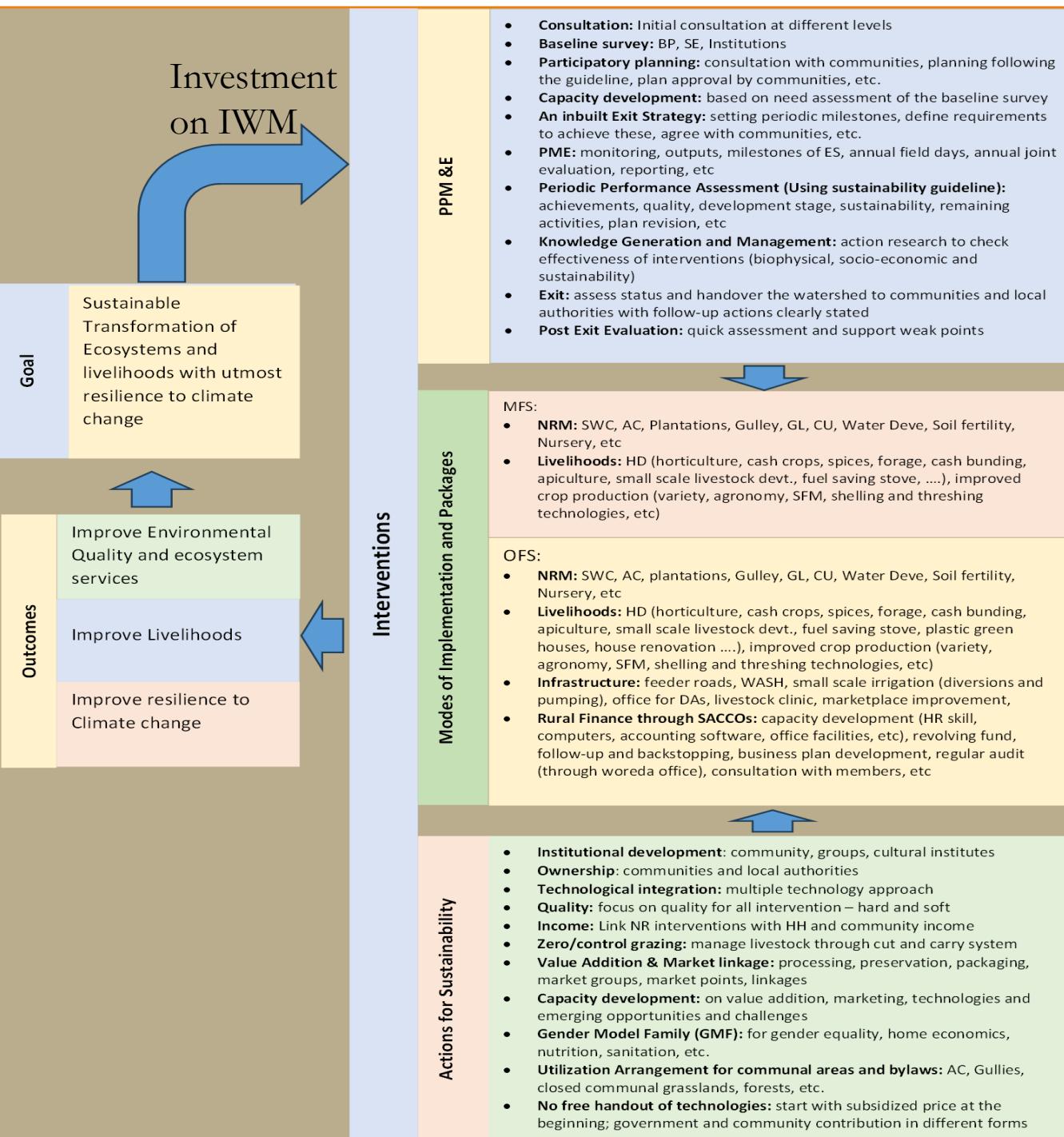
- There was a need to bridge research with development
- There was a need to design IWM at watershed level that is properly designed following the IWM principles that also addresses all observed gaps (since 1974):
  - Lack of proper Baseline situation data
  - Poor participatory design
  - Lack of science-based design
  - Focus only on independent technologies mainly Soil and water conservation structures or planation – little integration
  - Lack of livelihoods focus
  - Poor sustainability and lack of tools to address this issue
  - Lack of proper impact assessment
  - Poor institutional linkage
  - Lack of an inbuilt scientific monitoring – biophysical and socio-economic
- That is where we brought in the LW concept to:
  - Improving ecosystem services – reduce on-site and off-site impacts of LD,
  - Improving Livelihoods and
  - Build resilience community and landscape against CC
  - Addressing **unsustainability** issues of investments on NRM



# Approach

LW is a key WLRC initiative that supports & strengthens technical, institutional, & knowledge management of IWM

- LW principles are, among others
  - co-learning, co-production of knowledge & capacity building
  - adaptive planning,
  - engagement of stakeholders and management
  - Addressing institutional issues.
- Serving as live learning platform for all (farmers, researchers, policy makers)



# Modes of Implementation – Based on Funding Availability

- **There are two modes of implementation**

- Basic Level (Minimum funding scenarios (MFS) – we start with Basic Level
- Optimum Level (Optimum Funding Scenarios (OFS)

- **Funding Requirements**

- Basic Level – upto half a million EURO/Per watershed/5 years
- Optimum Level – upto one million EURO/Watershed/5years
  - The fund includes community and government contributions

- **Similarities and differences of the two scenarios**

- In both cases NRM and livelihoods packages are common – though more option are available in OL
- In OL – we add infrastructure (feeder roads, WASH, ponds, monitoring, and others) and rural micro-finance

- **Size: from 400-1000ha depending on heterogeneity of land use, landscape**

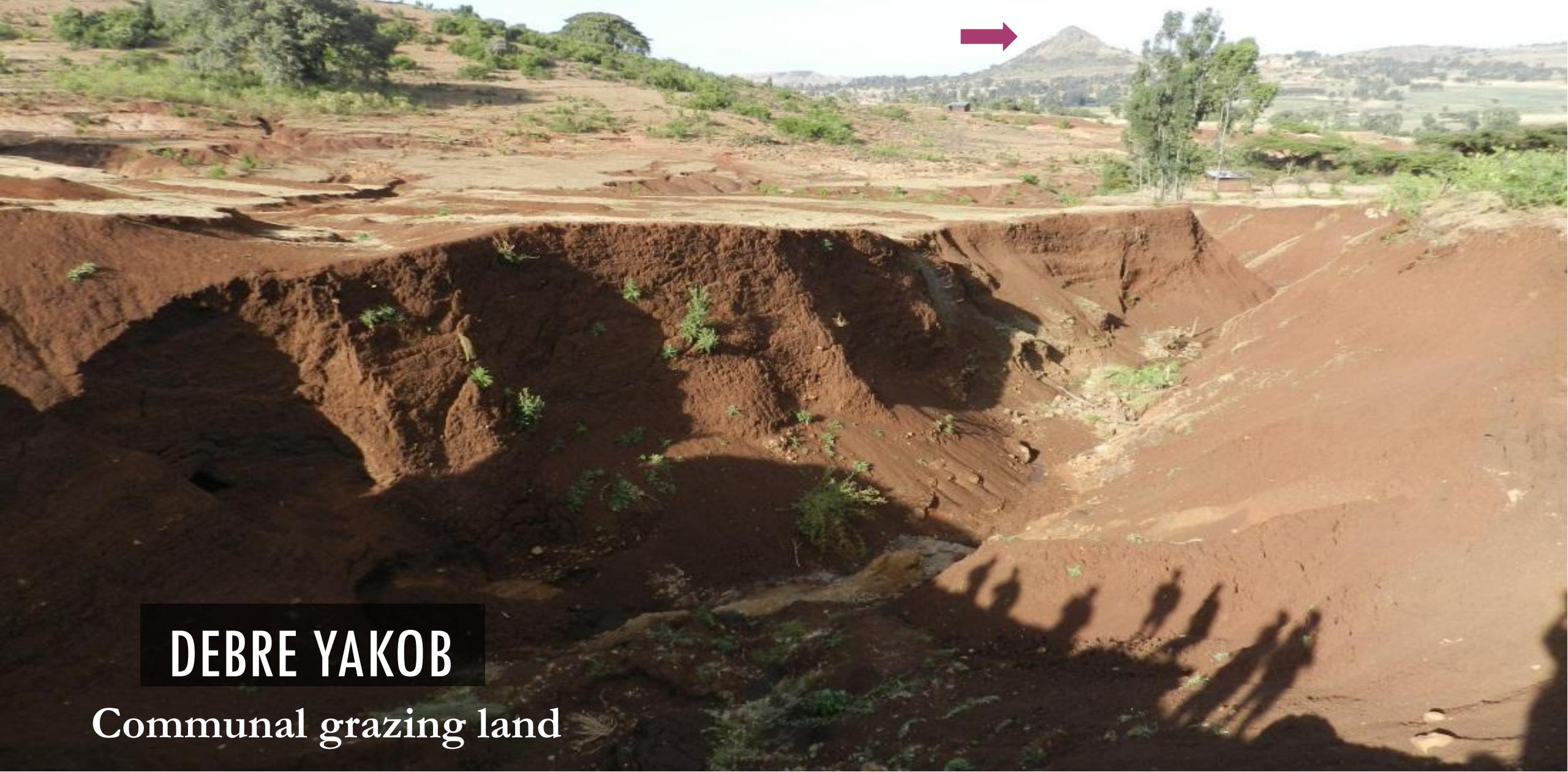


# Baseline situation of LWs in pictures (2012) - BL



Gully Erosion is a common problem in every parts of Ethiopia on  
communal grasslands, hills and cultivated lands

January 2012



Change is possible and can be quick if you follow the IWM principle – you can easily minimize erosion by 75%

February 2015

- What we did here:
  - Establish users groups
  - Develop utilization and management plan
  - Develop bylaws
  - Apply simple rehabilitation technologies (physical and biological)
  - Close follow-up and support



...

# Area Closure

February 2023

Converting degraded hillside  
into productive land with the  
same process



# Making Farm Terraces Productive

Making bunds on  
cultivated land  
productive

- Forage  
development
- Can be also fruit
- Or cash crop like  
Gesho (Hops)

→**Cash Bunding**

December 2015



**SWC structures are made  
Productive -converted into cash  
bunds – a key for sustainability**





Strengthening SWC with biological measures -make them productive - also enhances their effect in reducing erosion and sediment generation

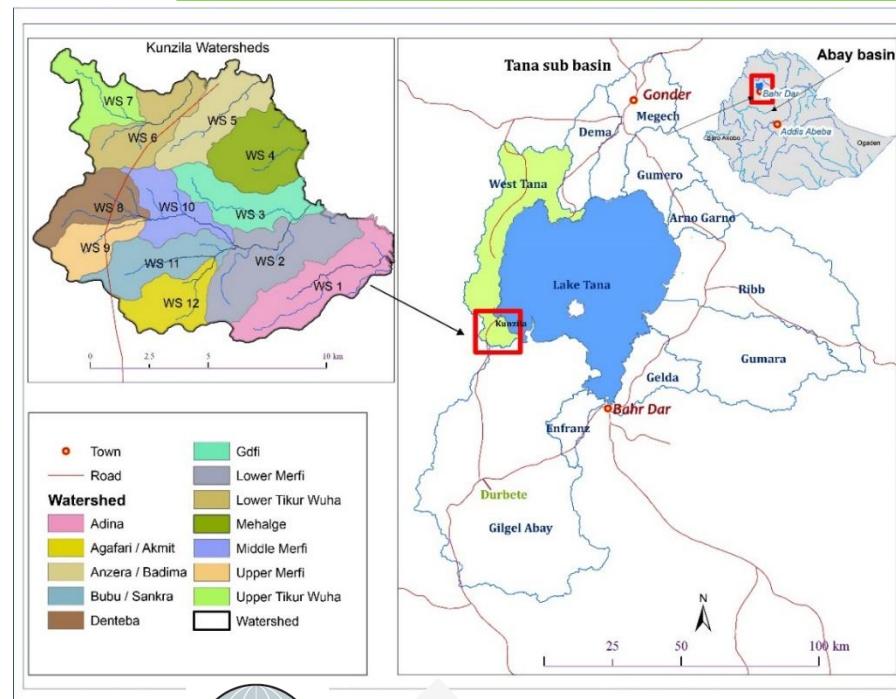
# To enhance livelihoods we transform Homesteads into Agroforestry productive lands with many packages





WATER & LAND  
RESOURCE  
CENTRE

# 5. Upscaling to OL - KILMWA-2020



18 WS, 6-  
Kebeles,  
11,720ha

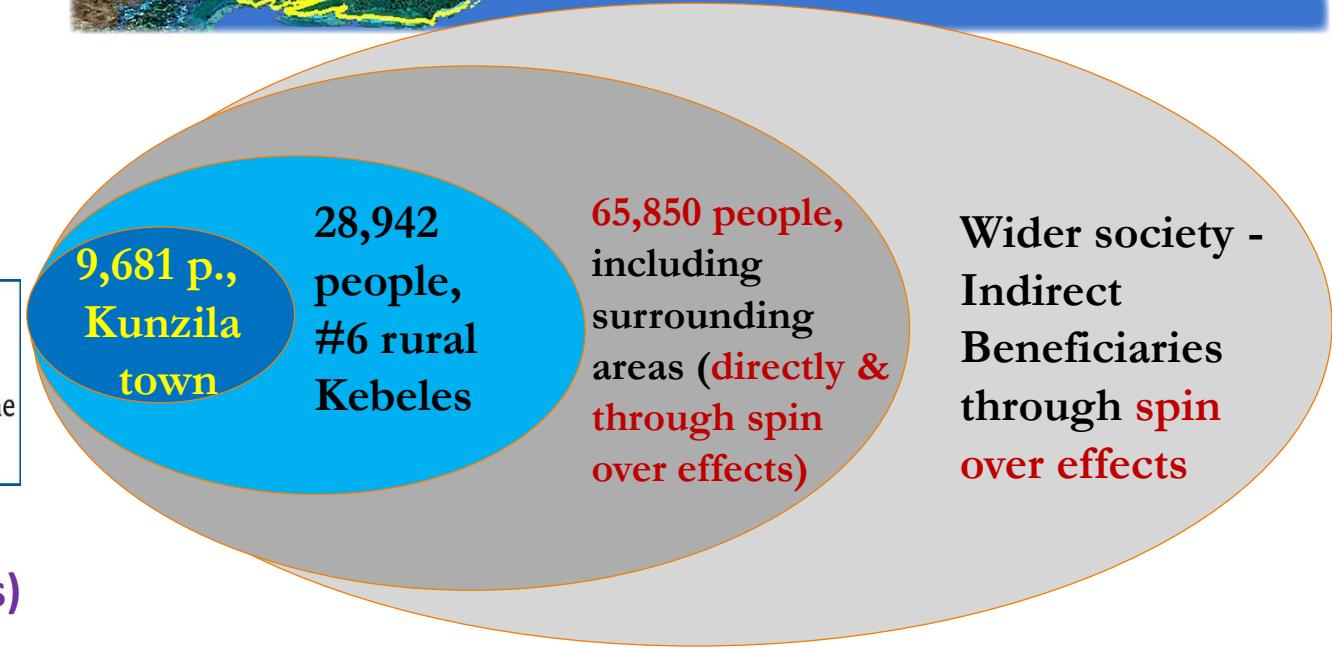


ILM/Scientific  
Monitoring/  
Capacity  
Development/  
Project Mgt



It has 8 Components

~€20 Million  
2020-2024 (5 Years)



# Baseline situation – very frightening

- Huge land degradation and Siltation of Lake Tana



- Poor livestock management, less than 43% forage supply



- Poor access to basic water supply: 70% of HHs, 67% of schools & 75% Health Care Facilities



# Optimum Level Example from ILMWA

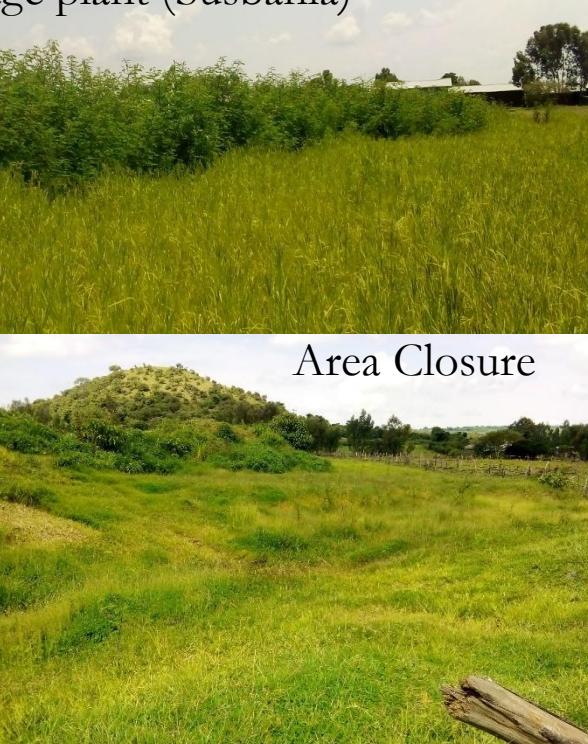


The **OL** focusses  
on:

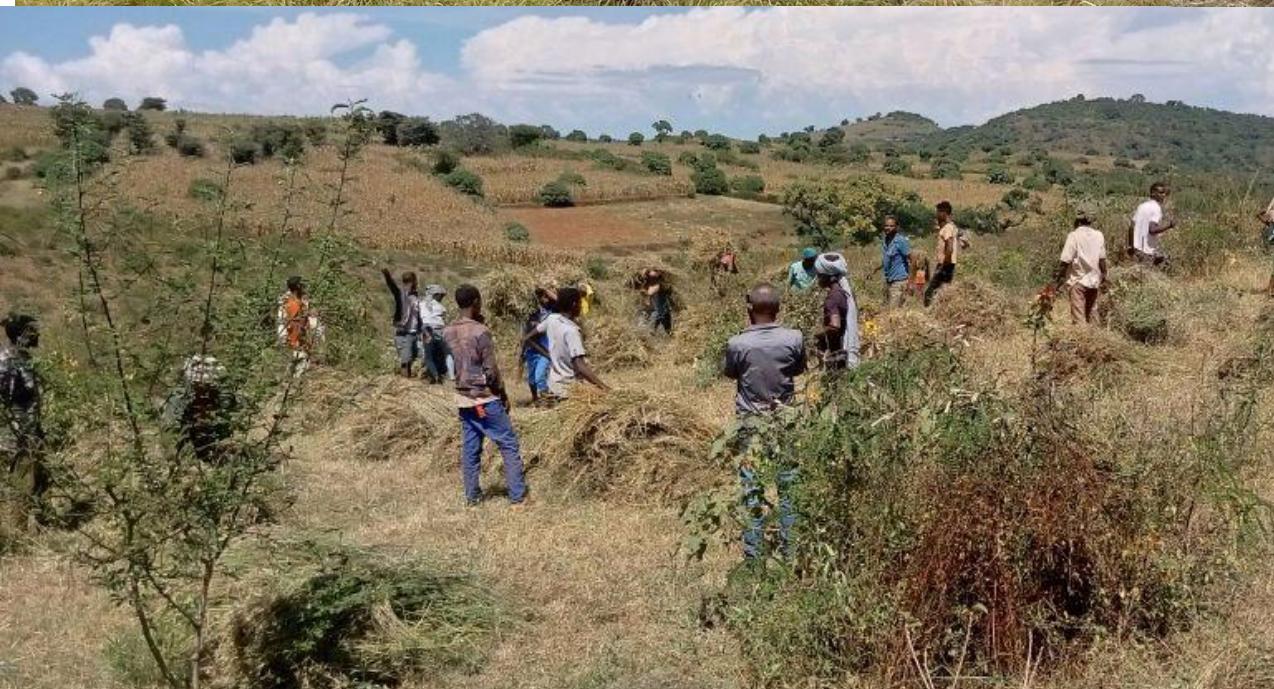
- NRM
- Livelihoods
- Infrastructure
- Rural Finance







# Forage Development on Degraded Communal Areas



# Homestead Development is the key component of the LWs in improving livelihoods, nutrition and empowering women



# Simple Greenhouse – 3 times/y



# Fruits, Coffee and Cash Crop (Gesho)





## Livestock Development



# Integrating simple Infrastructures with SWLRM transform rural livelihoods



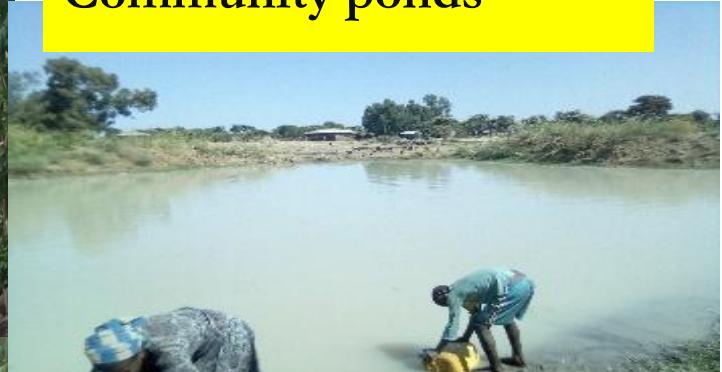
Surface pump SSI Scheme



Vet. Clinics + crash



Community ponds



Diversion SSI Scheme

# Ponds for Human and livestock



# Water Supply: three multi-village schemes for 60,000 people



# Institutional & HH WASH



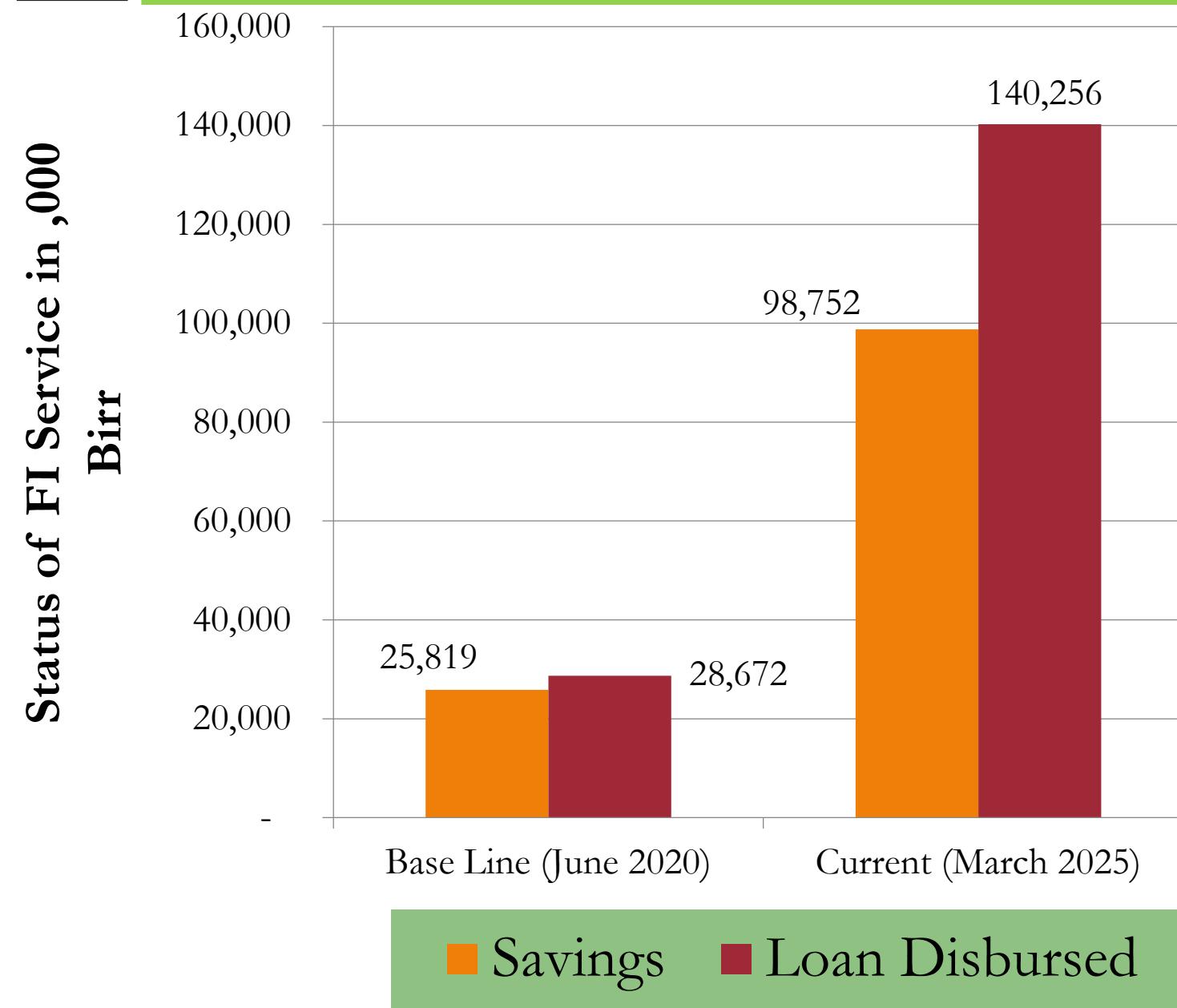
Newly Constructed Toilet in one of the Schools



Newly Constructed Market Place  
Toilet with Washing and Shower Facilities

- Schools
- Health Centers
- Market Place
- Household Level –  
Rural and Urban

# *Rural Micro Finance Through SACCOs*



## Compared to baseline situation

- 400% increment in loan
- 279% increment in savings
- 20% increment in membership



# Capacity Improvement - Community, experts and local leaders



# LW as a learning sites

- Use LWs **as live learning platforms**
  - Policy makers, land users, researchers, extension, other projects



# Lessons from LWs & impacts

- The Learning Watershed (LW) initiative have effectively addressed **complex social-ecological linkages** to improve both ecosystem services for community wellbeing and the sustained functioning of ecosystems
- LW promotes **transdisciplinary collaboration, transformative social learning, and adaptive planning that integrates co-knowledge production with its practical application**— linking learning and action
- Synergetic effects arising from integration of the diverse interventions are much greater than the sum of the independent effects of each intervention



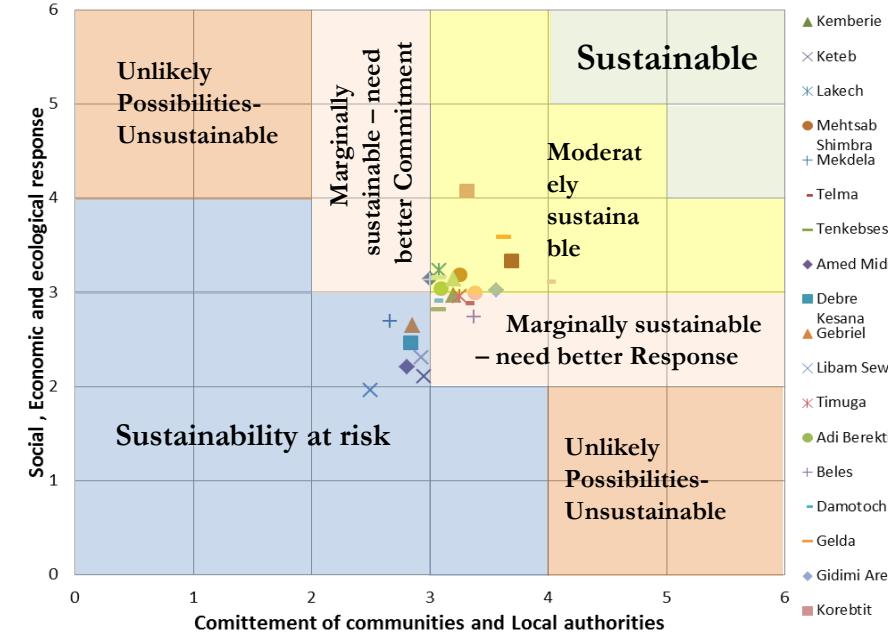
## 6. Tools Developed for SWLRM

# A1. The Sustainability Assessment Tool

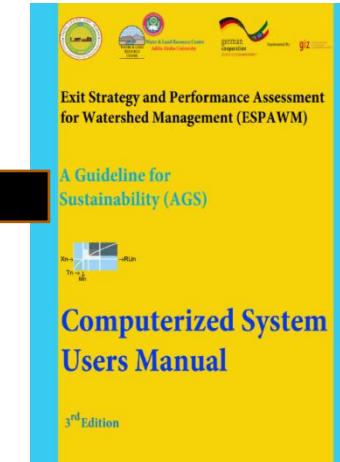
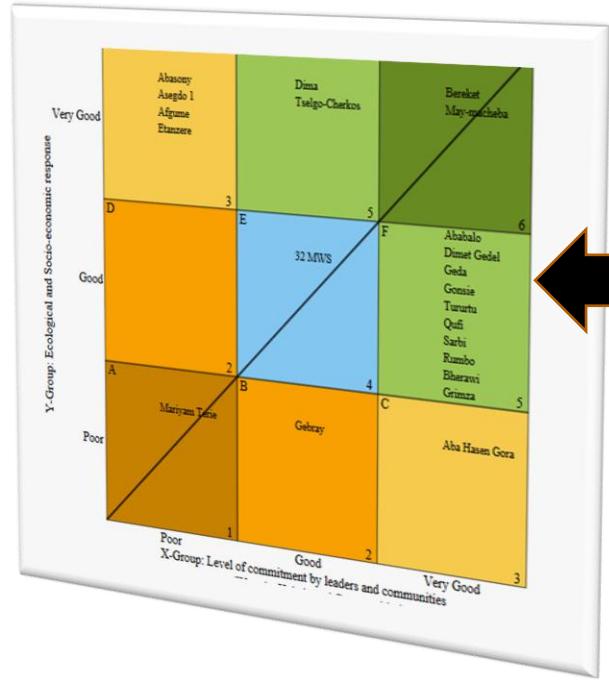
## What It Does

- In built ES
- Assess quality
- Determine WS Development stage
- Sustainability (Activities, Watersheds & Projects)
- Quantify remaining actions towards sustainability
- Post exit evaluation

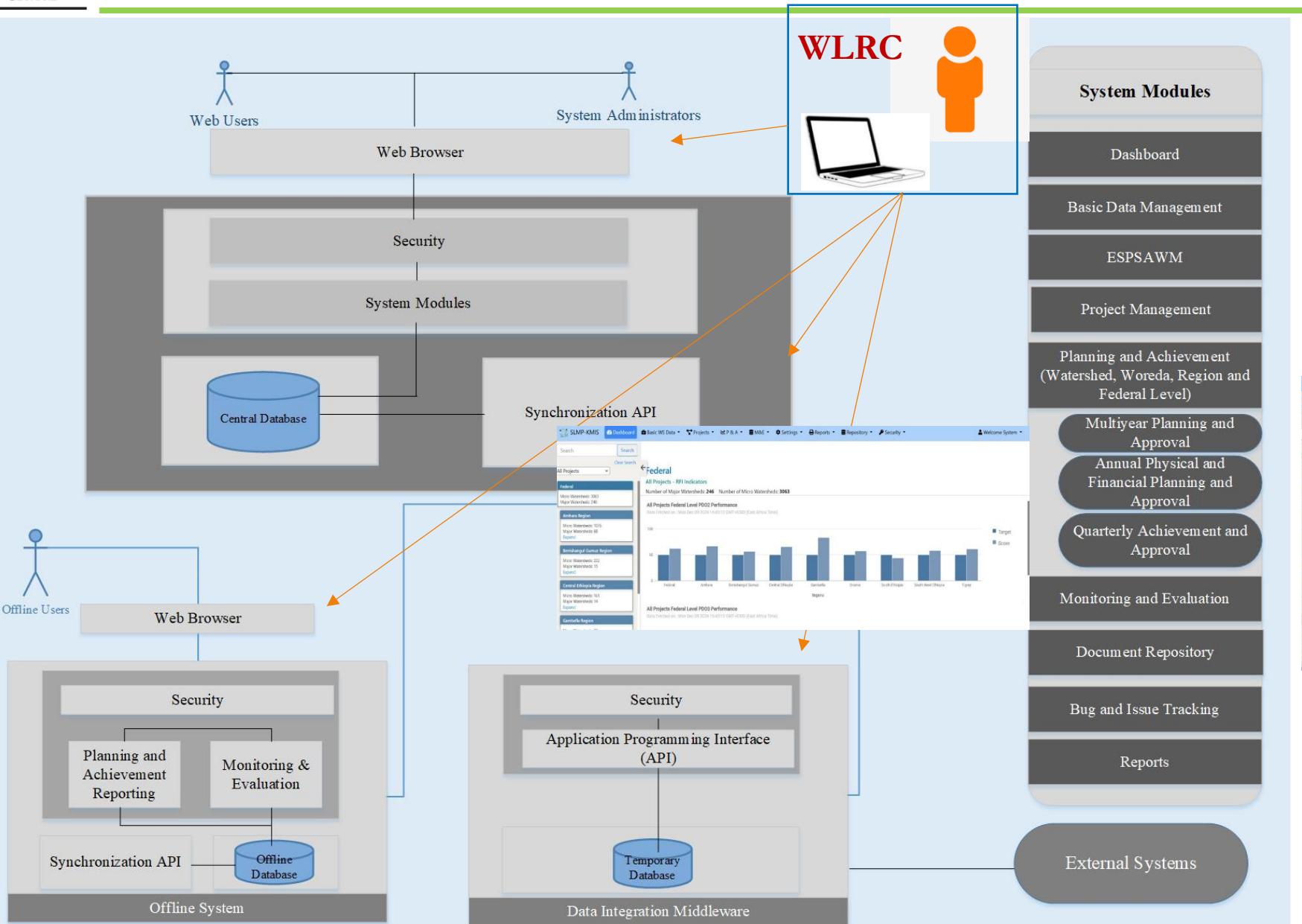
Plotted with actual values of X and Y



Average Value of X and Y

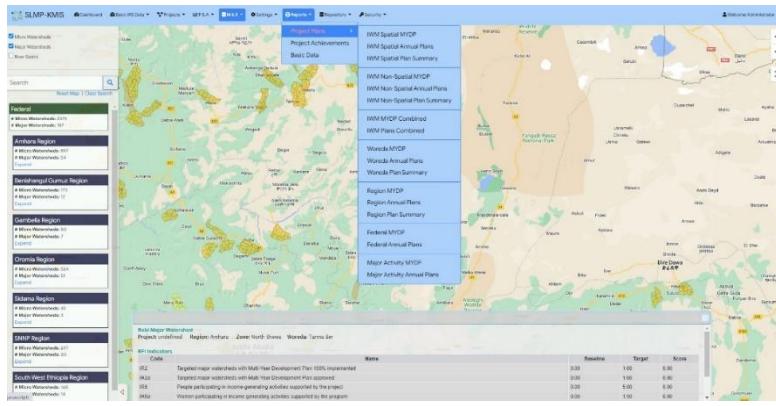


# A2. The SLM-KMIS



All done in one system

- Planning
- Reporting
- MEL – mobile application
- Online and offline system
- Very user friendly
- Used by field officers



Major watersheds managed by the system

246

Micro Watersheds managed by the system

3063

# Water Audit Information System (WAIS)

Hostpoint L | (6 unread) | How to Rea | Water scarc | SIWI - NAT | i7959e.pdf | at scale me | Water Audi | + | Not secure | http://wlrc-eth.org/water-audit-vis/maps.php

## Water Audit Information System (WAIS)

Wednesday 19, April 2023

Home Stats by Date View Dataset Maps Analysis About Logout Tena Alamirew

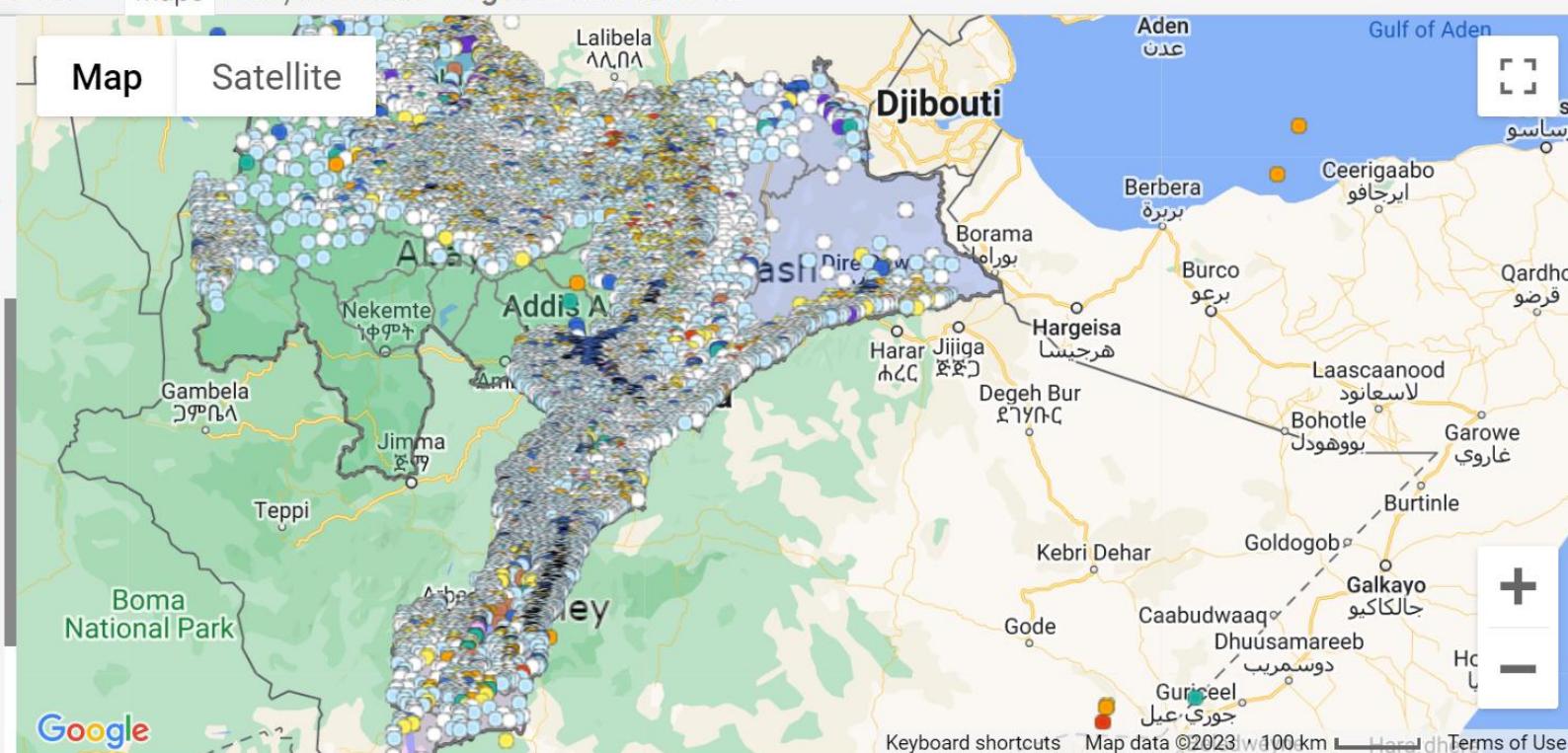
Show River Basins  
 Show Sub Basins  
 Show Rivers

[Reset Map](#)

Data Points Atlas Thematic Maps

Explore Data View

All  
 Borehole  
 Dam  
 Diversion  
 Dyke  
 Fishery  
 Hospitality  
 Hydropower  
 Industry

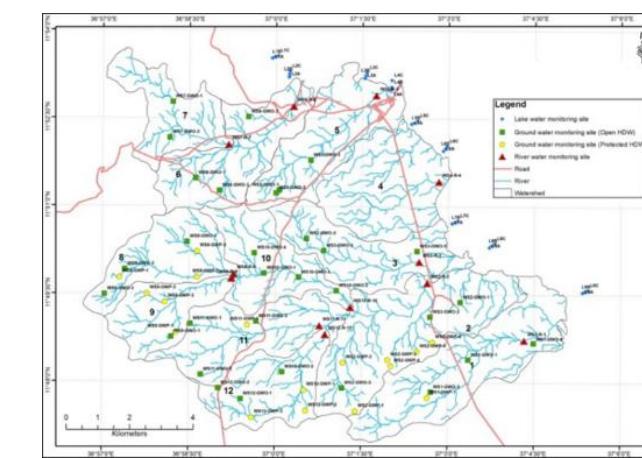


## **7. Monitoring the impact of IWM on runoff regulation, sediment control, soil moisture retention and GW recharge & Livelihoods**

# Scientific Monitoring

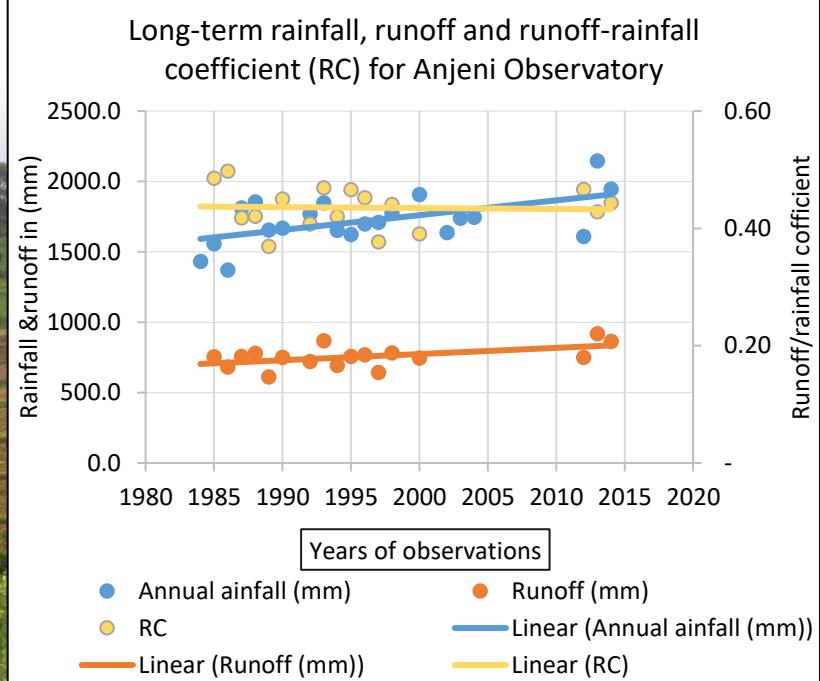
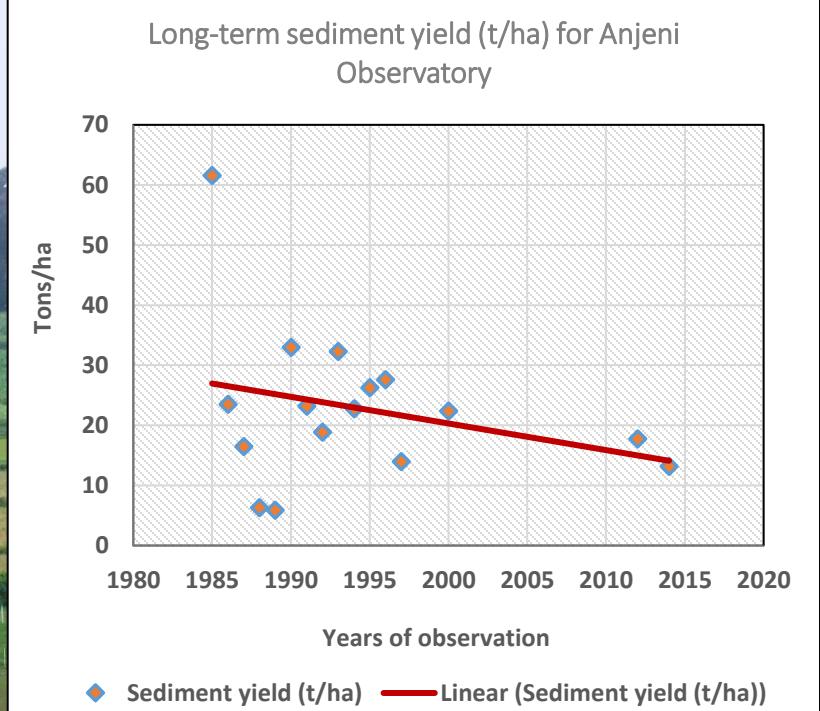
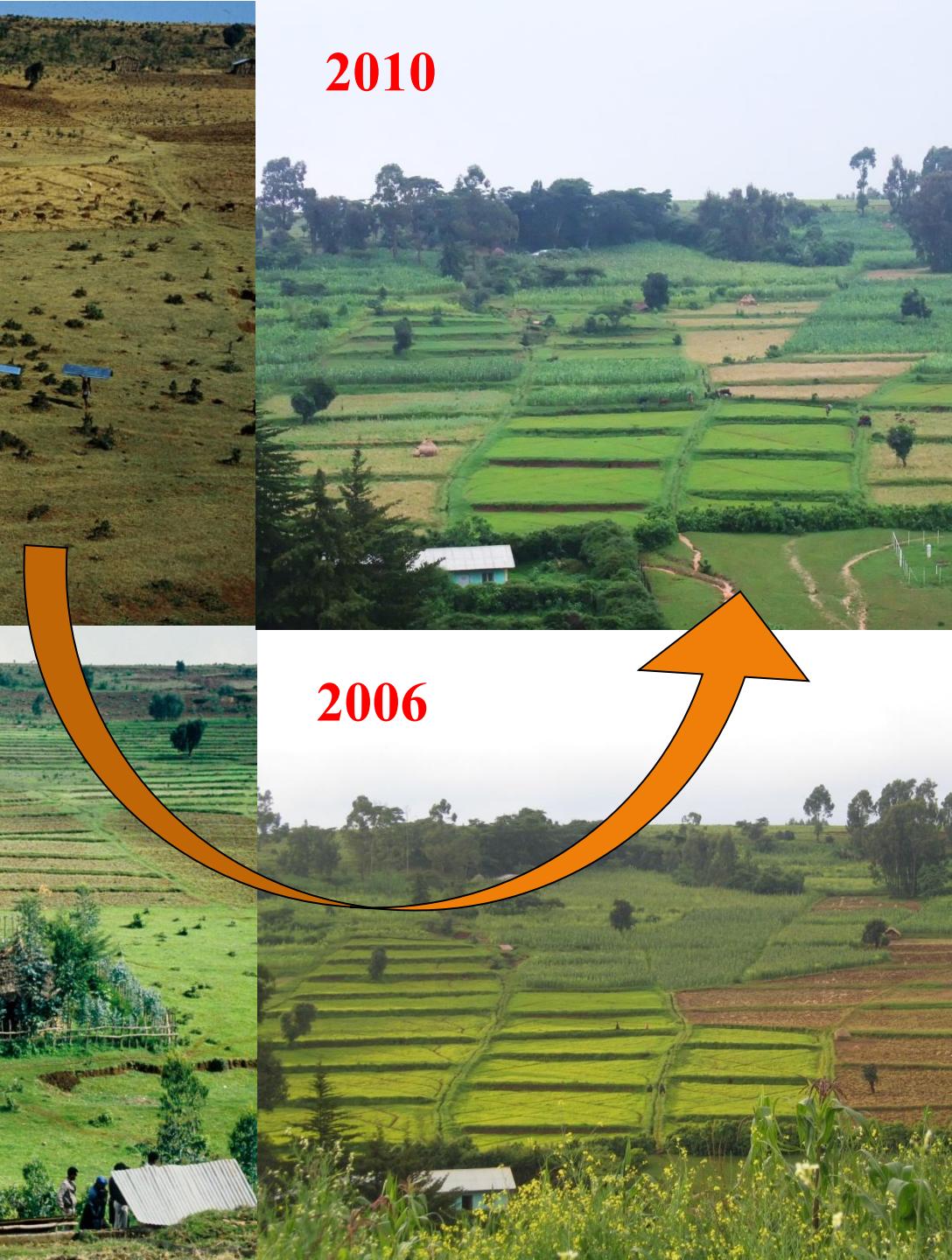
- Project outcomes and impacts are monitored through:

- River gauge stations,
- Groundwater monitoring stations,
- Water quality sampling and analysis
- HHs livelihood status – starting from baseline – changes are assessed



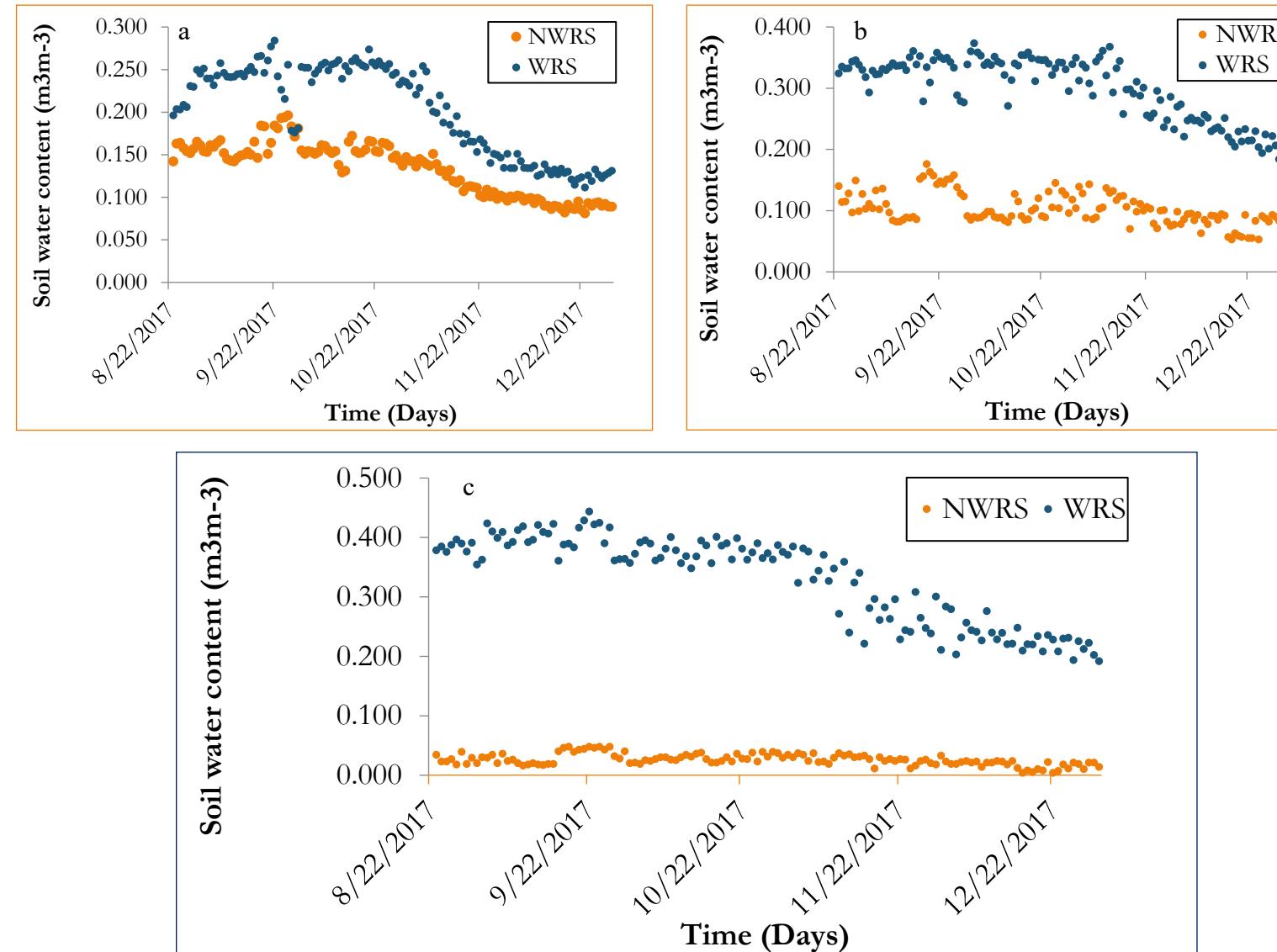
# Monitoring BP Impacts of IWM

- Untreated watershed sediment yield was 61t/ha/y
- Average sediment yield after IWM amounts 17t/h/y
- 72% reduction in SY moving downstream
- RC slightly reduced but small – because of increased base flow



# Monitoring Recharge Capacity

- The integration of water retention structures in steep slope area closures improved soil profile moisture storage by:
  - 47.90% at 200 mm profile depth (a),
  - 187.23% at 300 mm profile depth (b), and
  - 1169.57 % at 400 mm profile depth (c)
- Despite high vegetation consumptive water use at the conserved plot, moisture availability is high the deeper we go – potential for recharging the ground water

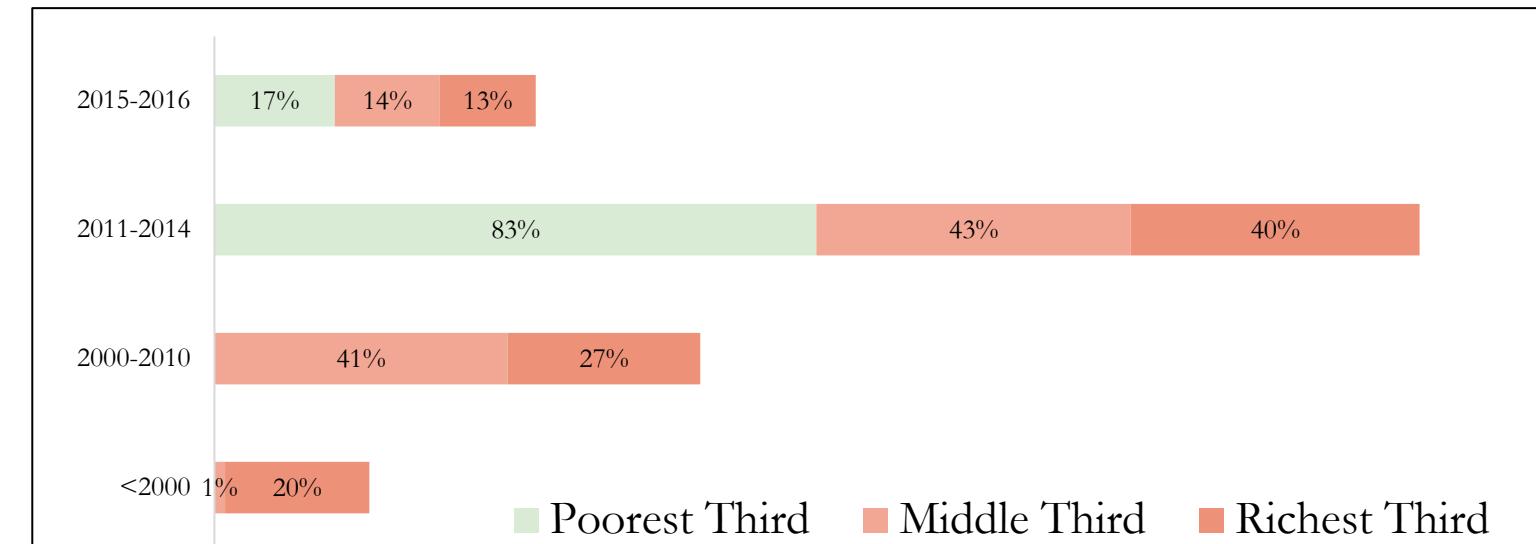
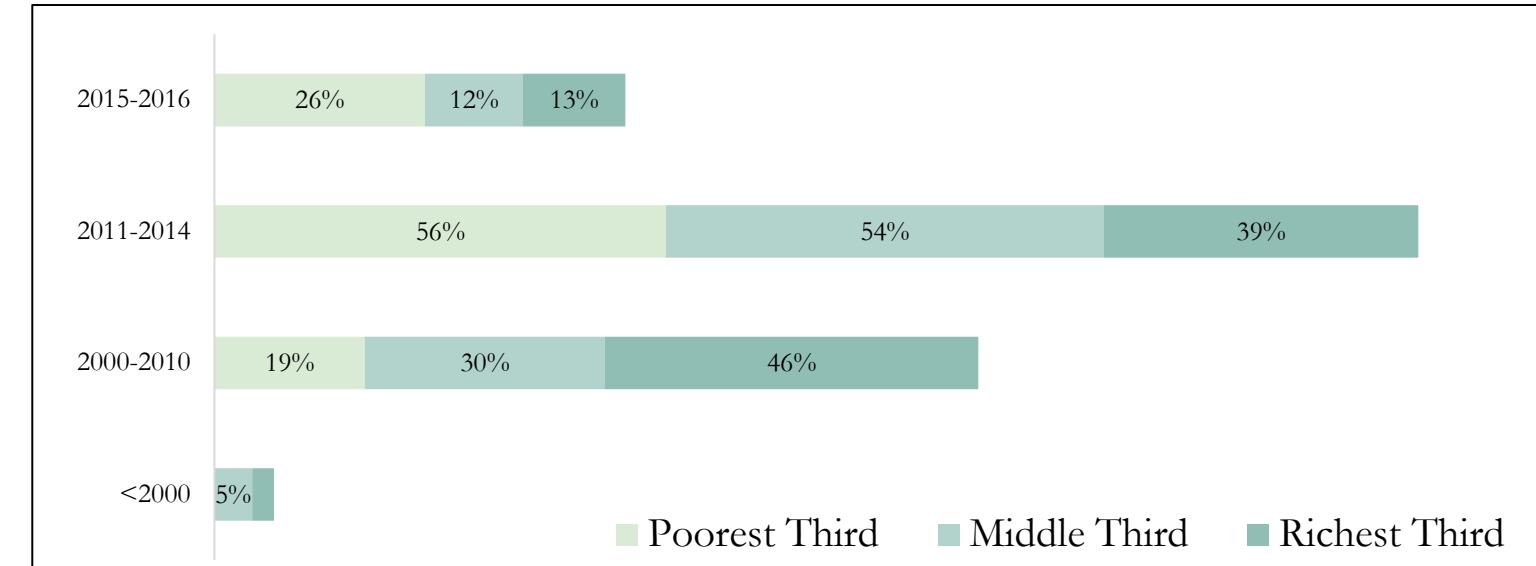


WRS – with water retention structures

NWRS - without

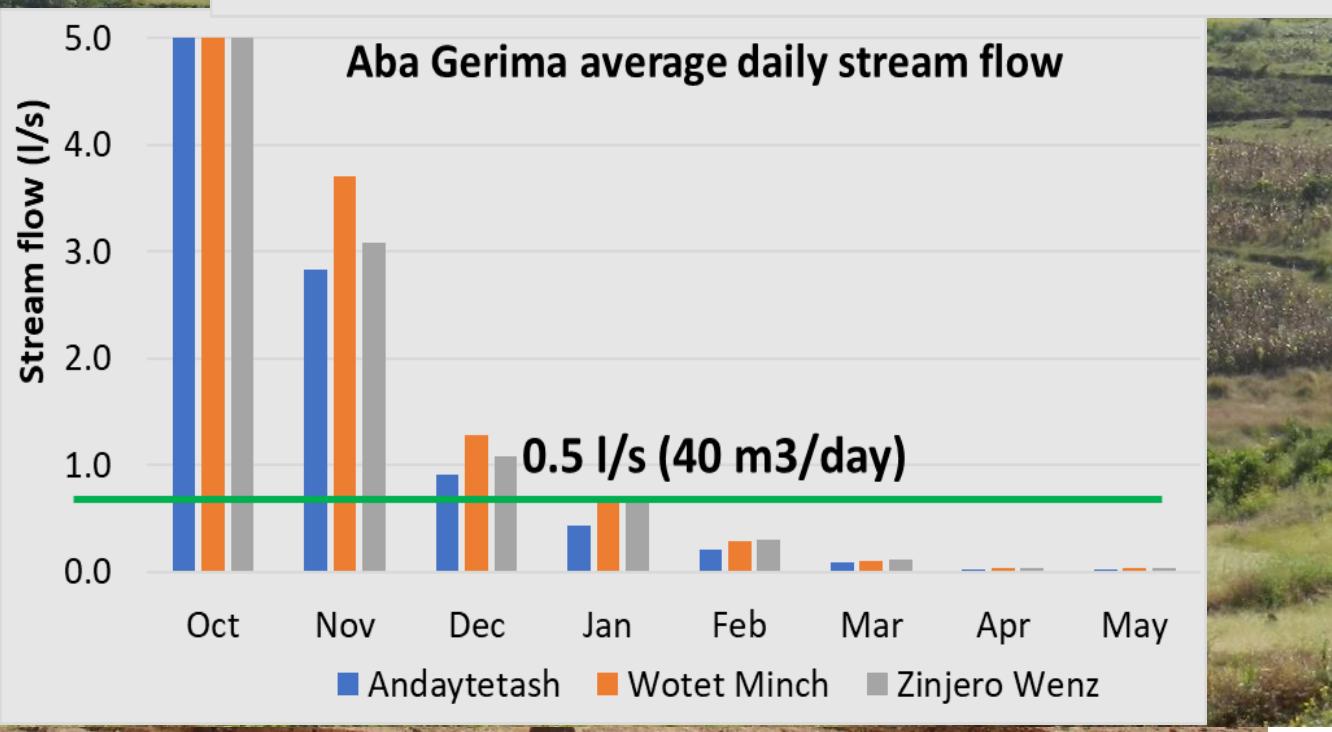
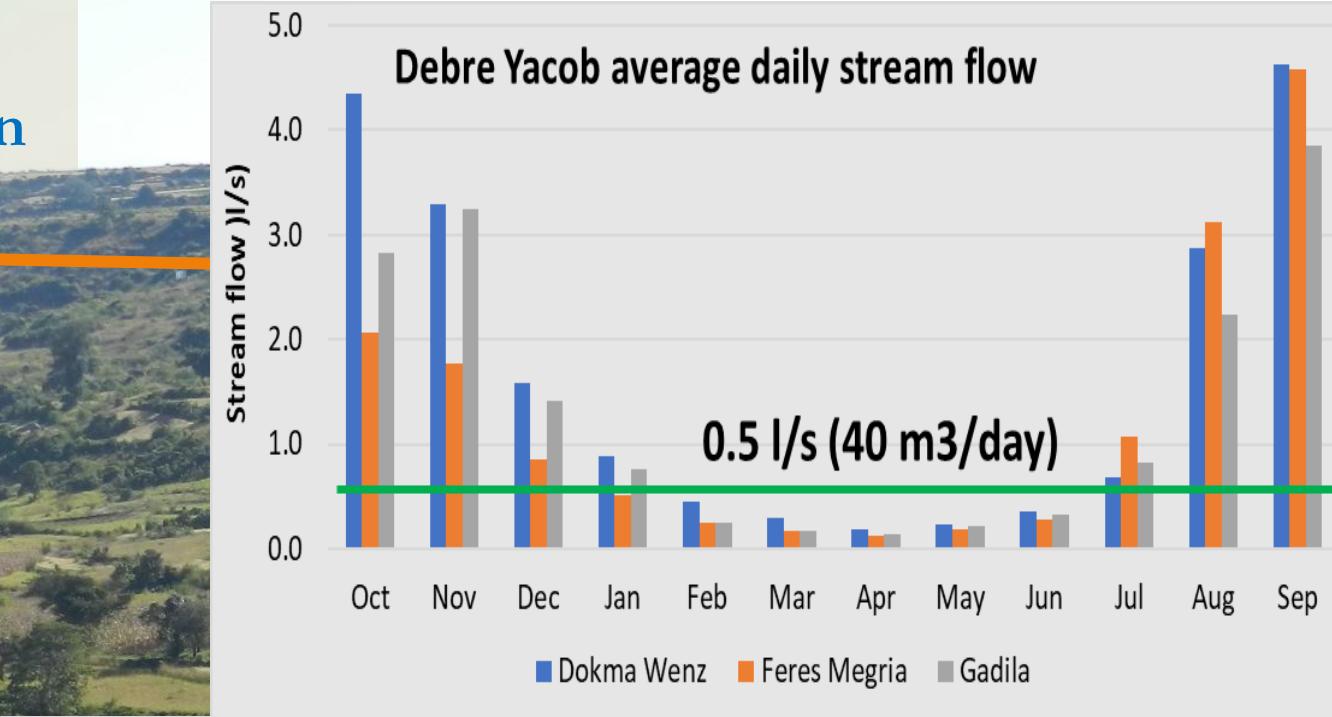
# Hand-dug Well Possession as Indicator of GW Recharge

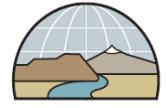
- The LW was initiated in 2012, it is only after that the poor starts having wells in both LWs showing the role of IWM in recharging the shallow GW
- The cost of digging gets small



Source: IRC-WLRC, 2017

## Base flow of streams improved in volume and extended to dry season

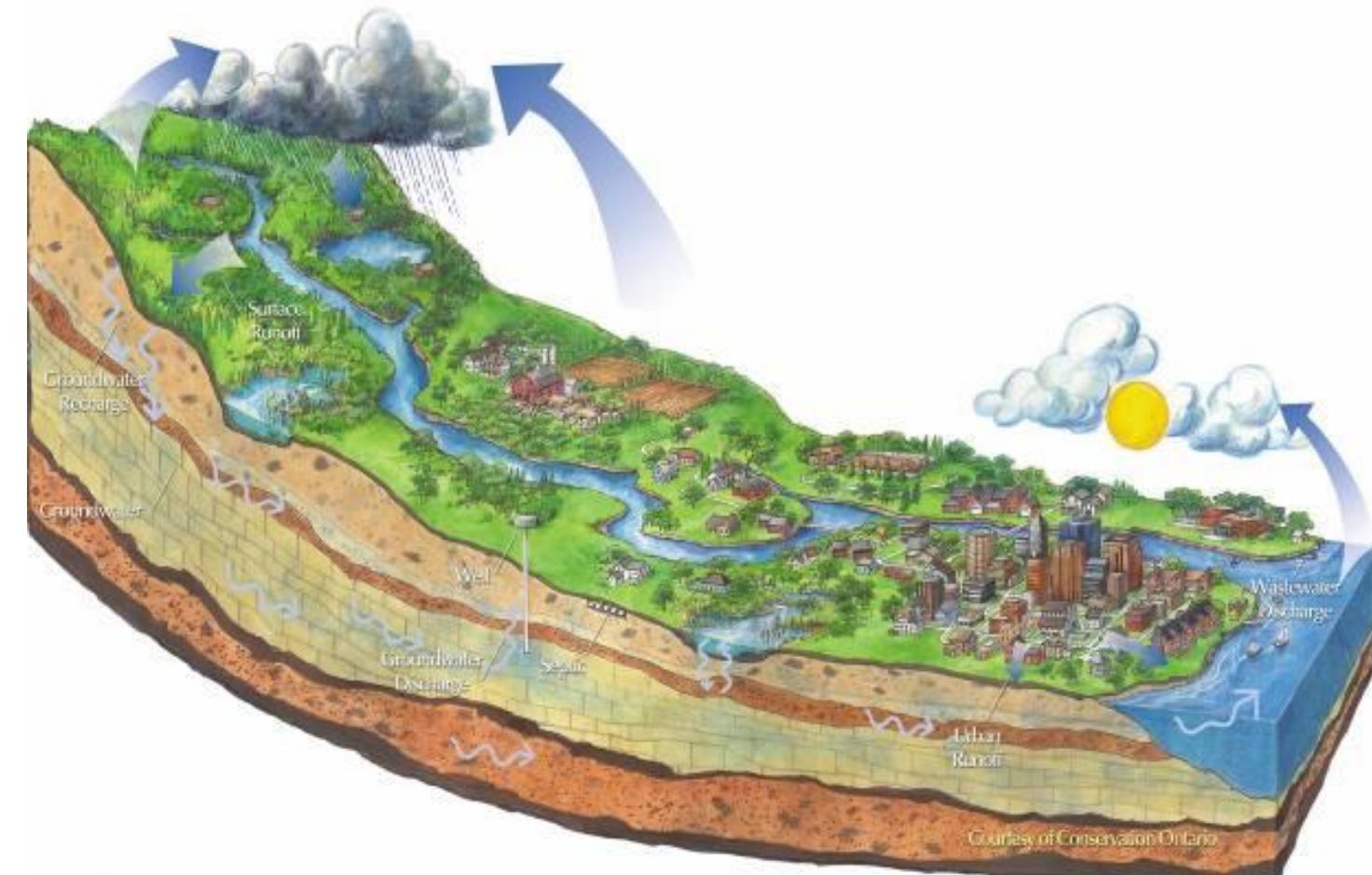




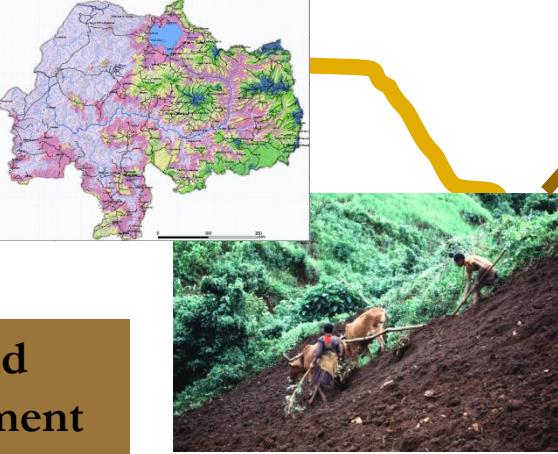
## 8. Concluding Key Messages

# Message 1: We should be aware at all times that water comes from the Watershed

- So, if we want to have sustainable supply of water for hydropower, domestic, industry, irrigation, commercial use, recreation, etc. under the current CC challenge – we must invest on integrated watershed management (IWM)!
- This is the most important part of IWRM but neglected



## Message 2: Untreated Catchments have huge impact



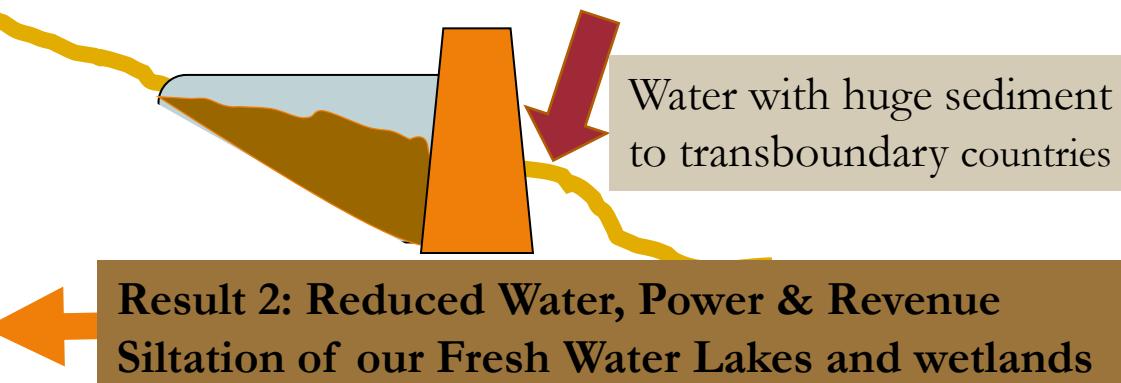
Huge sediment laden flow going down stream



Result 1: Severe land degradation in upstream areas and reduced productivity and intensify poverty

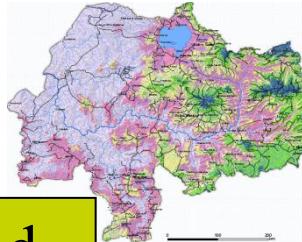
Impact: Economic drag, poverty and destabilization

- Catchments deliver both water and sediment downstream
- If we do not manage the catchment (the source) – two results and one high-level impact
  - Result 1: Upstream area will be degraded and productivity reduced
  - Result 2: Huge sediment will go down – fill our dam and reservoirs – reduced storage capacity – reduced power – reduced revenue, freshwater lakes, wetlands, etc
  - Impact: economic drag & poverty

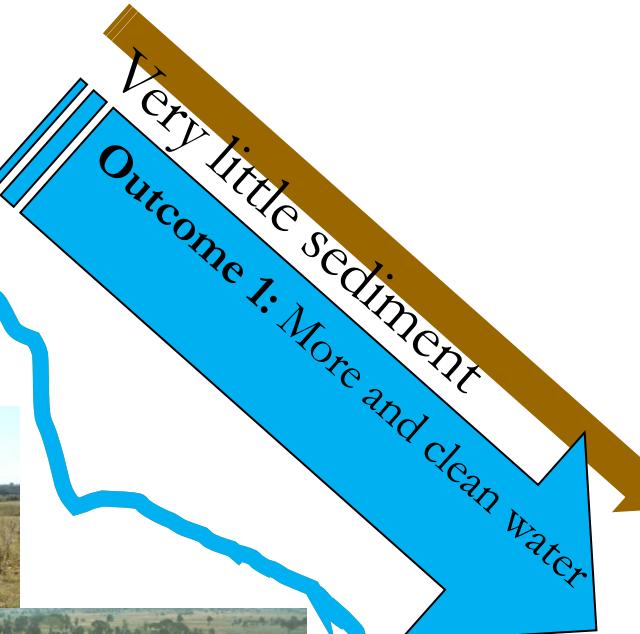


# Message 3: Managing the source of our water (the catchment) has multiple positive impacts – we have to invest on IWM

Better Land Management



Outcome 2: Productivity, Livelihoods and Environmental quality improved



- If we manage our catchment and invest on IWM – Multiple Impacts
  - LD will be minimized
  - Land productivity and livelihoods in upstream areas will be improved
  - Environmental quality will be improved
  - **Clean and more** water flows downstream
  - Life of our storage dam extended more power and more revenue gained
  - Three Outcomes and one Impact

**The cost of managing the source must be shared by transboundary countries too**

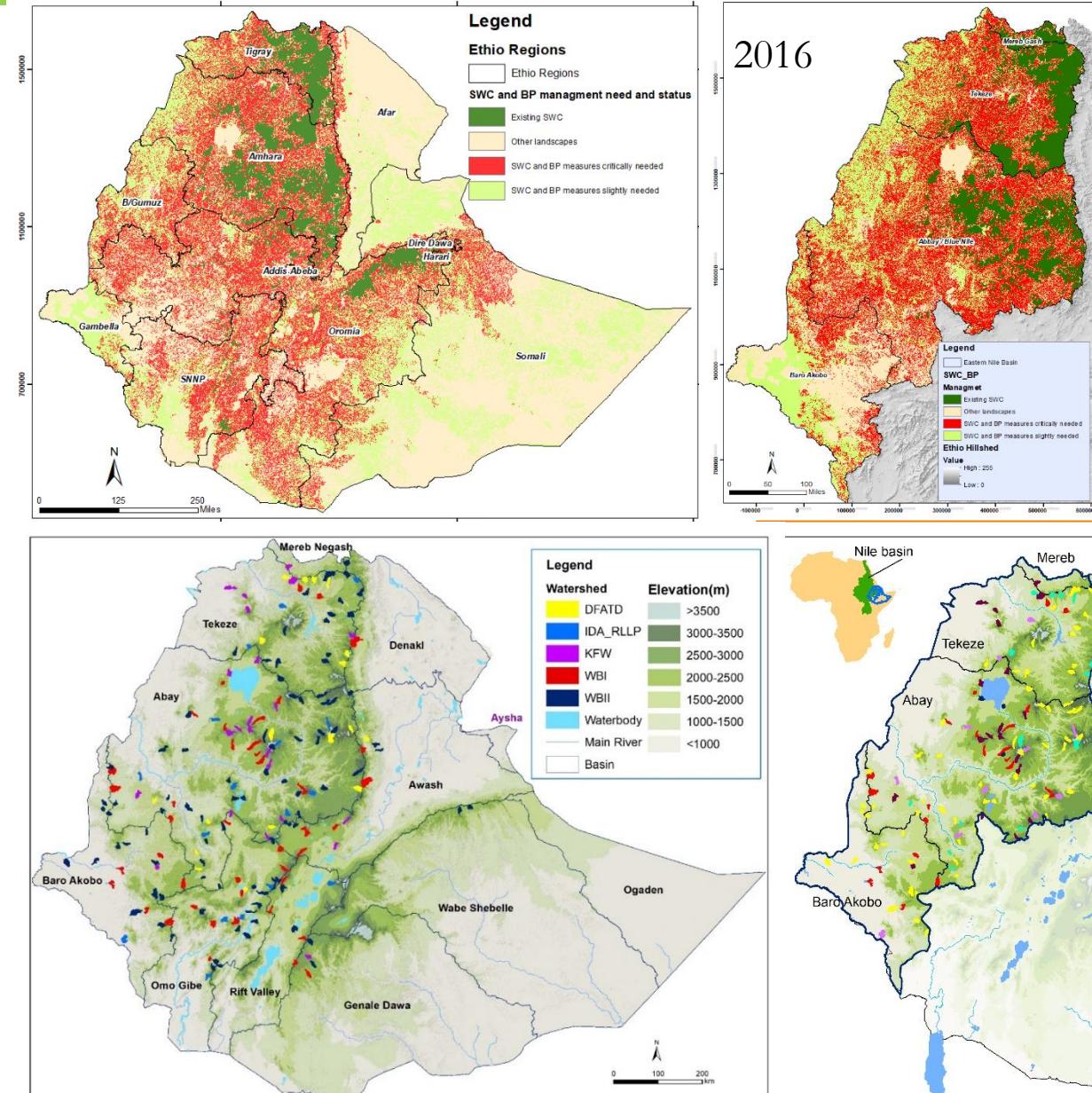
Clean and more water to transboundary countries

**High-level Impact:** Economic development as a result sustainable power generation, irrigation & land productivity

Outcome 3: Sustainable & More Power Generation/Irrigation for Many/Many Years

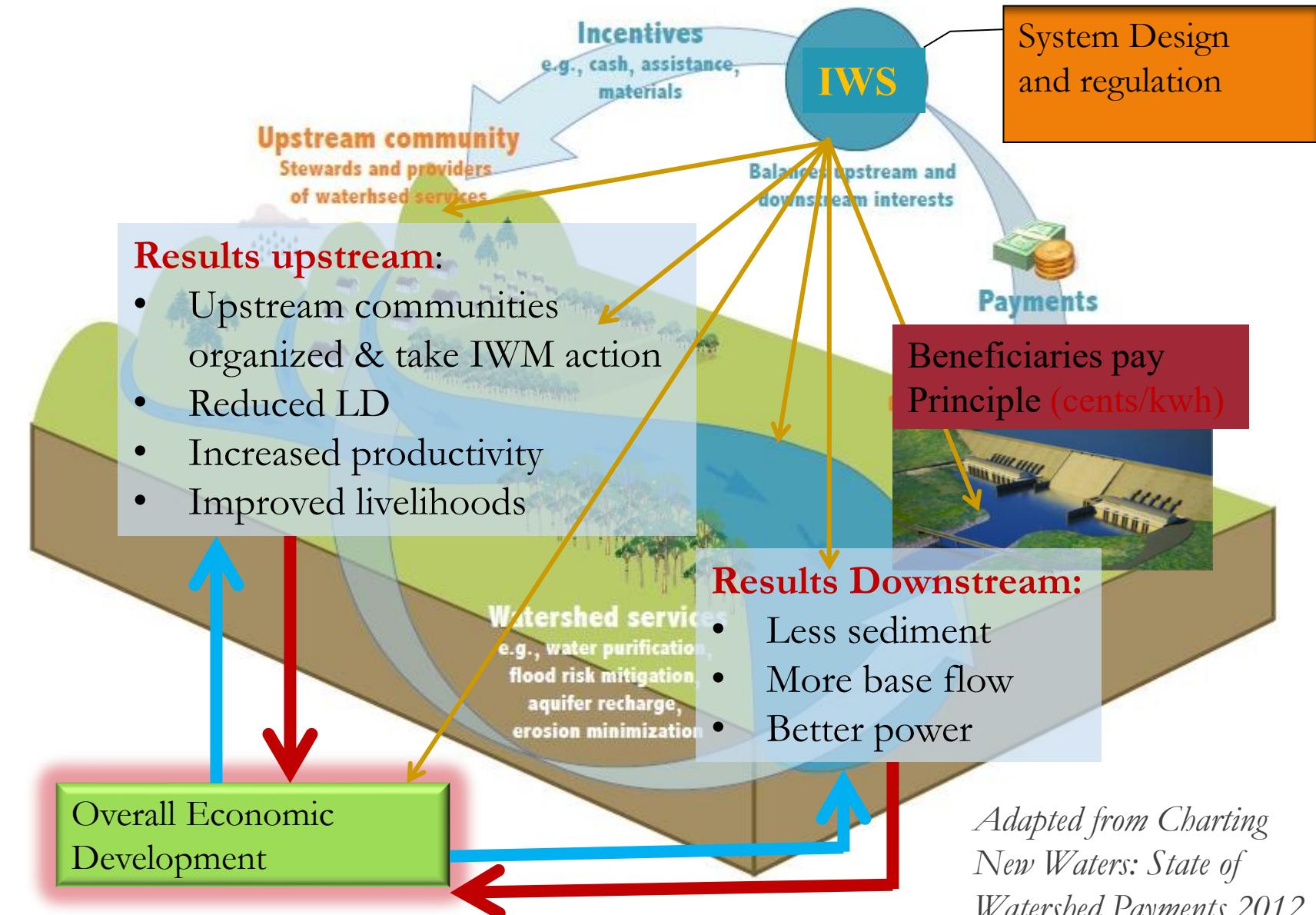
# Message 4: Why Cost Sharing? The Facts on UEN

- In 2016 we surveyed and mapped available SWC structures all over Ethiopia (WLRC, 2016)
- We got 7.7 million ha of sustained SWC structures
- 5.6 million ha of this – which is about 73% of the whole available SWC in the country in UEN
- We also mapped active projects on IWM in Ethiopia: SLMP-1, SLMP-2, RLLP, KFW, WLRC-LWs, etc
  - Covers an area of ~2.1 million ha
  - Major part (1.5 million ha) in UEN basin (~71%)
- Apart from these there are other projects and community mobilization for IWM and recently EGLI
- What do the data and facts tell us?
  - Ethiopia has been and is investing a lot solely on IWM in UEN (in protecting the source)
  - This is a multi-billion dollar investment
  - I recommend that Ethiopia should ask the riparian countries to share the cost of managing the source & also refund their share on previous investments



# 9. Recommendation

- Let our IWM follow the LWs principle and approaches
- IWS (PES) fee to be set aside from all water users and channelled for IWM based on the framework we designed
- Give strong emphasis for **sustainability** of IWM and investments on water storage infrastructures
- Up- and out-scale the rich experience from LWs as part of IWRM to:
  - Improve livelihoods of upstream communities with huge economic gains
  - Reduce siltation of dams and thereby extend their operation life and huge economic gain
  - Protect freshwater lakes, wetlands and river system
  - Overall improvement of ecosystem services



# Thank You



We work towards improving rural livelihoods, environmental quality and resilience – supported by knowledge guided technologies and approaches