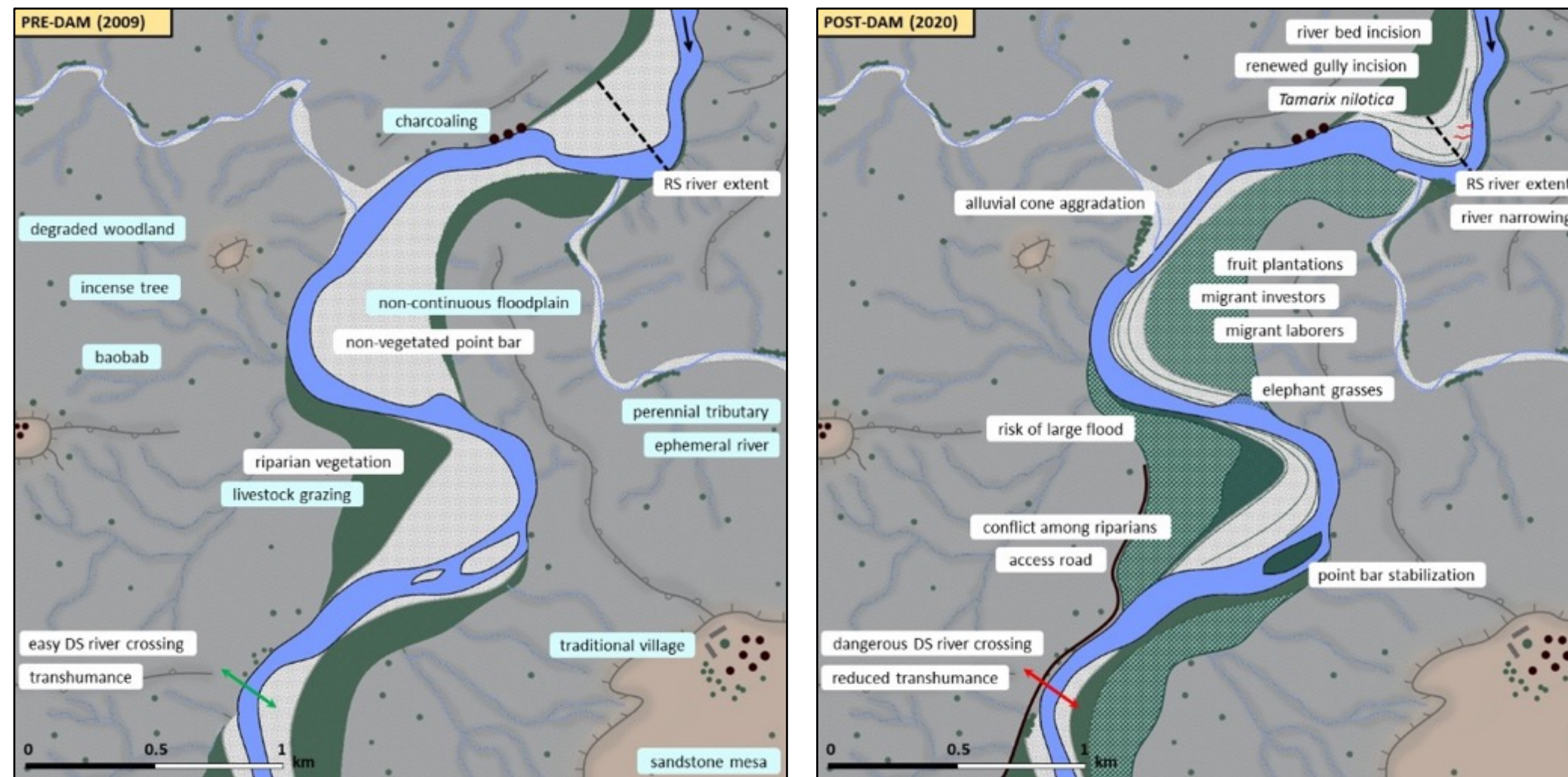


LAND RESILIENCE IN ETHIOPIA - THE IMPORTANCE OF A COMMON UNDERSTANDING BETWEEN FARMERS, SCIENCE AND POLICY

Jan Nyssen

INTRODUCTION

- Effects of large dams
 - On-site
 - Downstream
 - Most interventions in this conference
 - Watch out also for the work by Sofie Annys and colleagues



INTRODUCTION

- Effects of large dams
 - On-site
 - Downstream
 - Most interventions in this conference
 - Watch out also for the work by Sofie Annys and colleagues
- Upper catchment
 - Water delivery
 - Example: Tana-Beles sugar plantation will consume the water of GERD
 - Sediment delivery
 - The “technical” viewpoint
 - The upstream croplands: still the lion share of Ethiopia’s food production
 - Hence, this focus on soil erosion and upland communities

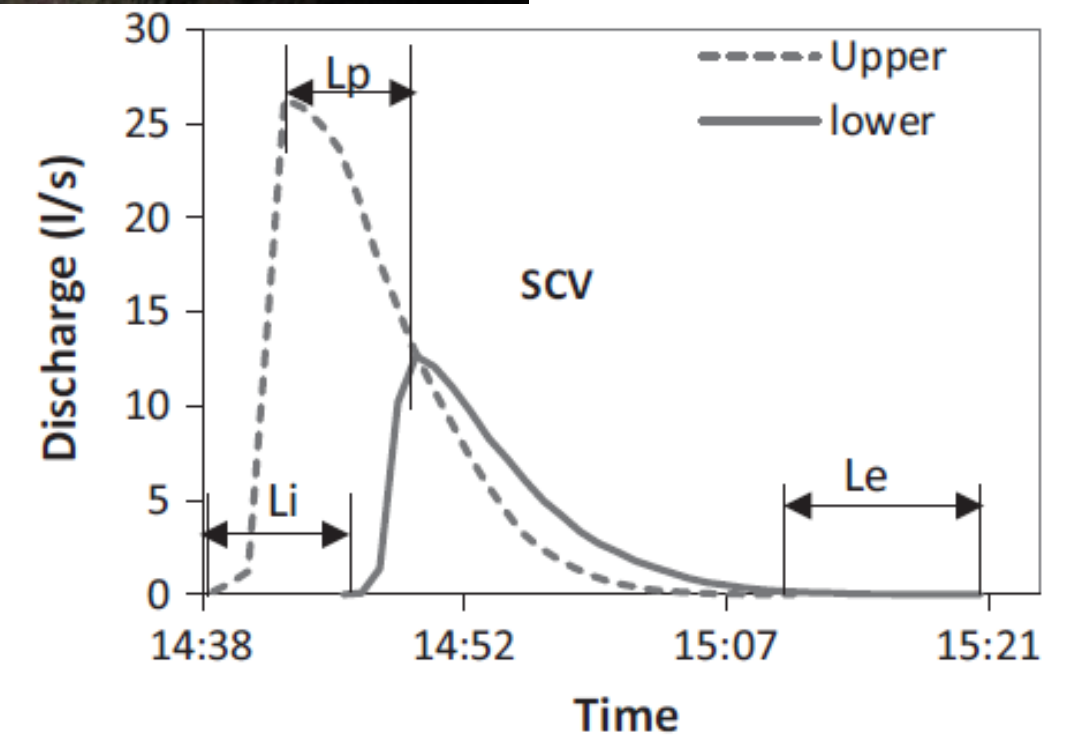
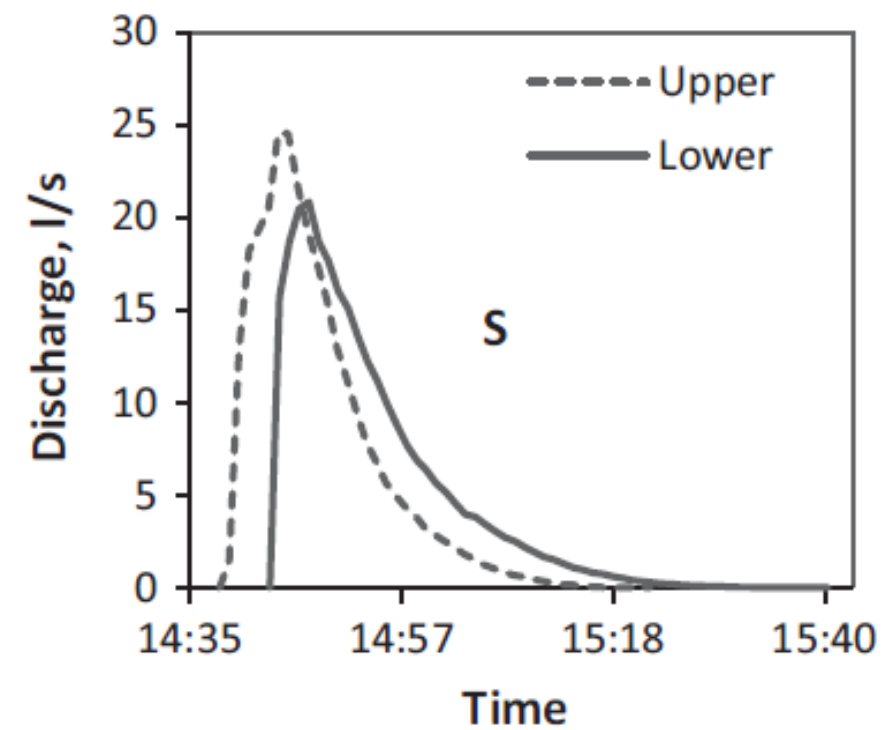
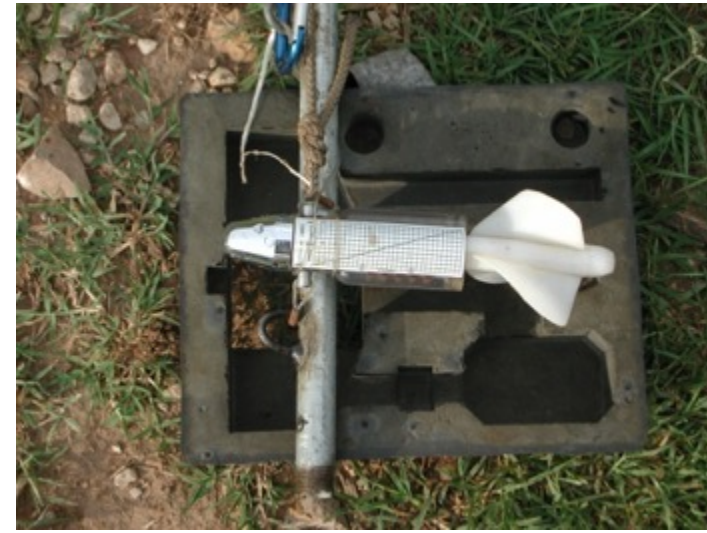
RESEARCH METHODOLOGIES

- Field-based!
- Geomorphological analysis



(Frankl et al., 2012)

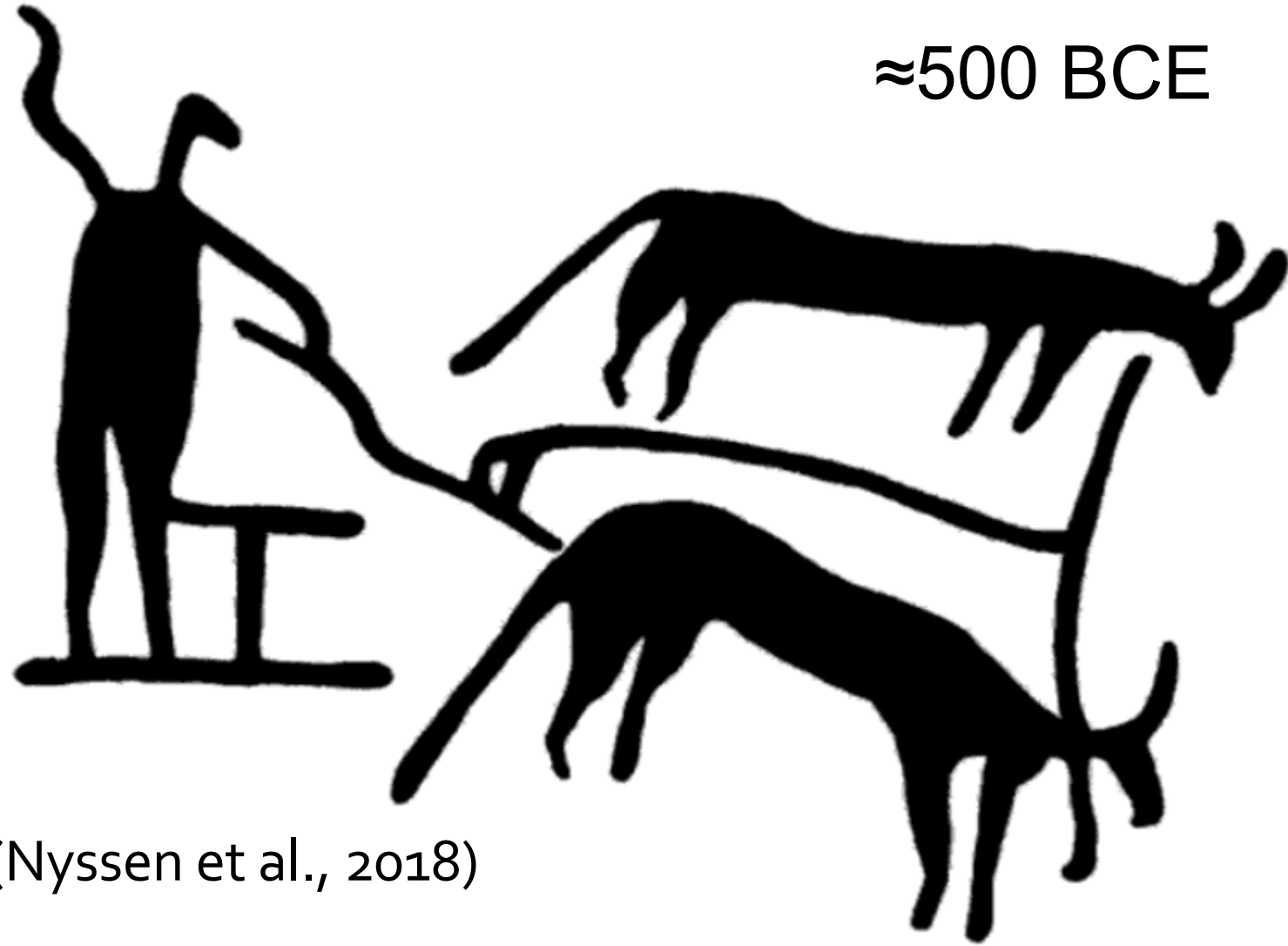
Hydrological measurements



(Etefa et al., 2017)

AGRICULTURAL SYSTEM WELL ADAPTED TO THE ENVIRONMENT

≈500 BCE



(Nyssen et al., 2018)

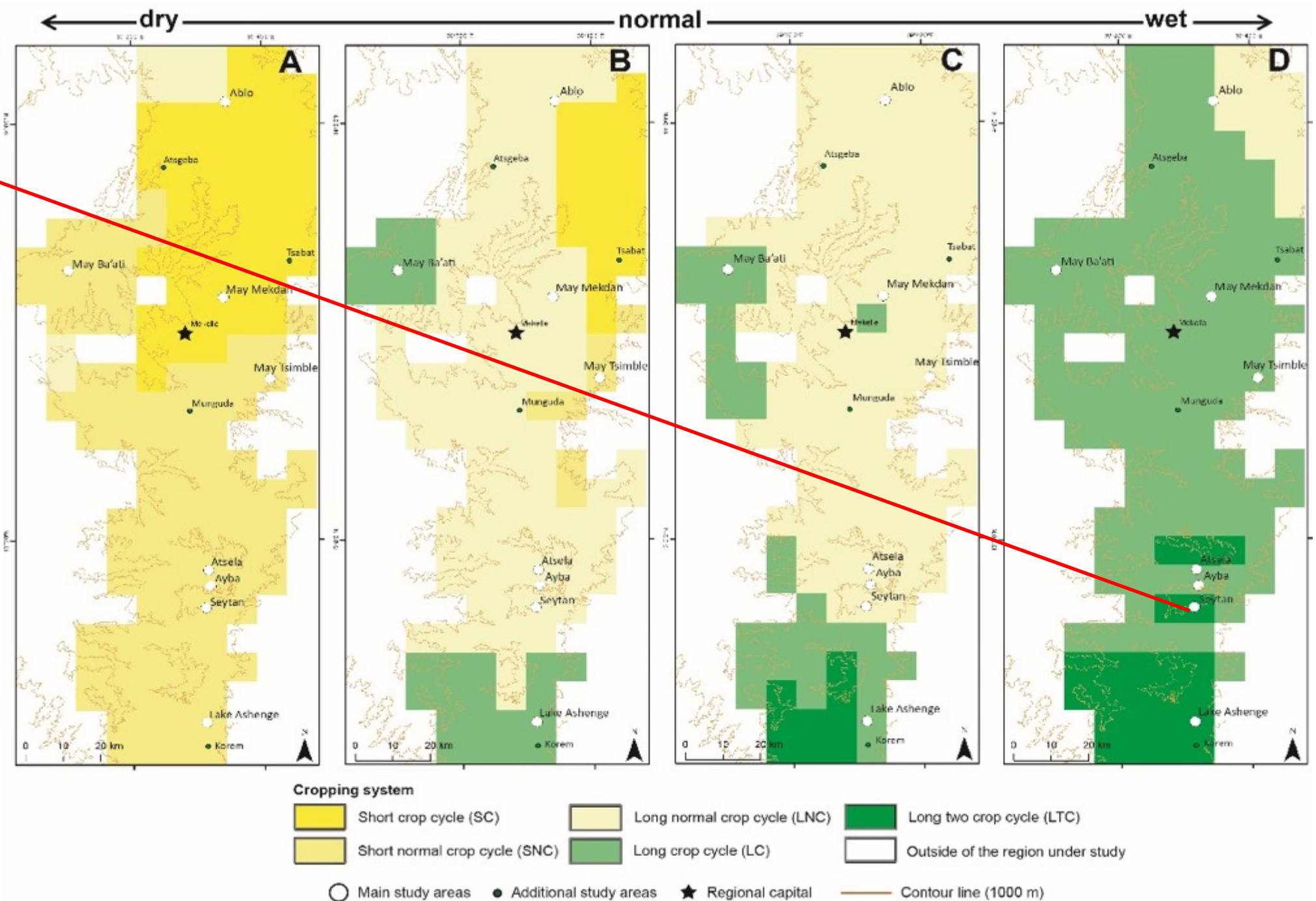
2017 CE

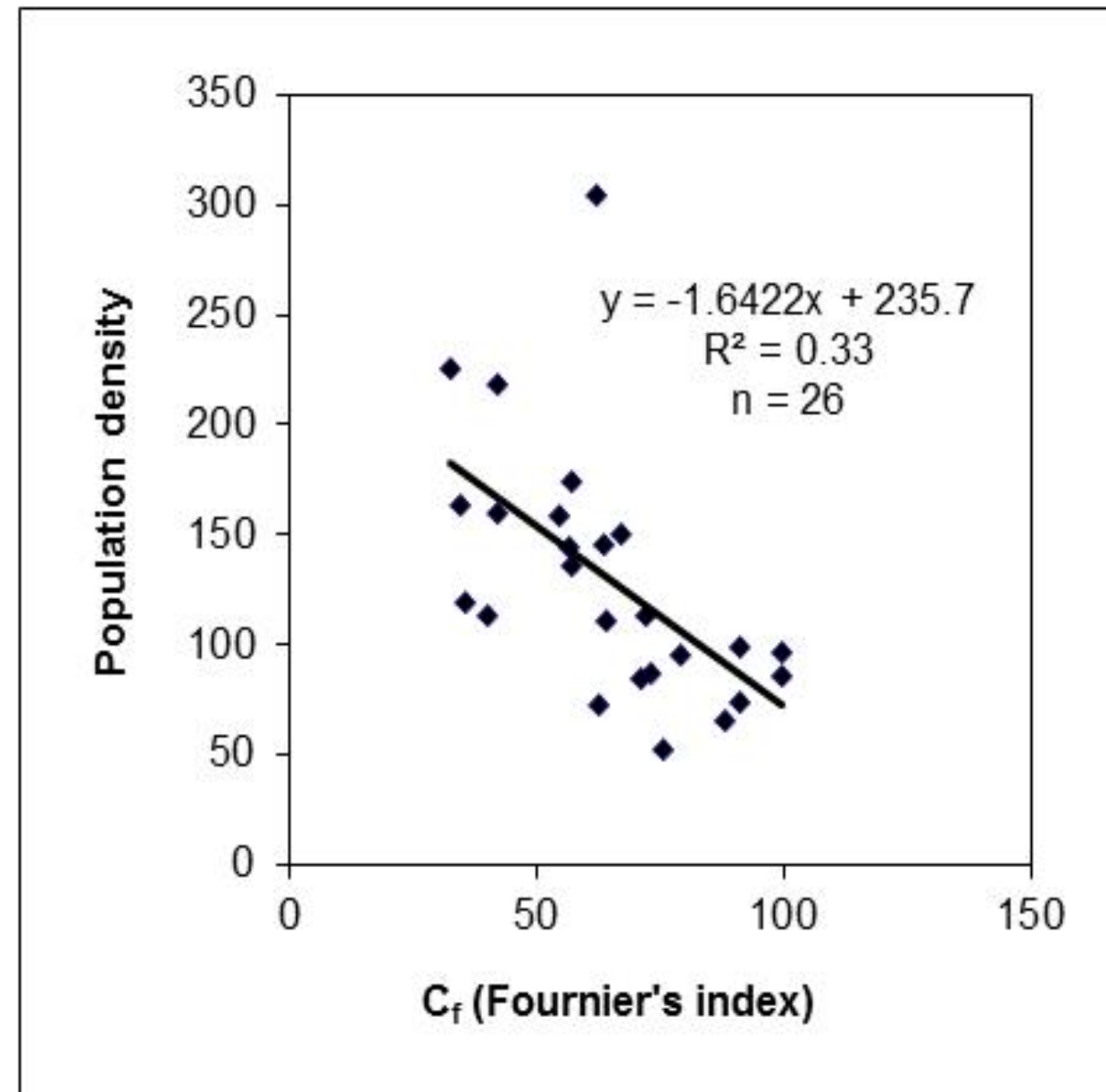


(Nyssen et al., 2011)



Korem
(Frankl et al., 2013)



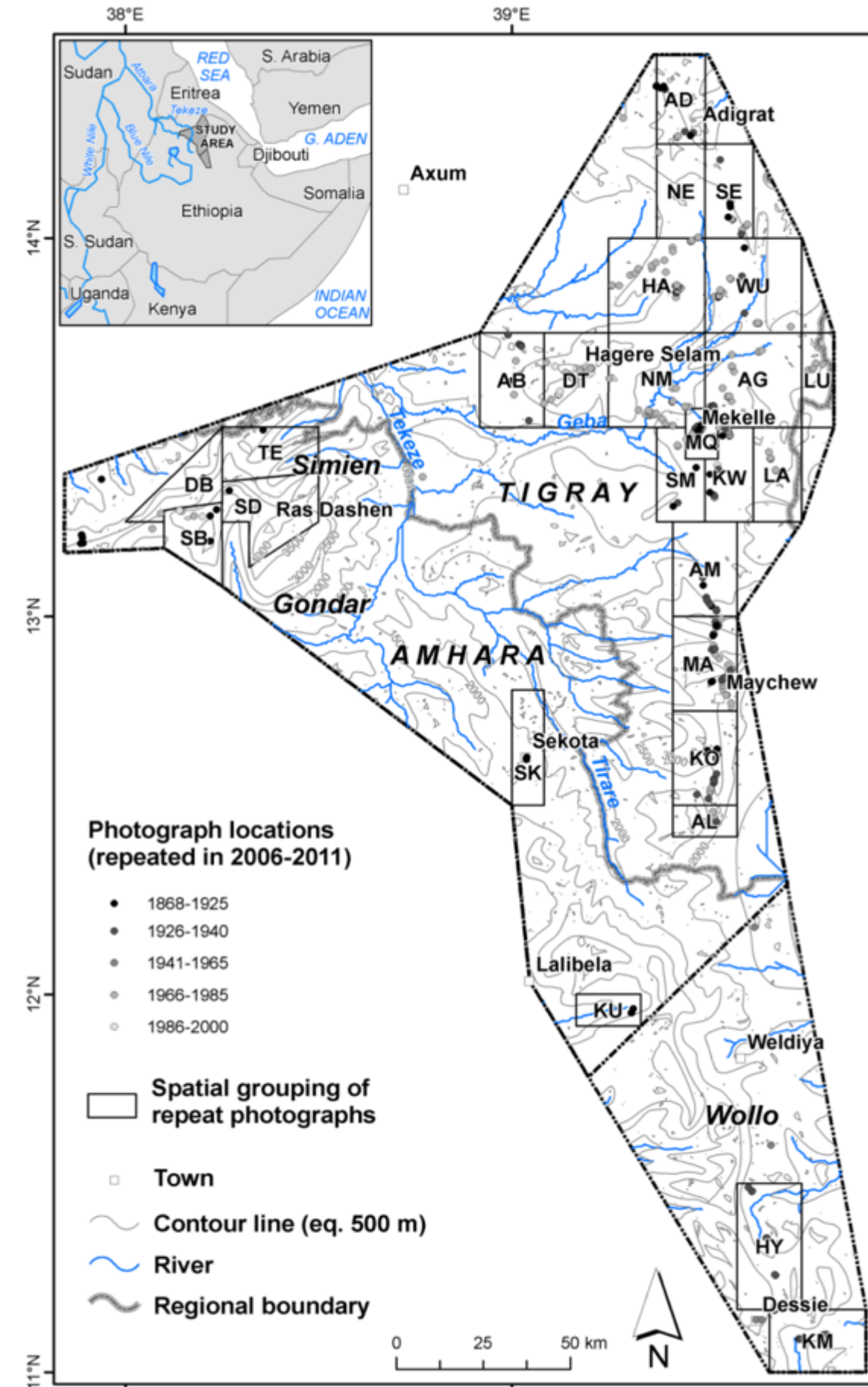


$$C_f = p^2/P_y$$

p = average monthly precipitation (mm) during the wettest month

P_y = average yearly precipitation (mm).

(Nyssen et al., 2014)



LAND DEGRADATION

- If uncontrolled, soil loss can reach up to 200 t / ha / y
- 2/3 sheet and rill erosion; 1/3 gully erosion



(Korem)



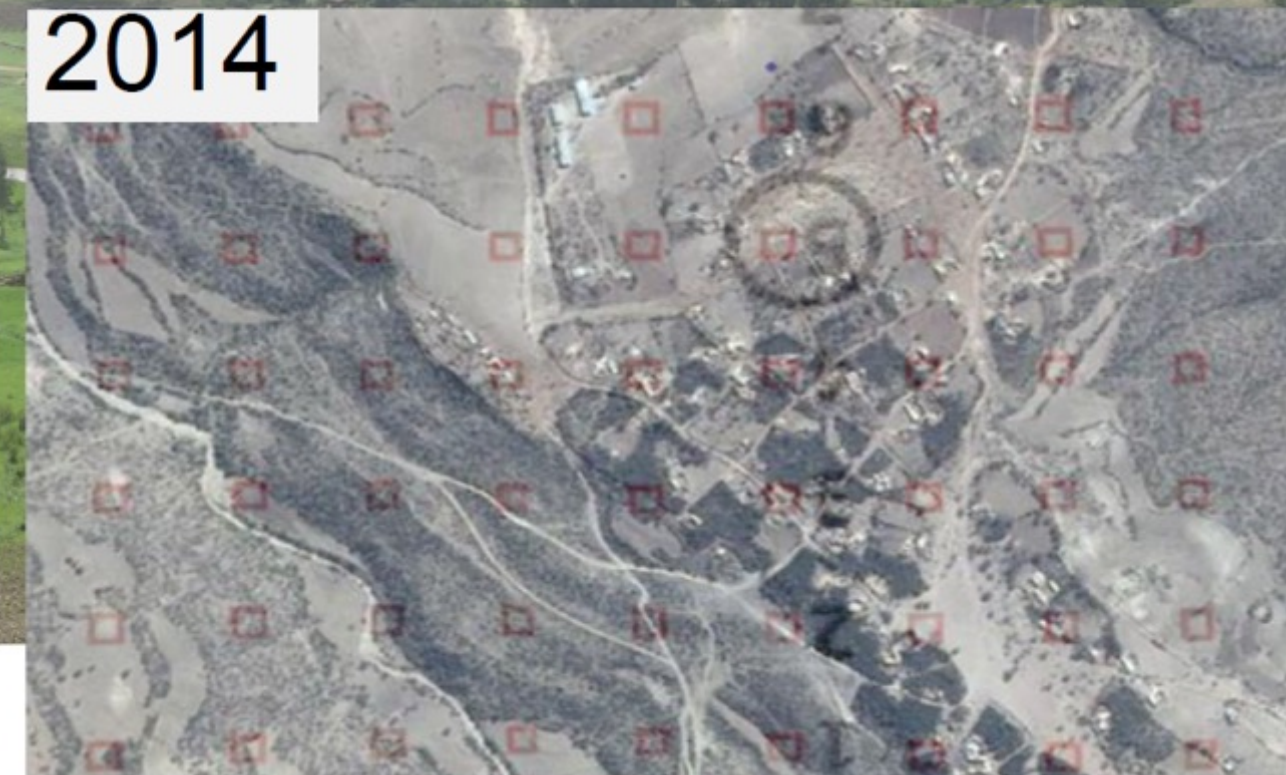
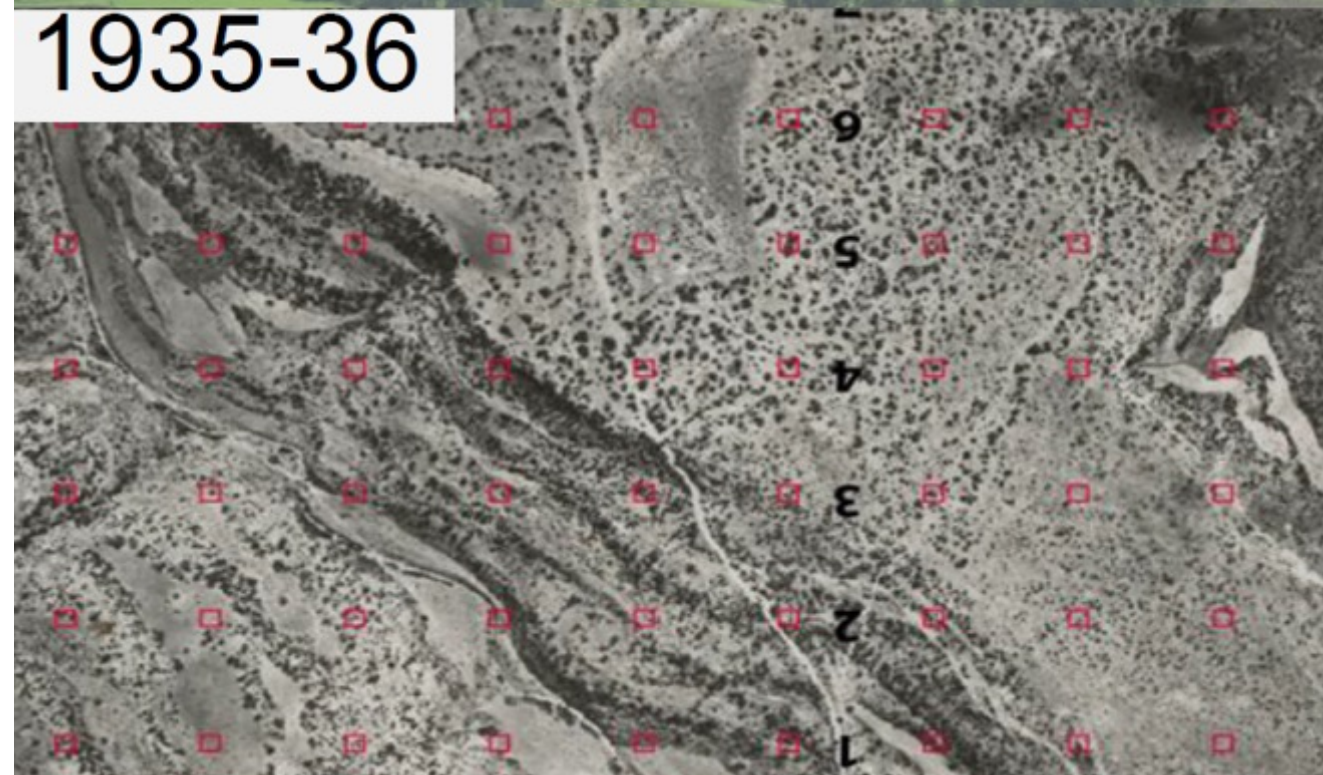
(Abaro)

HUMAN SETTLEMENT, CHANGE IN LAND USE AND LAND COVER

Deforestation

- Very old phenomenon (2000 – 4000 y)
- Cyclic, not linear
- Increase of eucalyptus forests
- Decrease of semi-natural forests

(Etefa, 2017)



LAND USE AND TENURE SINCE 1935

– Example in Menkere



1937 © AOI Archives, Firenze (I.)

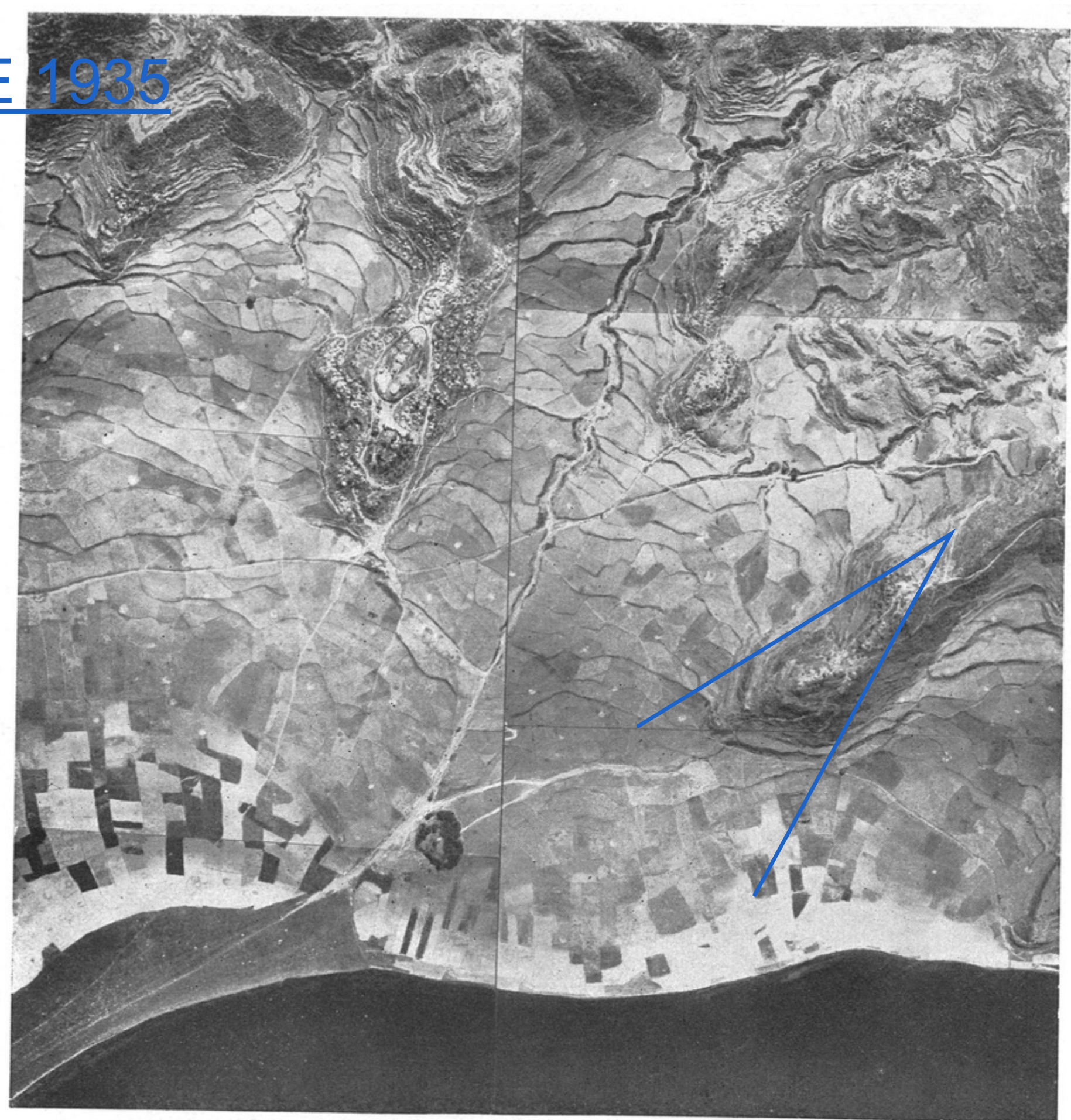


Fig. 106. – Mosaico di fotogrammi aerei. Riva del Lago Ascianghi. Marzo 1936.

SOCIAL AND HISTORICAL IMPULSES OF LAND USE AND COVER CHANGES

- Human impact (changes in land use and cover)
 - Agricultural stagnation over centuries
 - Macroeconomic decisions
 - Immediate returns at the expense of environmental degradation
 - Land distribution (Gini coefficient 32.5)

Reference: Crummey, D., 2000. Land and society in the Christian kingdom of Ethiopia, from the thirteenth to the twentieth century. Addis Ababa University Press, 373 p.

GRAZING

- Stocking rates in excess of optimum
- Stubble grazing
- Increased runoff, because:
 - decreased surface roughness
 - soil compaction; increased bulk density
 - decreased soil organic matter content
 - soil structure decay and decreased hydraulic conductivity



LAND REHABILITATION

1941 Amba Alage



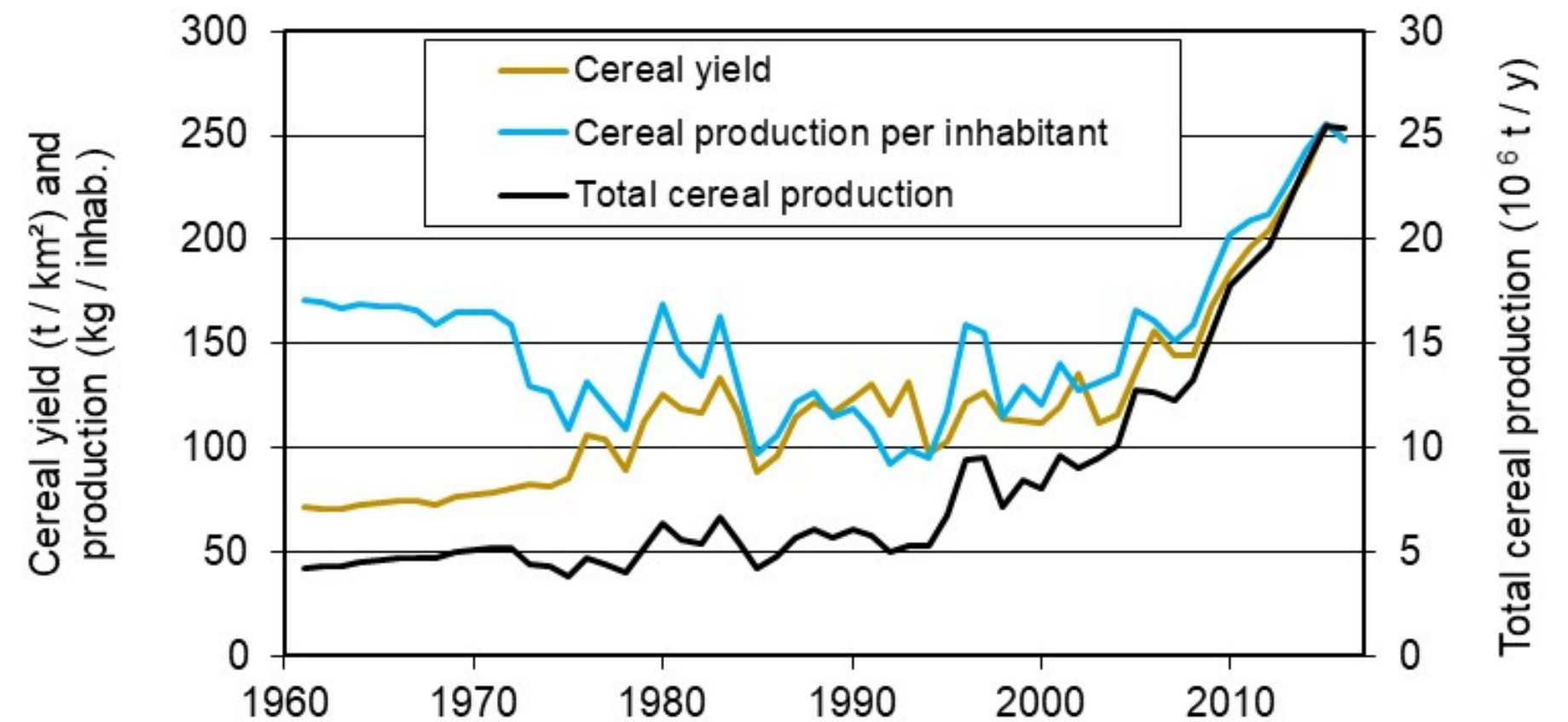
(Nyssen et al., 2014)

1941 Amba Alage 2009



AGRICULTURAL INTENSIFICATION

- Improved climatic conditions
- Human interventions (society reacts with innovative process)
 - Integrated SWC
 - Exclosures
 - Fertiliser (not always mineral)
 - Irrigation
 - Extension, seed selection, credit, etc.



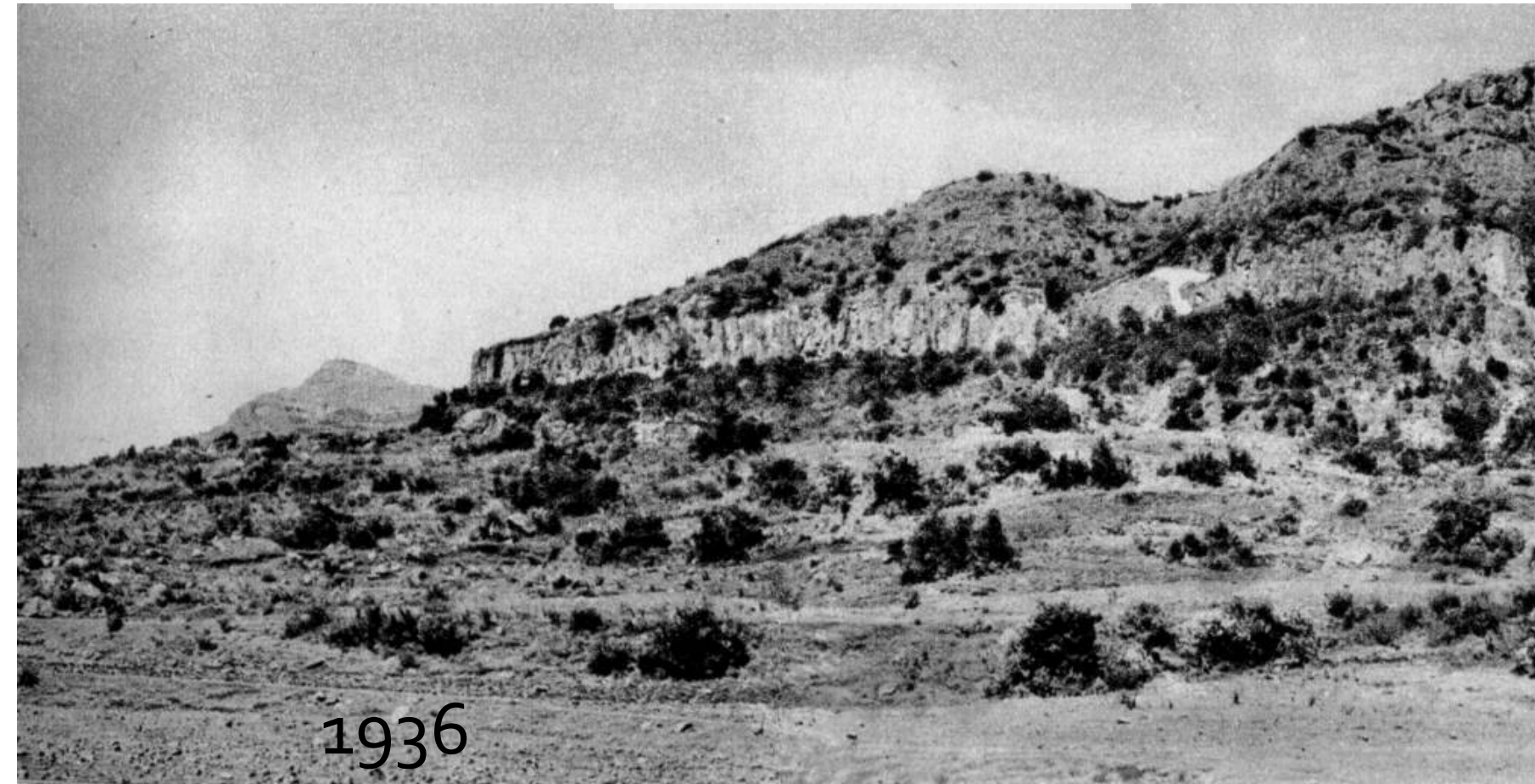
(Nyssen et al., 2018)
(data <http://faostat.fao.org>)

SOIL AND WATER CONSERVATION



DEFORESTATION AND REFORESTATION

(Nyssen et al., 2014)



1936

Debar

2009



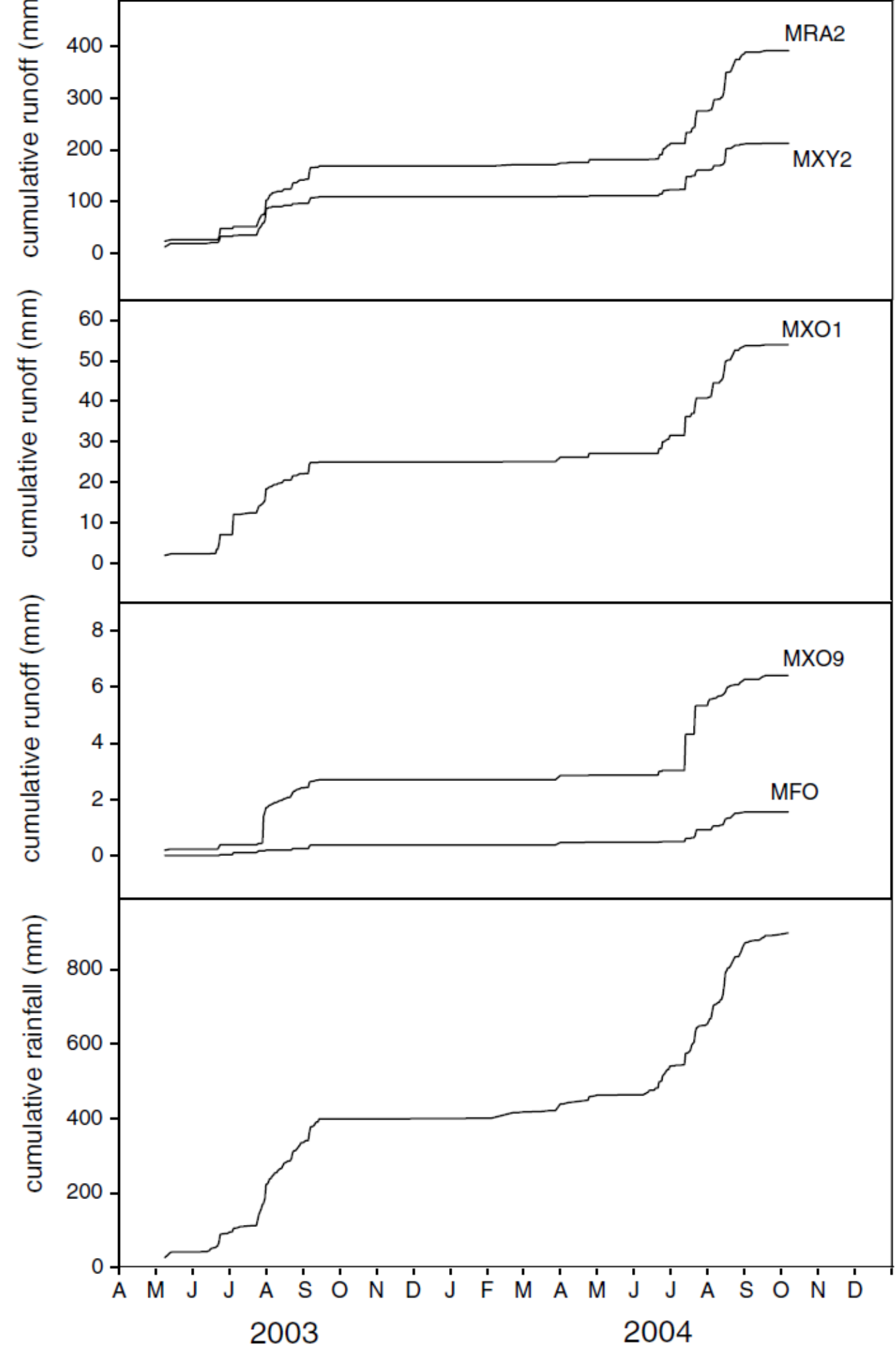
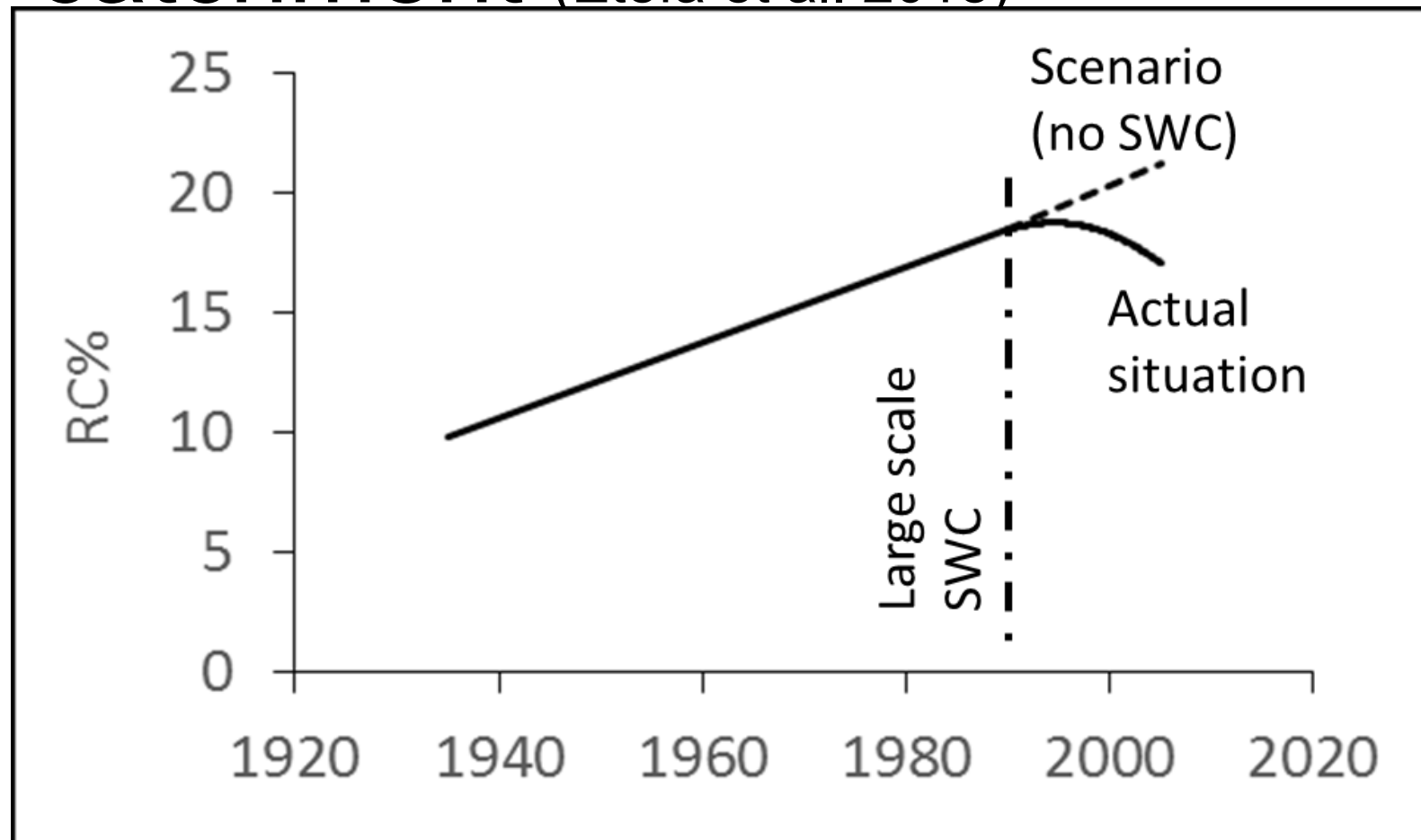
DECISION MAKING

- Process guided by authorities
- Largely interiorised by population
- Participation
 - Location, area, guarding decided by community
 - 20 days free work per year
 - Enhanced by remunerated activities
 - People work in areas where benefit for the whole community is obvious
 - “EthioTrees” == voluntary carbon market



EFFECTS

- Soils, biomass, ecology, ecosystem services (Muys et al., 2014)
- Runoff, scale of 30 runoff plots (Descheemaeker et al., 2006)
- Runoff, scale of a 5200 km² catchment (Etefa et al. 2018)



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- Springs improve = less drudgery for women
- From “misery” to “poverty”



CONCLUSIONS

- Environmental conditions: pronounced degradation
- Indigenous environmental knowledge
- Vision: vast transformation of landscape
- Characteristics of the communities
 - Equity
 - Mass mobilisation
 - Participation
- Accessible technology
- Scientific support
- Contribution expected from the “Hydropower-Urban conglomerate”





THANK YOU FOR YOUR
ATTENTION