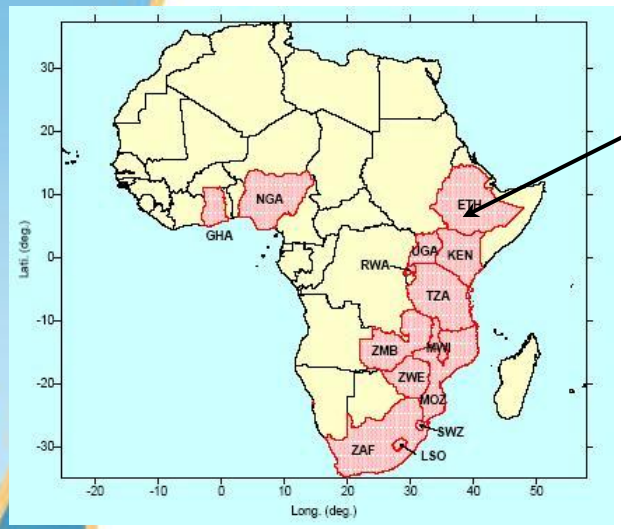
Spate Profile of Ethiopia



A Preliminary Assessment

FAO INTERNATIONAL EXPERT CONSULTATION MEETING ON SPATE IRRIGATION

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Cairo, Egypt

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Country Background

- Population - 80M
- Area - 1.13 Million km^2
- About 85 % of the country's population are rural
- Agriculture sector provides 86% of employment and 57% of GDP
- Annual rainfall in the country ranges between 2700 mm and less than 200 mm
- Nearly 70% of the total arable land in Ethiopia receives annual rainfall of less than 750mm.
- Arid and semi-arid regions constitute 60% of the country's surface area with a rainfall variable coefficient of 50%
- About 66 % of the total area of the country is considered as arable land. About 12.5% of the total land area is moderately cultivated
- Droughts are major social, environmental and economic disruptive forces in Ethiopia. Famines occurring on the average 2-3 years in recent two decades as compared to every 7-10 years over the previous decades

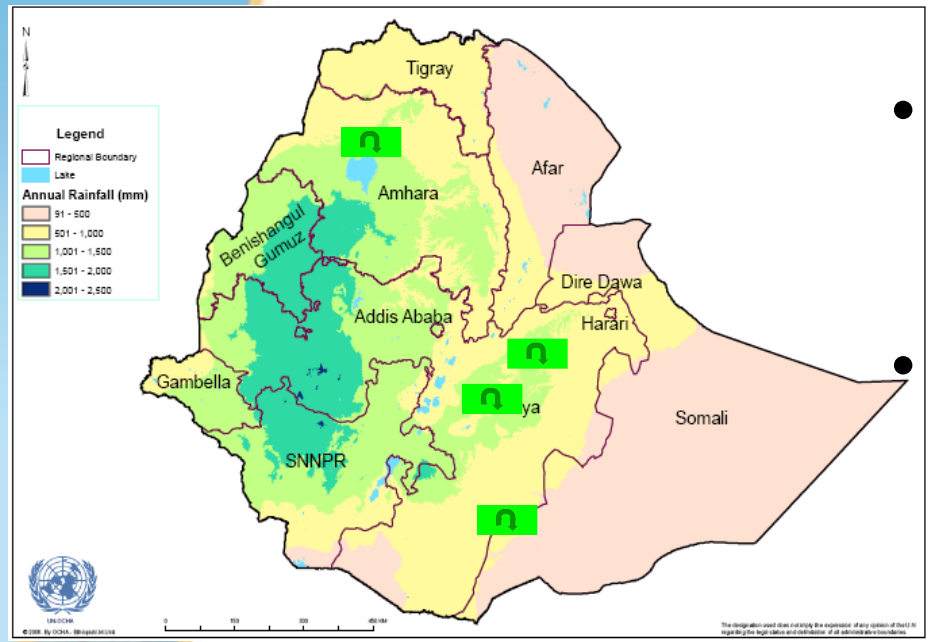
Water resources

- Mean annual specific **runoff** varies from **zero to 35 l/s** per km^2
- There is hardly **any perennial flow in areas below 1500m asl**
- **Perennial streams** and springs exist only in the vicinity of mountains with an annual **rainfall of more than 1000mm**
- The country's annual renewable **fresh water** resources amount to some **122BCM/yr** contained in twelve river basins, which is only **1525 m^3/yr per capita** share and only **3%** remains in the country
- At this stage the country withdraws less than **5% of its fresh water** resources **for consumptive uses. But i**t is estimated that 54.4 BCM of surface runoff and 2.6 BCM of groundwater could be technically developed for consumptive use
- 3.7 million hectares of land and 30,000 MW of power can be developed using the available water resources potential
- However, only less than 300,000 hectares of the irrigation and 854 MW hydropower potentials, respectively, have been developed.

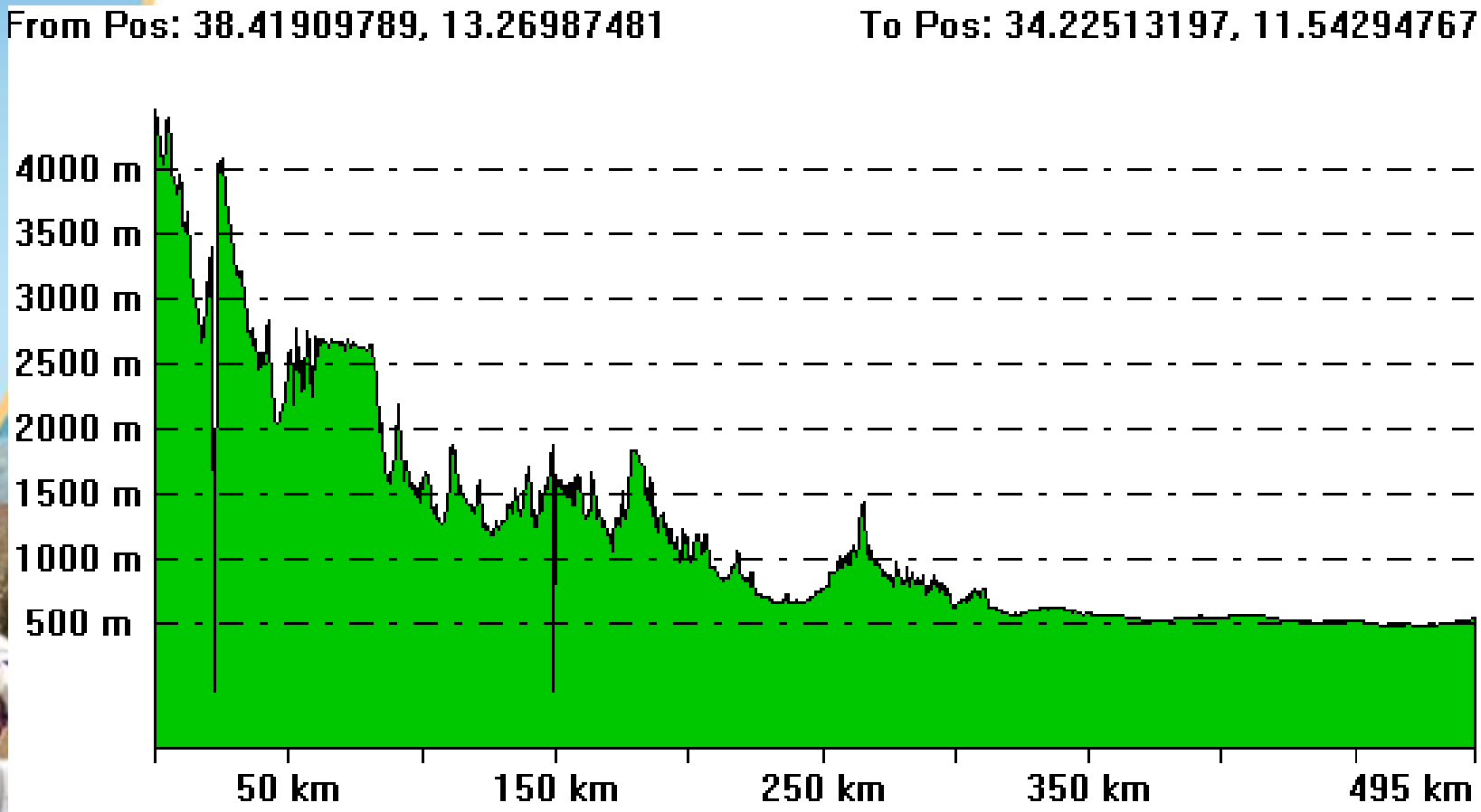
Spate Irrigation: Definition of spate in Ethiopia

- Definition of spate irrigation in Ethiopia differs from place to place. Generally the meaning of the word spate is using seasonal flood to compensate rainfall shortages
- The word ’Gelcha’ in southeast Ethiopia is used for spate irrigation with a literal meaning of divert the flood in to the farm. Where as the Word ‘Telefa’ is used in the northern parts of Ethiopia with a literal meaning of diversion.

Potentials of spate



- Ethiopia is known as a water tower of Africa for its peculiar geomorphologic and climatic setting
- Lowlands With thick and fertile alluvial covered plains and availability of runoff flowing across these plain millions of hectares of land is suitable for spate irrigation in Ethiopia. See slope gradient below
- Slope gradient from all directions of the country favours spate irrigation potentials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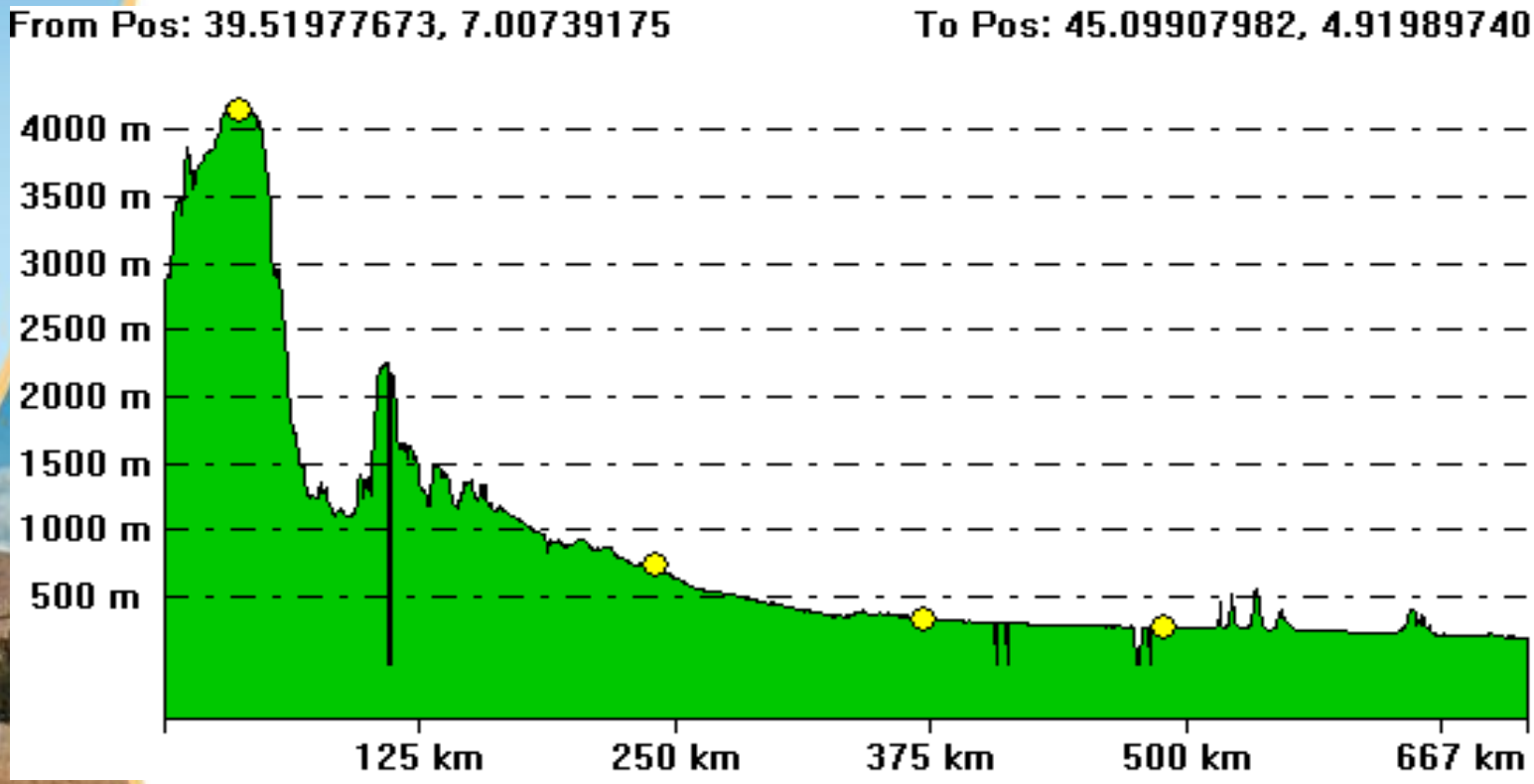
To Pos: 34.22513197, 11.54294767
4000 m
3500 m
3000 m
2500 m
2000 m
1500 m
1000 m
500 m
50 km
150 km
250 km
350 km
495 km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4000 m
3500 m
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2000 m
1500 m
1000 m
500 m
125 km
250 km
375 km
500 km
667 km


29 9:16PM

The development status

- The history of water harvesting in Ethiopia dated back as early as the pre Axumit period (560 BC)
- It is a common and growing practice mainly in arid parts of the country: East, north and southern Ethiopia
- According to various recent estimates trad spate irrigation farms in north, south and south-eastern parts of the country exceeds 100, 000 ha.
- But areas under improved and modern operational spate irrigation do not exceed 20,000 ha
- Spate projects under design and construction exceed 50,000 hectares and each year numbers of new projects are added
- Total area covered by spate irrigation in the lowland parts of the country is 140,000 ha
- In one of spate irrigation promoting regions, Oromia, there are 30 projects at reconnaissance stage, 58 projects under study and design and 38 projects are under construction


Areas of Spate Irrigation Activity in Ethiopia
0 100 200
Kilometres
Eritrea
Red Sea
Sudan
TIGRAY
Mek'ele
AFAR
Gonder
AMHARA
Lake Tana
Bahir Dar
Tendhao
Djibouti
Dese
BENSHANGUL
ADDIS ABABA
Finchaa
Addis Abada
Dire Dawa
HARARI
Jjiga
Somalia
Nazret
Roka
Wonji/Shoa
GAMBELA
Jima
Lake Zway
OROMIYA
SOMALI
SOUTHERN
Awassa
Lake Awassa
Lake Abaya
Kenya
Areas with traditional Spate Irrigation practice
Areas with improved Spate Irrigation Systems
Legend
City
Dam
Major Irrigation Scheme
River
Intermittent River
Water Body
Administrative Boundary
International Boundary

Source of water

- The main source of water for spate irrigation is seasonal flows in the dry streams.
- Using water harvesting and groundwater recharging techniques farmers in some areas use water from ponds and shallow groundwater reserves to irrigate their farms
- Such practice is growing fast and the need for centrifugal pump is increasing at higher rates
- Getting water in shallow wells as a result of recharging from spate irrigation is motivating more farmers to go for it.

- **Administration of spate irrigation**
  - farm structures and farms are mostly private
  - irrigation schemes are mostly public.
  - Operation and maintenance of spate structures is administered by both: public and private.
- **Water distribution methods**
  - spreading flood in individual fields
  - field to field supplies where users are organized

Water diversion structures

- Most diversion structures in traditional spate irrigation areas are spurs, constructed from earth, brushwood, sorghum roots, sand filled bags and the like

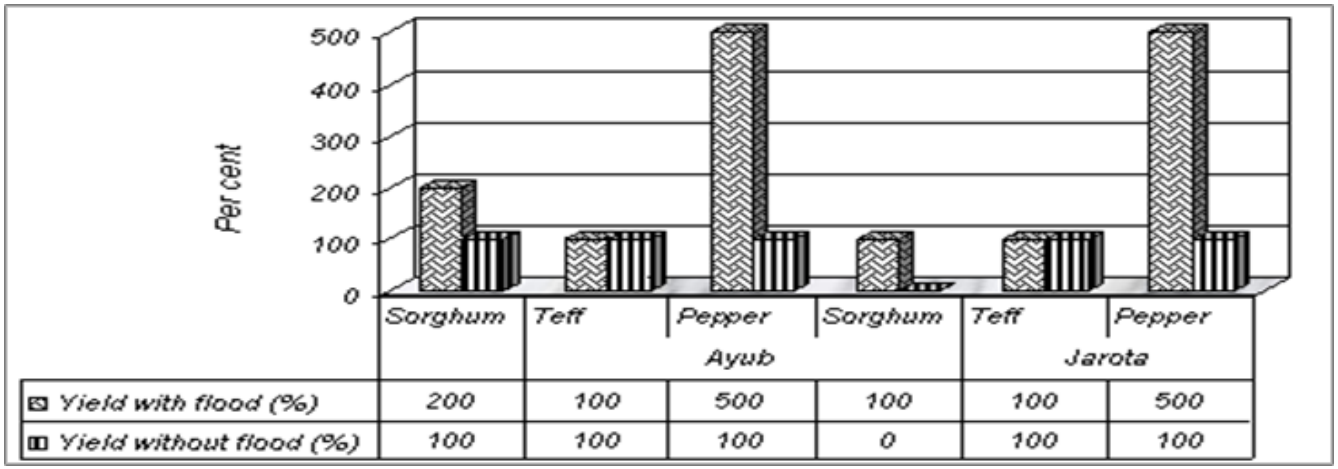
- Modern systems are constructed from masonry, concrete and gabions or combination of the above with metal control gates

- **Water distribution rules and rights**

  - there are federal water policy, law and regulation but it is not well enforced.
  - there are no well defined and common water distribution rules and rights in Ethiopia
  - Traditional rules and norms are more potent than the less enforced government water law and regulations.

Crops and productivity of spate farming

- Types of cultivated crops depend on preference of the community
- Sorghum and maize are dominant crops. Wheat, sesame, Chat,, chili pepper and Vegetables are also common
- Bio-fuel development and Agroferestery are also being introduced
- Productivity of spate irrigated farms have recorded a ten fold increase with the same farm management and input
- The main income generating practice in spate areas is cultivation of onion & vegetables. In eastern parts of the country cultivation of Chat is also the main income generating practice.
- Fattening using agricultural byproducts is also making spate irrigation more economical and acceptable



Constraints of spate irrigation

1. It is not well understood and known potential
2. Rapid deterioration of physical conditions of systems,
3. Rainfall variability: problem of flood control, unknown flood frequency and irrigation interval
4. Ignoring indigenous knowledge in improving and modernizing traditional spates systems
5. Equity
6. Lack of government/NGOs/donors financial support and extension services
7. Lack of market opportunities
8. Land Tenure

Conclusions

1. **Land use planning studies** in association **with spate irrigation** potentials is underway in south-eastern parts of Ethiopia. This helps to address the acute problems of these food insecure areas.

2. **Conjunctive use** of spate systems as **means of soil and water conservation** are adding more value to spate irrigation practices. Water stored in the sub-surface will be utilized in absence of the floods and the alluvial deposit helps to minimize the cost encored for the continuously increasing prices of fertilizer.

3. The **increasing interest by investors to go bio-fuel development and agroforestry** in most lowland areas using their spate irrigation potentials **will benefit farmers if they are made out growers and paid good prices for their produce**.

4. The **increasing need for spate irrigation development by farmers** need to be **supported by all stakeholders in designing and implementing sustainable projects** and provision of extension services supported by research.


Thank You!