Flood-based Farming and the Second Five Years Growth and Transformation Plan of Tigray, Ethiopia (2015/16 – 2019/2020)

By

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Mekelle University

Spate Irrigation Network Foundation

META

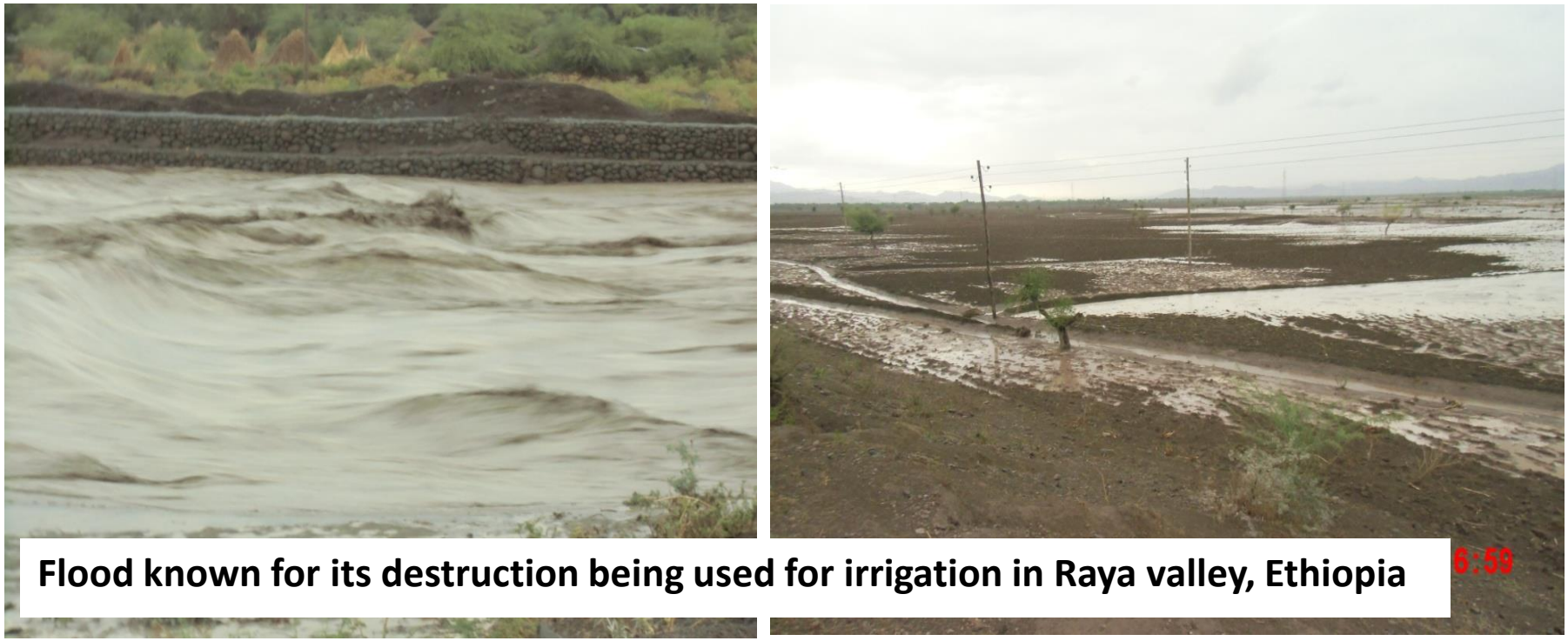
UNESCO-IHE
Institute for Water Education

1 Status of FBFS in Tigray

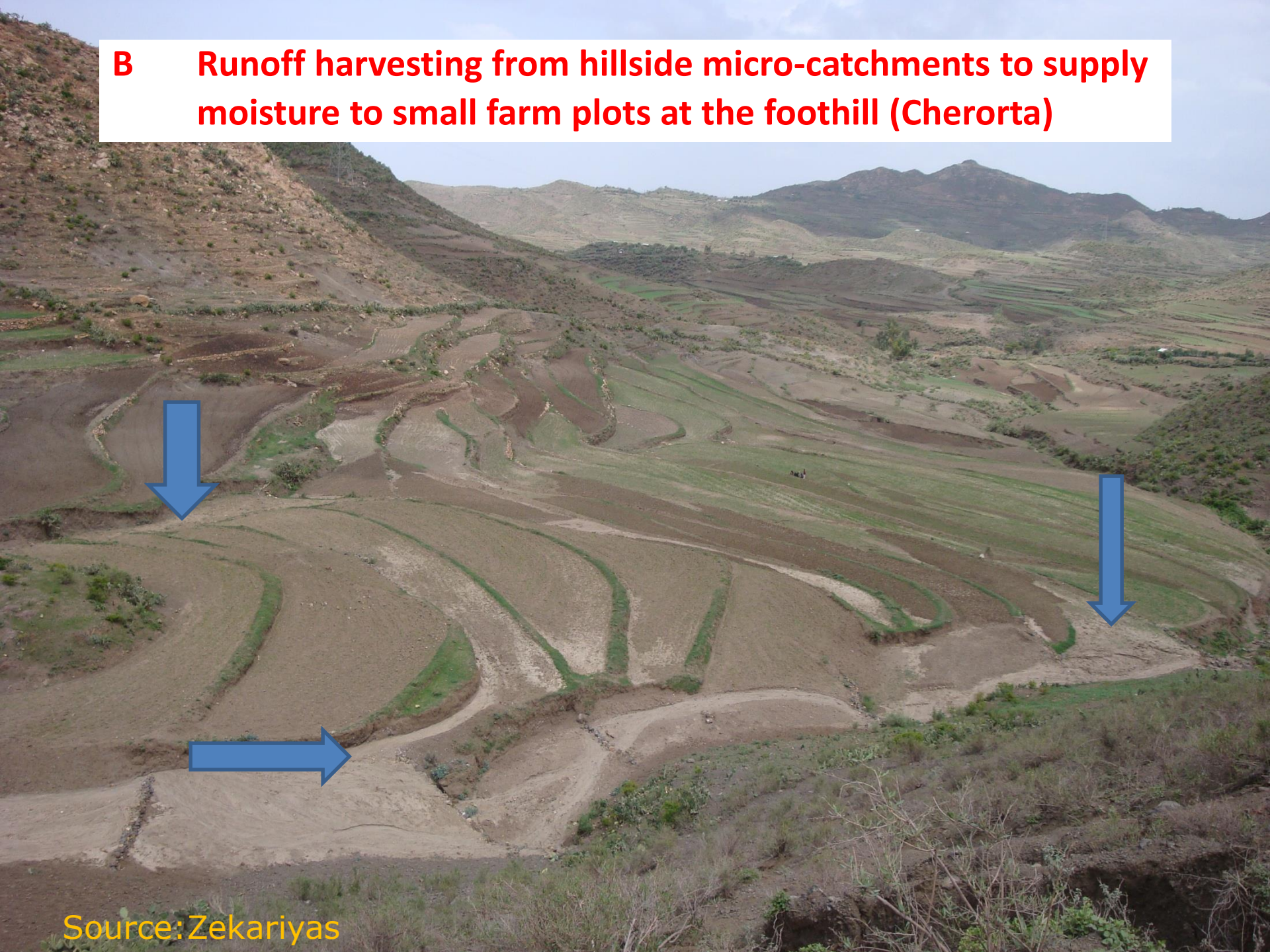
1.1 Types of FBFS in Tigray

A Flood diversion from seasonal rivers

- Spate irrigation systems: ***On seasonal rivers that bring huge flood to lowland valleys from large mountainous catchment***



Flood known for its destruction being used for irrigation in Raya valley, Ethiopia


B Runoff harvesting from hillside micro-catchments to supply moisture to small farm plots at the foothill (Cherorta)
Source:Zekariyas

C Runoff/Flood harvesting from roads

Photo: Kifle and van Steenbergen

2 Flood-Based Farming potential of Tigray

S/N	Name of the wereda	Watershed Area (Km^2)	Rainfall (mm)	Potential Flood (10^6m^3)	Area that can be irrigated by the flood (ha)	Estimated Command area (ha)
1	Mereb leke	2000	578	346.80	24771	30,000
2	H/Wegerat	3500	600	630.00	45000	50,000
3	Abergele	3500	550	577.50	41250	25,000
4	S/ Samre	3000	658	592.20	42300	25,000
5	R/Alamata	3700	765	849.15	60653	35,000
6	Raya Azebo	3000	550	495.00	35357	80,000
7	Enderta	2000	590	354.00	25285	50,000
8	K/Tembian	2000	958	574.80	41057	30,000
9	D/Tembian	1500	750	337.50	24107	15,000
10	A/Ahferom	2000	700	420.00	30000	20,000
11	Adwa	2000	775	465.00	33214	30,000
12	Hawzen	2000	600	360.00	25714	40,000
13	T/ Adyabo	4000	800	960.00	68571	100,000
14	L/Adyabo	2000	900	540.00	38571	40,000
15	Tselemti	4000	1200	1440.00	102857.1	100,000
16	Wukro	1800	600	324.00	23142.86	25,000
Total				**9265.95**	**661853.6**	**695,000**

3 Putting FBFS at the center of Tigray's GTP II: *Is it an option or obligation?*

3.1 The facts

Fact 1: Significant contributor to food security

- **If properly planned, designed, implemented and managed, it will be a significant contributor to the economic development and livelihood improvement of the region:**
  - **Assuming an increase in yield of 20 quintal/ha compared to purely rainfed and poorly managed FBFS:**
    - ***As indicated above, the surveyed total FBF potential is 661,854 ha***
    - ***2,647,416 quintal of additional yield can be harvested from 20% of the potential area alone***
    - ***This will support extra 1,231,000 population of Tigray***
- **Even in times of poor rainfall situation, one flood can make a significant difference in yield**

Appearance of Sorghum during the late season growth stage in purely rainfed system

Appearance of Sorghum during the late season growth stage in spate irrigation system

Fact 2: Untapped and least cost potential

- Most of feasible perennial rivers are already utilized
- Many of potential dam sites are studied, designed and constructed
- What does this indicate?
  - We need to look into other untapped potentials if the agricultural targets of GTPs is to be met
  - FBFS-diverting the flood directly to the farm or storing it in suitable structures such as ponds-is worth focusing
  - FBFS is also feasible investment wise

	Flood based farming	River diversion	Dam
Average Investment cost (Birr/ ha)	26,284	95,362	338,333
Number of cultivation per year	Once	Two-three	Two-three
Reliability	Less	High	High
Potential sites availability	Exist (very high)	Almost explored (finished)	Exist (high)

Fact 3: One of the only options in some areas

- In semi-arid lowland valleys adjacent to mountainous catchments such as Raya Valley, FBFS is the only feasible option for crop and livestock production, domestic water supply
- These areas are also bread baskets of Tigray due to their highly fertile alluvial deposition

Fact 4: Quintessential adaptation to climate change and variability

- Climate change and variability is increasingly adding to water resources uncertainty
- United Nations Environment Programme (2005):
  - Africa is the most vulnerable continent to climate change
  - 25 or almost half of the countries in Africa are expected to experience water scarcity or be under water stress situation over the next 20 to 30 years
- Many perennial and semi-perennial rivers are becoming seasonal
- Ethiopia not exceptional

The "Etu" river in Raya Valley used to be perennial when I was a kid/teenager (1980's)… It no more is now!! Just seasonal

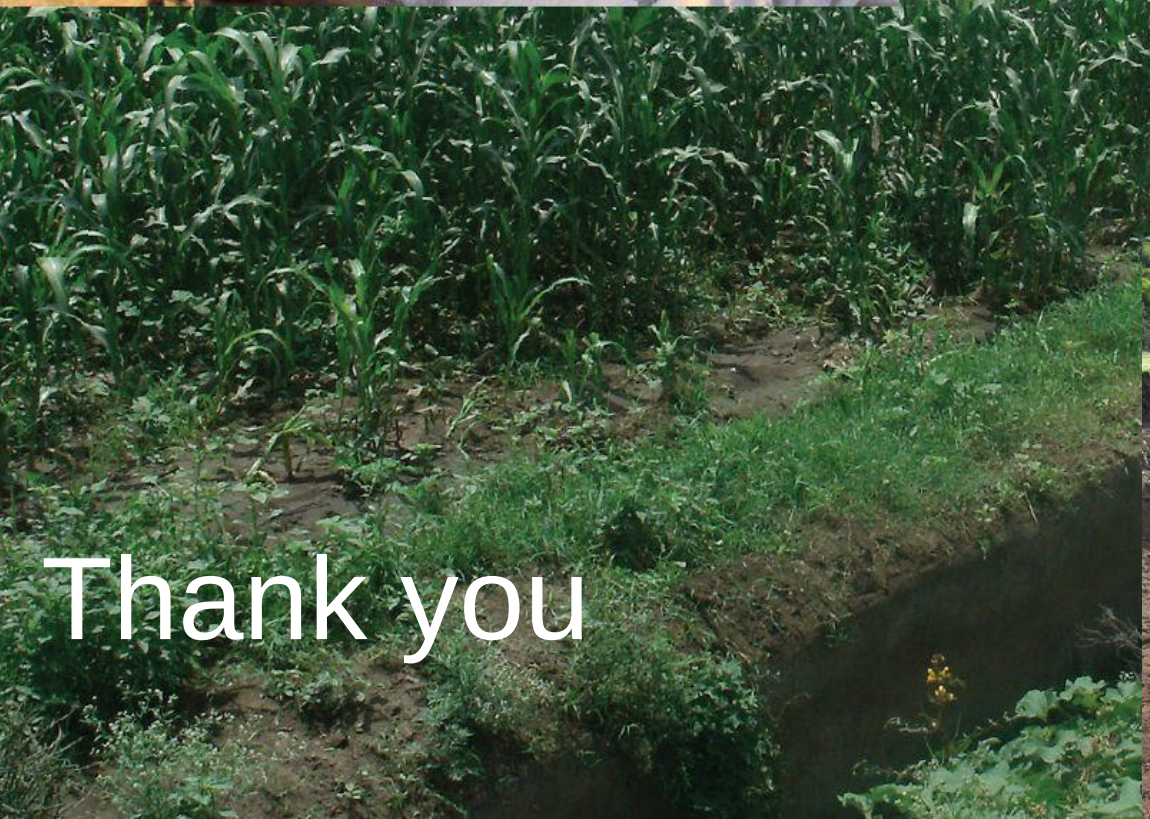
- **Increase in amount and intensity of rainfall is predicted in East Africa thereby increasing extreme events including floods**
- **FBFS is the best option to transform floods from forces of destruction to sources of livelihood for the most vulnerable ASAL community**

3.2 The results

- **A Regional Summit on "Towards Prosperous Tigray Region through Sustainable Investment in Flood-based Farming" was organized on 06 June 2014, Mekelle, Tigray, Ethiopia by:**
  - **Tigray Bureau of Water Resources, Mekelle University, Spate Irrigation Network Foundation, UNESCO-IHE Institute for Water Education, MetaMeta and IFAD**
- **Discussed whether FBFS should be an "Option" or "Obligation" during the Second Five Years Growth and Transformation plan that begins in September 2015**
- **The regional government agreed to put FBFS as one of the major pillars of GTP II (2015/16 – 2019/20)**

- **GTP II document preparation in its final stage, which includes the following major strategic plans for irrigation among others:**
  - **Irrigation development should focus on all ranges: from community based small-scale level to mega irrigation projects**
  - **Scaling up of best local practices and introduction of new technologies**
  - **Flood-based farming systems**
  - **Valley development authorities especially for the agriculturally potential lowlands such as Raya valley**


Flood is not a threat, rather source of livelihood to the most vulnerable communities if properly managed



Thank you