Need of Intensified Watershed Management Interventions in the Upper Catchment of GERD

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Outline of the Presentation

1. Background
2. Literature Review on GERD Sedimentation
3. Literature Review on d/s of GERD Sedimentation
4. Sediment Valuation
5. Prevailing Challenges in WM in Ethiopia
6. Framework Opportunities in Ethiopia for the Pursual of WM
7. The Way Forward /Recommendations

1. Background

1. The upper catchment of the GERD is **172,250** Km^2, it stretches up to 900km, hosts 31.9 million people (28%), and 39% LS,
2. Highland, steep slope, canyons, diverse agroecology, farming system, dense and fragmented holding, oxen plowing, free grazing, high rate of erosion – it is as if all the rugged part is given, by nature, to Abbay Basin
3. Deep and wide gully dissections is a common phenomenon – **10%** of the sediment load comes from gullies
4. What is eroding is **fertile top soil** which otherwise would have been used for agriculture /cropping
5. We are **losing** the soil, seed, applied fertilizer, compost, manure, lime
6. Although, there is on-going **re-greening** and **slope correction /terracing** effort, it is a long way behind

2. Literature Review on Sedimentation u/s GERD

Nº	Original Figure	Unit	Conversion Unit	Actual Value	Rounded Value
1	207	Million Cubic Meter	1.0	207	207
2	245	Million ton	1.1	269.5	270
3	287	Million Cubic Meter	1.0	287	287
4	308.6	Million ton	1.1	339.46	340
5	473	Million ton	1.1	**520.3**	520
				Average	**325 MCM**

3. Literature Review on Sedimentation - d/s of GERD

N°	Name	Year Commissioned	Purpose	Storage Volume in BCM	Sediment Volume/tone	Source
1	Sennar	1925	Sed. Management, irrigation, hydropower	1	0.71 BCM, in 61 years	Belachew, 2013
2	Jabal Awlia	1933	Hydropower /Fishery	NA	Highly silted	
3	Rosaires	1966 /1971	Irrigation /Hydropower	7.4	2.7 BCM in 28 years	Belachew, 2013
4	Merwoe	2009	Hydropower	12.5	84 MCM	ENTRO, 2006
5	AHD	1968	Irrigation/Hydropower	162	$136x10^{6}$ t TSS yr^{-1}	Shalash, 1982
6	Tekeze	2009	Hydropower	9	30MCM	*
7	GERD	Upcoming	Hydropower	74	207MCM/yr	Ethiopia
	*https://www.google.com/search?channel=trow2&client=firefox-b-d&q=tekeze+hydropower+project+pdf					

4. Sediment Valuation

- Valuing the annual soil /sediment lost at GERD, in financial terms
- Annual sediment volume is converted into hectarage of crop land having an assumed soil depth of 0.5m
- The equivalent area that could be cropped, every year, is 64,930ha.
- Cost-benefit analysis using the 10 Billion USD estimated cost for watershed management, at the current rate of wheat production of 27Qt $ha^{-1}yr^{-1}$, at 10% discount rate gives a NPV Present Value (NPV), changing to positive returns, at 29^{th} year
- Taking the potential wheat yield of 50qt $ha^{-1}yr^{-1}$ the NPV, showing positive returns will be reduced to 15 years
- Practicing double cropping using irrigation and /or residual soil moisture the NPV can be under 10 years
- Biological SWC can give NPV changing into +ve in the 2^{nd} year of investment
- Physical SWC measures give NPV changing into +ve in the 6^{th} year of investment

5. Prevailing Challenges in WM in Ethiopia

1. Land **degradation**
2. Absence of national **land use policy** and tenure security
3. Lack of **long-term** reliable financing for watershed /land management programs /project
4. **Short life** span of land management-based projects /programs
5. Lack of applying **quality** SWC measures
6. Soil erosion is a threat to lime application
7. Overlying of fertile agricultural lands and infrastructural facilities with **less fertile** subsoils and debris
8. Infestation with **invasive** and exotic plants
9. Poor or no involvement of the **private sector**
10. Lack of adequate community **ownership**
11. Limited **research**
12. Inefficient documentation, reporting, and **M&E** system.

6. Framework opportunities in Ethiopia for the pursual of WM

1. Presence of **diverse** landscapes, agroecology, and farming system
2. Presence of **extensive extension** on NRM, SWC and WM
3. The presence of solidly founded **past experience** to pursue WM
4. Existence of **community mobilized WM initiatives**
5. Presence of strong policy and **strategy on WM approaches**
6. Presence of **established planning unit** at the community level

6. Framework opportunities in Ethiopia for the pursual of WM Continued…

WM units and hydrological characteristics

Planning unit	Typical area (KM2)	Example	Degree of coupling
Community /Micro-watershed	5	Typical watershed adopted by SLMP II (Ethiopia) – Agam	Very strong
Sub Watershed	20 to 60	An assemblage of 9 micro-watersheds Gumara	Strong
Major Watershed	60 to 200	An assemblage of 3 to 4 Sub watersheds	Moderate
Sub-basin	Up to 15,000	Lake Tana	Weak
Basin	Up to 172,250	Abbay Basin	Very weak

7. The Way Forward /Recommendations

1. Need of adequate **resource mobilization**
2. Formulation and enforcement of national **land use policy**
3. Do comprehensive watershed **classification and coding**
4. **Scaling up** of best practices
5. Establish **labor support** system
6. Acquire sufficient **planting materials**
7. Strengthen **capacity building** and **knowledge management**

Kes (Mr.) Guadie Assefa, Working on gully plugging in Farta District, Maynet Kebele, Zefie Community Watershed, in the Lake Tana Sub-basin

Watershed Management in the "Before" and "After" – this happened in 1.5 years time – picture is in Farta District, Lake Tana Sub-basin, Maynet, Kebele Administration a proof that WM works, if applied correctly and timely

Thankyou!!!