



# Africa RISING R4D approach towards agricultural intensification and climate change adaptation in the Ethiopian highlands

Presentation for University of Wisconsin delegates

Kindu Mekonnen

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## I. Introduction to Africa RISING R4D program

- Duration of the 1<sup>st</sup> phase (2012-2016)
- Funded by USAID's through the US FtF initiative
- Principal focus – SI of mixed farming systems to contribute to food security, income diversification, nutrition, gender equity
- Operates— west Africa, E and S Africa and Eth highlands
- The Ethiopian AR project is implemented-8 research kebeles in 4 regions (Amhara, Oromia, SNNPR, S.Tigray)
- Partners in Eth – 9 CG centers, 4 local universities, 4 regional and 2 federal research institutions, 4 woreda agriculture offices, NGOs, farmers and Innovation Labs
- Partnerships facilitated via multi-tier IPs

# Africa RISING project research kebeles in Ethiopia





## 2) Systems understanding/diagnosis

### 2.1. Sites and research kebeles selection

- Representativeness, AGP, cropping systems, partners

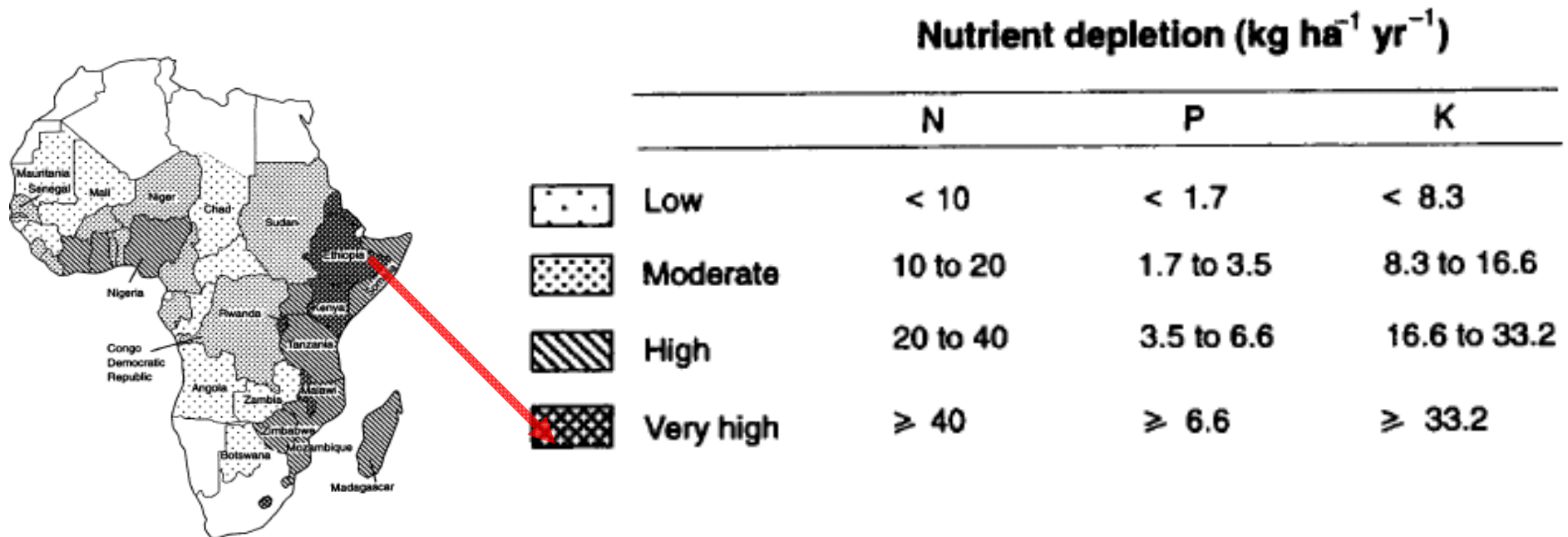
### 2.2. Tools and methods

- Rapid Telephone Survey (RTS)
- Livelihood survey using SLATE
- Participatory Community Analysis (PCA)
- IMPACTlite survey: hhs detailed characterization
- Survey on Agro-ecological knowledge, community knowledge groups – AKT5 tool
- FEAST and TECHfit
- Market/ Value chain studies



## 2.3. Major issues/constraints/challenges

- Climate variabilities (late onset and early cession of rain)
- Depletion of soil fertility (acidity, continuous cropping), soil erosion and drainage problem + high fertilizer price.



- Soil loss on cultivated land without soil conservation = 40 t ha<sup>-1</sup> yr<sup>-1</sup>



- Low crop yield due to lack of improved varieties ( $< 1 \text{ t ha}^{-1}$ )
- Crop pests, weeds and diseases, poor access to agro-chemicals and post harvest losses (30-40%).
- Lack of improved farm implements
- Shortage of animal feed (Av deficit in the past few years in Eth= 46 million t DM  $\text{yr}^{-1}$ )
- Poor access to veterinary drugs and animal health services
- Water shortage during the dry periods for human and livestock
- Shortage of wood for fuel (projected demand for 2020= 92 million  $\text{M}^3$ )
- Poor household nutrition (diets lacking protein + vitamins)
- Farm-to-market links are weak



## 3. Action research

### 3.1. Key thematic areas

1. Feed and forage development.
2. Field crop varietal selection and management.
3. Integration of high value products into mixed farming systems.
4. Improved land and water management for sustainability.
5. Improving the efficiency of mixed farming systems through more effective crop-livestock integration.
6. Cross-cutting problems and opportunities.
7. Knowledge management, exchange and capacity development.



### 3.2. Farm level R4D activities-CC adaptation interventions



Irrigated/rain-fed fodder



Crop residue management and utilization



Faba bean/forage intercropping



Fodder and fertilizer trees/shrubs





PVS on major crops



Community based seed multiplication



Management of enset bacterial wilt



Crop production and storage





Soil-test based nutrient amendments



Mechanized seeding



Raised bed/ ridges and furrow



High value fruit trees





Water harvesting, lifting and saving - ponds, rope and washer and solar pumps



Shallow well with a pulley system to irrigate vegetables and avocado trees



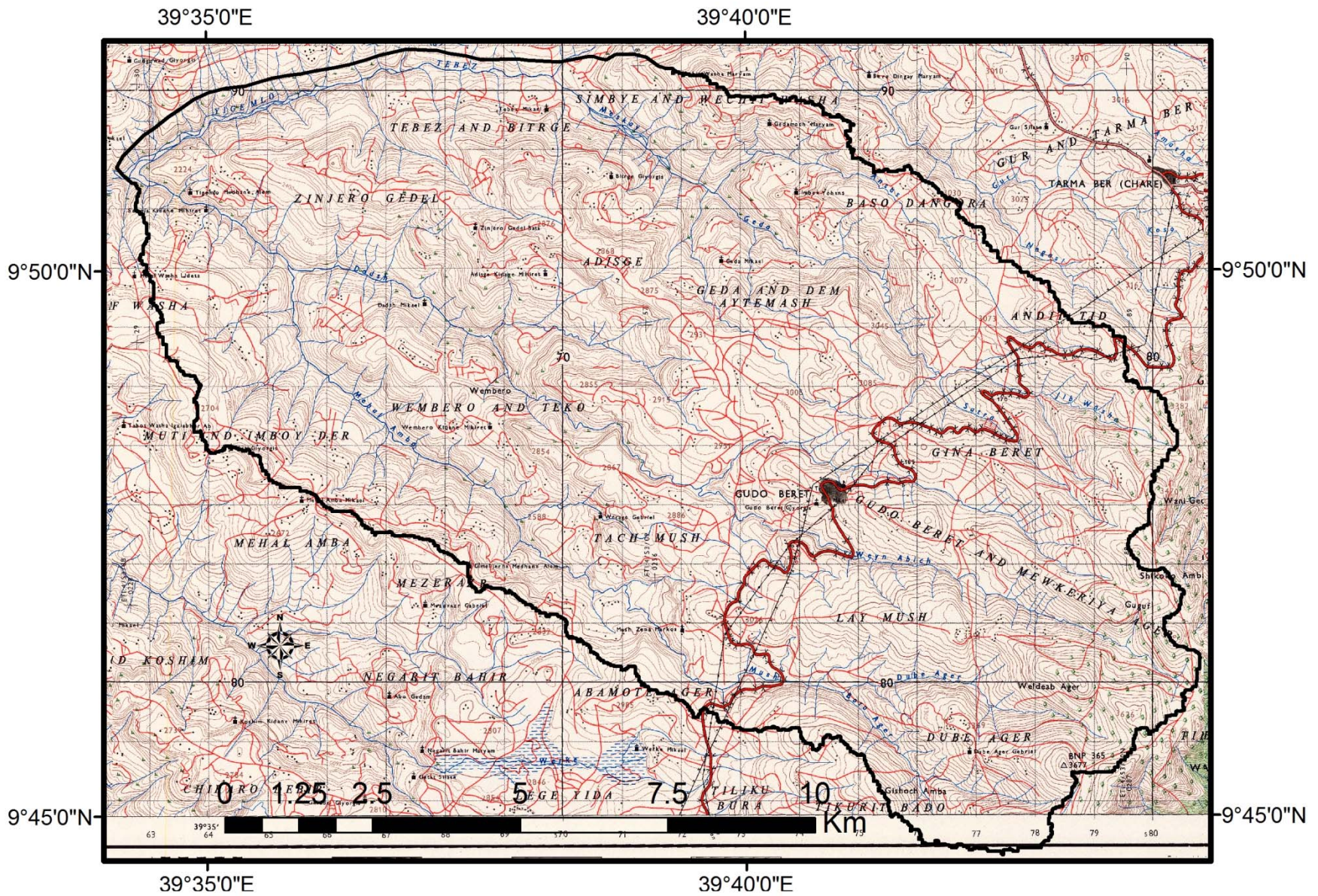
Tractor mounted motor pumps



### 3.3. Landscape/watershed level R4D activities

- Request from the extension to get support on **capacity building** (technical and training) and **technology demo**
- AR sees working in watersheds as an opportunity of **scaling** its farm level tested technologies, management practices and approaches
- AR has discovered a number of **researchable issues** that might bring quick solutions and attract farmers to realize immediate benefits
- AR sees community mobilization and local administration commitment and investment on SWC as an opportunity for **cost sharing and sustainability**

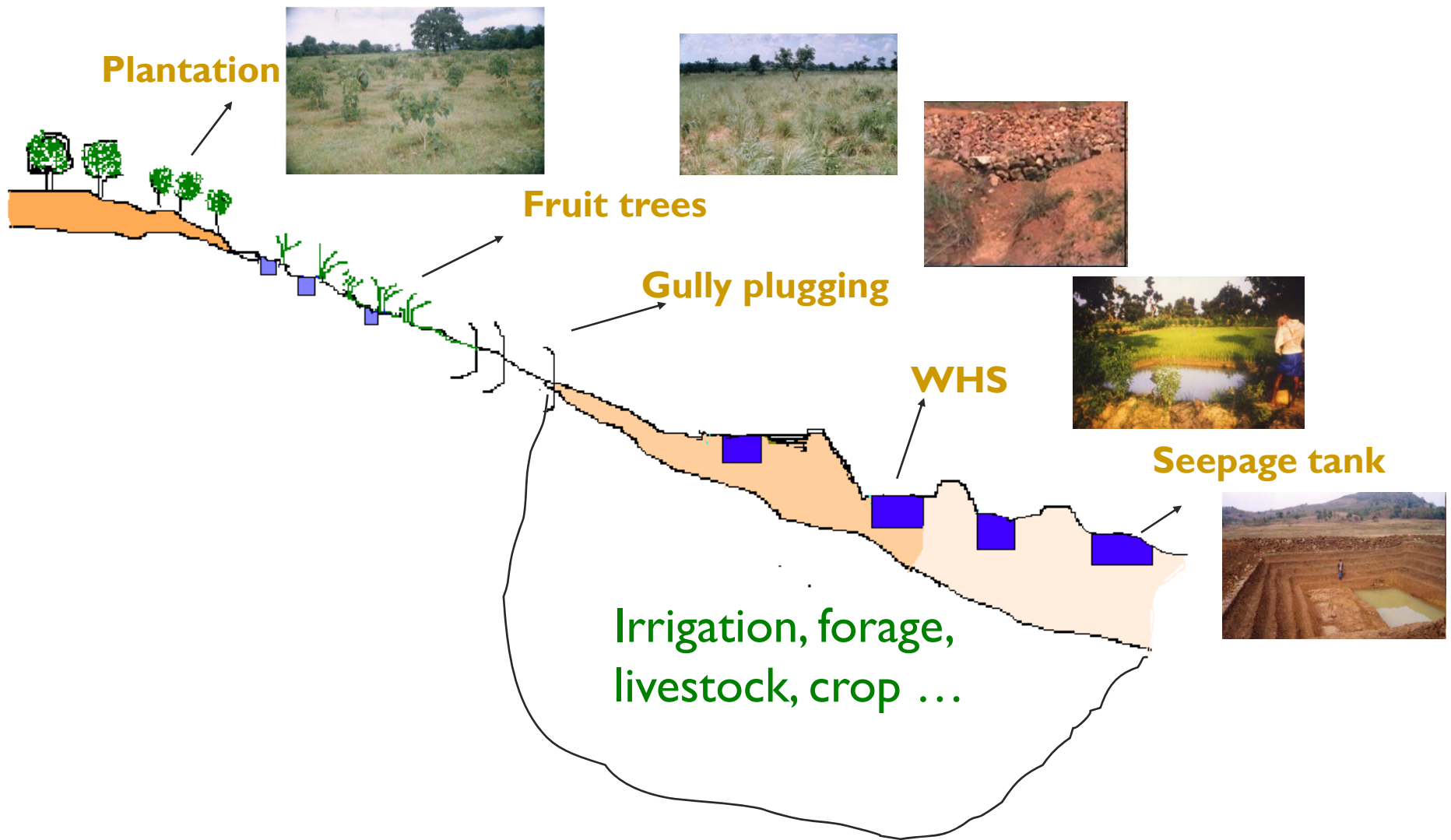




Geda Collaborative Model Watershed in Basona Worena







Possible site-specific and 'problem oriented' interventions for landscapes in AR sites





Partial view of the watershed in Basona Worena



Partial view of trench structures for SWC and water retention at the watershed in Basona



Gabions and gully shaping at the model watershed in Basona



Land reclamation through biological and physical means at the watershed in Basona





Percolation pits for water storage and irrigation use in Basona Worena



Shallow wells for small-scale irrigation at the watershed in Lemo



SWC activities at the watershed in Basona



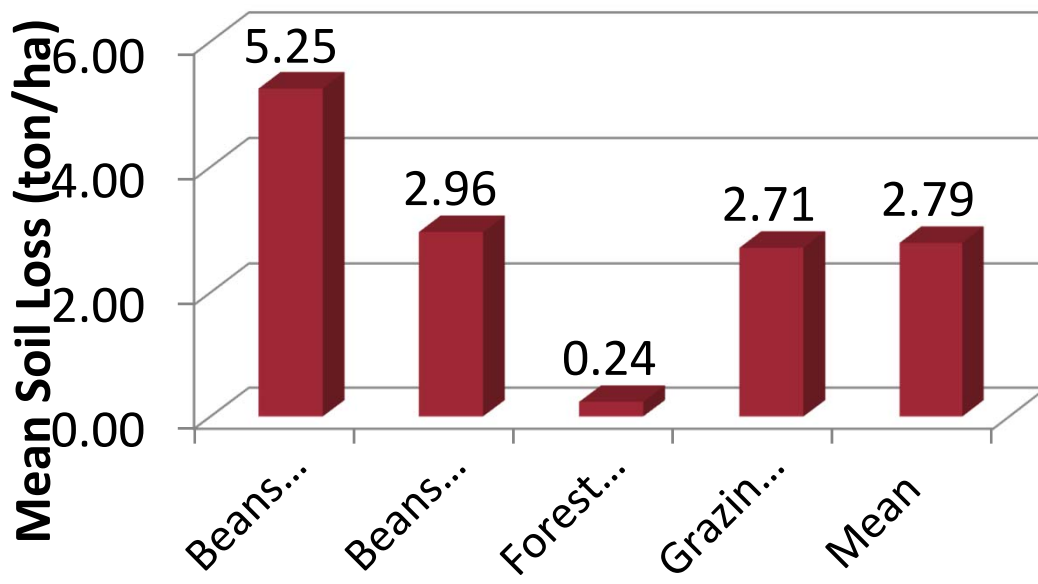
Desho grass on SWC structures at the watershed in Lemo



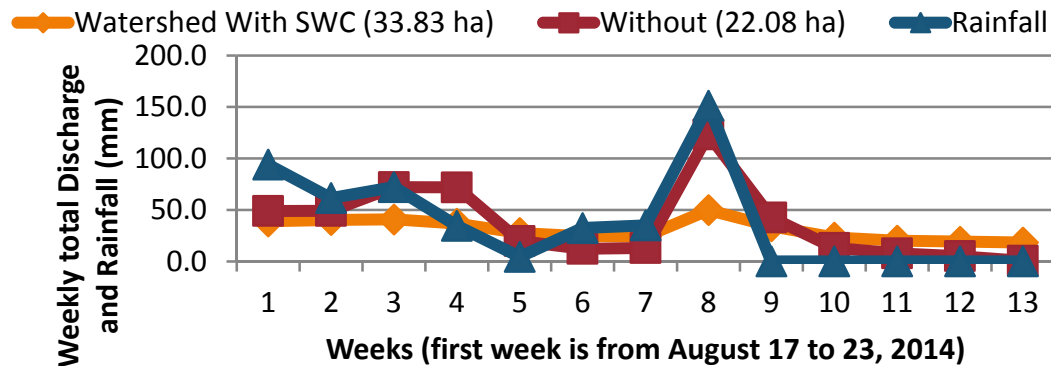
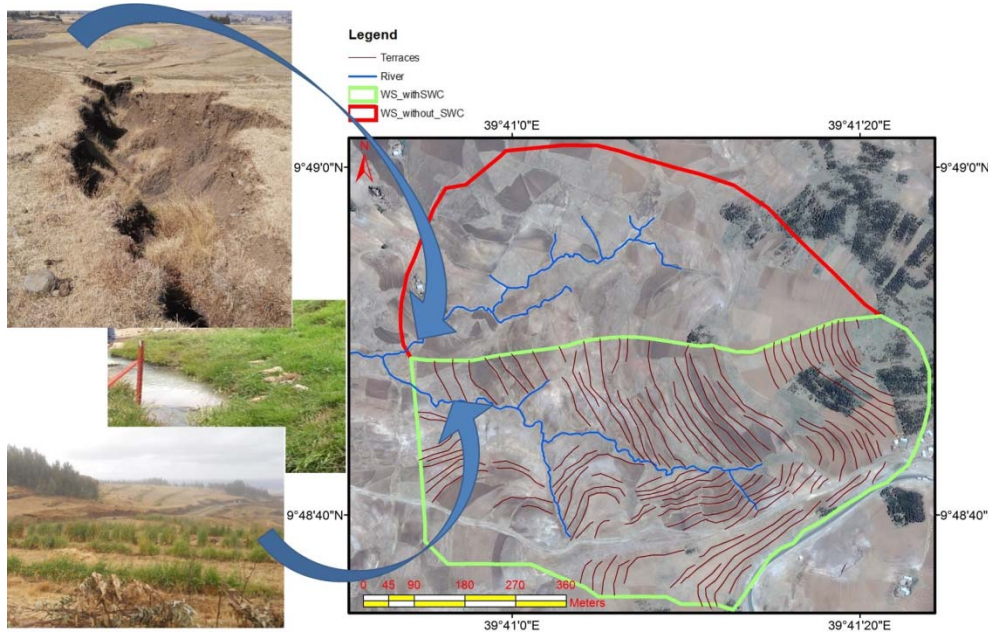


### 3.3.2. Monitoring/assessment

- Soil erosion assessment at plot and watershed level
- From 16 runoff events the highest average runoff ( $60\text{m}^3$ ) was observed on grazing land.
- During these runoff events the terrace together with the trench reduced the soil loss by 44 % in comparison with unmanaged cultivation.



○ Water and sediment yield study at mini watershed scale



Parameters	Watersheds	
	With SWC	Without SWC
Area (Ha)	33.83	22.08
Rainfall (mm)	479.8	479.8
Discharge (m <sup>3</sup> /watershed)	134682	105933
Discharge (m <sup>3</sup> /ha)	3981	4798
Sediment Yield (ton/watershed)	31.03	102.05
Sediment Yield (ton/ha)	0.92	4.62



### 3.3.3. Partners and their responsibilities

- CGIAR centers: CIAT, ILRI, ICRAF, ICRISAT, IWMI, CIP, ICARDA and CIMMYT (test technologies, generate evidences and fill capacity building gaps)
- Local Universities: DBU, MU, WU (training and research)
- Research Centers: DBARC, Areka ARC, Worabe ARC (technologies and demonstration)
- Farmers both in Basona and Lemo (implementation)
- NGOs and private entrepreneurs (extension)
- Extension: Basona Worena woreda office of agri, Lemo woreda office of agri. (Mass mobilization and extension)



Mass mobilization for SWC in Basona







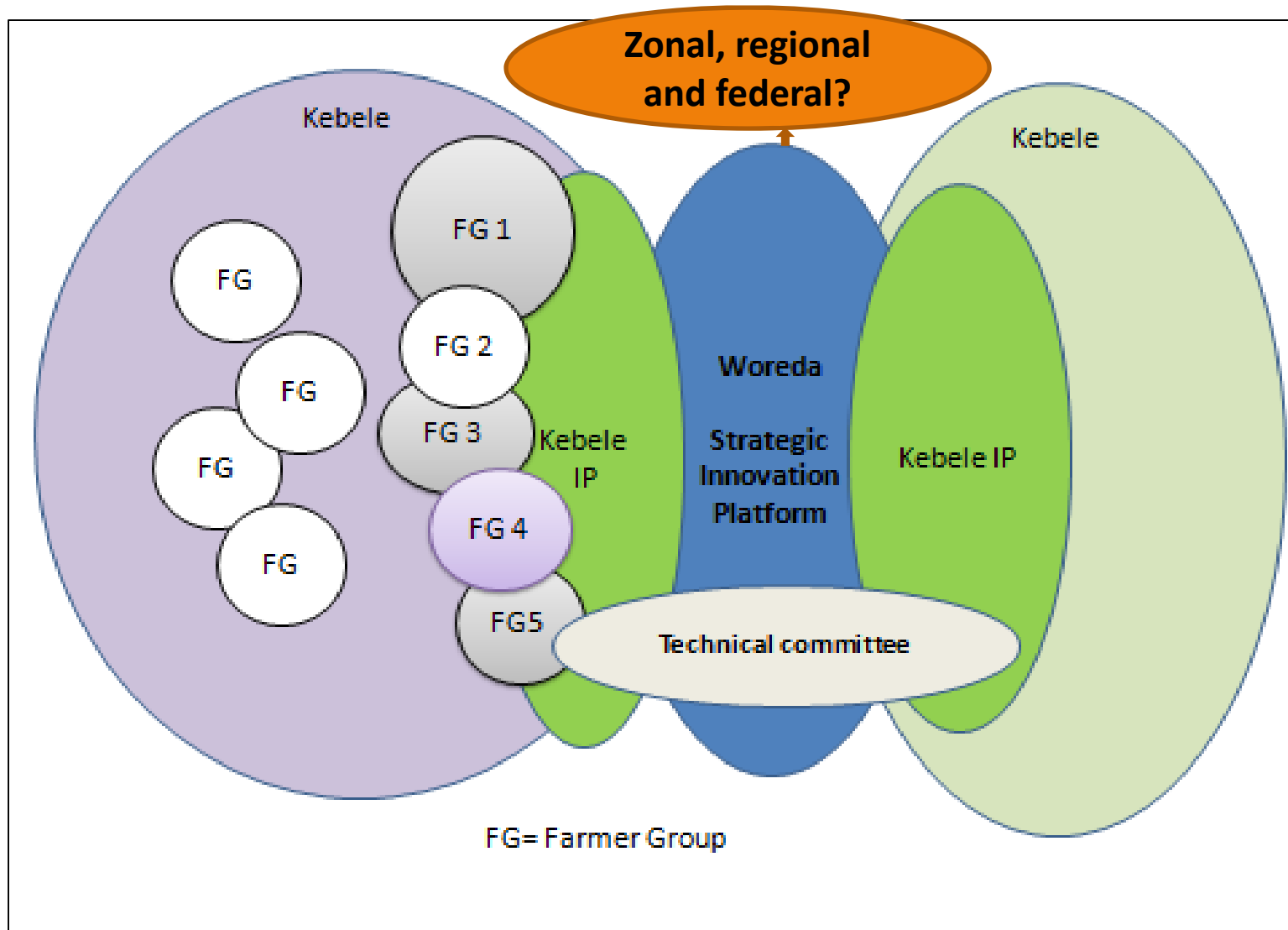
## 4. Capacity building

- Research attachment – 30 MSc and PhD students generating evidences and information on various topics
- Training and experience sharing visits

Africa RISING  
local partners  
from Lemo and  
Basona - Cross  
learning visit in  
Abrha WaAtsbha,  
Tigray



## 5. R4D innovation platforms- 4 sites and 8 research kebeles







## 6. Digital stories on CC adaption interventions- examples from ILRI-UNEP-WU and Africa RISING projects

1. Collective action on communal grazing land management
2. Improved field pea intervention
3. Water harvesting
4. Strengthening cooperatives



## 7) Conclusion

- Balancing short and long term benefits to the communities is a must
- Tailoring technologies to the local farm and landscape situation is necessary
- Stepwise approach for watershed management is very important
- Partnership is key to move forward and bring the desired impact



## Africa RISING CGIAR partners in Ethiopia





## Local partners - Ethiopia

- **Academic institutions:**
  - Wachemo, Mekelle, Madawolabu, Debre Berhan and Hawassa universities; Maichew Agricultural College
- **Regional research organizations:**
  - Amhara Regional Agricultural Research Institute, Southern Agricultural Research Institute, Tigray Agricultural Research Institute, Oromia Agricultural Research Institute
- **Federal research organizations:**
  - Ethiopian Institute for Agricultural Research, Ethiopian Public Health Institute
- **Offices of Agriculture:**
  - Endamekoni (Tigray), Basona Worena (Amhara), Lemo (SNNRP) and Sinana (Oromia)
- **Private entrepreneurs**
- **NGOs:** GRAD, Hundie, SOS Sahel, Sunarma
- **Agricultural Transformation Agency (ATA)**
- **Innovation laboratories:** ILSSI, IPM IL, Power Africa



## Africa RISING program communication tools:

- Website: <http://africa-rising.net/>
- Wiki space: <http://africa-rising.wikispaces.com/events>
- Flickr: <https://www.flickr.com/photos/africa-rising/sets>
- Presentation : <http://www.slideshare.net/africa-rising>
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<http://cgspace.cgiar.org/handle/10568/16498>



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