



Africa RISING in the Ethiopian highlands

Research for Development Driving Sustainable Intensification

A presentation prepared by the Africa RISING team

ECHO East Africa Symposium – 1 November, 2016



Africa RISING in the Ethiopian Highlands

- Five year first phase nearing completion (September, 2016);
- Funded by USAID BFS through the FtF initiative;
- Principal focus: Sustainable intensification (SI) of mixed farming systems to contribute to climate smart development, gender integration, improved nutrition, inclusive agricultural sector growth, private sector growth and research and capacity building (FtF focus areas);
- Implemented in eight research kebeles across the four, main highland regions (Amhara, Oromia, SNNPR, Tigray);
- Partners: 9 CGIAR centers, 4 local universities, 4 regional and 2 federal research institutions, 4 woreda agriculture offices, NGOs, innovation laboratories (SIIL, HCC, DII, ICR)

Africa RISING project research kebeles in Ethiopia



Demand Driven Research for Development (R4D)

Alignment with FtF priorities

- Focus on FtF goals at the outcome level;
- Site selection:
 - ✓ > 25% land area under wheat cultivation;
 - ✓ 1900 – 2400 m.a.s.l.
 - ✓ AGP woredas
 - ✓ Past and current complementary activities
 - ✓ Partnerships

Household characterisation and diagnosis

- Participatory Community Analysis
- Livelihoods and gender stratification
- Quantitative household characterisation
- Indigenous knowledge
- Characterisation of key value chains

Major constraints and challenges faced by Africa RISING's target households

- Climate variability;
- Low crop yields ($< 1 \text{ t ha}^{-1}$);
- Soil fertility depletion, erosion and poor drainage;
- High price and poor access to fertilizer;
- Crop pests, weeds and diseases;
- Post harvest losses (30-40%);
- Lack of improved farm implements;
- Acute shortage of animal feed;
- Poor access to veterinary drugs and animal health services;
- Seasonal water shortages;
- Poor household nutrition;
- Shortage of wood for fuel;
- Weak links to markets.

Thematic areas for action research

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 (markets, gender, nutrition).
7. Knowledge management, exchange and capacity development.

Addressed through 17 action research protocols implemented in collaboration with volunteer farmers.

Africa RISING 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



High value fruit trees - apple



High value fruit trees - avocado



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



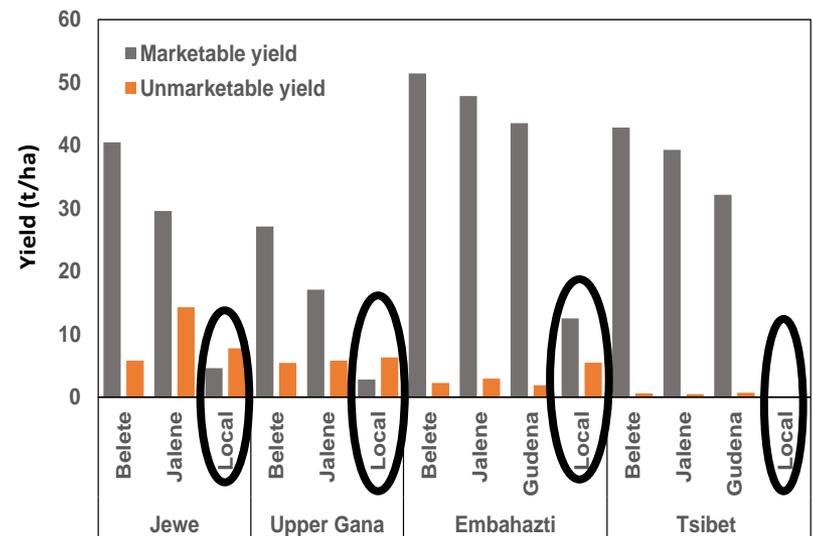
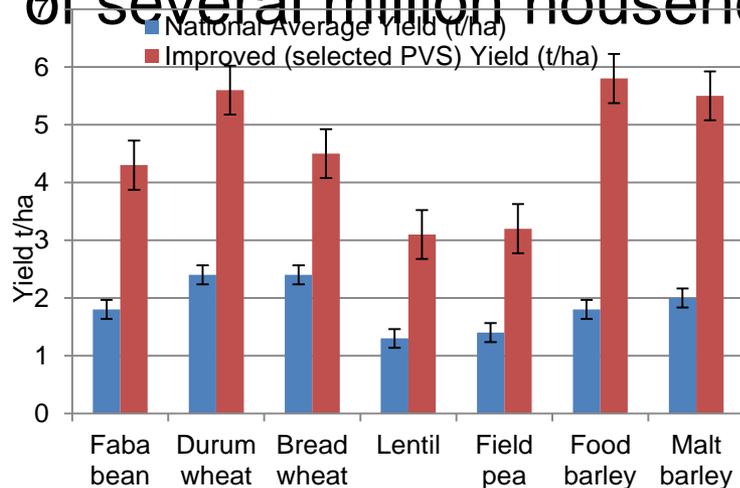
Shallow well with a pulley system to irrigate vegetables and avocado trees



Tractor mounted motor pumps

Outcomes 1: Crop production yield gaps closed

- Wheat yields of up to 9.4 t / ha for wheat on demonstration plots and 8.6 t / ha under farmers management conditions;
- Faba bean yields of up to 6 t / ha and production of quality seed in South Tigray;
- Improved potato varieties were high yielding (32-53 vs. 2-8 t/ha), early maturing (98 vs. 120 days) and tolerant to late blight.
- Africa RISING technologies used as a basis for regional benchmarks in crop production (potential scaling domain of several million households);





Hussein Haj Adam, Salka research kebele in Sinana, Oromia

- Community seed production for bread wheat (Hidase) and durum wheat
- Planted to 3 ha in 2015 producing 18 tons marketed at ETB180,000 (USD 9000)
- “Improved varieties also provide better quantity and quality of crop residues”
- “Involvement in AR action research motivated me to work more improve my livelihood status for the future”
- “I plan to share my successes and experiences with other farmers”

Outcomes 2: Seasonal livestock feed gaps closed

- Biomass yields from Africa RISING forage crops are making significant contributions to feed gaps (oat – vetch, 11 t DM / ha; tree lucerne, 5 t DM / ha; sweet lupin, 2.5 t DM / ha; forage – bean intercropping, 3 t DM / ha);
- Farmers have started allocating much larger land areas (>0.25 hectares) to the oat - vetch forage mixtures promoted by Africa RISING;
- This forage mix has also been found useful in rotations to break mono-cropping and disease infestation in Sinana, Bale Africa RISING site;
- Improved feed management innovations are significantly reducing wastage (improved feeding trough, wastage ↓ 30%; improved crop residue storage, wastage ↓ 50%);
- Some farmers are now adopting several of these complementary innovations.



- Desta Woldearegay**, Gudo Beret research kebele in Basona Werana, Amhara
- participated in multiple action research protocols (potato PVS, wheat seed production, oat-vetch mixed fodder production) with multiple benefits
 - “Improved storage allowed me to sell potato seed to Mush farmers’ cooperative and other individual farmers”.
 - “The project’s oat-vetch innovation has provided fresh fodder and hay for me my cow in times of feed shortage and I have forage seed for next season”.
 - “Africa RISING has improved my family’s livelihood. I can educate my two children in Debre Birhan as I can now pay their rent (ETB 330 / month) and cover their pocket money (ETB 350 / month) and other related costs”.

Outcomes 3: Improved water management

- Africa RISING client farmers expressed very strong demand for technologies to enhance their access and utilisation of water (the right amount at the right time);
- Improved water lifting technologies (rope and washer, solar powered and tractor driven pumps) have enhanced farmers capacity to irrigate high value crops.
- These technologies also complement the fodder initiative with irrigation adding, on average, 14% to dry matter yields;
- Introduction of wetting front detectors has improved timing of irrigation events making more efficient use of the water that is available.

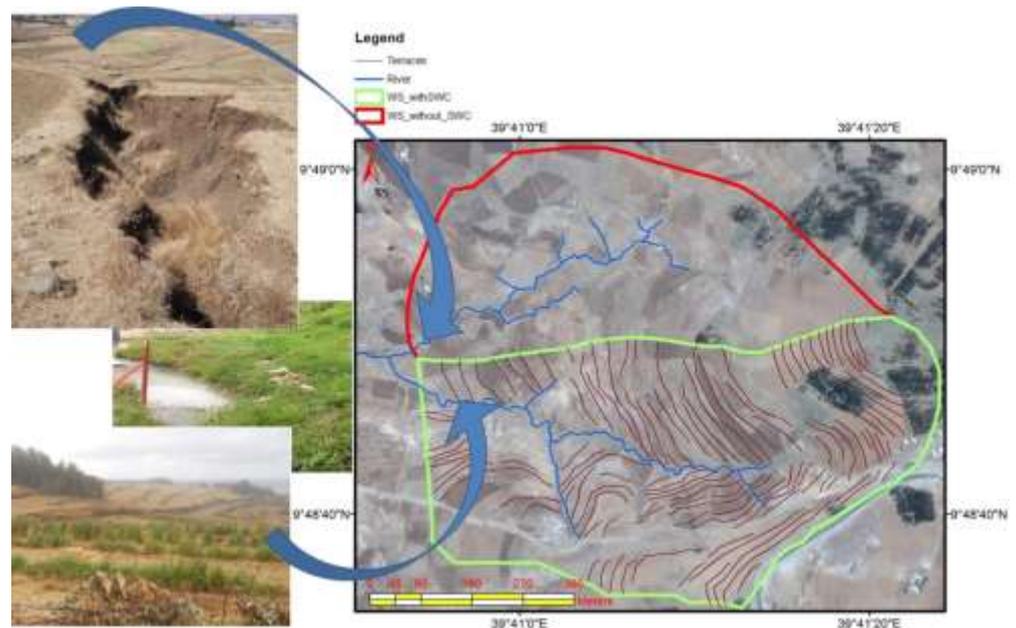


Alemu Kebed, Jawe research kebele in Hadiya, SNNPR.

- Again, participated in multiple action research protocols (water harvesting, vegetable production, tree lucerne, high value fruit trees);
- “ I only farm 0.5 ha but with the rain water harvesting pond that my family has constructed I can now irrigate 2000 m² of that land”;
- “I produced cabbage and carrot from a 100m² plot. I sold half of this for ETB 1000 and saved the rest for my family consumption”.
- “Using the Africa RISING interventions has taught me how to diversify my income and food sources through intensifying my home garden”;
- Alemu is married with eight children. Intensification and diversification appears to be helping him to achieve food security from his very small farm.

Outcome 4: Soil losses reduced and productivity improved at a landscape scale

- Implementing interventions at the landscape scale creates an enabling environment for the household scale interventions described above;
- Implementation of integrated SWC practices at landscape scale has reduced soil loss by over 80% in the Africa RISING watersheds;
- At plot level, management practices implemented in cultivated fields reduced soil loss by 87% compared to non-treated plots;
- A landscape management tool developed by the project is being used to evaluate potential impacts of interventions.





Gudo Beret and Adishghe Watersheds in Amhara.

- In these communities watershed, gully erosion was identified as the top priority with gullies of up to 3 meters in depth and 12 meters wide.
- Complementary / linked technologies across landscape have been reducing runoff and erosion whilst increasing infiltration and rehabilitating gully and landslide downslopes;
- Trenches, percolation pits and terraces integrated with biological measures in the upslope and complemented with grass strips, bamboos, gabions and percolation pits in gullies has enabled the restoration of about 40% of the affected area in just one season.

Outcomes 5: Fertilizer recommendations fine-tuned

- Crop responses on the ground have not, in some cases, been meeting expectations from the currently recommended fertilizer blends. Widespread incidence of “non-responsiveness” threatens the credibility of these initiatives;
- Crop responses to various combinations of fertilizer blends (N, P, K, S, Zn, Bn) in wheat-based cropping systems quantified;
- Soil-specific best fertilizer blends and rates for wheat have been identified for the research kebeles;
- These recommendations boost yields by up to three times, even in previously non-responsive soils;
- This research has catalysed a new national initiative (ATA, EIAR, MoA, RARIs, CGIAR) to deliver these innovations countrywide.

Capacity building

Summary of knowledge exchange and capacity development in 2014 and 2015

Year	Field days and visits	Trainings	Workshops and IP meetings	Engagement in surveys
Total 2014	1315	562	1998	704
Total 2015	876	582	1293	1527
Overall total	2191	1144	3291	2231
Total for 2014 and 15				8857

- Research attachment – 30 MSc and PhD students generating evidences and information on various topics



Exchange Visits for Building Capacity

- Africa RISING has organized a number of exchange and cross-learning visits for decision makers, farmers, extension, local universities, research and CGIAR centers
- These took place in Abreha wa Atsbeha watershed and Maichew (Tigray), Lemo (SNNPR) and Basona (Amhara) and have motivated local governments, farmers, extension, NGOs, local Universities and research to work more closely and implement integrated / linked innovations within watersheds.
- The Africa RISING partners' landscape management approach is bridging

Communication and learning

- The AR team published 124 blog posts, 169 evidence briefs and numerous posters, reports and brochures highlighting our work and communicating our findings to potential users and beneficiaries.
- The AR team drafted more than 15 journal papers during a write shop organized by Africa RISING. Most are submitted to peer reviewed journals.
- AR in Ethiopian highlands won an [award](#), sponsored by the USAID Learning Laboratory in 2015, for its success in collaborating, learning and adapting around its innovations.
- AR work in Ethiopia has generated significant media coverage at international, national and regional levels (<http://www.businessinsider.com/ethiopia-is-experiencing-one-of-the-worst-droughts-in-50-years-2016-5>)

Africa RISING: Second Phase

- Phase I: an action research project;
- Outcome evidence is robust but generated at limited scale with a high level of investment per beneficiary;
- Phase II: research will continue but move towards backstopping a portfolio of development partnerships;
- Who are the development partners?
 - MoA, AGP, ATA, other ministries;
 - NGOs (GRAD-REST, Inter Aide France, CRS);
 - Private sector (Maltsters, Kalyti Pasta and Macaroni)
 - Other bilateral donors (GIZ, ADA, IDC);
 - Other USAID investments (ICARDA Malt Barley and Bean Project, BPBL, ?).
- Preliminary targets: 0.5 million direct beneficiaries

Partnership- CGIAR centers and local partners



Local partners and others

- 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, SIIL, PHIL, LSIL,
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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