



Africa RISING in the Ethiopian highlands: Some phase I achievements

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1. Outcomes from R4D initiatives

Crop production yield gaps closed:

- Wheat yields of up to 9.4 t ha⁻¹ on demo plots and 8.6 t ha⁻¹ under farmers management conditions;
- Faba bean yields of up to 6 t ha⁻¹ and production of quality seed in South Tigray;
- Improved potato varieties were high yielding (32-53 vs. 2-8 t ha⁻¹), early maturing (98 vs. 120 days) and tolerant to late blight.



Seasonal livestock feed gaps closed:

- Biomass yields from forage crops are making significant contributions to filling feed gaps (oat – vetch, 11 t DM ha⁻¹; tree lucerne, 7 t DM ha⁻¹; sweet lupin, 2.5 t DM ha⁻¹;
- Post harvest feed handling technologies (feeding trough and shed) have reduced wastage from **30 - 50%**;
- Farmers attitudes changed - allocating **> 0.25** ha to the oat - vetch forage mixtures promoted;



Improved water management:

- Water lifting technologies (rope and washer, solar powered and tractor driven pumps) have enhanced farmers capacity to irrigate high value crops;
- Wetting front detectors have improved timing of irrigation events making more efficient use of the water that is available.



Soil losses reduced and productivity improved at a landscape scale:

- Implementation of integrated SWC practices at landscape scale have reduced soil loss by over 80% in the AR 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.



Fertilizer recommendations fine-tuned:

- 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;
- This research has catalysed a new national initiative (ATA, EIAR, MoA, RARIs, CGIAR) to deliver these innovations country wide.



High value fruit trees contributed to income diversification and nutrition:

- Improved avocado and apple varieties are fruiting in less than two years with variation across varieties and sites.
- Strengthened nursery infrastructure in some Africa RISING sites - capacity to produce 500,000 to one million seedlings that will benefit more than 50,000 hhs per year.



2. Most significant changes - Examples



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 and improve my livelihood status for the future”*
- “I plan to share my successes and experiences with other farmers”



- 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”.*



Alemu Kebed, Jawe research kebele in Hadiya, SNNPR.

- Again, participated in multiple action research protocols (*water harvesting, vegetable production, tree lucerne, oat-vetch, feed shed, high value fruit trees, 2 wheel drive tractor*);
- “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.



Bahafta, AR site in Endamehoni, Sothern Tigray.

- She has tested **3 improved varieties of potato** – Belete, Gudene and Jalene –in comparison with the local potato variety. She found marketable yields of 51, 47, 44 and 13 t ha⁻¹ tuber. The benefit she obtained from improved potato production includes increased yield, quality and early maturity.
- In 2015, she earned about 6000 birr from the sale of potato tubers for seed. She explains *“The land size I own is only 0.3 ha and with the previous production practice I was unable to feed my family. However, because of the potato varieties I am much better off in feeding my family and making additional investment.*
- From her income, Bahafta payed a loan for a motorized water pump and bought agri inputs that increase productivity of her small plot of land. *Owning the motorized pump enabled her to produce twice a year by pumping water from a distant shallow hand-dug wells.*

3. Communication and learning

- The AR team published **403 products** (146 blog posts, 89 reports, 62 presentations, and numerous posters, reports, briefs and brochures highlighting the project R4D activities.
- The AR team drafted **16 manuscripts** during a write-shop and finally submitted to peer reviewed journals. **Six are already published in international 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>)

4. Capacity building

- Trainings, field days, field visits, trainings, workshops in 2014 and 2015 – 8857 participants from local partners
- Research attachment – 30 MSc and PhD students generating evidences and information on various topics



5. Scaling

- Africa RISING validated technologies informally and formally scaled within and beyond its sites.
- Number of farmers and others who have already applied improved technologies or management practices through our development partners:
 - ✓ Sinana site- 45607
 - ✓ Endamehoni site - 6704
 - ✓ Lemo site – 984
 - ✓ Basona site- 3299

6. Partnership

- CGIAR centers: ILRI, CIP, ICARDA, IWMI, ICRISAT, CIAT, CIMMYT, ICRAF, IFPRI
- 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, Sunarma, Inter Aide France
- Agricultural Transformation Agency (ATA)
- Innovation laboratories: ILSSI, **SIIL, PHIL, LSIL**,



Thank You

Africa Research in Sustainable Intensification for the Next Generation

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