

Scaling agroforestry for diverse ecosystem services

Different approaches were used to take trees to scale with the number of people reached by the project being 12,345. Among the approaches used was through participatory trials where 3649 farmers were directly engaged and tried different agroforestry practices in their farms which included planting niches, different soil moisture retention structures (SMRS) and manuring and composting.

Seedling survival was lower in semi-arid than subhumid sites. Survival is apparently a function of many things including the seedling vigour, resources the plants get for growth, physical damages from browsing and trampling, and age

The project has now demonstrated that trees on homesteads, boundaries, soil bunds and crop lands can be increased especially if the challenges from open grazing system and moisture stress are addressed

Agroforestry improves nutrition

Over the last two years (2015 and 2016) more than 55,000 improved fruit seedlings (mango and avocado) have been produced by the two RRCs alone and sold to farmers generating over US\$ 5000 income. These together with the vegetables grown in the agroforestry systems provide essential nutrients throughout the year.

Through the Seqota Declaration, Ethiopia is committed to end child malnutrition by 2030

Sap flow installation in Ethiopia.
Photo Catherine Muthuri



Agroforestry is recognised as a key plank of the Ethiopian government's strategy to develop a "Climate Resilient Green Economy"



RESEARCH PROGRAM ON Forests, Trees and Agroforestry



Contacts: Catherine Muthuri. Project Manager, ICRAF
C.Muthuri@cgiar.org
Partners:

TREES FOR FOOD SECURITY

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For further information, please visit:
<http://www.worldagroforestry.org/project/trees-food-security-2-developing-integrated-options-and-accelerating-scaling-agroforestry>

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Australian Government

Australian Centre for International Agricultural Research



Beneficiaris discussing soil fertility
Photo: Albert Mwangi

and Transformation Plan II (GTP-II). He emphasised his Ministry's support.

T4FS partners include the Ethiopian Environment and Forest Research Institute (EEFRI), the Ethiopian Institute of Agricultural Research, the Oromia Agricultural Research Institute, the Mekele University and World Vision Ethiopia and Australian International partner CSIRO.

Achievements 2012 to 2016



Rural resource Centres RRCs in Ziway and Bako-Tibe are hubs for provision of quality tree germplasm, trainings, peer learning, and source of employment for landless women and youth.

Rural Resource Centres provide efficient supply of quality tree germplasm

The Magarissa co-operative in Ziway comprising of landless youth and women make their living from selling grafted seedlings and vegetables with earnings of around US\$ 5000 per year. These RRCs have been scaled out to Bale and Gergera in Tigray reaching nearly 10,000 farmers with training and improved trees.

The Ethiopian government has pledged to convert the 30,000 existing nurseries into RRCs. They also have a contract with donors to create 100,000 new jobs for Ethiopians and refugees.

Trees on farms sustain soil fertility, increase crop and livestock production and help farmers adapt to climate change. Tree shade reduces high daytime temperatures increasing yield of wheat by 25% under faidherbia trees. Trees in fields enhance nutrient cycling and provide fodder for livestock and firewood for cooking (allowing dung (*Kubet*) to be used as fertliser instead of fuel).

The Government now allocates 16% of its budget for agriculture and has pledged to rehabilitate 22 million ha of degraded land by 2025 to improve food security, environmental resilience, and carbon storage.



Tree-crop interaction in Melkasa
Photo: Miyuki Iiyama

Training and construction of water conservation structures for enhanced tree crop and livestock productivity

Water is the biggest threat to scaling up trees in semi-arid Ethiopia with results showing 70 to 100% seedling mortality in the first two years. Therefore combining water harvesting and underground water use, with agroforestry increases tree, crop and livestock productivity.

More efficient use of water creates economic opportunities. Training on simple rain water harvesting techniques and ground water prospecting was offered to local technicians and artisans. Ground water prospecting and construction of four wells (two wells and upgrading two existing ones) was carried out in April 2016. Upgrade of water supply at the two RRCs was undertaken and a sprinkler irrigation system installed at the Melkassa long term trial.

Edushe Guya at his shallow well. Photo: Albert Mwangi



Sustainability in farming systems

The ACIAR funded trees for food security project-T4FS Phase 1 operating in Oromia and Tigray regions in Ethiopia from June 2012 to Nov 2016 demonstrated the importance of trees in fields and farming landscapes for enhancing and sustaining crop yield and food security.

A number of promising climate smart agroforestry practices were developed, improving crop yield and in the longer term soil health, water use efficiency, carbon storage and livelihood outcomes.

Engagement of T4FS with the government of Ethiopia has demonstrated the importance of participatory farmer trials, provision of quality tree germplasm through RRCs and greater diversity of trees on farms.

Key adoption constraints include access to appropriate knowledge and financing options, barriers to smallholders accessing markets, availability of water resources, mechanisms to control free grazing and weak local institutions.

The second phase of the project (T4FS-2- FST/2015/039) will therefore continue and build on the achievements of the first phase and include value chain development, better water management and new approaches to govern livestock management.

The second phase was launched in February 2017 and attended by key government officials including Dr. Eyasu Abraha, Minister for Agriculture and Natural Resources.

Dr. Eyasu highlighted that the project aligns with the Ethiopian Government's mega strategies and plans, such as Climate Resilient Green Economy (CRGE) and Growth