Tekst

# Collaboration Wageningen University & Research with Ethiopia

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# CONTENT

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# ETHIOPIA: MSc Students and PhD Candidates

Jennie van der Mheen

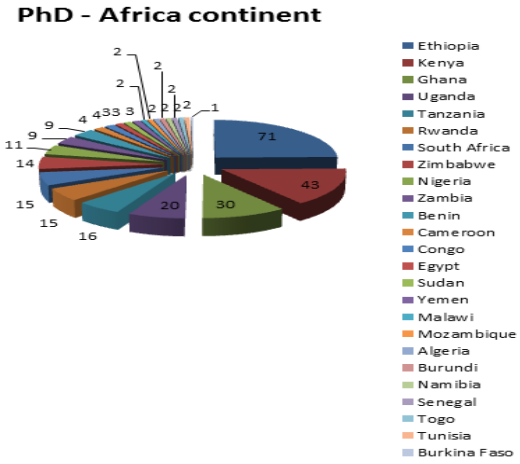
**Collaboration with Ethiopia is very valuable to Wageningen University & Research.**

**This is demonstrated by the high number of development oriented programmes we implement with Ethiopian partners, the high number of PhD research projects carried out and the relatively high number of Ethiopian Masters studying in Wageningen.**

## PhD

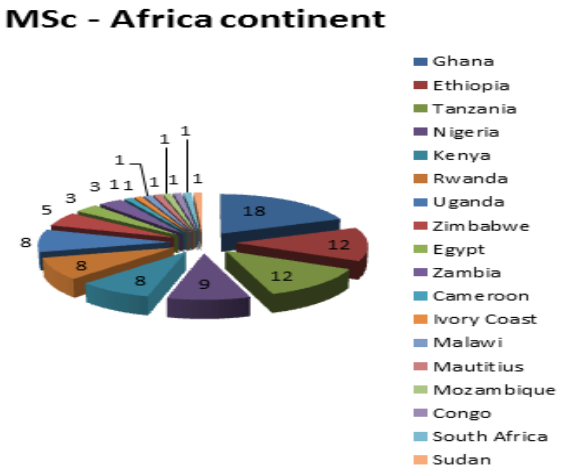
In the 2016-2017 academic year, 71 out of the 1.989 PhD candidates at Wageningen University come from Ethiopia.

The number of Ethiopian PhD candidates has been relatively stable over the past years and fluctuates around 65 per year.




## MSc

In the 2016-2017 academic year, 12 out of the 5.480 MSc students at Wageningen University come from Ethiopia

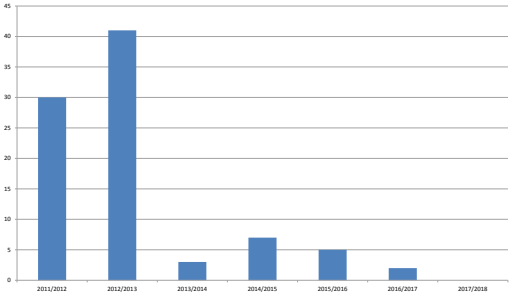



## Trend enrolment Ethiopian MSc students

While the number of Ethiopian PhD candidates has been relatively stable during the past years, we see a sharp decline in the number of Ethiopian MSc students in Wageningen.

In 2012 a total of 116 Ethiopian MSc students were registered, in 2013 when Wageningen University introduced an English proficiency test the number suddenly dropped to 66. In this academic year we only have 12 MSc students from Ethiopia.

The figure below shows the number of scholarships awarded to Ethiopian students for a Master study at Wageningen University during the past years. Unfortunately, no Ethiopian MSc student will join us in the upcoming academic year.

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# Current research topics Ethiopian PhD candidates at Wageningen University

Jennie van der Mheen

**Below you will find an overview of the topics that Ethiopian PhD candidates are currently working on. It shows that a lot of knowledge and experience is being generated on a wide variety of topics. All within the domain of Wageningen: Food and Living Environment**

- Genetics of drought tolerance of field grown potato (*Solanum tuberosum* L.) in Ethiopia
- Role of strigolactones in striga resistance of sorghum
- Genetic diversity of potato for nitrogen use efficiency under low input conditions in Ethiopia
- Identification, characterisation, ecology, uses and possible establishment of selected wild food plants as agroforestry crops by subsistence farmers in Ethiopia.
- Optimization of Productivity and Quality of Irrigated Tomato (Solanum lycopersicum) by smallholders in Ziway, Central Rift Valley Area of Ethiopia.
- Ethno-Botany and diversity of wild / semi wild edible and medicinal plants in South Omo Zone, Ethiopia, with special reference to the Male and Ari ethnic groups
- Trends and prospects for the productivity and sustainability of homegarden agroforestry systems in Southern Ethiopia.
- Sustainability of farming systems: GHG emissions, climate change resilience, environmental and socio-economic sustainability.
- Seed potato quality: technology and supply systems in Chencha, Ethiopia.
- Developing ware potatoes with improved quality for sustainable chain development in southern Ethiopia.
- Upscaling best soil and water conservation practices for sustainable land management in Lake Tana Region, Ethiopia
- Soil fertility and nutrient management at regional level in Ethiopia.
- Exploring the Role of Scattered On-farm Trees in Sustainable intensification of Smallholder Farming Systems
- Understanding host legume X rhizobium strain interactions in common bean and chickpea.
- Towards optimal research-led development approach: understanding the promotion, non (adoption) and impact of potato technology in the context of Southern Ethiopia.
- Integrating satellite time-series, terrestrial laser scanning and genomics technologies for the monitoring of biodiversity changes in degrading tropical forest environments (Kafa, Ethiopia)
- GAP monitor: Developing global community-based crowdsourcing approaches to support monitoring and assessment of yield gaps.
- Management of water hyacinth (*Eichhornia crassipes* [Mart.] Solms.) using bio-agents in the Rift Valley of Ethiopia
- Natural Resource Management Intervention Effects on Watershed Dynamics And Ecosystem Services for Learning and Observatory Watersheds in Amhara region, Ethiopia.
- Understanding the process of valley floor gully formation and development to reduce reservoir sedimentation, The case of Northwest highlands of Ethiopia.
- Maize yield gaps and their mitigation in Ethiopia: an integrated assessment
- Exploring the potential of agro-biodiversity of farms and landscapes to promote enhanced child nutrition in Ethiopia.
- Eco-epidemiology of Bovine Tuberculosis (BTB) in cattle at the wildlife-livestock interface.
- Explorative design for bacterial wilt management in potato production systems in Ethiopia.
- Taking Maize Agronomy for Scale in Africa
- Local best practices on the regional scale Ethiopia
- Ecohydrological Effect of Climate Change in Human Driven Landscape of Bashilo River Catchment, Blue Nile Basin, Ethiopia
- Participatory Watershed Management, Rural Livelihoods and Food Security in Ethiopia
- Understanding and forecasting food security in Ethiopia: a new, high-spatial-resolution coupled agrometeorological model
- Integrated Water Resources Management for Sustainable Irrigation Development: Upper Awash Basin, Ethiopia
- Effect of Land Fragmentation on Climate Change Adaptation in Agriculture
- Catchment-Scale Surface Water Modelling to Estimate Industrial Effluent Load into Stream: the case of Kombolcha City (Ethiopia)
- Quantifying Limitations in Sustainable Agricultural Production in Irrigated areas: The case of Gumselassa Irrigation Scheme, Tigray, Ethiopia
- Water quality variations and options for sustainable management in the Lake Tana Basin, Upper Blue Nile, Ethiopia
- Land and water management enhanced improvement of efficiency and productivity of small scale irrigation systems under climate change in Ethiopia
- Assessment of occurrence, fate and effects of newly emerging chemicals in tropical freshwater sediment
- Hydrological and agronomical evaluation of African water harvesting techniques, including costs and benefits
- The use of local foods to cost-effectively improve complementary feeding in four regions in Ethiopia (Amhara, Tigray, Oromiya and SNNPR).
- The impact of quality protein maize on child growth of Ethiopian children: A randomized controlled trial.
- Investigation of the risks and benefits of 'Ashkulebya' as health food or therapeutic alternative.
- Knowledge Base Support for Collaborative Research (KBSCR)
- A Bayesian approach to consumer-oriented new product development
- Unpacking the seed policy process in Ethiopia: Identifying opportunities for collaborative governance in seed sector development
- Smallholders Social Capital and Collective Action as means of Household and Livelihood Resilience: Environmentally Vulnerable Rice Farming in the Low Guayas River Basin
- Index-based Insurance Marke Development for Pro-poor Risk Management in Ethiopia
- Performance of Agricultural Innovation System in Tigray, Ethiopia
- Socio-economic burden of Rabies in Ethiopia
- Development intervention mechanisms towards food security: the case of Ethiopian productive safety nets programme (PSNP)
- Competence Development and Change in the Agriculture Sector: Case of West Gojjam Zone, Amhara Stat Ethiopia
- Producer Organizations and Integration into High-Value Agribusiness Chains: Analyses on Livelihood Impact and Smallholders Market Linkages in Ethiopia
- The role of active learning approaches in fostering sustainability competencies of management students in selected universities of Ethiopia
- The Nexus between Development and Poverty: the Dilemmas of Life among the Agro-Pastoralist Mursi of South Omo River in Ethiopia
- Determinants for Resilient Non-Farm Entrepreneurship: A Comparison of Men and Women Entrepreneurs in Ethiopia
- Economic and environmental impacts of locally adapted pork production in Brazil
- Market-Orientation in the Ethiopian Seed System
- Impact Evaluation of Green Resources AS, Tanzania and Mozambique
- Production and Marketing of Frankincense in Ethiopia
- The role of market knowledge in customer value creation among Ethiopian pastoralists
- Analysis of local business model and critical success factors in integrated seed sector development of Ethiopia
- The role of marketing capabilities in fostering market orientation among Ethiopian Patoralists: Implications for food security and livelihood
- EVOCAs for Disease Management in Potato Production
- Lumpy skin disease occurrence, cost and impact of vaccination in Ethiopia
- The Genomics of Feed Conversion Efficiency in Poultry
- Fine mapping and genomic selection for detailed milk
- Closing the yield gap: increasing survival and production efficiency in smallholder farms of

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# Current Research for Development Programmes in Ethiopia

Jennie van der Mheen

**Together with our Ethiopian partners, Wageningen University & Research implements many applied research programmes. The list below gives an indication of the number and variety of programmes that are currently being implemented.**

- BENEFIT
- BENEFIT-CASCAPE II
- BENEFIT-ISSD
- BENEFIT-SBN
- BENEFIT-ENTAG Ethiopia-Netherland Trade Facility for Agribusiness
- ADIAS project "Assessing and supporting Dairy Input & Advisory service Systems
- IMAGINE: Integrated assessment of the determinants of the yield gap in maize production in selected regions in Ghana and Ethiopia
- Africa chicken genetic gains (BMGF funded)
- TAMASA - Taking Maize Agronomy to Scale in Africa
- small scale irrigation
- Horn of African Environmental Centre & Network - Landscape Learning Journey (Hoa-ccp)
- Innov Africa
- scaling climate resilient maize 2013-2017
- Rural migration and environmental degradation: A vicious cycle Ongoing
- Responsible life-sciences innovations for development in the digital age: Environmental Virtual Observatories for Connective Action (EVOCA) in crop, water, livestock and disease management.
- Enhancing reliable access to quality seed in Africa. (ISSD Africa 2)
- Food Systems for Healthier Diets, an A4NH flagship programme
- Coffee
- Sustainable integrated fish-vegetable production
- Aquaponics – fish & vegetable production
- Greening of Ethiopian Dairy Value Chains: evaluation of environmental impacts and identification of interventions for sustainable intensification of dairy value chains
- Livestock and Manure Management
- Appropriate Solutions for Mechanisation of Agriculture (ASMA) in Ethiopia, Facility for Sustainable Entrepreneurship and Food Security
- LEAF-WASH sanitation
- CommonSense
- Opportunities for Dutch Climate Tech firms to establish or expand business internationally
- Dairy Business Information Service and Support project Ethiopia (DairyBISS)
- Farmer-led Agroforestry Innovation in Ethiopia: Improving livelihoods and food security by utilising Acacia saligna
- Development of an executive MBA strengthening Agribusiness in Ethiopia, Jimma University
- N2AFRICA - Putting nitrogen fixation to work for smallholder farmers in Africa
- Nile AM
- Fair planet (http://www.fairplanetseeds.com/)
- EPHEA Horticulture - Integrated Pest Management
- CDI in Horticulture programma of SNV
- AFER+ (Agricultural Fertility and Environmental Resources)
- Agricultural Value Chain Laboratory
- Conceptual framework Food Systems
- CoCoon: Investing in land and water: turning new climate finance mechanisms into tools of cooperation
- Topsector India/Ethiopia - potatoes
- Consultation potatoes Ethiopia - VERIS investment
- AfriAlliance
- Fertile Grounds Initiative
- MONQI 2.0
- Climate Smart Interventions for realizing Food Security and sustainable development in Ethiopia
- LIFT Ethiopia (Land Investment for Transformation)
- 2e Copernicus
- Training on salinity and alkalinity; how it is driven by irrigation and how it affects soil quality
- IFOAM Nutrition in Mountain Agroecosystems
- Unlocking sector potential by catalysing social innovation – learning from the Sesame Business Network (KB)
- C-Ensuring sustainability 2017
- 2017 Youth Sensitive Analysis Tools
- Sesame Open, unlocking the potential of organic sesame, Agri-Food AF 16060, Proposal Private-Public
- Barley monitor
- Poultry project
- CSA project Solidaridad
-

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# Current Research for Development Programmes in Ethiopia (continued)

Jennie van der Mheen

**The map below gives an indication of the geographical locations where Wageningen University & Research with its partners implement research for development projects.**

**Kindly note that this map does not cover all the projects, and that it dates from the beginning of 2016. It is currently being updated.**

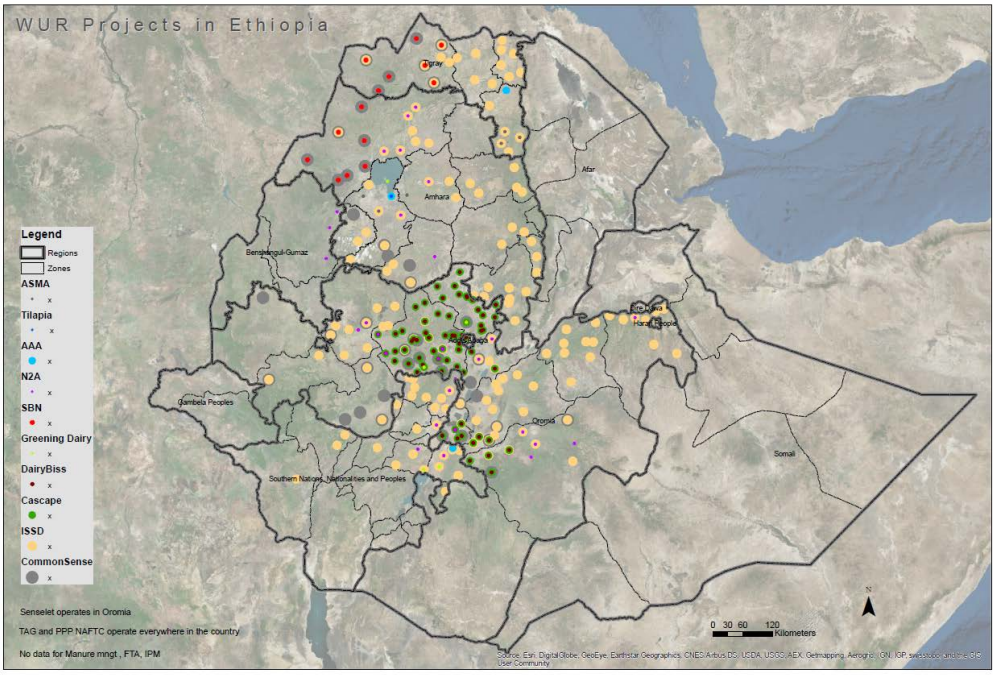


**Figure 1.** geographic locations of some research for development projects co-implemented by Wageningen University & Research

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# WUR Alumni Network in Ethiopia

## About

**Wageningen University and Research (WUR) Alumni Network in Ethiopia has been established in December 2015. This network consists of an organized group of 100+ professionals that have taken part in a short course, MSc or PhD study at Wageningen University and Research in The Netherlands. The network is based in Addis Ababa with sub-networks in Mekelle, Bahir Dar, Jimma and Haramaya. Our network is not affiliated with any religious or political entity and aims to remain independent.**

## Why a WUR Alumni Network in Ethiopia?

This network has been established because Ethiopia and The Netherlands have a long-standing and strong relationship. The Wageningen University in particular has accommodated a large amount of Ethiopian students in the last 10-20 years and is highly involved in a number of innovative research projects in different parts of Ethiopia. By organizing ourselves in a network of Wageningen University alumni, we are able to link Ethiopian alumni with each other, the Wageningen University and Dutch organizations, projects and companies active in the agricultural sector in Ethiopia.

## Main activities

Our network activities are tailored to the needs of the network members and key partners. Our main focus is to:

1. exchange knowledge & expertise on a variety of topics within the agricultural sector in Ethiopia.
2. provide spaces for networking and career development
3. link WUR alumni to Dutch organizations, projects and companies that are active in Ethiopia

**Figure 1.** Field visit to Holeta Agricultural Research Center (June 10, 2017).


**Figure 2.** WUR Alumni Network Event (August 27, 2016).

## Achievements

We have organized 4 network meetings:
- WUR alumni drink on 19 March, 2016
- WUR alumni event on 27 August, 2016
- WUR alumni excursion to the Heineken Brewery in Qilinto on 28 January, 2017
- WUR alumni field visit and seminar at Holeta Agricultural Research Center on 10 June, 2017

We have two big key partners / sponsors of our network:
- The Dutch Embassy in Ethiopia
- The Heineken Brewery in Ethiopia

## Looking for collaboration with the WUR Alumni Network?

If you are interested to collaborate with our network, you will benefit from:
- our network of 100+ alumni professionals working in different fields within the agricultural sector
- our assistance to your organization in finding WUR alumni experts in different fields
- a platform where you can share your knowledge and expertise (e.g. as a guest presenter, by sharing research, through half day/full day training, etc.)
- Our network meetings across Ethiopia where you can promote your organization, your products and/or services

## How to join our network

If you would like to join our network, please contact us by sending an e-mail to alumni@wur.nl or visit our Facebook Page: ***Wageningen University Graduates lives in Ethiopia***

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# Capacity Building for Scaling Up of Evidence Based Best Practices in Agricultural Production

BENEFIT – CASCAPE

## CASCAPE: Capacity Building for Scaling Up of Evidence-Based Best Practices in Agricultural Production in Ethiopia

**The CASCAPE project is a joint effort of Ethiopia and The Netherlands to improve agricultural productivity in Ethiopia. CASCAPE is executed in close cooperation with the Agricultural Growth Programme (AGP) of the Ethiopian government**.

### Context

The CASCAPE project works with Ethiopian Universities (Jimma, Hawassa, Mekkele, Bahir Dar, Addis Ababa) on on-farm validation of agricultural innovations for high potential (AGP) woredas. To this end, it works closely with the MoA, BoAs, RARIs and EIAR. CASCAPE focusses on validation of technologies that aim at increasing crop productivity for farmers. Capacity building of local and regional technical staff of the partner organizations is a key mechanism to create sustainable and significant change. This way, CASCAPE contributes to food security and reduced poverty in Ethiopia.

### Project

CASCAPE works on the basis of an assessment of problems identified by farmers. Through the selection of the right variety, the right soil fertility management options, cropping practices and attention to storage, processing and marketing it tries to come to superior recommendations. To this end, it carries out on farm research, with over 1000 farmers, covering 250 ha. This way CASCAPE operates one of the biggest applied agricultural research infrastructures in the country.

**Figure 1.** Comparing potato varieties in Farta woreda, Bahir Dar.

**Figure 2.** A farmer field day: discussing wheat in Hawassa.

### Results

CASCAPE has handed over 30 best practice manuals to the Ministry of Agriculture and is supporting the scaling of these best practices in 65 AGP woredas. 30 more best practice manuals are under preparation. CASCAPE best practices significantly increase agricultural production. In depth research into issues like soil fertility management, soil mapping, gender specific issues, drivers for adoption and other issues lead to new insights that can further enhance the impact of the CASCAPE .
**CASCAPE strives to support the extension of CASCAPE developed best practices to over 600.000 farmers in its current phase.**

### Follow-up

CASCAPE faces the challenge to support the Ethiopian Government with new fertilizer recommendations that optimize the use of the newly available blend fertilizers. CASCAPE will put more emphasis on integrated soil fertility management and will seek to deploy its practices to resource endowed and resource poor farmers alike.

Integration with the ENTAG program will ensure strong market linkages and integration with the Integrated Seed Sector Development project (ISSD Ethiopia) will support the availability of high quality seed.

### More information

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# Integrated Seed Sector Development in Ethiopia

BENEFIT – ISSD Ethiopia

**The goal of Integrated Seed Sector Development in Ethiopia (ISSD) is to improve women and men smallholder farmers' access to and use of quality seed of new, improved and farmer-preferred varieties. Quality seed is essential for increasing agricultural productivity.**

## Ensuring access to seed is challenging

Quality seed has to be made available at the right place at the right time in the right amount at an affordable price. Moreover, quality seed needs to be of a variety well suited to the local agro-ecological conditions and preferences of farmers and markets. Farmers rely on more than one seed system for getting access to the seed they need or prefer for different crops and varieties.

## Strengthening seed systems in Ethiopia

The program on Integrated Seed Sector Development in Ethiopia (ISSD Ethiopia) increases the production, dissemination and marketing of quality seed by farmers; their organizations; and by inter/national public and private companies in small-, medium-, and large-scale seed enterprise. Furthermore, the program increases demand for new and improved varieties, also preferred by women; enhances the business orientation and financial viability of seed producers in the country; and diversifies crop and varietal portfolios for food and nutrition security.

## Improving the performance of seed value chains

ISSD Ethiopia facilitates linkages between seed producers and key input and service providers. The program also supports the establishment of multi-stakeholder partnerships at local, regional and national levels for coordinating stakeholders' responses to the bottlenecks in seed value chains that they experience.

## Contributing to an enabling environment for the sector

Embedding evidence-based innovations in regulatory frameworks, ISSD Ethiopia contributes to seed sector development. The program also supports practical implementation of seed policy.

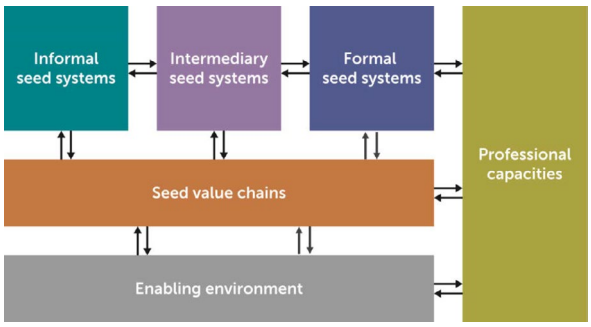


**Figure 1.** ISSD Ethiopia program components

**Figure 2.** Women threshing, sorting and grading wheat seed

## Results in 2016

- Technical support was given to four public seed enterprises; 25 private seed producers; and 144 local seed businesses (LSBs), organized as seed producer cooperatives;
- ISSD Ethiopia has committed its to support 36,000 farmers in informal seed systems through training, extension and communication; improved seed storage; institutional linkages;; and deployment of new, improved and farmer-preferred varieties
- Participating LSBs and private seed producers produced 15,777 tonnes of quality seed of over 100 varieties of 26 different cereal, legume, oilseed, vegetable, spice and forage crops;
- In addition, 6,751 tonnes of 11 different seed potato varieties and over nine million sweet potato cuttings were produced;
- 21 innovation in barley, field pea, haricot bean, maize, lentil, potato, sesame, sorghum, teff and wheat value chains piloted;
- Four directives from federal government were supported to create a better climate for seed business in Ethiopia;

## Major challenges in 2017

- Supply of quality early generation seed in Ethiopia remains the single greatest obstacle to the further development of the sector
- Despite being scaled more than 100 woredas and accounting for over 8,000 tonnes of hybrid maize (one-third national supply), direct seed marketing has yet to obtain official endorsement
- Regional regulatory authorities are seriously constrained in their capacity to control the quality of all seed produced commercially

## In partnership with BENEFIT and Ethiopian partners

ISSD Ethiopia is implemented in partnership between Bahir Dar University; Haramaya University; Hawassa University; Mekelle University; Oromia Seed Enterprise; and Wageningen Centre for Development Innovation.

## More information

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# Sesame Business Network

Production-push and market-pull dynamics for sesame sector performance improvement

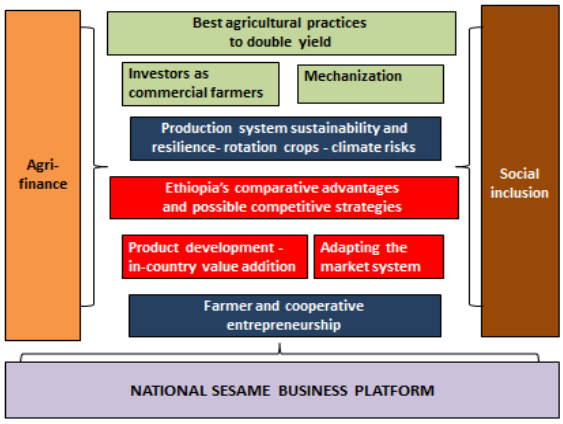
BENEFIT - SBN

## Sesame Business Network (SBN)

The SBN support program addresses the challenge of improving the performance of the Ethiopian sesame sector by contributing to: (i) Yield improvement (+50%); (ii) Quality improvement; (iii) Post-harvest loss reduction (-30%); (iii) Improved access to formal credit to farmers and reduced credit costs (-50%); (iv) product development, diversification and in-country value addition; (v) market access improvement.

## Context

After coffee, sesame is the second agricultural export earner for Ethiopia. There are 10 strategic challenges that are important for fundamental sesame sector transformation.




## Stakeholder-owned 'project'

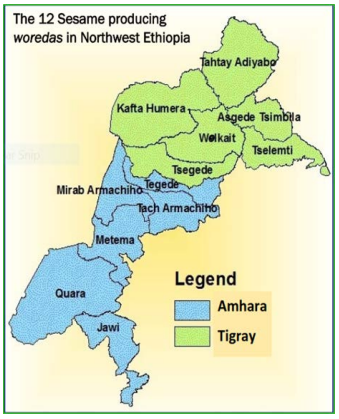
The SBN program supports sesame sector stakeholders to achieve their objectives. The project succeeds if farmers succeed to double yields per hectare and/or better access agricultural loans, if research and extension are innovative and achieve high adoption of innovations, if there is more in-country value addition and if the country export reaches higher value markets. Because of this stakeholder ownership, SBN program partners observe: "*we do not see SBN as an external project – it is ours*"

**Figure 1 Diversity of support activities for a range of related objectives**

**Figure 2. The SBN support program operates at production and market side**

## Results

The successful translation of research findings in farmer-oriented extension messages (20 steps), the proof that yields can double, more attention for farmers' access to credit and financial literacy are among the main results of the SBN program.
The SBN approach is aligned to the ATA Agricultural Commercialization Clusters (ACC) and is inspiring MoANR and regional and local authorities for commodity-oriented development in specific geographic zones.




## Follow-up

It is essential to address the key strategic challenges, which are directly or indirectly of great importance for all stakeholders of the Ethiopian sesame sector, at the highest level. Preferably a national sesame business platform is established, with strong public-private sector leadership and interaction. This is urgent for maintaining/ regaining Ethiopia's leading role in the sesame sector. At local (kebele and woreda) level practical change is possible if local public administration and agencies work together with farmers' cooperatives and financial institutions.

## Films on SBN

SBN Project: https://www.youtube.com/watch?v=m4S2gE2kyQ0
20 steps: https://www.youtube.com/watch?v=k-lgvaRGKGk
Loss reduction: https://www.youtube.com/watch?v= 3iXBOTLj0A

**Website : www.sbnethiopia.org**

## More information

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# Nexus study sesame in Tigray, Ethiopia

Monica Altamirano (Deltares), Arend Jan van Bodegom (Wageningen CDI), Nico van der Linden (ECN), Jan Verhagen (Wageningen Plant Research).

## Nexus study Sesame Tigray

**In the sesame production area in Tigray an agro-industrial park is planned with the main focus on processing of sesame seed. This study aims to assess the long term Water, Energy and Food (WEF) resource availability in the region, more specifically in and around the industrial park, in light of a changing climate. The study will examine potential trade-offs and synergies between the WEF sectors and will develop climate smart solutions to address them simultaneously. To strengthen the intersectoral coordination key national/regional stakeholders from the three sectors will be involved in the study.**

## Context

The main problem is to identify relations between the water, food and energy sectors in the sesame production belt. There are plans to establish an industrial park near Humera. Our entry point is this industrial park and connected to this, the sesame value chain. Attention for processing, storage and distribution of sesame is needed. In addition demands for water, energy and food from the growing urban population are important. This study is done in close cooperation with the Sesame Business Network, part of BENEFIT.

## Project

The Dutch Climate Solutions project is a research programme funded by the Netherlands Ministry of Foreign Affairs and is implemented by a consortium comprising ECN (Energy research Centre of the Netherlands), Deltares (Dutch Water Institute) and WUR (Wageningen University and Research). One of the activities under this programme is the development of a study on the Water-Energy-Food (WEF) nexus in times of climate change. For this study a conceptual framework is in its final stage of development, which is being applied to a case study in Ethiopia.

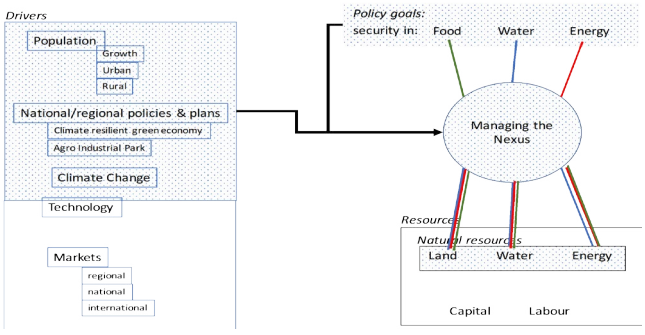


**Figure 1. Scope of the study**

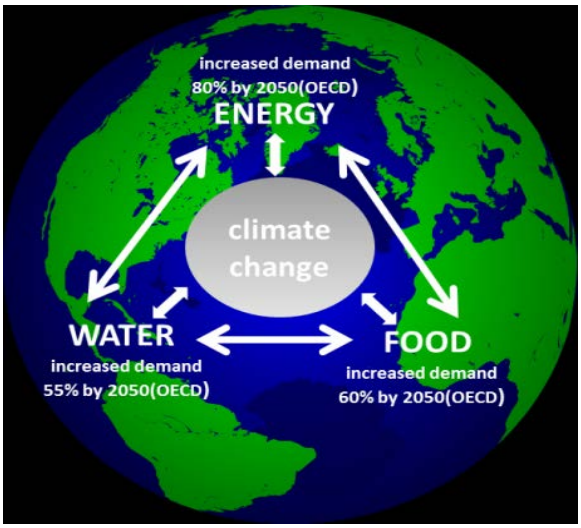


**Figure 2. Nexus as a global issue**

## Expected Results

- Assessment of the value chain for sesame and proposals for adding more value within Ethiopia, making clear the consequences for consumption of energy and water. Sustainable options to deliver the needed additional energy and water.
- Assessment of water and energy needs for improving the horticultural sector, and for the expanding urban areas and concrete proposals to deliver according to these needs.
- Inventory of climate finance options to finance the proposed investments and activities.
- Identification of potential business opportunities for the private sector created by the nexus approach

## Follow-up

In May 2017 a scoping visit to Addis Ababa was organized in order to establish contacts, ways of cooperation and to determine the focus of the study. A second mission to Makele and the study area, planned for July-August, to collect information and interview stakeholders. Before the end of 2017 a workshop will be organized in order to inform stakeholders about the findings and verify results. The project is intended to come up with recommendations, but has no means to implement them.

## More information

http://www.wur.nl/nl/project/dutch_climate_solutions.htm

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# Ethiopia–Netherlands Trade for Agricultural Growth

BENEFIT – ENTAG

## ENTAG

**Ethiopia–Netherlands Trade for Agricultural Growth (ENTAG) is a 4-year program financed by the Royal Dutch Embassy in Addis Ababa, and hosted by the BENEFIT-office of Wageningen University and Research in Addis Ababa.**

## Context

Key challenges: providing relevant support for Ethiopian and Dutch entrepreneurs

## Project

ENTAG aims to

- stimulate agribusiness in Ethiopia to contribute to enhancing food, income and trade sustainability
- increase agribusiness productivity, trade and foreign direct investment by strengthening the private sector in working more effectively with smallholders in applying new technologies and accessing finance for investment purposes.

## Services offered

1. Front office: website for entrepreneurs, investors and policy makers with information related to investment and B2B linking
2. Hands-on support and advise to agribusiness entrepreneurs in the area of inclusive agribusiness
3. Establishment of subsector platforms to identify new issues and opportunities in relevant sectors and create new linkages between the companies
4. Innovation fund to address constraints and opportunities identified during the platform meetings
5. B2B-component to support agribusiness companies with serious business plans and sufficient financial means, both from Ethiopia interested to work together with companies from especially the Netherlands, as well as for companies from especially the Netherlands with serious investment plans in Ethiopia: individual B2B-support, trade mission, market studies and quick scans, etc.
6. Supporting the private sector associations in increasing their member base, training and setting up a sustainable business models.

**Figure 2.** Soy production

## Results

ENTAG supports agribusiness in Ethiopia in general, but the program has a special focus on the following sectors: aquaculture, legumes, oilseeds, poultry, spices and sesame.

Sector platforms: Within this challenging year, ENTAG was able to successfully coordinate, 9 platforms in the sectors of aquaculture (2), spice (2), poultry (2), legumes (1), dairy (1) and sesame (1).

B2B and trade missions: During the trade mission organized by ROV and the embassy ENTAG supported with some of the logistics, the Dutch business day and the B2B component resulting in links between Dutch and Ethiopian companies.

Technical assistance: ENTAG provided technical assistance for 35 companies in the sectors of aquaculture, spices and poultry.

Innovation fund: 136 companies along with supporting / collaborating institutions applied with their concept notes.

Training: the project has provided one business plan development training, for 18 companies & 1 institute working on aquaculture, spices, soya and poultry.

## Follow-up

ENTAG is planning a poultry trade mission from Ethiopia to the Netherlands, among others, for staff of Ministry of Livestock and Fisheries.

## More information

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# Bilateral Ethiopian Netherlands Effort for Food, Income and Trade Partnership

BENEFIT – Partnership

**BENEFIT: The Bilateral Ethiopian-Netherlands Effort for Food, Income and Trade (BENEFIT) Partnership aims to improve sustainable food, income and trade among rural households in Ethiopia.**

## Uniting four agricultural development programmes

The BENEFIT Partnership unites the four following agricultural development programmes:

1. Integrated Seed Sector Development in Ethiopia (ISSD Ethiopia), which supports the development of a vibrant, pluralistic and market oriented seed sector in the country;
2. Capacity building for scaling up of evidence-based best practices in agricultural production (CASCAPE), which improves agricultural productivity through promoting evidence-based best fit agricultural practices;
3. The Ethiopian-Netherlands Trade Facility for Agribusiness (ENTAG), which supports private sector development and trade in Ethiopia;
4. The Sesame Business Network (SBN) support programme, which supports stakeholders of the SBN in developing competitive, sustainable and inclusive sesame value chains in Ethiopia.

## More impact through collaborating in partnership

Through combining efforts in the BENEFIT partnership, the programmes will achieve a higher impact than working in isolation. The BENEFIT partnership enhances synergy through:

- Increased effectiveness through an integrated value chain approach, combining efforts in selected locations where multiple projects work on the same commodities or products, and collaboration on policy and scaling level;
- Increased efficiency in management and administration in joint planning, monitoring , reporting and mainstreaming gender and nutrition., supported by a Programme Coordination Unit (PCU).

**Figure 1.** breeder seed of new wheat variety: start of integrated value chain

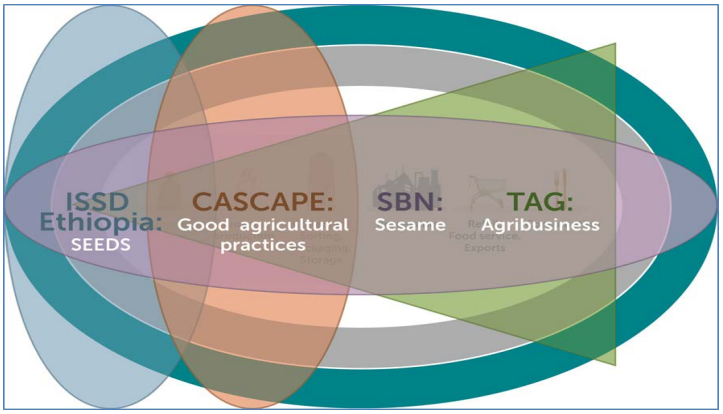


**Figure 2.** BENEFIT integrated value chain approach

## Results: Food security, income and trade

Expected outputs by 2019:

- 3 million smallholder farmers reached with improved agricultural practices and technologies, including quality seed, and access to markets;
- 230 cooperatives and associations and 2,500 SMEs and entrepreneurs supported;
- Direct investment of 22 Dutch/international companies;
- Partnership developed with 11 Ethiopian knowledge institutes including 6 universities, 4 regional agricultural research institutes and the Ethiopian Institute of Agricultural Research;
- 1,800 research and extension staff at national, regional and Woreda level trained ;
- 100 improved technologies, practices , innovations introduced.

## Results: System innovation and dialogue

Expected outputs by 2019:

- 16 commodity platforms established;
- 6 evidence-based policy options for improving the performance of different seed systems shared;
- studies addressing strategic bottlenecks hampering uptake of technologies handed over to national and regional policy makers
- Private sector associations strengthened in representing the interests of their members;
- Strategic networks in the sesame agribusiness sector for more competitive, sustainable and inclusive sesame value chains development formed

## Engagement with MoANR and MoLF

- Regular engagement in BENEFIT advisory board meetings;
- Engagement in policy dialogue;
- Mainstreaming of demonstrated evidences in public programmes

## More infomation

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# Taking Maize Agronomy to Scale in Africa (TAMASA)

Pytrik Reidsma, Workneh Kenea, Banchayehu Assefa, Tesfaye Balemi, Jordan Chamberlin, Katrien Descheemaeker, Martin van Ittersum

## Summary of project

Maize is an important staple food and feed crop in SSA. Smallholder maize yields are well below the best yields that can be obtained on farm with current technology. There is an opportunity to close this 'yield gap' using innovative approaches that: (i) use modern large data and analytics to map maize areas, soil constraints and attainable yields at different scales; (ii) work with input suppliers, agro-dealers, government research and extension services (i.e. service providers) to identify and co-develop systems and applications that transform this data and information to useable products that support their businesses or programs to reach clients more effectively; and (iii) build capacity in national programs to support and sustain these approaches

## Context

Wageningen University collaborates with CIMMYT by supervising two PhD students. They both focus on the mitigation of maize yield gaps in Ethiopia. The first study uses national and local household data to analyse the influence of crop management, farm(er) characteristics, biophysical factors and socio-economic conditions on maize yield gaps. Production ecological concepts are combined with econometric techniques. The second study analyses current and alternative crop management options, and re-designs improved crop management options in a participatory manner. The focus is on nutrient management and interaction with other management. Nutrient Omission Trials (NOTs) are analysed, on-station and on-farm experiments are performed, and bio-economic farm modelling will be used.

## Project

The main activities in the project include large household surveys and NOTs (see Fig. 1). The PhD students are involved in analysing the household surveys and the NOTs, to analyse factors that explain maize yield gaps, and to understand yields responses to different nutrients, and improve decision-support regarding nutrient management.

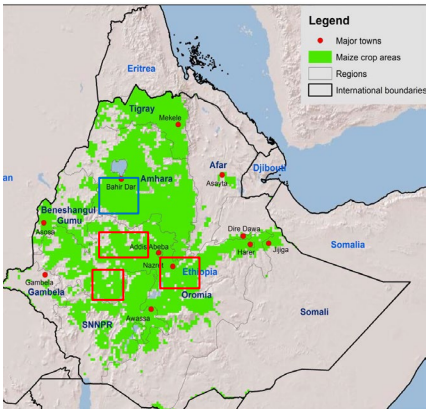


**Figure 1.** Maize crop areas in Ethiopia and locations of NOTs

**Figure 2.** A maize field in Ethiopia.

## Results

The analyses of the first PhD student, mainly based on household data, will provide insights in main crop management, biohysical factors, farm(er) characteristics and socio-economic explaining yield gaps. This will be relevant information for policy makers, and interventions may be better targeted. Factors determining adoption of new varieties and fertilizers will be specifically analysed. The relation between yield gaps and food security will also be investigated, to understand the importance of other factors like market access and off-farm income.
The study of the second PhD student will provide more insight in optimal nutrient management, by analysing NOTs and performing on-station and on-farm experiments showing interactions between nutrient management and other factors. Decision-support systems may be improved based on these insights, and the fertilizer supply system may be adapted where needed.

## Follow-up

The TAMASA project is still on-going, and the PhD students are in their second year. Collaboration takes place with the IMAGINE project, led by WUR, and related projects at CIMMYT.

## More information

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# Soil information for food security

J.G.B. Leenaars, A. Bosma, H. van den Bosch

## Introduction

**Investments in the management of soil fertility and soil water are at the basis of increasing agricultural productivity. To inform decision-making, adequate soil data and information and tailor made applications are needed. ISRIC - World Soil Information is equipped and experienced to work with partners on these issues and to build capacity at the global, continental, national and regional scale. This poster presents work in Sub Saharan Africa and in Ethiopia in particular.**

## Context

Ethiopia faces urgent challenges in meeting growing demands for agricultural products while the productive capacity of its soil resources is eroding. Recently, major investments have been made in topsoil sampling to produce soil fertility maps and formulate fertilizer recommendations. However, it is a challenge to formulate effective soil fertility management options which are profitable for smallholder farmers, based on topsoil data only, and indeed site-specific throughout the highly variable landscapes of Ethiopia. Such requires an integrated assessment of the agronomic soil-crop-response complexes at the appropriate scales.

## Project

ISRIC collaborates with national institutes to collect and compile soil profile (sample) data and to produce soil property maps according to global standards. Together with partners from Wageningen University & Research, ISRIC develops relevant use applications to interpret these soil information products, for purposes as Soil and Water Conservation and Integrated Soil Fertility Management. Upon agreement, the national soil data can be globally integrated into the World Soil Information Service (WoSIS) database and the national soil maps into SoilGrids.

**Figure 1.** Two different soil types in the Ethiopian highlands

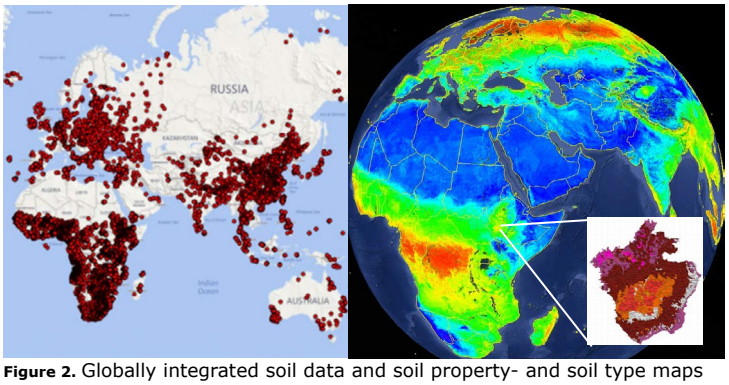


**Figure 2.** Globally integrated soil data and soil property- and soil type maps

## Results

ISRIC has recently developed detailed soil property maps of Sub Saharan Africa in collaboration with the Africa Soil Information Service (AfSIS) and partner countries including Ethiopia. Soil types were mapped for selected woredas in collaboration with the CASCAPE project of Wageningen University & Research and regional universities in Ethiopia. These soil maps are input to soil-crop-response models which evaluate soil fertility parameters and also soil water and soil depth and other agronomic parameters. As an example, QUEFTS (Quantitative Evaluation of the Fertility of Tropical Soils) was used to model and extrapolate fertilizer trial data and fertilizer recommendations for major crops in West Africa. This approach is applicable and relevant in Ethiopia.

## Follow-up

Soil data and information (maps) of Ethiopia can be aligned with global standards for soil data and information and interpreted accordingly for developing validated effective strategies and measures for integrated soil fertility management and where necessary soil and water conservation. ISRIC is ready, together with Wageningen University & Research, to collaborate with the Ethiopian Soil Information Service (EthioSIS) and the federal and regional soil departments in developing and serving key information in support to sustainable and inclusive agricultural growth.

## More information

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# Integrated assessment of the determinants of the MAize yield Gap in Sub-Saharan Africa: towards farm INnovation and Enabling policies (IMAGINE)

Reidsma P., Tesfaye K., Assefa T. ,Van Loon M., Descheemaeker K., Van Dijk M., Morley T., Jongeneel R., and Van Ittersum M.

## Summary

**Aim of IMAGINE is to identify key bio-physical and farm and crop management factors that determine the maize yield gap (the difference between water limited potential crop yield and currently realized crop yields) in sub Saharan Africa (SSA) and how these are related to existing institutional, infrastructural, socio-economic and policy constraints. Maize is the major food crop in SSA and mainly produced by small scale farmers. The project focusses on Ethiopia and Ghana. Innovative of this project is the use of a framework that integrates agronomic and economic approaches to assess the yield gap and analyze agricultural performance at plot and farm level.**

## Context

Agricultural production in Sub-Saharan Africa (SSA) will have to triple to fulfil demand by 2050 (Alexandratos and Bruinsma, 2012). Yield gap estimations and explanations provide important information on the scope for production increases on existing agricultural land through better farming systems, farm management and enabling policies (Lobell et al., 2009; Laborte et al., 2012; van Ittersum et al., 2013). In order to increase agricultural productivity, it is important to better understand the biophysical and socioeconomic factors, and their interactions that prevent closing the yield gap.
IMAGINE is implemented in Ethiopia by Wageningen University & Research, CIMMYT and the Ethiopian Economics Association.

## Project

In the project nationally representative farm level surveys are analyzed with econometric estimation techniques to assess the impact of environmental and farmer-controlled factors on maize yield. This is deepened by means of an in-depth investigation of farm and plot level production data that is gathered via surveys in two selected districts in Ethiopia. Based on this, the project will identify promising technological improvements and policy interventions, that will be assessed in on-farm experiments and policy and stakeholder workshops.

**Figure 1.** Women farmers discussing with each other while visiting the demonstration fields during the field day in Adami Tulu Jido Kombolcha district

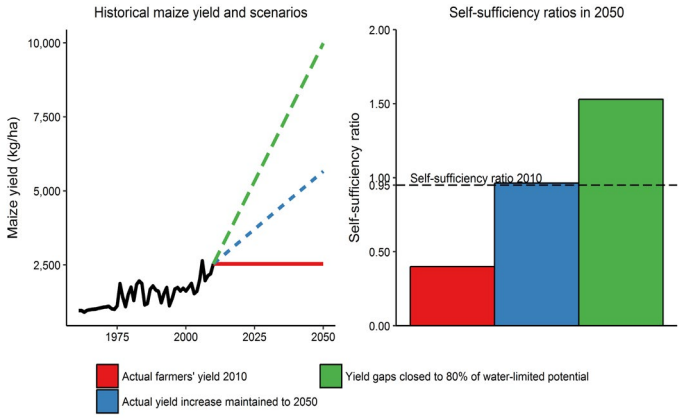


**Figure 2.** Maize yield scenarios and cereal self-sufficiency ratios in 2015. Source: Van Ittersum et al. (2016)

## Results

On national level maize yield can be increased via expanding extension services to all farms, but agro-ecologies and farmers are highly diverse and hence require tailor made extension advisories. Furthermore, the high input price relative to output price indicate the need to rethink ways to make fertilizer more affordable to farmers. As currently profitability analysis suggest that input and output prices are such that farmers do not have an incentive to expand production beyond the current level. On the local scale climate variability issues should be addressed through water conservation and drought tolerant maize varieties which increases benefit from fertilizer use in dry environments

## Follow-up

In the 2017 growing season a new series of demonstration experiments in Adami Tulu and Bako is foreseen. In April 2017 a stakeholder workshop has been organized in Addis Ababa. A concluding meeting with stakeholders is foreseen for November/December 2017. Opportunities to narrow yield gaps will be further analysed, tested and outscaled through the new Crop Nutrient Gap project: http://www.cropnutrientgap.org/

## More information

http://imagine.pps.wur.nl/

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# N2Africa: Putting nitrogen fixation to work for smallholder farmers in Africa

Endalkachew Wolde-Meskel, Tamiru Amanu, Berhan Abdulkadir, Bernard Vanlauwe, Ken E. Giller

## The project

N2Africa is a large scale, science-based research-in-development project focused on enabling African smallholder farmers to benefit from symbiotic nitrogen fixation by grain legume crops through effective production technologies and long-term partnerships.

Funded by The Bill & Melinda Gates Foundation, N2Africa has been active since 2013 in Ethiopia, Tanzania and Uganda, and since 2009 in DR Congo, Ghana, Kenya, Malawi, Mozambique, Nigeria, Rwanda and Zimbabwe.
Action sites in Ethiopia represent 31 Woredas in 4 regions; Amhara, Benishangul Gumuz, Oromia and SNNPR.

## Putting nitrogen fixation to work

Many smallholder farmers are stuck in a poverty trap as they struggle with land scarcity, infertile soils, limited availability of agricultural inputs and poor yields. To help alleviate these constraints, N2Africa aims to intensify sustainable cultivation of legume crops.

Legumes are protein-rich and they bring atmospheric nitrogen into the soil. Enhanced productivity of legumes thereby contributes to improvements in household nutrition, income and soil fertility.

## Approach

N2Africa provides hands-on training for African smallholder farmers and encourages them to try out improved legume varieties and technologies, including i.a. fertilizers and inoculants. Feedback from farmers ensures co-development of best-fit practices.
N2Africa links scientific knowledge with capacity building, women empowerment, and access to input-output markets through the Public-Private Partnerships (Figure 1). A strong network ensures sustainability in the future.

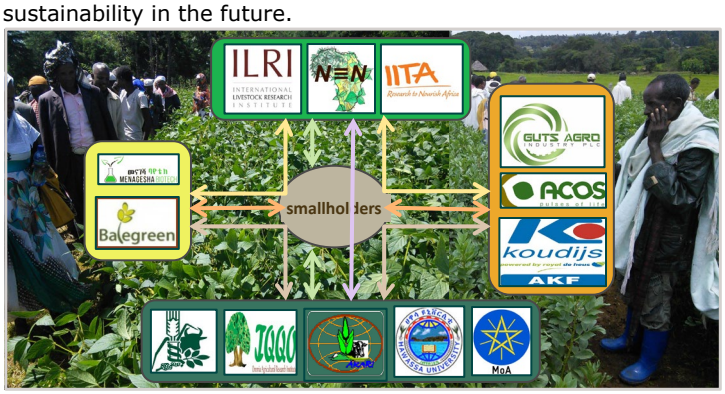


**Figure 1.** Public-Private Partnerships for knowledge transfer, technology dissemination, efficient supply chains and access to markets.

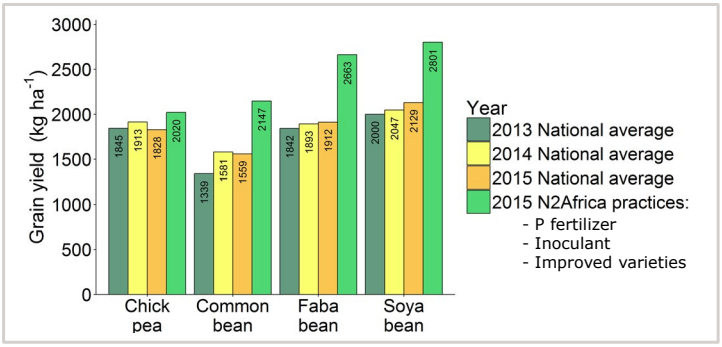


**Figure 2.** Mean legume yields obtained on N2Africa's demonstration trials compared to national average legume yields of three years (Ethiopian Central Statistical Agency 2014-2016 reports).

## Results

N2Africa's achievements in Ethiopia up to 2016 include:
- Best-fit technologies of N2Africa (displayed in demonstrations on-farm) significantly improved legume productivity (Figure 2).
- Local and N2Africa practices were evaluated on almost 3000 adaptation trials on farmers' fields.
- Over 35,000 farmers were reached, primarily via field days.
- 128 new strains of rhizobium have been isolated and elite strains are being identified.
- Farmer cooperatives and unions were connected to the inoculant producer (Menagesha Biotech Industry) and output markets (i.a. Guts Agro Industries and Agricultural Commodity Supply).

## Follow-up

In Ethiopia, project challenges and opportunities are found for the following topics:

- Drafts of Standard Operating Procedures for inoculants are awaiting approval of the Ethiopian Ministry of Agriculture and Natural Resources. With increasing popularity and use, inoculant quality control has emerged to be a serious concern.
- Development and regulated trade of fertilizer blends specifically targeting legumes.
- Policy tools that promote the pulses sector.
- Further empowerment of farmers, farmer's organizations and partners regarding market creation, input usage, marketing and entrepreneurship.

N2Africa's legacy will be strong national expertise in grain legume production and nitrogen-fixation research and development.

## More information

www.n2africa.org
https://www.youtube.com/watch?v=hdfUA1aebZ0

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# Dairy Business Information Services & Support (DairyBISS)

Jan van der Lee, Karin Andeweg, Tinsae Berhanu, Liya Girma, Adriaan Vernooij

## DairyBISS: improving dairy production and profitability

**The Dairy Business Information Services and Support (DairyBISS) project is a three-year, EKN-funded project aiming to improve the private dairy sector in Ethiopia by increasing the number of profitable dairy farms and firms in the Ethiopian private sector, by improving B2B relations, the availability and utilization of quality business information, and advice.**

## Context

The dairy sector is an important sector for Ethiopia and provides a main source of livelihood and animal protein for many Ethiopian families. However, dairy production efficiency is low and the sector is mainly informal with less than 2% of milk marketed through the formal chain. This is associated with a number of factors, such as inadequate feed and fodder, widespread diseases, poor genetic dairy potential of local breeds, marketing problems and inefficiency of livestock support services. DairyBISS and its partners aim to address these issues and to increase dairy production and profitability along the dairy value chain.

## Project

DairyBISS has developed three main pillars:

1. **Establishment of a Dairy Business Platform**. This platform brings together private sector and other stakeholders who enable pilots, studies and capacity development activities for private dairy sector development. This includes B2B brokering between Ethiopian and international dairy related companies, business development support, and business information supply.
2. **Business information & business case development**. Develop business information through collecting technical and business information that is needed for dairy farm management, by means of pilots and strategic studies. The project identifies, researches and documents examples of business cases, which focus on critical aspects for profitable dairy farming in Ethiopia, such as housing; animal health and welfare; feeding and forage production.

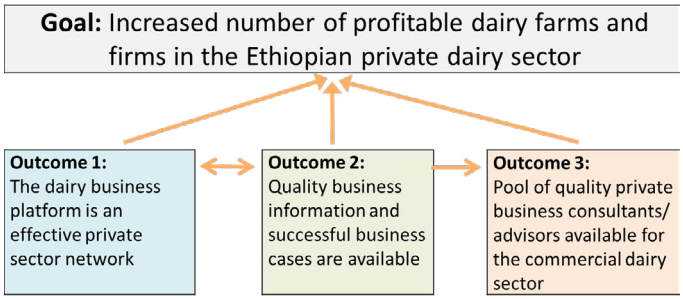


**Figure 1.** The three pillars of the DairyBISS project

**Picture 1 & 2: Training of dairy advisors; trained advisor providing advice to a dairy farm.**

**3. Capacity building / development of a dairy advisor network**. Develop a pool of high-quality private business advisors for the medium and large-scale commercial dairy sector. These advisors receive training and coaching to improve their skills in the areas of veterinary care and AI service; feed and fodder; milk collection and quality; and financing.

## Results

By the end of the project in 2018:

- The Dairy Business Platform will be an active network of actors in dairy business, that addresses common issues in the dairy sector. Milk quality is one common issue that is worked on this year.
- Business information and successful business cases will provide government, dairy entrepreneurs, and NGOs with lessons on how dairy production can be supported.
- A pool of quality advisors will be available to advice farms and firms on improving dairy production. Training modules will have been developed and trainings given in cooperation with Ethiopian knowledge institutes.

## Follow-up

The DairyBISS project is a catalyzer to improve dairy production and profitability in Ethiopia. Sustaining the Dairy Business Platform that facilitates events that continue to bring actors together and address common issues in the dairy value chain, by setting the agenda for new research, identifying needs for training and education is needed to optimally benefit the project's results. Continued investment of actors involved is needed to realize the Platform's potential.

## More information

www.dairyethiopia.com

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# ADIAS – Assessing & supporting Dairy Input and Advisory Service systems

Towards resilient market-oriented smallholder dairy systems in the Ethiopian and Kenyan highlands

Dr ir Laurens Klerkx and ir Jan van der Lee

## The project

ADIAS is a research project that contributes to the search for sustainable intensification pathways for the dairy sectors of Kenya and Ethiopia, by looking at two key issues:

- how do input-service systems support farmers in adapting to the demands of increased market-orientation?
- how do input-service systems contribute to development of resilient farming systems?

**Ethiopia partners**
College of Veterinary Medicine
Addis Abeba University
Alema Koudijs Feed
WUR

**Kenia partners**
Egerton University
New KCC
African Centre for Technology Studies
WUR

## Context

Major trends and issues in the dairy sector in Ethiopia and Kenya:

- Rising remand for value-added dairy products (resulting from demographics and income levels); this leads to intensification, specialization, and market orientation
- Experimentation is happening with input & service supply systems by processors, cooperatives, financial institutions, etc.
- Key sector issues include seasonality of production, high cost of production, inadequate quality, and uncompetitive formal chain
- Smallholder dairy farmers are locked-in by on-farm issues (access to capital, land, labour/skills), inadequate input supply & service provision, and supply chain issues – weak linkages & insufficient quality assurance

## Project

ADIAS is looking at access of dairy farmers to inputs & services and output markets, as related to market quality and proximity. The project looks more specifically at how input & service provision strengthens the resilience of dairy farming.
Study areas include 3 districts in Ethiopia (Bishoftu, Digalu-Tiyo and Limuna Bilbilo (East Shoa and Arsi zones of Oromiya Region); and 2 counties in Kenya (Nyandarua and Nandi).
Some innovation areas that are studied more in-depth include animal feeds, milk quality, linkages of smallholders to commercial farms, and linking of advice to inputs and other services.

## Results

Expected results from this project include:

- Input & advisory service configurations appropriate to market orientation levels and institutional context
- Lessons learned on pluralistic dairy advisory services and on introduction of dairy farming incentives
- Dissemination packages with knowledge on sustainable intensification of dairy farming.

The projects runs 2016-1018.

## Research questions

*Main question:* How do innovations in input & service supply affect the resilience of commercializing dairy farming in the East African highlands?

*Insight questions:*

1. How is input & advisory service supply organized for dairy farming systems at different levels of market orientation?
2. How and why do input & advisory service support configurations react to the adaptation and perceived resilience challenges of commercializing dairy farming systems, particularly around feed supply and milk quality assurance?
3. How do farmer-advisor learning processes undergird the adaptive capacity of dairy farming systems and where are their competence gaps?
4. What is the institutional environment that supports or constrains effective input & service supply to support the commercialisation of the dairy farming sector?

*Innovation questions:*

5. What areas of advisor's capacity need to be strengthened to support integrated advice on resilient dairy farming?
6. What policies need to be in place to provide adequate incentives to have a coordinated pluralistic advisory system that covers different elements of resilient dairy farming?

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# Promoting Healthy Diets and Agri-business development through Aquaponics farming

Authors: Maja Slingerland, Bouke Kappers and Abebe Tadesse

## Why integrated fish and vegetable farming?

The dietary intake of Ethiopians - mainly composed of Cereals/ Grains – is mostly monotonous. Furthermore due to fasting many diets do not contain animal protein for part of the year. In this period fish is allowed as protein source but local availability and affordability of fish is la problem. Besides malnutrition, water and nutrient scarcity is limiting opportunities for agricultural development.

Through introducing Aquaponics as a business model for local families and entrepreneurs, we aim to offer employment/business opportunities that make healthy (organic) vegetables and fish available locally.

## Policy Context

The Ethiopian government has identified aquaculture as one of the strategic areas of intervention to address the problem of food insecurity and poverty. However, to allow a better dietary diversification, efforts from all agricultural sectors are necessary. For that reason, we believe that developing integrated agriculture and thus increasing the local availability of diverse food products is one of the solutions for Ethiopia.

## Partners involved

*Addis Ababa Univerisity, Wageningen University and Research, TGS business and development initiatives and SunRise Ethiopian Development Program.*

## Project

Aquaponics saves up to 80% of water compared to traditional irrigated agriculture and can be implemented on non-fertile lands as it is a soil-less growing technique. It is therefore highly suitable to overcome droughts and/or a lack of arable lands. A number of beneficiaries have been selected in cooperation with the local administration to evaluate the business model. For each site a different management approach is chosen to identify how the technique can be applied best.

**Figure 1.** Cucumber, Kale and an aquaponics unit in Metahara

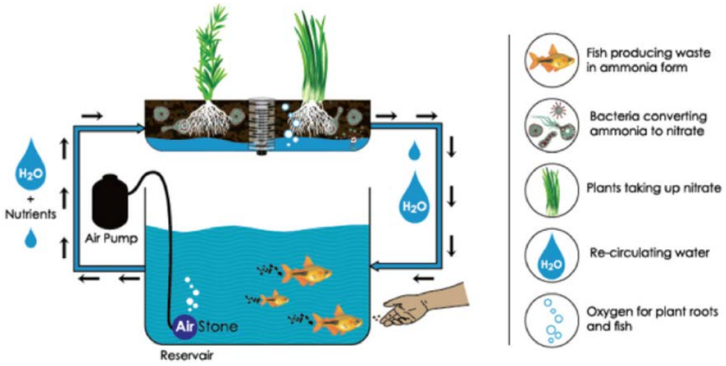


**Figure 2**. The aquaponics technique

## Results

Aquaponics has currently been established at three project sites:
1. Showarobit: 8 female entrepreneurs with a system of 12m$^2$
2. Metahara: A system of 300m$^2$ managed by a youth cooperative
3. Hawassa: 8 entrepreneurs with a system of 12m$^2$ each

In the different localities the project works with local government

Main results:
1. The technical functioning of Aquaponics has been proven
2. Increased production of fish and vegetables is achieved
3. Increased income for the producer(s)
4. Increased nutrition in diets of producers
5. Increased access to fish and vegetables for local buyers assuming that this will also improve their diets
6. In each locality Ethiopian people are trained in supporting aquaponics systems

## Role of government

The government is already involved and could propagate the system at larger scale for instance through supporting training of extension workers. To support aquaponics in future the production of small fish and of fish feed also needs to be supported.

## Follow-up

The outcome of this research will be a fully functional and sustainable aquaponics business model that can be copied by any interested parties. To allow for further adoption there is a need to disseminate the technology to a larger public.

In order to maintain long-term sustainability a knowledge platform is currently being build to ensure that knowledge will remain available after project termination.

## More information

www.sustainable-aquaponics.com

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# Upscaling Potential of Water Harvesting across Africa

Luuk Fleskens

## Upscaling of water harvesting

**Two key challenges concerning African agriculture converge: how will Africa feed its growing population? And how will African agriculture cope with climate change? Water harvesting can be a way to overcome these challenges. This project aims to: i) co-create knowledge on the applicability of and priority for water harvesting technologies (WHTs) across Africa while ii) building a network of people across Africa and Europe interested in the topic and iii) improving access to local knowledge on the potential of WHTs and share knowledge between sites, countries and continents.**

## Context

Knowledge about water harvesting is fragmented. This AfriAlliance Action Group project will build on the knowledge base developed by the recently completed EU FP7 WAHARA project and the EU FP7 WHaTeR and ongoing ACP-EU AFRHINET projects to assess the upscaling potential for WHTs across Africa considering environmental, economic, cultural and socio-political dimensions. Action Group membership is open but organized around members of the above projects, including Mekelle University in Ethiopia.

## Project

The central aim of the project is to produce a high resolution continental scale map about the potential of water harvesting technologies considering environmental and socio-economic dimensions, and to validate the potential map through stakeholder consultations in at least 4 countries, including an assessment of context-specific cultural and socio-political barriers and comparison with current extent of water harvesting adoption.

**Figure 1.** Catchment scale rainwater harvesting in Tigray, Ethiopia

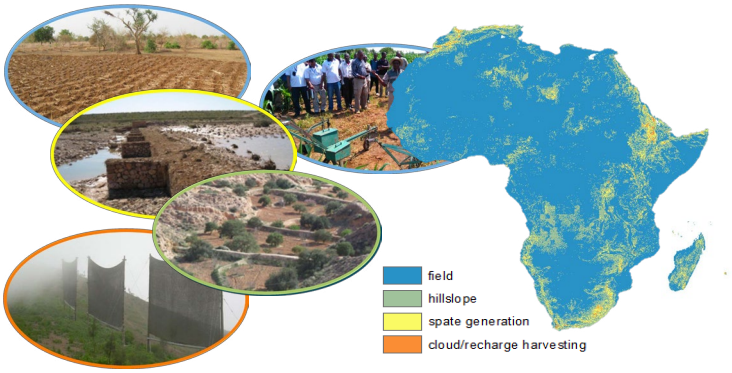


**Figure 2.** Water harvesting technologies: high-resolution potential mapping.

## Results

The project will make an inventory and functional classification of the diversity of WHTs through literature analysis, previous project experience, WOCAT database, and contributed technologies.

The resulting high resolution map of different WHTs technologies is targeted at different policy makers and implementing organizations of sustainable land management interventions.

With the map and supporting information, they will have a tool available to identify the type of WHT most appropriate for their context and help planning interventions to support food security and enhance food production, and to adapt to climate change.

## Follow-up

A series of stakeholder consultation workshops will be organised at country or regional level to: i) provide feedback on the high resolution water harvesting potential map, ii) discuss any cultural and socio-political dimensions that further condition the potential for WHTs, and iii) compare potential to current adoption levels.

The feedback from stakeholder consultations will be considered in an update of and preparation of a final version of the water harvesting potential map and accompanying compilation of non-mappable considerations.

Furthermore, the Action Group will share knowledge about multiple aspects of identifying, defining, assessing, and documenting the feasibility and potential of water harvesting technologies through a series of on-line meetings and webinars.

Action Group results will be disseminated through open-access multi-media products targeted to different target audiences.

## More information

http://afrialliance.org/action-groups/
https://rsr.akvo.org/en/project/5278/

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# Farmer-led Agroforestry Innovation: Improving livelihoods and food security utilising *Acacia saligna*

Frans Bongers

## Improving use of *Acacia saligna* by farmers

**Tree resources are scarce in many dryland areas. *Acacia saligna* has been introduced as a restoration species in area exclosures. This project evaluates *A. saligna* as a multipurpose tree for use by farmers in Tigray. We combine research field trials for identifying optimal provenances and tree management strategies, with farmer driven tree use and management trials in three communities. Active use of the species (both products and services) will improve farmers livelihoods and food security.**

## Context

*A. saligna* has been widely planted as a restoration species in area exclosures. The multipurpose nature of the species (fodder, firewood, poles, seeds, soil improvement) is barely known and currently under valued. Introduction of the best varieties of the species on farm land potentially improves the livelihood of farmers. In this project we evaluate provenances and varieties in terms of the product they provide and the capacities to provide them under field and farmer management conditions.
The project is executed in three woredas in Tigray and led by the Tigraian Agricultural Research Institute (TARI) in collaboration with World Vision Ethiopia, Mekelle University, Wageningen University & Research, ICRAF and World Vision Australia.

## Project

This project partners, in close collaboration with farmer groups, evaluate the quality and quantity of the products this tree provides and the impact of various tree management practices. We combine field trials on tree management effects with feeding trials to animals. Meanwhile we evaluate adoption of the species and its management by farmers. Main funder is NWO-ARF.

**Figure 1.** Discussing *A. saligna* tree management

**Figure 2.** Farmers show their *A. saligna* trees and explain their values

## Results

The species is widely distributed in green areas, but not yet in farming fields. The multipurpose nature of the tree is evident and farmers are starting to use and adopt the species. Our provenance trials show that some varieties are better than others, depending on the use and management. Fodder types and pole types can be selected for. Sheep, cattle and poultry accept the species as feed, and in combination with other feed, the species improves feeding conditions and health, improving farmers livelihoods. Out reach and policy briefs may stimulate wider use of the species. Possibilities of farmer use of *A. saligna* planted in exclosures will need to be evaluated.

## Follow-up

Extra work on longer term impacts of intensification of use of this species is needed, both with regard to quality and quantity of tree products, as well as the impact of the use as animal fodder, Use for poles, wood products, pulp and paper, and as fertilizer has to be evaluated. Farmer trainings and experiments, and outreach needs upscaling through collaboration with extension organisations and policy makers.

## More information

https://www.nwo.nl/en/research-and-results/research-projects/i/35/14135.html
http://knowledge4food.net/research-project/arf2-agroforestry-innovation-ethiopia/

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# Integrated Pest Management in Ethiopian Horticulture

Anne Elings & Gerben Messelink

## IPM in Ethiopian horticulture

**To remain internationally competitive, Ethiopia is committed to stimulate biological crop protection as an element of Integrated Pest Management. Chemical crop protection needs to be reduced because of, for example, lower consumer acceptance of residues, workers' safety and developing resistance. The project identifies indigenous predators and microorganisms, provides training, and supports universities. Commissioned by EHPEA, the project collaborates with growers, academia and companies.**

## Context

Although applied by a number of growers of roses and other crops, the application of biological crop protection needs further stimulation. Also, a national industry is not yet developed. EHPEA wishes to stimulate such developments by strengthening the identification and use of local predators and microorganisms, by providing training to its staff, growers and university personnel, and by suggesting improvements for legislation on biological control agents. The project mainly serves protected horticulture, which is still concentrated around Addis Ababa, but which may be expanding to other regions.

## Project

The project has identified in a number of regions around Addis Ababa and Jimma for collecting and identifying indigenous predators and parasitoids that could potentially be used for biological pest control in Ethiopia's horticultural sector. It also is identifying at the DNA level microorganisms that can serve as plant growth enhancers. Training to EHPEA trainers has been provided, and knowledge dialogues with growers have been held. The curriculum of JKUAT university has been reviewed.

**Figure 1.** *Orius naivashae*, an important predator of thrips in Ethiopia

**Figure 2.** Collecting predatory mites for identification.

## Results

More than 20 species of indigenous predators and parasitoids of major horticultural pests, such as thrips, spider mites, whiteflies and mealybugs, were identified. The identification of these natural enemies and microorganisms is promising: it can contribute to a horticultural sector that uses less chemicals. However, besides indigenous species, the import of commercialized specialist natural enemies may be needed in addition to any other crop protection means.

Training of knowledge workers, trainers and growers in IPM should be intensified.

## Follow-up

Once predators and parasitoids have been identified, their functionality in horticulture depends on their interaction with pests and crops. Further research on the biology of predators is therefore required before they can potentially be commercialized, for which close collaboration between public and private stakeholders is required.

The growing need for, and interest in IPM calls for a revision of the current legislation to enable the easy import, export and application of predators.

Continued training and knowledge exchange should be elements of follow-up activities.

## More information

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# CGIAR Flagship Research Programme Food Systems for Healthier Diets – A4NH

## About A4NH

The CGIAR Research Program on Agriculture for Nutrition and Health (A4NH), led by the International Food Policy Research Institute (IFPRI), is built on the notion that agriculture has the potential to do much more than reduce hunger and poverty. Our high-quality research and evidence from Phase I (2012–2016) confirmed that agricultural development has enormous potential to make significant contributions to improving the nutrition and health of people. In Phase II (2017–2022), our focus is expanding to address challenges related to food system transformation, the rising burden of foodborne disease, and emerging health risks, like antimicrobial resistance. Our work continues to recognize that addressing inequality related to gender or other social categories is a development objective in its own right and an important condition for achieving other development objectives, particularly improved nutrition and health.

As CGIAR's only research program on nutrition and health, A4NH makes a unique contribution to three specific CGIAR targets related to reduced poverty and improved food and nutrition security for health.

Recognizing this is a major task, A4NH brings together 5 CGIAR Centers and 2 academic institutions (Wageningen University & Research, and London School of Hygiene and Tropical Medicine) plus the talents and resources of a wide range of partners. Together, we carry out research activities through five unique, yet complementary, flagship programs and three cross-cutting units in at least 30 countries.

## Flagship 1: Food Systems and Healthier Diets

### Rationale and objectives

Governments, businesses, and civil society groups increasingly realize the important need of supporting food systems to produce and supply diverse, nutritious, and safe foods for healthy lives. Flagship 1 responds to concerns about global diet trends and demands from countries on how to support sustainable and systemic food system transformations for healthier diets to address unabated problems of undernutrition, micronutrient deficiencies, and overnutrition. This flagship takes a holistic perspective of food systems, including production, distribution, waste disposal, and food consumption. The systems approach aims to understand the interactions between different parts and act upon how together they are effecting change, rather than improving specific components in isolation. This is necessary because a food system is multidimensional. It includes sociocultural, economic, environmental, and political aspects, with many actors (food producers, food-chain actors, and consumers) managing multiple, linked agri-food value chains within dynamic food environments.

### Cluster of activities

Research in Flagship 1 focuses on analysis of the food system transformation and dietary transitions occurring in several countries, but with special attention on Ethiopia, Bangladesh, Nigeria, and Vietnam. Our research is designed to improve understanding of not only the dietary impacts and effectiveness of specific types of policy interventions, consumer and business innovations in relation to food systems for different target populations, but also their possible environmental and economic trade-offs. Flagship 1 is led by Wageningen University and Research Centre (WUR) and combines resources from Bioversity International, the International Center for Tropical Agriculture (CIAT), the International Food Policy Research Institute (IFPRI), the International Institute of Tropical Agriculture (IITA) and collaborates with the Amsterdam Initiative against Malnutrition (AIM/GAIN) and other strategic partners. Research is organized into three main clusters of activities:

1. **Diagnosis and Foresight** assesses regional and sub-regional drivers of food system transformation, and options and constraints for dietary change. The evidence, along with development and testing of methods, metrics, and tools, helps identify leverage points in food systems that can improve diets and enables partners to incorporate nutrition, health and gender in their own evaluation and design of agri-food value chains and other food system programs.
2. **Food System Innovations** tests concrete food system innovations and interventions at supply and demand-site to sustainably improve diet quality. Results from these effectiveness and impact evaluations are translated and disseminated so that stakeholders – investors, civil society, policymakers, and other CGIAR programs – consider healthier diets in processes related to food systems.
3. **Scaling up and Anchoring** supports the scaling up of successful actions through effective engagement of multi-stakeholder platforms and multi-sectoral mechanisms so that partners can implement A4NH strategies for agri-food value chain and/or food system innovations at scale.

The Flagship programme was launched in Ethiopia in February 2016 during a stakeholder workshop. During this workshop the situation in Ethiopia concerning food systems and their links to dietary changes were discussed. This was followed by a comprehensive literature review resulting in about 25 research questions concerning the food system-diet linkages, and potential key leverage points in food systems to improve diets. This was presented during the National Nutrition Conference at Hawassa University in February 2017. In collaboration with CGIAR partners and local Ethiopian partners including the major Universities, several research programmes have started involving PhD and MSc students.

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# CommonSense

Tomaso Ceccarelli, Allard de Wit, Jandirk Bulens

## Project summary

CommonSense (CS) is part of the Geodata for Agriculture and Water (G4AW) programme funded by the Dutch Ministry of Foreign Affairs. The programme aims to improve food security in developing countries using satellite data. CS targets smallholders in the country, directly or through actors across their value chains including unions, cooperatives, micro-finance institutions (MFIs), and extension agents. By providing actionable information based on geographic (Geo) data and satellite products, the project ambition is to strengthen these value chains and eventually improve the livelihoods and food security of smallholders. A requirement of G4AW is that services must sustain themselves after the project ends.

## Context

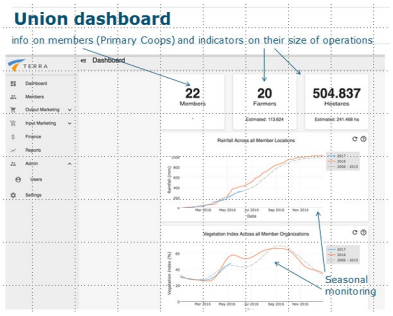
Smallholders and other value chain actors need reliable and timely geo-information to make decisions on their farming, marketing and financial activities. Information based on geo-data including satellites can support this by providing services such as weather forecasting, seasonal monitoring, yield forecasting, farm advisory, crop suitability, risk assessment and credit portfolio management. The CS consortium is a combination of private partners from Ethiopia and the Netherlands: knowledge organizations, remote sensing, weather and IT service providers, specialists in capacity and business development, microfinance institutions. CS has also established a cooperation with government bodies (MoANR, NMA, ATA, FCA, etc.) and other stakeholders in Ethiopia.

## Project

CS is developing a platform of specialized applications including:

- **Management of (geospatial) data for unions** and potentially out-grower schemes and other actors in relevant value chains
- Dedicated dashboards for **monitoring current and future crop conditions** including seasonal monitoring and yield forecasts
- IVR-SMS and Web services delivering **weather forecasts** and sesame **market prices** for smallholders and other users through mobile phones and other means (with NMA and the Sesame Business Network-SBN)
- Applications dedicated to MFIs including tools for **individual agri-credit assessment** and **portfolio management and planning**
- Field applications dedicated to **extension services** (with MoANR) in support of field data collection and consultation of farming recommendations; also includes weather forecasts.

**Figure 1.** The CS platform development, a co-design process with the relevant stakeholders



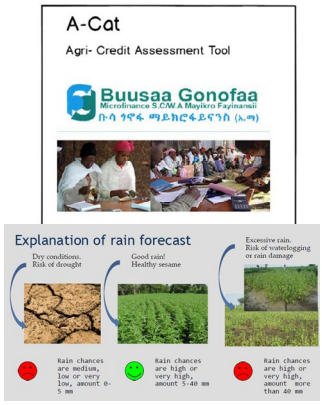




**Figure 2.** Some of the applications offered:

1) The Union dashboard 2) The MFI agri-credit tool and 3) Explanation of SMS weather forecasts messages

## Results

Applications for unions are expected to improve their planning, operations and visibility, with positive trickle-down effects for their members (primary cooperatives and farmers) in terms of services provided and overall trust. Currently 4 unions in 3 different regions are piloting the service; in the next upscaling phases many more are expected to follow.

MFIs applications for individual crop loans as well as tools for management/planning will improve their efficiency and outreach. Applications are under design and will be piloted in this and the next growing seasons.

Selection of applications for extension is being finalized with MoANR and will be piloted this or in the next growing seasons. CS is also supporting the National Spatial Data Infrastructure through capacity building targeting staff from MoANR, INSA, NMA, ATA, EMA, etc.

Cross cutting weather services are under development with NMA in cooperation with MoANR, ATA, EIAR, SBN. CS is contributing to the improvement of the quality of weather forecasts and their piloting through SMS/IVR systems starting from the sesame growing areas.

CS has MoUs established with MoANR and NMA and started a dialogue with the ATA on agro-meteo advisory services and remote sensing support to the ACC tracking/reporting system.

## Follow-up

CS is in a constant dialogue with MoANR (through a specific technical committee) and the NMA, for a follow-up on the further design, piloting and up-scaling of the activities envisaged. More recently, CS has established contacts with ATA and the FCA in relevant domains.

## More information

https://g4aw.spaceoffice.nl/en/projects/G4AW-projects/63/commonsense.html

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# Landscape Governance Learning Journey

Cora van Oosten, Joyce Engoke

## Landscape Learning Journey in the Horn of Africa

The Horn of Africa region has great potential in terms of natural resources and economic opportunities. However, the region is also affected by multiple conflicts, many of which have a territorial basis, as well as by climate change. Both issues require social dialogue, spatial planning and climate change adaptation.

To this end, the Horn of Africa Regional Environmental Centre and Network (HOAREC&N) has developed its Climate Change Programme, which aims to develop a regional focus on climate change, with local action in six selected landscapes in Ethiopia, Djibouti, Somaliland, Sudan, South Sudan, and Kenya.

## Context

In order to address climate change within six selected landscapes in the Horn of Africa, we set up a regional Landscape Governance Learning Journey. This Learning Journey aims to bring together local stakeholders from throughout the region, to learn from each other, and help each other to find practical solutions to urgent problems.
The Learning Journey specifically focuses on landscape governance, as we believe that climate change adaptation and mitigation depends on the spatial decisions which are taken by stakeholders within landscapes. The better this process of spatial decision making, the better its outcomes.

## Project

In order to enhance landscape governance capacities in the Horn of Africa, we designed a landscape governance framework which provides guidance to the regional learning process. The five major elements of the model are described in figure 1.

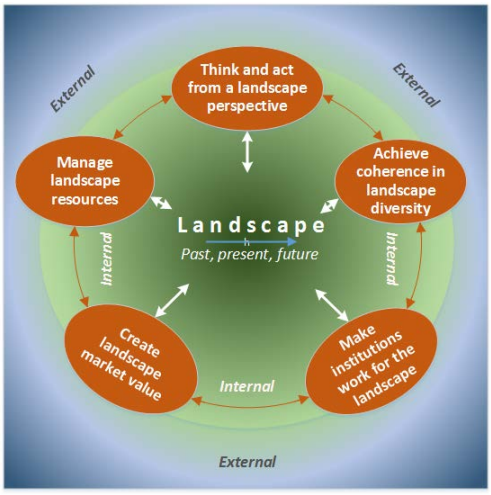


**Figure 1. A framework for creating capacities for landscape governance**

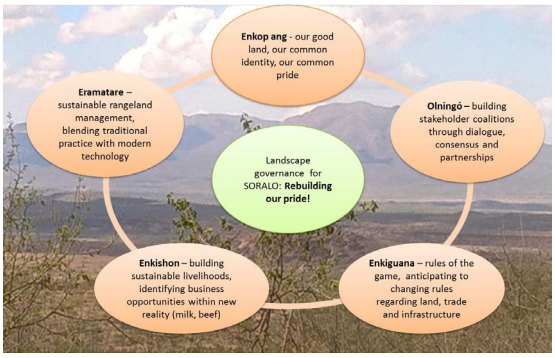


**Figure 2. Application of the framework in Kenya's South Rift Region**

## Results

The results of the learning journey are quite amazing. According to the participants, the journey helps them to have a much better insight in the spatial processes taking place in their landscape, and has equipped them with a range of tools and instruments to respond to climate change.
It has helped participants to facilitate multi-stakeholder dialogue within their landscape; to develop a shared vision among stakeholders and mediate in conflicts; to better align sectoral policies affecting their landscape; create market opportunities; and identify the best management options that fit the landscape's changing realities.

## Follow-up

So far, we are still in the midst of our learning journey. Five events have taken place, covering most of the countries of the Horn of Africa. After having finalised our regional tour, we will get together to write down some joint experiences, lessons learned, and success stories to be shared.

So far, we think we have developed a nice method to enhance collaborative learning at the regional level. By bringing together stakeholders within and between landscapes, we have contributed to more regional exchange, to more collaboration between landscapes, and create more coherence within the participating landscapes. We believe that this method adds value, and should be expanded by adding more landscapes; or be replicated in other regions in Africa and beyond.

## More information

Horn of Africa Regional Centre and Network, http://hoarec.org/
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Wageningen Centre for Development Innovation, http://www.wur.nl/en/Expertise-Services/Research-Institutes/centre-for-development-innovation.htm

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