

Can we grow our way out of the charcoal crisis?

By Philip Dobie (with contributions from Clement Okia, Athanase Mukuralinda, Phillio Kihumuro and Elisée Bahati Ntawuhiganayo)



Charcoal sellers in Mozambique. (Photo: World Agroforestry)

Charcoal production in much of Africa is not only a major source of energy but also often illegal because of its apparent association with deforestation.

In most parts of Africa, a common sight is sacks of charcoal being carried through rural areas towards towns and cities. They are carried on bicycles, motorcycles, cars, pickups and trucks. Sometimes they are moved at night, to avoid being stopped by police, and sometimes during the day they are nodded past by authorities that have already pocketed bribes. Charcoal production is often blamed for massive deforestation. Authorities often try to ban or control the trade, both of which have failed.

There are many half-truths and myths associated with charcoal that are worth dissecting to understand why the trade remains so prevalent and so poorly controlled. It is often believed that charcoal is a fuel used by the poor. This is not true: most charcoal is used for cooking by people in the growing urban areas who generally have more purchasing power than the poor in rural areas. The rural poor generally use firewood. Policy makers hope that the use of charcoal will reduce as countries get richer.

This does not happen. There is simply a growth in urban populations and their demand for charcoal. Charcoal is often regarded as a marginal business with little impact on economies. In fact, the charcoal market in Africa has been estimated to be worth between USD 9.2 and 24.5 billion per year (Nelleman et al. 2014).

Many development projects have focused on improved cookstoves that reduce the amount of charcoal used. Although better stoves are more efficient, there has been limited success in increasing their use in Africa to an extent that makes much difference to the demand for charcoal. Although some models of cookstove are showing signs of success in some markets, a significant proportion of potential cookstove users in Africa either reject improved stoves even if they are offered free or express no willingness to pay for even highly subsidized stoves (World Bank, 2014).

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Can we grow our way out of the charcoal crisis? cont.

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The most widely held belief concerning charcoal is that it is responsible for widespread deforestation. This is partially true, especially if the definition of 'deforestation' is extended to embrace the degradation of woodlands rather than simply their total destruction. There is no doubt that a great deal of wood is cut in Africa to produce charcoal and that large areas are being damaged to supply the cities with their favourite fuel. However, it is seldom possible to demonstrate that charcoal production is responsible for widespread deforestation.

The fact that charcoal is always available in abundance in all markets in Africa casts doubt upon popular assumptions that charcoal production is denuding landscapes. The World Bank (2011) reports, based on several studies, that 'scarcity of wood-based biomass occurred in very few and specific locales, and that its extraction rarely resulted in forest loss'. True deforestation is the result of clearance of land for agriculture.

Charcoal production is certainly out of control in some places but whether it could be controlled and made sustainable depends upon a lot of things. Many charcoal makers do not cut whole trees but trim branches, leaving the trees to regenerate; others might use prunings and waste from managed woodlands. Unfortunately, the nature of the charcoal business in most parts of Africa makes it very difficult for the actual production and sale of the commodity to be carried out efficiently and fairly.

Because of its perceived evils, the trade throughout Africa is completely or partly illegal. Prohibition, however, has mostly failed because of the political economy of the charcoal sector: the informal sector dominates; institutions are weak; illegality attracts criminals; and corruption is rife.

Charcoal is mostly produced by burners who are either given access to trees by landholders who wish to get some much-needed, extra income or the burners simply enter communally-owned or poorly-regulated land and take the wood for free. They use the simplest of technologies: piling earth on the burning wood to carbonize it; they seldom employ improved kilns because of the expense and the difficulty of moving them to the next location.

The burner sells the charcoal through complex but often very efficient pathways to urban markets, usually first to intermediaries and then to larger-scale traders who transport it to final markets.

The illegality skews the movement of the commodity: it's common for consignments to be stopped until a bribe is paid; vehicles – even bicycles – might be impounded (Smith et al 2015); often, trucks move at night to avoid roadblocks.

However, the demand from urban centres is so great that in most cases a fairly efficient informal trade continues, but with added cost at every stage as palms are greased to allow the commodity through. When serious efforts are made to stop the trade, retributions can be rapid.

On the 16th of January 2018, the Governor of Kitui County in Kenya announced a ban on commercial production and transportation of charcoal within the county. Following the ban, several trucks carrying charcoal through the county were impounded and violence broke out,' explained Brian Chiputwa, a Livelihoods Expert with World Agroforestry. 'Angry residents who regard the illegal charcoal business as a major source of environmental degradation in the area offloaded charcoal from some of the trucks and set alight one of the trucks. The unrest spread to a distant charcoal distribution centre where riots erupted on the Kitui-Garissa highway, blocking it for several hours with immobilized vehicles.'

In retaliation, transporters in Kiambu also protested against the ban by blocking the Nairobi-Nakuru highway with logs and lighting bonfires.

Most African countries have tried some sort of regulation of the charcoal trade but where the trade depends upon routine, informal payments, legislation has proved ineffective.

Yes, it is technically possible to make charcoal sustainable. Uganda has put into operation a system under which farmers are allowed to grow trees on degraded areas of forest, either for timber or fuelwood including the production of charcoal. The Government recently called for the private sector to invest in biomass energy.



A charcoal burner carbonizing charcoal with an earth-mound kiln, the efficiency of which is as low as 10% in a landscape consisting of farmland, grazing land and woodland remnants in Bugesera, Rwanda. (Photo: World Agroforestry/ Miyuki Iiyama)

Can we grow our way out of the charcoal crisis? cont.

The Energy ministry plans to establish tree nurseries in collaboration with youth to grow seedlings for fuelwood. The hope is that the legally-grown charcoal will compete with the informal charcoal trade. The effort deserves support and could form the basis for a sustainable charcoal industry. However, a number of issues will have to be taken into consideration.

First of all, there is anecdotal evidence that already farmers are expressing a preference to grow timber rather than fuelwood because charcoal in the informal market is cheap at source: landholders and charcoal burners earn very little and most of the profit accrues to intermediaries, dealers, markets and the shadowy figures who facilitate crossing legal lines. Fortunately, waste and prunings from timber production can still produce valuable charcoal. Concurrent with this development, the forest concessions system would need to be managed in a flexible manner to encourage both timber and fuelwood production. It will be challenging for the Government to supervise land allocations for biomass energy to ensure that it is actually used for that purpose; and that appropriate species for high-quality charcoal yield are also included in the species' list. The choice of trees is important because much of Uganda's charcoal is from the north, where it is made primarily from acacias with high wood density. The species produces a very popular, heavy charcoal that creates a great deal of heat for its weight. But trees grown in forest concessions are likely to be fast-growing, less-dense species that will produce a less desirable charcoal. Finally, getting charcoal from these new sources into the market might prove difficult.

'The informal charcoal markets in Uganda are well integrated vertically and very efficient,' explained Ross Hughes of the World Bank. 'It will be challenging for new formal sources of charcoal to compete in the current informal market.'

There are lessons to be learned from Rwanda. Given that the majority of forests in Rwanda are protected, charcoal production relies on privately-owned forests and woodlots. Around 72% of Rwanda's firewood and charcoal comes from eucalyptus woodlots (MINIRENA 2013).



*Smallholder farms in Rwanda's Eastern Savannah Region
(Photo: World Agroforestry)*

Up to 80% of all charcoal is produced in the Southwest on sloping and least-productive land. Woodlots and crop production are the main components of the agricultural landscape, with farm households increasingly managing woodlots of different sizes (Ndayambaje et al 2013). Eucalypts are a major source of income for many households through charcoal production. However, individual charcoal producers often have poor negotiation power with traders owing to their weak organization. Further, the production and commercialization of charcoal are subject to taxes and regulations that restrict the harvesting of immature trees. Woodlot owners do not like these multiple layers of control and advocate a single tax for tree harvesting and charcoal making, and a single tax for the transportation of wood products.

The Government of Uganda will need to be serious about regulating to stimulate the legal charcoal industry rather than restrain it. Fortunately, Government policy recognises the value of biomass energy, including charcoal. The Constitution requires the Government to 'promote and implement energy policies that will ensure that people's basic needs and those of environmental preservation are met'.

There are efforts to decentralize the operations of the energy sector but in liaison with other stakeholders in order to effectively deliver energy services efficiently. This is leading to a welcome focus on making charcoal sustainable. The United Nations Development Programme, for instance, is engaged in efficient charcoal production under the Green Charcoal Project in collaboration with Ministry of Energy and local governments in Uganda. However, local and even national efforts may not be enough. It must be recognized that charcoal is heavily traded across national borders, usually illegally. Ugandan charcoal moves into Kenya, Kenyan charcoal moves into Somalia and Somalia has for decades traded charcoal from the Horn of Africa into the Gulf States.



Charcoal for sale in Nairobi, Kenya. (Photo: World Agroforestry/ Miyuki Iiyama)

World Agroforestry is leading a project called [Harnessing the potential of trees-on-farms for meeting national and global biodiversity targets](#). Part of the project sets out to understand the incentives for farmers to plant trees, which kinds of trees, and for what uses. In Uganda, the project will seek to understand how tree planting for woodfuel can be made profitable and desirable for farmers. Sharing this knowledge with policy makers throughout the region is designed to lead to improvements in the lot of poor farmers, both economically and environmentally, with particular emphasis on addressing the many complex issues facing the charcoal trade.

The debate on sustainable charcoal comes at an important time. Concerns have been voiced about a looming woodfuel crisis since the oil crisis of the 1970s. Up to now, wood has not disappeared. However, areas are being degraded at least partly through charcoal exploitation, and charcoal is increasingly being sourced from areas more distant from urban centres. It will be important to address these trends, and a fresh and healthy debate on the policy challenges of replacing the current charcoal business model with a sustainable model is very much needed.

Improving dairy production through uptake of agroforestry trees and innovation platforms

By Lydia Spilsbury

Innovation platforms in Uganda are empowering smallholder farmers adopt agroforestry practices to increase dairy production quantity and quality and improve livelihoods



Healthy cattle in Eastern Uganda
(Photo: World Agroforestry/ Joan Kimayo)

The largest challenge faced by smallholder farmers worldwide is having access to high-value markets and receiving profitable returns for their produce. The monetary difference accrued from access to these markets impacts the livelihoods and food security of such smallholder communities. Through the use of innovation platforms (IPs), the developing value chain innovation platforms for food security (VIP4FS) project, based in Uganda and Zambia, has created coalitions of stakeholders to identify and address local agricultural development problems.

In Eastern Uganda, many smallholder farmers face the challenge of low milk yields due to poor feeding practices. A comprehensive ‘planned comparison’ study for the dairy value chain in the Manafwa and Kapchorwa districts of Uganda, aimed to identify cost-effective means of supporting smallholder dairy farmers to produce and appropriately utilize shrub fodder, Calliandra, for increased milk yields.

Calliandra is a valuable fodder crop as it contains large amounts of protein and can be browsed or cut-and-carried to livestock. Calliandra is often used in agroforestry systems as it is disease and drought resistant, it flourishes in a wide range of soils and as a leguminous crop, it increases soil fertility. “Baseline surveys conducted in both districts demonstrated that most farmers did not know about supplementary fodder,



Calliandra growing on a farm
(Photo: World Agroforestry/ Joan Kimayo)

or how to improve cattle’s nutritional diet” explained Joan Kimaiyo, a researcher at World Agroforestry. “Many farmers simply practiced free grazing and/or give banana leaves to cattle, which often results in livestock receiving inadequate protein or energy from pastures, especially in situations of drought” she adds.

The implementation process of this project was threefold, including information dissemination through intensive training, the use of citizen scientists for participatory demonstrations of good feeding practices and effects of Calliandra if fed to cows, and the establishment of fodder nurseries. Information dissemination involved training between 700 and 800 farmers on good feeding practices, soil and water conservation and the distribution of manuals used to further guide communities. 28 citizen scientists across the districts were provided with mature fodder (Calliandra) to feed their lactating cattle for one month while regularly meeting with community groups to share their experiences and compare results with farmers without access to Calliandra to see how the fodder impacts the milk. The project also established 19 nurseries raising Calliandra, run by local nursery operators who were to sell seedlings at a subsidized price (UGX 100) to enable farmers easy access to fodder planting material.



*Training and preparation of fodder for the cattle
(Photo: World Agroforestry/ Joan Kimayo)*

Initial results of the planned comparison study showed that the cattle who had been fed *Calliandra* fodder had increased both quantity and quality of the milk in comparison with the cattle who had not been fed with *Calliandra*. Scovia Chesang, a citizen scientist from Chelalmoi Village in Tegeres Sub-county reported an increase of 3.5L per day to 6L per day. She said: “The milk became thicker, heavier and creamier, while the aroma from the boiling milk was stronger”. For the general health improvement, Betty Laibich from Kaplak Village in Kapchesombe Sub-county began the study with a sick and malnourished cow yet after a month of feeding she described, “the cow is looking healthier and has an increased appetite. It is producing much thicker milk, with a striking yellowish glitter and an added sweetness to its taste.”

The total milk yield per day per cow increased from 4L to 9L after only a few weeks of *Calliandra* fodder supplementation. Betty referred to *Calliandra* as a “magic” fodder species and has been imploring other farmers to purchase and plant it on their farms. Rose Mengezi, from the same district reported that her cow “looked bigger and healthier” than Betty’s (the *Calliandra* feeding citizen scientist), yet Betty’s cow produced more milk during the study.

Nevertheless, some of the non-*Calliandra* feeding citizen scientists also reported increased milk yields throughout the study. Nathan Tumwa, a citizen scientist from



*Citizen Scientist in Namabya subcounty, Manafwa district
displaying the results of the experiment
(Photo: World Agroforestry/ Joan Kimayo)*

Buwabuya Village in the Namabya sub-county reported an increase of 5L to 7.5L yield of milk per day. Nathan attributed this increase to the zero-grazing practices and better management of his dairy cow taught through the training in dairy management at the beginning of the study.

To ensure the sustainability of fodder production and good dairy management practises, the project plans to embed fodder nurseries into Innovation Platforms established at the local level. The citizen scientists have also been established as demo farmers in the community.

The dairy innovation platforms in Eastern Uganda have improved the dairy feeding practices and increased milk yields among 1,300 dairy farmers through agroforestry and soil and water conservation. In village nurseries approximately 350,000 *Calliandra* seedlings have been raised, generating approximately UGX 35million. The innovation platform has realised a major shift in the behaviour of smallholder farmers in terms of the adoption of the fodder species. More than 75% of farmers have fodder in their farm over 2018-2019, with more than 93% of farmers understanding that *Calliandra* and other fodder species would likely improve milk production. This shift in knowledge will likely improve farmer incomes and livelihoods across the region.



*Calliandra seedlings in a new nursery
(Photo: World Agroforestry/ Joan Kimayo)*



*Calliandra seedlings in a new nursery
(Photo: World Agroforestry/ Joan Kimayo)*

Eradicating hunger through the African Orphan Crops Consortium

By Rob Finlayson

Training scientists in advanced plant genomics is set to transform nutrition in Africa. The Food and Agriculture Organization of the United Nations works with the Consortium to assist its member countries.



*Africa's top plant breeders are working to fight malnutrition and poverty across the continent through improving traditional crops.
(Photo: World Agroforestry)*

The African Orphan Crops Consortium is an African-led, international consortium founded in 2011 with the goal of sequencing, assembling and annotating 101 African orphan crops. The Consortium was approved by African heads of state at the African Union Assembly and is led by the New Partnership for Africa's Development (NEPAD).

The Consortium and its African Plant Breeding Academy, which is run by the University of California, Davis, comprise the most comprehensive and integrated crop-improvement venture on the continent. The Academy is funded by Mars Inc and the Alliance for the Green Revolution for Africa, among many other donors, and is hosted by World Agroforestry (ICRAF) in Nairobi, Kenya. The Academy trains African plant scientists and breeders to develop better crop varieties faster from genetic 'maps' of orphan crops. It has trained 85 of its target 150 African scientists to use DNA-sequence information to breed more nutritious, productive and resilient varieties that can withstand threats from environmental change.

'The Consortium and the African Plant Breeding Academy have created synergy across the continent to promote African orphan crops and assist improvement of these crops through knowledge, skill, and technology transfer to African scientists,' said Ermias Abate Desta, a graduate of the Academy. 'This initiative is creating a network of "new breed" African plant breeders with a shared vision of a continent with no hunger, malnutrition and poverty. I am part of this great movement.'

'Orphan crops refers to a diverse range of plant species that are economically and socio-culturally important, but which are neglected by science and research because they are not widely traded commodities.

The Consortium is raising the importance of these species and accelerating research activities for plant growth and development. By 2030, the use of nutritious climate-resilient African crops stimulated by Consortium's work is expected to be a part of dietary improvements in 20% of rural populations and 10% of urban populations.

The orphan crops include annual and biennial shrubs, bushes and trees that act as principal food sources for the 600 million people living in rural Africa. The Consortium has been sequencing the genomes of 101 species to allow scientists to efficiently improve the crops' productivity, climate resilience, disease and pest resistance and nutritional quality and also training African scientists to best use the genetic information. All completed genetic 'maps' are published online with open access, with the intellectual property held by the African Union.

In 2017, the Food and Agriculture Organization of the United Nations (FAO) signed a letter of intent with the Consortium to assist member countries of FAO develop policies, regulations and laws that facilitate the genetic improvement of orphan crops; strengthen institutional and human capacities of member countries for research and development of genomic tools, plant breeding and seed-delivery systems; and convene neutral platforms for stakeholder engagement to advocate for greater investments in breeding nutritious and climate-resilient crops.

In 2018, the Consortium's work was formally recognized at the October meeting of FAO's Committee on Agriculture (COAG). During the Consortium's side event at COAG, eight graduates from the African Plant Breeding Academy shared information about their work to help fight malnutrition in their own nations through transferring research methods and results and through training.

FAO Director of Nutrition and Food Systems, Anna Larrey, told the meeting that the Consortium's approach has the potential to spur a revolution for orphan crops in Africa. Moreover, Larrey highlighted how the program can contribute to the nutrition targets of the United Nations 2030 Sustainable Development Agenda, with a focus on the Decade of Action for Nutrition, which is a UN commitment to eliminate malnutrition from 2016 to 2025.

'Together we have created a movement to end hunger and malnutrition in Africa. Stunting will be eliminated in your lifetimes, if not earlier,' said Howard-Yana Shapiro, Chief Agricultural Officer of Mars Inc and co-founder of the Consortium.

Kenya value-chains are crucial for regreening efforts

By Grace Koech



Markhamia lutea seedlings in a tree nursery in Homa Bay county, Kenya. It is an important agroforestry species – it provides shade in crops, controls soil erosion and mulch. Its wood is used for light construction, furniture, poles, beehives, tool handles and props for crops. The roots, bark and leaves have medicinal value. (Photo: World Agroforestry/ May Muthuri)

Researchers show development of value chains is important for restoring degraded land in Kenya.

Development of value chains is a key driver for successful implementation of regreening efforts and market access, say researchers from World Agroforestry and [World Vision Kenya](#) who are collaborating in the [Regreening Africa](#) project.

Sammy Carsan, lead scientist on value chains presented the findings of an analysis carried out between July and August of 2018 in Migori and Homabay counties at a workshop held 13-14 February 2019 in the two counties, respectively.

‘The status of the development of value chains is a good predictor of the uptake of agroforestry technologies,’ said Carsan.

Agroforestry is often a key element of regreening efforts. In such cases, typically farmers are encouraged to plant more trees on their farms to not only improve their livelihoods and nutrition but also increase environmental benefits.

‘Money is not only in gold but also in trees,’ said Joseph Tinkoi, World Vision’s regional manager. ‘People should therefore invest in agroforestry for better livelihoods, food security and land restoration.’

Markets for agricultural and agroforestry products in developing countries, however, were either missing or highly disorganized, noted Carson. Accordingly, people involved in value-chain were not able to maximize returns on investment.

‘The baseline assessment and value-chains scoping analysis employed a methodology that involved interviewing a sample of people that was representative’ noted William Odera, Lambwe area program manager.

During the study, researchers held focus-group discussions and key informant interviews with farmers in the two counties.

The farmers identified five main value chains: 1) timber and poles; 2) charcoal and firewood; 3) medicinal plants; 4) fruit trees; and 5) honey.



Charles Odhiambo, Project Manager of Regreening Africa at World Vision Kenya, shows a tree nursery in Migori. (Photo: World Agroforestry/ Grace Koech)

Kenya value-chains are crucial for regreening efforts cont.

The researchers found that the value-chains were variously 'gendered' inasmuch as timber and poles were mainly produced and traded by men whereas the production and trading of firewood was mainly carried out by women. Fruit production was by both men and women in Migori but women only in Hombay. Charcoal and medicinal plants were produced and traded by both men and women.

In such cases, to be most effective, regreening efforts should be sensitive to the differences in gender in each value-chain and ensure participatory and fully inclusive approaches.

Farmers had prioritized the fruits and firewood value-chains as potential for development by Regreening Africa. Fuelwood was the main agroforestry product collected on farms and 90% of households relied solely on fuelwood for their cooking needs yet only around 30% grew fuelwood. Growing fuelwood on farms significantly reduces time spent on collection.

Farmers wanted help with selection and prioritization of fruit and timber tree species, cultivation and management, and nursery establishment.

As part of any development, World Agroforestry and World Vision needed to work closely with the government and other institutions to promote greater access to water and transport in the two counties.

Exchange visits to Makueni, Mwingi and Kitui were also proposed to challenge farmers to plant more fruit trees because the areas were prone to drought.

'On their own initiative,' said Charles Odhiambo, project manager with World Vision, 'farmers could also use locally available, innovative technologies, such as recycling used water bottles for potting seedlings grown for regreening.'

World Vision's monitoring and evaluation officer, Pius Akumu, noted that Regreening Africa has continuous monitoring and an end-line survey to determine impact. All of the information collected during the research and the subsequent actions to achieve the regreening targets would be carefully observed to allow for adjustments as needed so that farmers could experience benefits sooner rather than later.



Fuelwood is a major agroforestry project collected on smallholder farms. (Photo: World Agroforestry/ Susan Onyango)

In attendance at the workshop were over 100 people drawn from the Ministry of Environment and Natural Resources, county governments, Kenya Forest research Institute, farmers' groups, participating households, enumerators and staff from both World Agroforestry and World Vision.

Fixing forests: How Decision Analysis is working on the ground in East Africa

Originally published on the [CGIAR Research Programme on Water, Land and Ecosystems](#)

Among East Africa's biodiversity hotspots is the Desa'a forest, which borders Tigray and Afar in Northern Ethiopia. The forest has become a priority area for conservation, as years of conflict, deforestation and mismanagement have left it highly degraded. But new sets of tools bring an opportunity to reverse these trends and restore and protect this important natural wonder.

[WeForest](#), a nonprofit organization with the goal to restore 25,000 ha of forests around the world, is working in the Desa'a to maintain the remaining 10% of dense forest cover while working with the local communities to restore the surrounding buffer zones and increase forest cover.

The CGIAR Research Program on Water, Land and Ecosystems ([WLE](#)), through partners at the World Agroforestry (ICRAF), are using Decision Analysis (DA) to help the WeForest team determine how best to prioritize their work going forward. It's a term we hear often, but what does DA actually look like on the ground? Thrive talked to Yvonne Tamba and Joshua Wafula from the Land Health Decisions team to learn more. Read the interview [here](#).



Yvonne Tamba and Joshua Wafula are part of the Land Health Decisions team at World Agroforestry. (Photo: WLE/Rachel Ryan)

The missing middle: how enabling environments will translate global commitments into local action

By Susan Onyango



Participants at the Global Soil Week 2019 (Photo: IISD)

Healthy soils are required to tackle the three main challenges in the world today: hunger, climate change and biodiversity loss.

Delegates at Global Soil Week 2019 push for effective land governance, local governance structures, extension services and finance and markets to ensure sustainable and climate resilient agriculture.

For Africa's development agenda to succeed, enabling environments are needed that encourage inclusive and sustainable rural development, with special attention and dedication to the climate crisis. Inclusive investments in sustainable land management will ensure food security for smallholders. This will be made possible if land governance, local governance structures, extension services and finance and markets work for the good of smallholders. That was the message from [Global Soil Week 2019](#) held at World Agroforestry (ICRAF) headquarters in Nairobi, Kenya, from 27-30 May 2019.

The goal of Global Soil Week 2019 was to contribute to creating enabling environments for sustainable and climate-resilient agriculture in Africa that will lead to food security for smallholders, investments in the sector, small-scale investments in locally driven learning and innovation processes, and dialogue at regional, national and local levels.

Global Soil Week 2019, which had the theme, Enabling Environments for Sustainable and Climate Resilient Agriculture, brought together over 200 development practitioners, researchers, farmers and government officials from Africa and Asia. The conference started with technical sessions, rooted in active, on-the-ground case studies that identified key elements needed to build an enabling environment to achieve the SDGs and global climate targets at local and global scales. Participants shared experience from projects on women's participation in sustainable land management and decision making, inclusion of smallholders in markets, strategic partnerships across development actors and scientific institutes, the need for evidence-based decision making and, most urgently, the mechanisms for implementing global initiatives at local levels.

TMG Research identified 16 cases that highlighted activities toward sustainable and climate-resilient agriculture, from community-centered conservation agriculture in Zambia led by WWF through ApisAgribusiness in Ethiopia led by Rare and IFOAM to [Regreening Africa](#) in the Sahel led by ICRAF. These case studies were presented, discussed and debated in interactive fora with cross-sectoral, interdisciplinary experts who prepared key recommendations.

Following the technical session was a two-day, high-level segment in which representatives of governments and development institutions from Benin, Burkina Faso, Ethiopia, Germany, India, Kenya and Madagascar called for urgent attention to what has become a climate crisis.

'There are opportunities for creating an enabling environment for sustainable agriculture in Africa', said Alice Kaudia, a facilitator of the event. 'These include land governance, extension services, local governance and markets. However, there is a missing middle. We need functioning institutions at the ground level that can translate the global commitments on the SDGs and climate change into practical actions that can transform lives.'



Alice Kaudia, Kenya environmentalist and Alexander Muller of TMG Think Tank (Photo: World Agroforestry)

The Missing Middle: how enabling environments will translate global commitments into local action cont.



Tony Simons, Director General, ICRAF (Photo: World Agroforestry)

It was noted that despite the role of soil as a life-support system, including protecting biodiversity and storing carbon, it does not receive the attention it deserves. Global Soil Week was started in 2012 as a platform to bring together a diverse range of people to initiate and strengthen policies and actions on sustainable soil management and responsible land governance.

‘Soil is the basis of our life’, said Alexander Muller of TMG Think Tank and board member of ICRAF. ‘Without healthy soil we will not be able to tackle the three main challenges we are facing in the world today: hunger, climate change and biodiversity loss. We need to make soil part of the solution because soil management is part of the problem’.

Agriculture and rural development are the foundation of most economies in Africa. However, agricultural production on the continent is hampered by land degradation and poor soil fertility. Therefore, we can only improve food security and improve livelihoods by restoring degraded land and returning it to sustainable tree, crop and livestock production.

‘Call it soil if you like but Global Soil Week is about people’s livelihoods from the land, about how land is best governed and managed, and about how we can sustainably profit from the land,’ said Tony Simons, director-general of ICRAF. ‘Soils are complex mixtures of minerals, water, organic matter and organisms. To solve their complex problems, we need complex mixtures of partners and solutions to protect, improve and benefit from them’.

Speakers made recommendations on actions to transform Africa’s agriculture, including translating

scientific analysis into action, strengthening rural management, reviewing legislation from the bottom up, to replicate and scale up successes in sustainable land management, establishing flagship projects on land restoration and strengthening extension services. They also highlighted actions currently underway by governments, including enabling policies and structures for sustainable land management, initiatives for climate-resilient agriculture, insurance schemes, fertilizer subsidies and rainwater harvesting. Also emphasized was the need to link discussions at international level to local level and root them in soil. It was noted that the German Federal Ministry of Economic Cooperation and Development (BMZ) has established programmes to improve food security while protecting the environment.

In closing, speakers from Deutsche Gesellschaft für Internationale Zusammenarbeit, BMZ, United Framework Convention on Climate Change (UNFCCC), African Union and the Government of Kenya highlighted key issues in the transformation of agriculture and rural development. The role of women in sustainable land management and agriculture was one. Others included incorporating youth in agriculture and value chains, linking soils to business, incorporating youth and creating local ownership of processes to improve production.

‘Climate change is impacting food security’, said Martin Frick, senior director for Policy and Programme Coordination at UNFCCC. ‘Climate-resilient agriculture has a carbon benefit that should reach farmers. I have just learned today of the incredible capacity of ICRAF to monitor and map soil organic carbon at relevant spatial scales. This advancement in technology can help link farmers to the carbon market’.

‘Findings of fora such as Global Soil Week should find their way into policy making so that the urgency can permeate and for right decisions’, said Hamadi Boga, principal secretary, Ministry of Agriculture in Kenya. ‘If we have to transform agriculture in Kenya, we have to deal with soil, data and resilience. We need to work with other Government ministries and development partners to find lasting solutions to soil issues and food security.’



Panelists at the closing session. From left, Tim Christophersen, UNEP; Martin Frick UNFCCC; Joan Kagwanja, African Land Policy Centre; Fatoumata Tall, GRAF; Christel Weller-Molongua, GIZ; and Elvis Paul Tangem, African Union. (Photo: IISD)

Staff Updates

Staff Arrivals



JUDITH MUGAMBI
Project Assistant,
Kenya



**EVERLYNE
OBWOCHA**
Programme
Assistant, Kenya
Office

ERIK ACANAKWO
Junior Research
Assistant, Uganda
[NOT PHOTOGRAPHED]

Staff Departures



**LOES VAND DER
PLUIJM**
Project Coordinator
FBLN

Staff Visitors

- Mary Njenga supervised interns, Jessica Rudd and Siri Ranung from the Royal Institute of Technology in Stockholm, Sweden who researched cleaner cooking methods
- The regional office welcomed a new intern, Melda Odima in the finance department

Publications

Duguma, L.A.; Atela, J.; Minang, P.A.; Ayana, A.N.; Gizachew, B.; Nzyoka, J.M.; Bernard, F. Deforestation and Forest Degradation as an Environmental Behavior: Unpacking Realities Shaping Community Actions. *Land* 2019, 8, 26.

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