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Discussion brief

Can Agroforestry Address Food Security Concerns in a Changing Climate?



*A Lubuk Beringin villager shows a palm nut fruit, Indonesia
Photo: Tri Saputro/CIFOR (CC BY-NC 2.0)*

Do agroforestry systems produce more and a greater range of ecosystem services than segregated agriculture and forestry systems? Agroforestry practices and multi-functional landscapes have recently returned to the forefront of discussion in response to challenges of the conventional agriculture systems.

Diverse and mixed cropping systems are at the heart of agroforestry, and scientists and practitioners alike claim that well-established and highly productive agroforestry systems (AFS) can reduce the effects of climate change and poverty as well as increase food security and nutrition when compared to monocropping (the cultivation of a

About this brief

This brief is based on the workshop “Can agroforestry address food security concerns in a changing climate?” held at Chalmers University of Technology, Göteborg, Sweden in November 2014. The workshop brought together leading scholars-practitioners from five parts of the world - Sweden, Nepal, Sri Lanka, Kenya and Ecuador - to share knowledge of and aspirations for agroforestry systems. This brief is about the issues and discussions raised at the workshop.

KEY FINDINGS

1. A sustainable approach to agroforestry expansion and intensification should promote long-term gains, not only short-term outputs.
2. Scaling up agroforestry systems takes time and effort. Clear policies and their effective enforcement as well as the choice of empowerment instruments should suit local context and should take into account local needs in terms of social, historical, cultural, and ecological aspects.
3. Livelihoods, income and food security of the farmers are the priority. Listening to farmers and understanding their needs, motivations and constraints is key. Potential incomes from climate mitigation strategies can only be a co-benefit.
4. There is not enough research about trade-offs, synergies, and risks between the preferred choices made by individual farmers and those options that are most preferable from climate mitigation or an ecosystem services perspective.
5. Creating incentives and institutional support for creation of global niche and bulk markets is essential. Private sector investment incentives could be made through improved land tenure for farmers, well developed long-term management strategies and reduced institutional barriers to market access.

single species). Such claims have renewed interest in agroforestry systems that use diversity and mixed cropping patterns to drive their productivity.

Agroforestry is the intentional mixing of trees and shrubs into crop and/or animal production systems to create environmental, economic, and social benefits. Agroforestry systems are common all over the world, can be found on 43% of all agricultural

land globally and represent categories such as silviopastures, alley cropping, parklands, and home gardens.

Different cases from Sri Lanka, Ecuador, Nepal, and Kenya highlighted both different and similar preconditions that need to be in place if any AFS are to be successful. All cases highlighted the importance of listening to farmers and understanding their needs, motivations and constraints as well as the need to pick up and facilitate the empowerment instruments suitable for a particular context. As size and value of an agroforestry project are often small, it is important to be realistic of what agroforestry can deliver and not view agroforestry as a panacea.

Can agroforestry systems provide enough food for the growing population while managing negative climate impacts? Answering this question unveiled a vivid discussion which includes the following points:

- Growing agroforestry systems
- Developing agroforestry products
- Securing the land
- Focusing on farmers

Growing agroforestry systems

Given the escalating global demand for land, intensification of land use systems to increase production is necessary. Agroforestry practices claim to fulfil these requirements; however, the intensification potential depends on the landscape as locality often dictates the need and intensity. The time frame available for an agroforestry project is also important because trees take more than a year to grow to become productive and exert economic and ecological functions. Any intensification or expansion approach requires a detailed cost-benefit analysis to assess the effects on the local ecosystems, community and culture as well as the consequences for the involved land-users and other stakeholders. Any sustainable intensification approach should also promote and focus on long-term gains and not only on short-term outputs. If intensification initiative has little or no support to food security, it is not desirable.

Barriers to intensification or expansion have similar characteristics, but are locally and context specific. Barriers include tenure, labour, market possibilities,

knowledge, mentality shifts, organisational structures, land availability, and interaction of wildlife and livestock. Opportunities include higher production, enhanced food security, and lower risks for farmers due to higher and more diversified outputs from various crops and animal components of the systems.



Agroforestry system in Sri Lanka. Photo: Eskil Mattsson

AFS can be scaled up to support livelihoods, improve food security, restore ecosystem services, and reduce deforestation. Such measures take time, effort, clear policies and their effective, enforcement, and suitability to local needs. Scaling up AFS requires process ownership, involvement and transparent dialogue by all stakeholders as well as profound knowledge of the local context in terms of social, historical, cultural, and ecological aspects.

Developing agroforestry products

Moving locally produced products further up the value chain requires identification of investment sources and opportunities. Investments in farmer cooperatives, whether private or public, capture value of production locally. Certification plans that have socially inclusive and ecologically sound production criteria and provide economic benefits can also help to commercialize local products. To reduce investment risks, one could aim for both niche and bulk products for local as well as global markets. This also includes incorporating local and independent producers or cooperatives in co-management that are familiar with the local social and cultural context. Such actors could be given incentives for extending their portfolios to increase their demand from a range of local products.



Banana plant in a home garden. Photo: Eskil Mattsson

Institutional support for creation of global markets is essential. It could include incentives, tax exemptions, local consumption mandates, provision of market analyses, and financial support for certification. Similarly, institutional contexts need to enable private investments in agroforestry through, for example, improved land tenure for farmers, a plan for long-term management and access to markets. New markets for new products could be promoted, e.g. new non-timber tree products such as *Ilex guayusa*, new production approaches for well-established products such as charcoal, or products that have been produced under Payment for Ecosystem Services such as coffee and cocoa.

Securing the land

Tenure rights need to include secure long-term rights to access both markets and land. AFS policies need to support bottom-up self-organizations which are more tenable than top-down imposed tenure systems. Agroforestry legislation and policies need to have framework for both those areas where AFS are expanding and where they are constrained.

There is a need to support AFS globally, not just in developing countries. At the same time it is clear that there is no one-size-fits-all solution for agroforestry, especially in terms of tenure rights. An agroforestry policy that is good to work with has to include a range of policy options with instructions how to adapt it to different localities. It is important to have in mind that development discourses and policies that are those repeatedly emphasize increased production of specific crop or animal products threaten sustainable agroforestry.

Focusing on farmers

Farmers should always be a priority. What matters most for households is food and income. Potential incomes from carbon capture through carbon finance schemes can only be a co-benefit, if at all. There are trade-offs, synergies, and risks between the preferred choices made by individual farmers and those options that are most preferable from an ecosystem services perspective. These synergies and trade-offs are locally-specific and need further research to assess their potentials and implications. Even if AFS holds many promises on multiple scales it is important to accept that forests and traditional agricultural systems can be fully justified only in cases where they make sense in terms of agricultural productivity and



Vegetables in a dry-zone agroforestry system. Photo: Eskil Mattsson

social life. Quantitative and qualitative research on where agroforestry systems are most suitable is necessary. This research must consider ecological, social, and political perspectives and identify where most ecosystem services created by AFS can be generated.



Lush homegarden in Beralihela, Sri Lanka. Photo: Eskil Mattsson

Learning more

Agroforestry systems capture a wide variety of practices and agro-ecosystem types. Thus, integrated models can teach what roles agroforestry can play to optimize and predict sustainable food productions with the help of pre-assessments of strategies. Such strategies can include climate adaptation, resilience or coping needs, markets, and income sources and they can yield evidence on productivity of different AFS using a common approach.

Scaling up AFS could provide more products for niche and bulk markets. It is worth exploring a collaborative process where local, existing, and new knowledge is taken into account by all relevant stakeholders as well as lobby organizations. Currently there are few studies that examine the power structures of conventional food production at national and sub-national levels. In many countries there has not been made a comparison between AFS and conventional systems in terms of productivity, environmental impact, subsidies and markets. Impact evaluation of certification initiatives and identifying potentials and bottlenecks of whole value chains also requires further research.

This brief is written by Eskil Mattsson, PhD.

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The views presented are solely the author's.

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