Policy brief

SHOULD AGROFORESTRY BE USED AS FARMERS RISK MANAGEMENT

KEY MESSAGE

- ✓ Global warming's **grave consequences** can be seen within and beyond the agricultural community
- ✓ Global warming impacts food security and terrestrial ecosystems, and is contributing to desertification and land degradation in many regions of the world.
- ✓ Heatwaves, droughts, dust storms, desertification, heavy rainfall, changing rainfall patterns impact humans and nature, and will **continue to do so** in the future.

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Introduction

Agriculture remains the main source of livelihood for households in the rural populace of sub-Saharan Africa. It plays a crucial role in the economic development and contributes significantly to the gross domestic product (GDP) of sub-Saharan African countries. However, population growth coupled with land degradation is aggravating the challenges of crop production (Tscharntke et al., 2012). Previously, farmers had compensated for yield decline due to soil impoverishment by clearing virgin forests to extend their farmlands. Nowadays, improving crop production by intensification cannot be practiced because of population growth and the necessity of stability of provisioning ecosystem services (Hardaker et al., 2021). Beside soil fertility decline and land degradation, climate change currently represents the major threat to agriculture and sustainability of rural households' livelihoods in West Africa with potential negative impacts on crops productivity and food security (Kone et al., 2022; Matiu et al., 2017; Ray et al., 2015).

Approach

The main communities in the study area were selected for the study. The communities were The pilot sites chosen for the study were done in accordance with the different community groups and agroforestry practices. Random sampling (Zheng et al., 2006) was used to select pilot sites according to the distribution of communities after the reconnaissance survey of all

the sites where agroforestry was practised. Farmers were selected from each pilot site using the snowball purposive sampling technique.

Key findings

Agroforestry practices are intentional combinations of trees with crops and/or livestock which involve intensive management of the interactions between the components as an integrated agroecosystem. These four key characteristics - intentional, intensive, interactive and integrated - are the essence of agroforestry and are what distinguish it from other farming or forestry practices. To be called agroforestry, a land use practice must satisfy all of the following four criteria:

- ✓ **Intentional:** Combinations of trees, crops and/or animals are intentionally designed and managed as a whole unit, rather than as individual elements which may occur in close proximity but are controlled separately.

- ✓ **Intensive:** Agroforestry practices are intensively managed to maintain their productive and protective functions, and often involve annual operations such as cultivation, fertilization and irrigation.
- ✓ **Interactive:** Agroforestry management seeks to actively manipulate the biological and physical interactions between the tree, crop and animal components. The goal is to enhance the production of more than one harvestable component at a time, while also providing conservation benefits such as non-point source water pollution control or wildlife habitat.
- ✓ **Integrated:** The tree, crop and/or animal components are structurally and functionally combined into a single, integrated management unit. Integration may be horizontal or vertical, and above- or below-ground. Such integration utilizes more of the productive capacity of the land and helps to balance economic production with resource conservation.

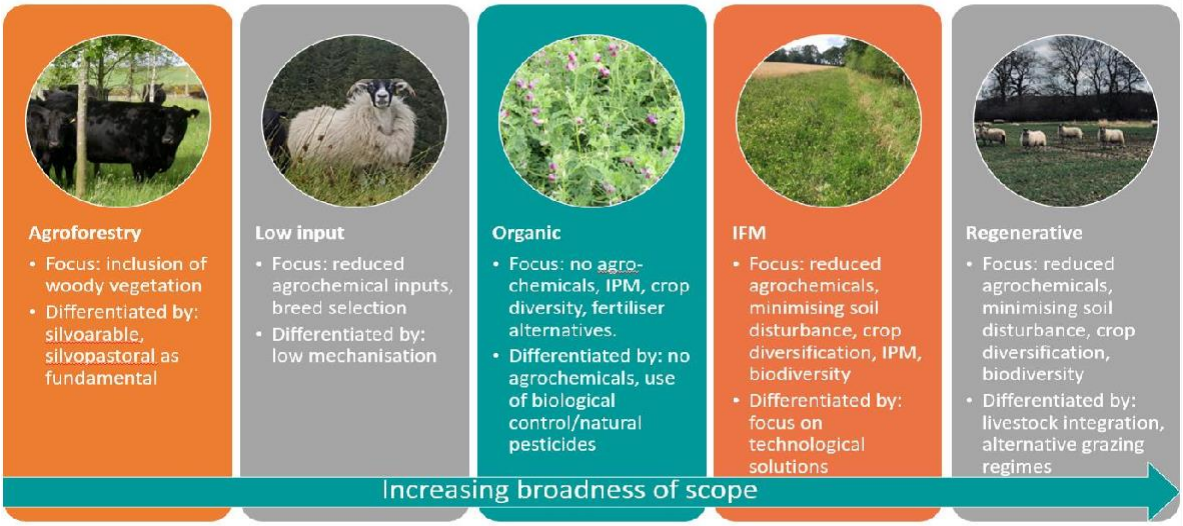

Figure1. Agroforestry system

Trees species in agroforestry system

The indigenous tree species constituted 85% while the exotic was 15 %. The indigenous trees were more represented (84.21 %) and 15.79 % for exotic. For conservation status, 47.36% of trees were Least concerned (LC); 39.47 % were Not Evaluated (NE); 7.89 % were Vulnerable and 2.64% respectively were Near Threatened (NT) and Endangered (EN).

Population structure of trees species in the agroforestry systems

To assess the structural characteristics of trees species, the top 10 most frequent tree species were considered taking account their structural characteristics. The top four of them were as follows *Vitellaria paradoxa, Parkia biglobosa, Anarcadium occidentale and Lannea macrocarpa* (Figure 2).

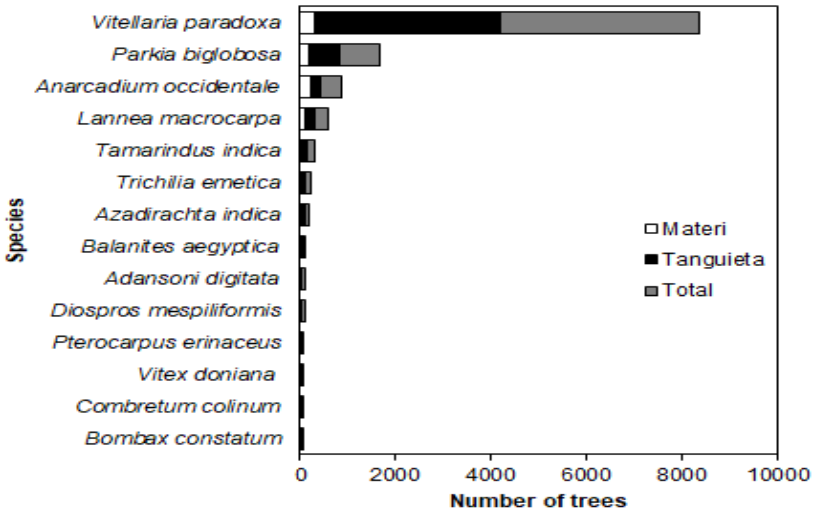

Figure 2. Top 10 of the most frequent tree species inventoried in the two studied districts

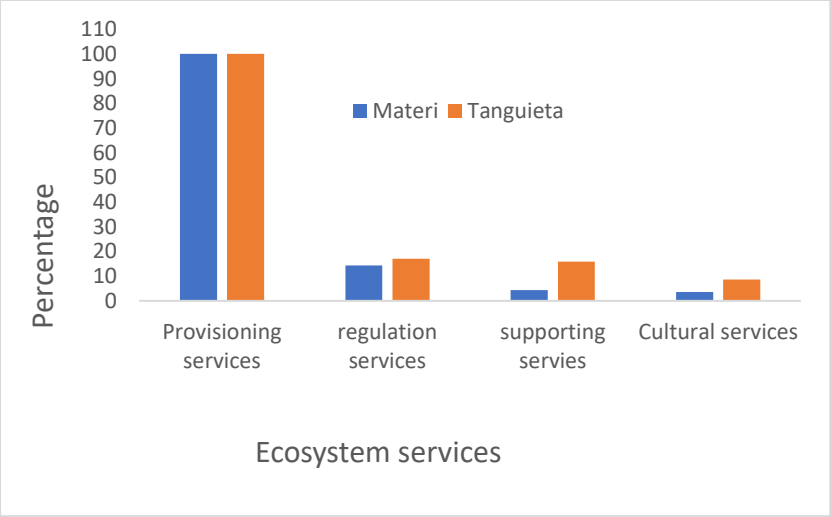

Figure 4. trees services in agroforestry system

Recommendations to policy- and decision makers

- Support local communities in implementing agroforestry practices to tackle climate change.
- Secure land tenure rights and create incentives to encourage farmers to invest time and money in land use practices such as agroforestry.
- Make agroforestry visible, by exploring policy changes to include agroforestry, for instance in development co-operation strategies, technical assistance and budgets. A starting point is to make it easier to identify if development cooperation includes support to agroforestry.
- Develop strategies, frameworks and indicators at all levels to continuously measure progress in agroforestry systems and their climate benefits.
- Create effective, cost-efficient and equitable policies by using agroforestry to combine climate change adaptation and mitigation, as well as their cross-cutting synergies, with economic development.
- Connect agroforestry to the climate agenda and report progress: United Nations Framework Convention on Climate Change (UNFCCC), supporting agroforestry makes sense from both an adaptation and mitigation standpoint

ACKNOWLEDGEMENT

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SPONSORED BY THE

Federal Ministry of Education and Research

Zentrum für Entwicklungsforschung
Center for Development Research
University of Bonn