REFOREST PROGRAMME POLICY BRIEFS - APRIL 2025

ETHIOPIA

Improved Avocado Cultivars Enhance Soil Fertility, Food Security and Income for Smallholder Farmers in Ethiopia

Introduction, Rationale and Methodology

The improved avocado cultivation aligns well with Ethiopia's Agroforestry Development Strategy, which aims to enhance production, productivity and functions of agroforestry systems across the country through extensive demonstration and implementation of improved technologies. Enhancing agricultural productivity through appropriate interventions, particularly for smallholder farmers, is a key policy priority in the country. Improved avocados account for 10% of total fruit production in Ethiopia and are gaining attention due to their high yield, shorter maturation periods and potential for diversifying income sources. Ironically, some farmers are hesitant to integrate avocados into their croplands, because of the perception that they compete with other crops for nutrients and water. However, there is limited scientific evidence on the extent to which improved avocados contribute to soil fertility, food security and income diversification in Ethiopia. This policy brief presents research findings on four-year PhD study on the effects of improved avocados on soil fertility and their contribution to income diversification and food security.

The study was conducted in Central Region of Ethiopia covering Jewe and Upper Gana kebeles. A total of 112 soil samples were collected from three different radial distances from the avocado tree trunk, at depths of 0-20 cm and 20-40 cm. The physical and chemical properties of these soil samples were analyzed. Additionally, 164 households cultivating improved avocado cultivars in the two Kebeles were interviewed using a semi-structured questionnaire. Information from focus group discussion and key informant interviews supplemented household survey data.

Findings and Policy Implications

- Ettinger, Hass & Nabal avocado cultivars had a significant effect in improving soil properties. Soil under Hass had a relatively higher total nitrogen and available phosphorus content than control soil while Nabal soil showed high soil organic carbon. Integrating Hass and Nabal cultivars into the cropping system improves soil nutrients.
- These avocado cultivars, on average, accounted for 14% of household annual income and 10% of food consumed in the studied kebeles. On average a household harvested 155 kg of avocado fruit per year. About 64% of the avocado production was used for income generation and 35% for home consumption and dietary diversity. This indicates that promoting and supporting the adoption of these avocado cultivars is an effective strategy to enhance livelihoods of smallholder farmers.

- This study revealed that farmers have diverse perceptions on advantages and disadvantages of improved avocado farm integration. There is a gap between farmers' perceptions on incorporation of avocado cultivars into their farmland and the measures implemented to address the adverse effects of improved avocado cultivation.
- Furthermore, farmers' decisions regarding the integration of improved avocado on their farms were significantly influenced by security of land tenure, tree management practices, availability of family labour, access to grafted seedlings and competition between improved avocados and annual crops.

Policy recommendations

- Policymakers should strengthen security of land tenure for smallholder farmers, to enable the integration of fruit tree on-farm.
- The cultivation of improved avocado in agroforestry systems be prioritized in the National Agroforestry Development Strategy.
- Address farmers concerns by increasing support for adoption of improved avocado cultivar through extension services and access to planting materials; and

- Enhance research and development in collaboration with relevant organization to increase access to high-quality grafted avocado seedlings.

Photo: On farm integration of improved avocado

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This Policy Brief is derived from Hadia Seid PhD research (2000 to 2024) financed by Sida through REFOREST Programme hosted by College of Forestry Wildlife and Tourism at Sokoine University of Agriculture, Tanzania. The study was supervised by Prof John F. Kessy, Prof Sigrun Dahlin and Prof Zebene Asfaw.

Participatory Forest Management Successes and Dilemma for Effective Implementation of REDD+ Initiatives in Ethiopia

Introduction, Rationale and Methodology

Ethiopia targets to restore and sustainably manage 22 million hectares of forest land by 2030. This commitment has been included in the country's climate policies, strategies and programs. To reduce the ever-increasing deforestation, PFM was introduced to engage the local communities in sustainable forest management and utilization.

Currently, PFM in Ethiopia covers about 2.5 million hectares and it is intended to serve as a mechanism for implementing REDD+ initiatives. There is significant synergy between the goals of PFM and those of REDD+ as regards in reduction of forest loss, increasing forest cover and generating long-term benefits to local communities. PFM practices do not always enhance forest conditions or carbon storage. The overall objective was to assess the potential of PFM for REDD+ implementation at the Adaba-Dodola community forest in Ethiopia as part of PhD study, with this Policy Brief as part of outputs. The study compared PFM and non-PFM managed forests.

Biodiversity and carbon stock assessment were conducted through forest inventory while deforestation rate and forest enhancement were assessed through Land Use Land Cover Change (LULCC) analysis. additionally, forest governance was examined through in-depth interviews, focus group discussions, and analysis of relevant documents.

Findings and Policy Implications

Based on the results of the study, the following are the key findings and policy implications:

- **Carbon stock:** The mean aboveground biomass carbon stock of PFM forest (225.5 t/ha) was significantly greater than that of the non-PFM forest (156.2 t/ha). This implies that PFM forests can potentially improve forest carbon stock by 69% compared to non-PFM. Assuming zero leakage, PFM is therefore contributing about 254.2 tCO_2eq/ha. Activities such as forest patrol, land use plans' enforcement and enhancement of regeneration increased carbon storage.
- **Biodiversity:** Stem density was 5115 stem/ha in PFM and 2114 in non-PFM, implying that PFM potentially improved number of stems per ha by 41%. Additionally, there was higher woody species richness (29 in PFM and 23 in Non-PFM forests).
- **Forest regeneration:** In terms of seedlings and saplings, there was a significant higher recruitments (3619 and 710 respectively) in PFM compared to non-PFM (1610 and 310 respectively) .

This implies that there is more effective forest regeneration in PFM than in non-PFM areas. PFM is more effective in contributing to the REDD+ goals of enhancing carbon storage than non-PFM.

- **Deforestation and Forest Cover:** In the period 2000 to 2023, the annual deforestation rate was 0.23% in non-PFM while the annual forest gain was 0.3% in PFM areas. In the same period, agricultural land increased by 0.42% per year in non-PFM sites but decreased by 0.1% per year in PFM areas. Therefore, the increase in forest cover is attributed to the effectiveness of PFM in reducing deforestation and promoting forest conservation.
- **Local Forest Governance:** The local forest governance in the Adaba-Dodola PFM was rated as moderate. Whereas the legal and policy framework was rated as working well, the planning and decision-making process scored medium performance, while the implementation and law enforcement were rated as inadequate. Low transparency and accountability, political interference, lack of independent community organizations, inadequate staff capacity (in the judicial system and forest agencies), weak inter-sectoral coordination, corruptions and lack of non-forest-based livelihood alternatives were identified as the major governance weaknesses. PFM governance was rated as inadequate, limiting the potentials of REDD+. This implies a supportive legal and policy framework is needed in PFM areas to achieve the intended goals of the REDD+ and reduce governance dilemmas.

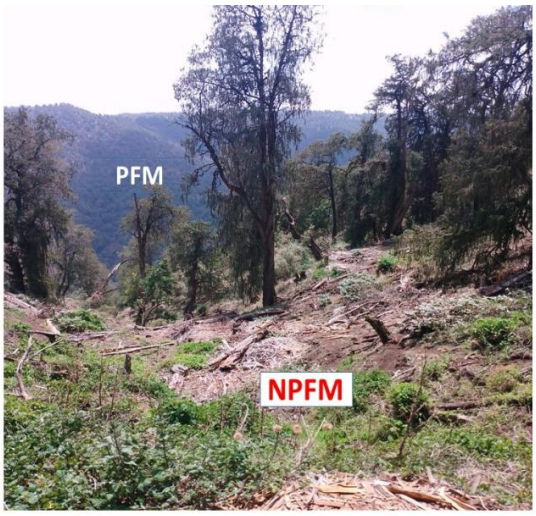

Photo: Forest degradation under Non-PFM

Acknowledgment

This Policy Brief is based on PhD research study entitled 'The Potential of Participatory Forest Management for Effective Implementation of REDD+ in South-eastern Ethiopia) carried out by Lemma Tiki with supervision of Jumanne M. Abdallah (Sokoine University of Agriculture, Tanzania), Kristina Marquardt (Swedish University of Agricultural Sciences, Sweden) and Motuma Tolera (Hawassa University, Ethiopia). Swedish International Development Cooperation Agency financially supported the study through the REFOREST Programme

Views expressed in this policy brief do not necessarily represent those of SUA, Partner Universities, the REFOREST Programme or Sida.

The Need for Policy and Regulatory Frameworks to Support Traditional Herbal Medicine in Ethiopia

Introduction and Rationale

One-third of the world's population, especially in developing countries, relies on traditional medicine for primary healthcare needs. Many countries lack regulations over conventional medicine products and practices, hindering access to better healthcare. Approximately 80% of Ethiopians depend on herbal medicines for their primary healthcare needs. However, the safety, efficacy, and standard of herbal-based treatments are weak due to lack of regulatory frameworks. The country established "Proclamation 27/1942 and the health strategy since the 1970s but focusing on disease prevention and health promotion particularly for rural health facilities. The Office for the Coordination of Traditional Medicine was established in 1979, but there is a lack of direction and resources for implementing activities. Traditional herbal medicine practices and products remain uncontrolled, and their safety and therapeutic usefulness are not always assured.

There are no regulatory mechanisms for guiding sales of herbal medicines, or guidelines for clinical trials using traditional medicines. This policy brief presents research findings and recommendations on gaps, weaknesses, challenges, and opportunities in implementing traditional medicine practices and product regulation in Ethiopia.

Findings

- Formal recognition of traditional medicine in Ethiopia was given in 1942 (Proc. 27). This was reaffirmed in 1943 and 1948 (Proc. 100) Medical Registration Proclamations. Articles in the Ethiopian Penal Code (512/1957) and the Civil Code (8/1967) provide guidelines for the practice of traditional medicine. However, requirement for registration was not stipulated.
- The National Policy on Traditional Medicine was issued as part of the Health, Drug, and Science & Technology Policy issued in 1993 and Proclamation No. 1112/2019 established Ethiopia's traditional medicine regulatory legal base. However, traditional medicine is defined as 'medicine' under Proclamation article 2/9, while this proclamation does not address the definitions of traditional medicine practice and practitioner.
- Currently, there is no officially registered traditional medicine product by the regulatory authority, although some galenic formulations exists in the market. Some regional health bureaux authorize the registration of traditional medicine practices.

- Code of ethics for traditional medicine practices, the traditional medicine national expert committee, traditional medicine local production, national monographs for traditional medicine, the traditional medicine national pharmacopeia, the national plan for integrating traditional medicine into the national health service delivery, and related information are not included in Ethiopia's traditional medicine policy.
- No specific legislation on the protection of indigenous knowledge and associated flora therefore intellectual property rights are at risk of infringement.
- There is overlapping of functions, powers and responsibilities with conventional medicines because of absence of specific policies, laws, and regulations for traditional medicine.
- There are no regulations on the collection of medicinal plants, particularly; endangered and rare plant species.
- There are inadequate human resources, finance, research institutions, and quality control laboratories, regulatory tools (such as traditional herbal medicine checklists) inadequate training and a lack of support to healers.

Policy recommendations

- Establish a policy, regulatory framework and declaration for traditional herbal medicine. For a well-informed policy the processes may involve researchers to assess the current state of practices, legal foundation, obstacles, and the necessary assistance required for regulatory personnel and herbal medicine practitioners;
- A formal recognition and participation of traditional healers is necessary;
- Establish a traditional herbal medicine regulatory authority that will ensure customers' safety, efficacy and quality of herbal products before being registered in the same way as for conventional medicines.
- Ensure that the forest policy (Proclamation No. 1065/2018 1992) is enforced to also support conservation of traditional herbal medicinal plants. Conservation and management efforts should be undertaken to promote the diversity and protection of rare and endangered plant species; and
- Support preservation of the indigenous knowledge of useful herbal plants and their utilization.

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Promoting Ziziphus Fruits Production and Utilization in Ethiopia

Introduction, Rationale and Methodology

In Ethiopia, about 52 species of edible wild fruit trees have been identified, offering health, economic, environmental and cultural benefits. Among these, the Ziziphus species is of particular interest because of diverse values it provides to the communities. Collection and utilization of wild Ziziphus fruits is integral part of rural households livelihood in many parts of Africa. In Ethiopia, Ziziphus fruits are appreciated for their nutritional values and income generation. They are known for lowering sugar and fat levels in the blood system, rich in fibre, vitamins C & B and fatty acids. In times of food shortage, they serve as emergency food mainly for rural communities. Despite this potential, the fruits are often underutilized and overlooked, although their value has gained increasing recognition in recent years. Ziziphus fruits are valued as supplementary foods and are highly regarded across Asia, the Middle East and Africa. They are consumed raw, pickled or processed into beverages, jams, jellies and juices.

Despite their importance, Ziziphus species have received limited attention in Ethiopia, primarily due to low awareness, cultural beliefs and perception across different age groups and gender. The impact of these factors on harvesting and utilization varies across regions and among different ethnic groups. Furthermore, the production, harvesting and quality of Ziziphus fruits are influenced by both abiotic and biotic factors. To address the challenges related to the cultivation and utilization of wild Ziziphus fruit trees, is essential to enhance local perceptions on their values.

A study on "Utilization, Morphological Traits, and Insect Pests of Ziziphus Species Fruits in Ethiopia," was conducted over three years in two distinct agroecological zones and three different land use types namely the Eastern Shewa Zone of the Oromia Regional State and the Oromia Special Administrative Zone of the Amhara Regional State, Ethiopia. Data collection involved household surveys, key informants interviews and focus group discussions. Data collected

included fruit characteristics, associated insects, morphological traits/dynamics and fruit utilization patterns.

Findings

The findings revealed the following:

- Ziziphus fruit yield per tree varied among the study sites;
- Extent of cultivation and marketing was low at all study sites;
- Women and children were the main collectors and sellers of the fruits;
- Low Ziziphus cultivation, harvesting and marketing was attributed to inadequate community support, weak oversight and low market prices.
- Culture and biotic factors were identified as major hindrances to the production and sustainable utilization of Ziziphus fruits.

Policy Implications

- Low awareness on the importance of this Ziziphus fruit, resulting in low cultivation. Training is needed to raise awareness and address negative cultural influences that affect production and utilization of Ziziphus fruits. The training should include also nutrition values of the fruits and processing mechanisms that stimulate off-farm economy.
- The government and stakeholders should support youth and women to create enabling environment that will promote reaerch, cultivation, value-addition, utilization, preservation and marketing of Ziziphus fruits and other products.
- Develop and implement management strategies to control diseases and insect pests, including training;
- Promote domestication of Ziziphus trees to increase fruit production;

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