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# **Background**

Ethiopia has an area of 1.14 million square km, and it is the 7th largest and the second populous nation in Africa with about 100 million people. The country has diverse ecology and biodiversity owing to its location in the tropics and its land physiognomy. However, much of the natural vegetation is greatly deforested and depleted. Because of the deforestation and the expansive agriculture in Ethiopia and the mountainous and rugged topography, much of the Ethiopian landscape is highly degraded.

The Government of Ethiopia, together with development partners, has been undertaking several initiatives as remedies to avert the situation such as afforestation and reforestation, participatory forest management, sustainable land management and watershed protection. However, the magnitude of the problem is immense, and coupled with the rapidly increasing population puts pressure on the country’s natural resources. Whereas the natural forest in Ethiopia shrank from 14.6 million ha in 1990 to 11.5 million ha in 2015, the planted forest increased from 216,000 ha in 2000 to 972,000 ha in 2015. Analysis of the contribution of the formal forest sector to employment and GDP of Ethiopia in the year 2011 showed that 9,000 people got employed in round wood production, wood processing and pulp and paper industries, and the sector contributed to 3.2 % of the GDP.

The major challenges of plantation and agroforestry (PAF) research include prioritization of research problems that need to be addressed to meet the stakeholders' expectations, getting seeds of target species and provenances in the right amount and quality, emerging problems such as eucalypt insect pests, less success on on-farm trials due to open grazing and poor post-planting management including watering. The opportunities for PAF research and development are many, and they include that forestry is an important pillar of the green economy strategy of the country, the commitment of the government towards forest landscape restoration, and afforestation/ reforestation is also considered essential to achieve many of the sustainable development goals Engaging MSc and PhD students in research is another opportunity to carry out biophysical and socioeconomic studies on project sites. Wide ranges of scholarly articles are available, and metanalysis is possible for adaptation and policy brief preparation. Engaging MSc and PhD students in research is another opportunity to carry out biophysical and socioeconomic studies on project sites. Wide ranges of scholarly articles are available, and metanalysis is possible for adaptation and policy brief preparation. PAF can use biotechnology for technology generation and ICT based tools for efficient data collection, databases and extension of technologies to end-users.

# **National Priorities in Afforestation and Reforestation**

The Climate Resilient Green Economy (CRGE) strategy of Ethiopia outlines that 3 million hectares of land would be put under afforestation and reforestation and 4 million ha of forests and woodlands under sustainable forest management by 2030 for improved abatement potential. The second Growth and Transformation Plan (GTPII) has been under implementation as of 2015/16 to 2019/20. The GTPII agricultural sector development plan targets for accelerated and sustained growth of agriculture within the framework of the Climate Resilient Green Economy Strategy and include increasing the area of watersheds supported with physical soil and water conservation structures from 8.12 million hectares in 2014/15 to 27.23 million hectares by the end of the plan period. Also, the GTPII sets a target of increasing the national forest coverage from 15.5% in 2015/14 to 20% by the end of the GTP II period.

Furthermore, Ethiopia has pledged to restore 15 million hectares of land by 2030 under the Bonn Challenge. The Bonn challenge commitment of country expounded to 22 million hectares in the UNFCCC summit in New York for the implantation of the Paris Agreement. Ethiopia is also party to the Pan African Great Green Wall for the Sahel and Sahara Initiative (GGWSSI) to establish a green wall to prevent the expansion of the Sahara Desert. Thus, the country has shown great interest in forest landscape restoration and forest creation.

The National Forest Sector Development Program (NFSDP) stipulates to serve as the general framework for the enhancement of sustainable forest management in the country from 2016 to 2025. It identifies different programme areas, which include forest production and value chain, forest environmental function, urban greening and urban forests, and forests and rural livelihoods program areas. Thus, research in plantation and agroforestry would be highly relevant to all the above programme areas.

# Besides, the PAF research could contribute to the sustainable development goals (SDGs) through livelihood improvement, improved environment, better nutrition, improved water production and hydrological cycle, improved forest products supply, improved resilience and adaptation and mitigation to climate change, preservation and restoration of ecosystems and biodiversity, and through gender-sensitive and gender-equitable approaches and through establishment of strong partnerships in research and development.

# **Plantation and Agroforestry Research Directorate Goal and Programmes**

The goal of the Plantation and Agroforestry Research Directorate is to develop forested landscapes with economically important tree species and increase tree diversity in landscapes and agricultural systems for sustainable ecosystem products and services including climate change adaptation and mitigation. The Directorate aims at generating and adapting technologies and scientific information that are relevant for afforestation and reforestation in a Research in Development approach. The Directorate has identified the following five research program areas as relevant to Ethiopia based on plantation/agroforestry type and purpose: 1) Industrial Plantation Research, 2) Environmental Plantation Research, 3) Agroforestry Research, 4) Smallholder Plantations Research and 5) Urban Forests Research, each with 5 to 7 sub-programmes.

# Prioritization of PAF Programmes

The Directorate recognizes the need for prioritization of the above listed programme areas and sub-programmes in each of EEFRI’s Research Centers: Central Ethiopia, Bahirdar, Mekelle, Jimma, Hawassa and Diredawa. The prioritization would consider the following issues:

* + Identify priority research areas for the upcoming GTP period 2020/21-2024/25.
  + Align activities with national priorities and government commitments such as Forest Landscape Restoration (Bonn Challenge/ NYDF)
  + Align with the Sustainable Development Goals (SDGs)

The prioritization will guide allocation of resources (financial, physical and human) properly against priority activities and deliverables. PAF will seek funding sources to supplement government investments for the priority programs and sub-programs. PAF has developed a theory of change for clarifying priorities by defining goals and the path to reach them. PAF will work closely and form strategic partnership and collaborations with the 1) Federal and Regional Agricultural Research Institutes, 2) Strategically important public universities involved in forestry education and research, 3) Pastoral and Agro-pastoral Research Institutes and 4) the CGIAR’s Forests, Trees and Agroforestry Research Programme.

Structurally, the Plantation and Agroforestry Research Directorate has three Divisions: Agroforestry Research Division, Commercial Plantation Research Division and Environmental Plantation Research Division.

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