Deutsches Biomasseforschungszentrum
gemeinnützige GmbH

Press release

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Transformative Research International: nutrient-rich biochar for better soils and food security in Ethiopia

Soil degradation and low soil fertility in many African countries such as Ethiopia amplified by constant deforestation and overexploitation poses a major challenge to achieving food security. The problems are also exacerbated by climate change. Since 2021, the 'ETH-Soil' project, which is being implemented by the DBFZ and funded by the German Federal Ministry for Economic Cooperation and Development (BMZ), has been pursuing the goal of sustainably improving the living conditions of smallholder farmers in rural regions with food shortages by introducing new technologies and processes. Stakeholders from all areas of society have already been won over to the approach of using high-quality biochar-based fertilisers made from agricultural residues.

In the DBFZ project 'ETH-Soil - Soil improvement in Ethiopia through the energetic and material utilisation of agricultural residues with a special focus on education and training', technologies and processes are to be developed with the aim of sustainably securing the food supply of smallholder farmers in rural regions of Ethiopia (Oromia region). In collaboration with partners from research, education, agricultural advisory services and the private sector, expertise is being built up to significantly improve the fertility of degraded farmland in particular. Biochar produced by pyrolysis of nutrient-poor agricultural residues is combined with compost or fermentation residues from biogas plants to create a biochar-based fertiliser (PBD). The incorporation of this carbon- and nutrient-rich mixture into acidified or degraded arable land increases its storage capacity for water and nutrients. At the same time, the microbial biomass stimulates soil fauna, enzyme activity and plant root growth. This leads to an increase in soil fertility and crop yields in smallholder households. CO2 storage in the soil also slows down climate change.

After demonstration in small-scale field trials and the training of multipliers in previous years, a total of 244 smallholder households were recruited in 2024 to apply biochar-based fertilisers to degraded farmland. They were trained for this by the governmental agricultural extension service in the Oromia region. Implementation partners from the Oromia Agricultural Research Institute (IQQO) and the Faculty of Agriculture at the University of Jimma provided 110 tonnes of quality-assured biochar in three pilot districts and supplied the poorest households directly with test quantities of BBF. All other farmers used their own worm compost, manure or fermentation residues to charge the biochar with nutrients. They are currently sharing their enthusiasm about the increase in growth and yield on a total of 16.6 ha with dozens of their neighbors acting as multipliers of the approach. This will spur mobilisation of farmers and village communities for independent biochar production to start in 2025.

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The next level of sustainability is to be achieved in 2025 with the certification and commercialisation of the carbon sinks generated. Carbon sink certificates (carbon credits) will compensate the rural population for their efforts and incentivize the continuation and expansion of activities. The introduction of low-emission pyrolysis cookers will also enable the production of biochar with simultaneous heat utilisation at household level. Findings from the parallel soil research are incorporated into teaching at the Faculty of Agriculture at the University of Jimma.

BACKGROUND

ETH-Soil is a project of the DBFZ Deutsches Biomasseforschungszentrum gemeinnützige GmbH with a duration of 2021-2026, funded by the German Federal Ministry for Economic Cooperation and Development (BMZ). Together with the project partners from research, education and politics, the international project contributes to the 2030 Agenda for Sustainable Development. With ETH-Soil, the DBFZ is expanding its existing portfolio of projects and measures in Africa. This will enable technologies, expertise and experience to be incorporated into transformation processes for the benefit of the people of Ethiopia and Africa as a whole. Further information: www.eth-soil.com

Biochar for soil improvement in Ethiopia / Picture: @ DBFZ

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