



Multi-purpose Kiln for Biochar Production

Description

A biochar kiln is a specialised device used to produce biochar - a type of charcoal produced from organic materials through a process called pyrolysis. Pyrolysis yields a combination of solid (biochar), liquid (bio-oil), and gas (syngas) products.

Types of biochar kilns

- Top-Lit Updraft (TLUD) kilns: Small-scale kilns where biomass is loaded from the top and ignited, with airflow controlled to ensure pyrolysis.
- Traditional kilns: Include cone kilns and retort kilns, often used for larger-scale biochar production with controlled heating and airflow.
- Continuous pyrolysis kilns: Industrial-scale kilns that continuously process biomass, providing a more efficient and automated approach.



Multi-purpose Bio-char Kiln

Importance of biochar

- Enhances soil structure, water retention, and nutrient availability for improved plant growth.
- Biochar sequesters carbon in a stable form, contributing to climate change mitigation.
- Converts biomass waste into a valuable resource, reducing reliance on landfill disposal.

Challenges

- Access to efficient and affordable biochar kiln technology may be a barrier in some regions.
- Dependence on biomass feedstock availability and the need for a consistent supply.
- The benefits of biochar are not well-known making farmers reluctant to use it.

Country Example: Namibia

The Namibian University of Science and Technology (NUST) produced a small-scale Top-Lit Updraft (TLUD) kiln that has multiple purposes. It can produce biochar, cook food and heat water.

TLUD biochar process.



- Wood chips are loaded in the central chamber
- Water is added in the metal sleeve that surrounds the central chamber
- The woodchips are lit from the bottom.
- The kiln is sealed with a lid
- A pot of food is placed on top for cooking
- The water is heated by the burning woodchips
- Biochar is produced at the bottom and removed to fertilise the soil

Knowledge Sharing Centres

Below are the contact persons for country specific questions. Please refer to them or the Coordinator from Hochschule Wismar, for details about the technologies that have been piloted or project research, training, and dissemination activities that are being planned in your region or country. The project runs until May 2025, with Knowledge Sharing Centres established to continue the work beyond that date. More details available on the website <https://www.divagri.org>

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This fact sheet serves as a general overview of the above bio-based technology (BBT). It is one of seven BBT factsheets. It describes one prototype of this technology that was developed prior to 2023. Adaptations of it have been made for the various country and local contexts. Please contact the country Knowledge Sharing Centre for more details. The EU-funded DIVAGRI project (2021-2025), 'Revenue diversification pathways in Africa through bio-based and circular agricultural innovations' seeks to provide African subsistence and smallholder farmers with tools to sustainably improve farm productivity, profitability and resilience through improved management of farming resources, output diversification and creation of high-value circular bioproducts. For more, visit [divagri.org](https://www.divagri.org)



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101000348.