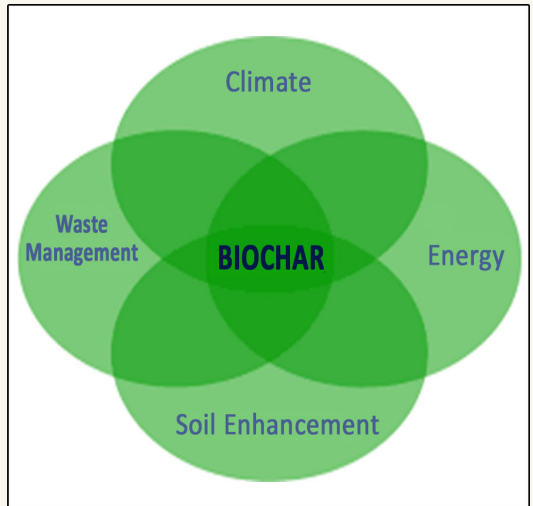


Meghalaya Community Biochar Initiative

a community centric endeavour for soil enhancement, livelihood improvement and climate resilience

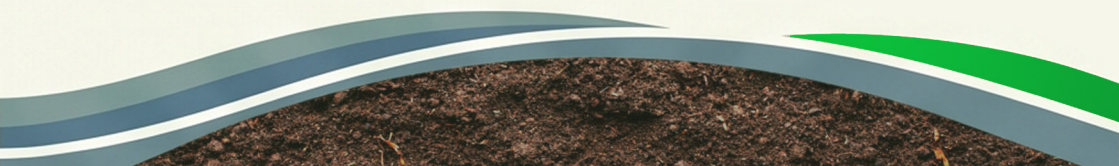
Meghalaya is uniquely positioned to advance sustainable development by integrating organic farming, climate resilience, and rural livelihoods. One promising solution that connects all these goals is **biochar**, a carbon-rich material produced through the pyrolysis of organic biomass in a low-oxygen environment. With the State's abundant natural resources and strong policy support for green initiatives, biochar has the potential to become a transformative tool for Meghalaya's climate resilient future.



Meghalaya Community Biochar Initiative

Envisioned for the State-wide scaling up, the Pilot Project on biochar has been initiated in two clusters one each in Khasi-Jaintia & Garo Regions of the State. Two mid-size Pyrolysis reactors have been installed at Umsli and Chenggalgre Biochar Production Plants. These Plants are located at the centre of clusters of bamboo growers and farmers. The salient features of the initiative are as follows.

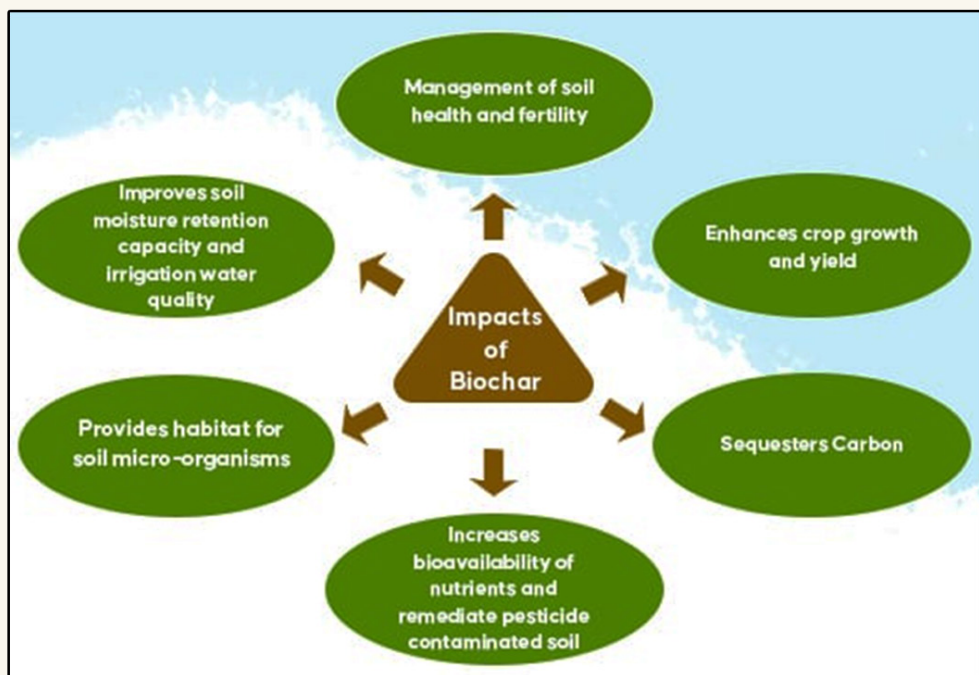
- » Cluster approach in partnership with the Farmers' Organizations/ Co-operative Societies
- » Soil improvement leading to organic and natural farming and agri - productivity enhancement are the primary objectives.
- » Create income generating opportunity by utilizing locally available biomass in sustainable manner – bamboo in the first phase
- » Convergence with the on - going Organic Farming Mission in the State in collaboration with MEGNOLIA
- » Employment creation in the cluster villages
- » Leveraging Carbon Credit benefits for the communities and other stakeholders
- » Contribute to the National and State's goals towards carbon emission reduction
- » Contribute to the State's green economy pathway and emission reduction goals
- » Collaboration with a technical partner for leveraging carbon credits
- » Collaboration with the research organisations like ICAR and BRDC



Soil Health and Agricultural Productivity

One of the most significant applications of biochar is its use as a soil amendment. Meghalaya's soils are mostly acidic, nutrient-deficient and prone to leaching. Biochar helps address these issues by:

- reducing soil acidity
- improving soil structure and porosity
- enhancing water retention capacity
- promoting beneficial microbial activity
- increasing nutrient availability and reducing leaching



These improvements lead to better crop yields and long-term soil fertility, making biochar specially valuable for sustainable natural and organic farming systems.

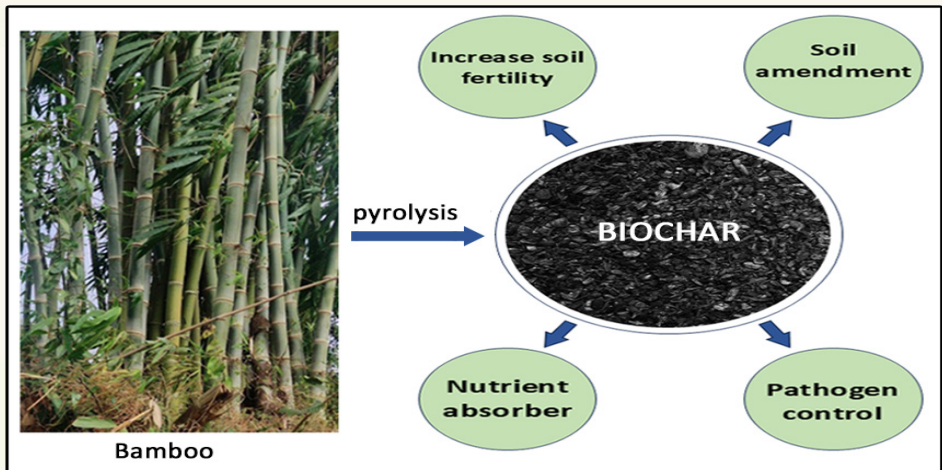
Climate Change Mitigation and Carbon Credits

Biochar plays a crucial role in carbon dioxide removal (CDR). During plant growth, biomass absorbs carbon dioxide from the atmosphere. When converted into biochar, this carbon becomes stable and can remain stored in the soil for hundreds to thousand years. This makes biochar a carbon-negative solution, helping reduce greenhouse gas emissions while improving soil health.

Due to its role in CDR, biochar generates **carbon credits**, which are increasingly valuable in global markets due to their durable nature. Each ton of biochar can produce multiple carbon credits, with prices currently going up to 180 US dollars and thus offering an attractive revenue stream. Platforms like Puro.earth facilitate the trading of these credits, making biochar projects economically attractive.

Biomass availability and Local Relevance

The State has a rich supply of biomass, including bamboo, agricultural residues, forest produce, and organic waste. Much of this biomass currently remains underutilized. It is often disposed off by burning, which leads to environmental degradation. Converting the biomass into biochar not only prevents waste but also creates a valuable resource that can be used across multiple sectors.



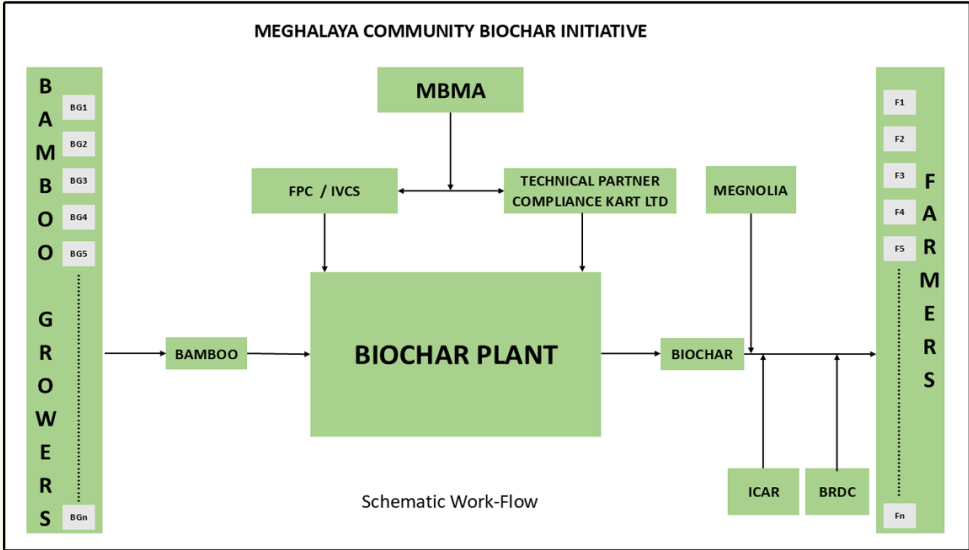
Bamboo, in particular, offers a major opportunity. Meghalaya has vast bamboo reserves—estimated at around 21 million tonnes—which can be sustainably harvested and converted into biochar. This creates a pathway for developing a **bamboo-based green economy**, generating employment and supporting community-based biochar enterprises and meeting demand for soil amendment.

Economic Opportunities and Livelihoods

The promotion of biochar can create diverse livelihood opportunities in Meghalaya by

- setting up mid-size to large biochar production units
- sustainable bamboo harvesting and processing
- utilizing other biomass as feed stock
- training and extension services for farmers
- participation in carbon credit markets

With the State’s Organic Mission targeting large-scale conversion to organic farming, the demand for biochar is expected to rise significantly. This could lead to a market worth hundreds of crores rupees within the State, benefiting rural communities and strengthening the local economy.



Waste Management and Environmental Benefits

Biochar provides a sustainable solution for managing agricultural and organic waste. Instead of burning residues—which releases CO₂ emissions—biomass can be converted into biochar and reused productively.

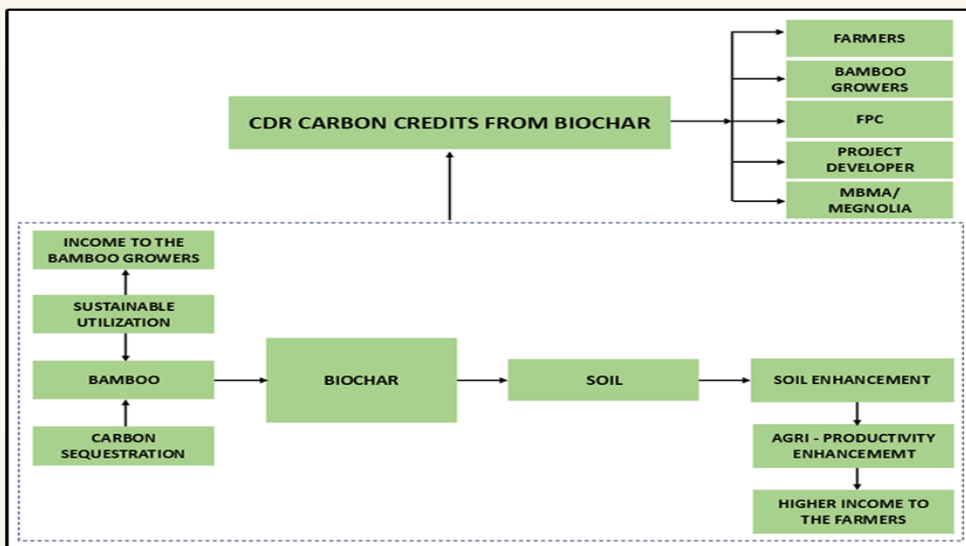
Other environmental benefits include:

- reduction in greenhouse gas emissions
- improved water quality through filtration properties
- prevention of land degradation and soil erosion

Industrial Use and Policy Support

Beyond agriculture, biochar has applications in industries such as water purification, construction, cosmetics, and pharmaceuticals. Meghalaya's industrial policies can support the development of biochar-based industries, encouraging innovation and investment.

Government initiatives, including pilot project led by COE (NRM & SL) and the Meghalaya State Bamboo Mission, are aimed at demonstrating the feasibility of bamboo-based biochar production. These projects involve community participation and aim to scale up cluster based biochar plants across the state.



Conclusion

Biochar represents a solution that connects agriculture, environment, and economy. It supports soil restoration, enhances agricultural productivity, enables carbon sequestration, and creates new livelihood opportunities.

With strong policy backing, community engagement, and sustainable resource management, biochar can play a pivotal role in transforming Meghalaya into a **climate-resilient, green economy**. It is not just a technological innovation but a “**win-win strategy**” for environmental sustainability and socio-economic development.



*The Centre of Excellence (CoE) for
Natural Resource Management & Sustainable
Livelihoods (NRM & SL) under the
Meghalaya Basin Development Authority (MBDA)
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