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Short Communication

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Biochar: Not Just Carbon Removal but a Path to Global Resilience

Michael Shafer

Director, Warm Heart Foundation, Thailand

*Corresponding author
Michael Shafer, Director, Warm Heart Foundation, Thailand.

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In the urgent discourse on climate change, the conversation often centers around high-tech solutions like carbon credits, direct air capture, and large-scale technological interventions. While these approaches are crucial for mitigating climate change, they primarily benefit wealthier nations and large corporations. However, as climate impacts become an ever-present reality, particularly in the Global South where vulnerability is highest, the focus must shift to resilience—specifically, how communities can adapt and thrive despite climate challenges.

Understanding Resilience

Resilience refers to the capacity to withstand the impacts of climate change before disasters strike, as well as the ability to respond effectively once they occur. In wealthier regions, governments often have access to resources that facilitate both mitigation and recovery from climate disasters. In stark contrast, communities in the Global South frequently lack these resources, underscoring the necessity for low-cost, community-driven solutions. One such solution is biochar.

What is Biochar?

Biochar is a form of charcoal made from a variety of carbon-containing feedstocks, including agricultural waste, construction debris, and even industrial byproducts. Unlike traditional charcoal, which contributes to deforestation and carbon emissions, biochar is produced through pyrolysis—heating biomass in the absence of oxygen—resulting in about 40% of the carbon becoming stable and resistant to re-entering the atmosphere. This process not only helps to mitigate climate change by reducing emissions from practices like open-field burning but also sequesters carbon in a way that enriches soil health and improves agricultural productivity.

The Need for Biochar in the Global South

As we confront the immediate threats presented by climate change—such as droughts, floods, storms, rising temperatures, and sea levels—biochar emerges as an accessible and versatile tool for enhancing resilience. For the 530 million smallholder farmers, primarily in the Global South, biochar serves multiple purposes:

- **Combatting Drought:** Biochar's ability to retain moisture in the soil helps communities adapt to increasingly erratic rainfall patterns, providing a buffer against drought conditions that threaten food security.
- **Mitigating Flooding:** By improving soil structure and water retention, biochar can reduce runoff and flooding, protecting crops and infrastructure from extreme weather events.
- **Addressing Climate-Induced Heat:** As global temperatures rise, agricultural productivity suffers. Biochar can enhance soil fertility and resilience, helping farmers to sustain crop yields.
- **Reducing Air Pollution:** The production of biochar, when done correctly, generates minimal smoke. This could significantly reduce PM2.5 emissions, which are linked to millions of deaths annually, particularly heavily affecting populations in the Global South.
- **Alleviating Deforestation:** With around 85% of the world's population relying on charcoal for cooking, the transition to biochar can diminish reliance on firewood, thus helping to protect vital forest ecosystems.
- **Enhancing Soil Health:** Biochar enriches soil, potentially reversing topsoil loss and contributing to sustainable agricultural practices.

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Conclusion

The potential of biochar goes beyond mere carbon removal; it provides workable, global, low-cost approach to resilience that directly addresses the pressing needs of millions and the world as a whole. While high-tech climate solutions are essential, they cannot replace the need for immediate, practical, and accessible strategies that prioritize resilience in the face of climate change. By enabling smallholder farmers and vulnerable communities to turn waste into a valuable resource, biochar offers a great opportunity for all of us in the fight against climate change and the quest for a sustainable future.

Implications for the Developed World

The global resilience demonstrated by the world's smallholder farmers carries significant implications for developed nations. With approximately 2.5 billion smallholders globally, even a modest adoption of biochar practices by a fraction of this population could yield substantial climate benefits. Moreover, as smallholders become more resilient, the pressure on affluent nations to address climate challenges diminishes. Finally, given that developed countries face many similar challenges as those in the Global South, the advancements made by these poorer communities will ultimately have a positive effect among wealthier nations.