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Indonesia promotes Biochar as a solution to agricultural land degradation

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The Indonesian Chamber of Commerce and Industry (Kadin) is urging the widespread adoption of biochar technology as a strategic solution to combat the countryâ??s worsening agricultural land degradation crisis.

Devi Erna Rachmawati, Vice Chair of Kadin Indonesia for Agriculture, emphasized that biochar is essential for restoring damaged agricultural land and ensuring long-term soil sustainability.

"Right now, Indonesia is in urgent need of biochar technology. More than 60% of our agricultural land is degraded and no longer healthy. Biochar offers a practical solution, and the raw materials are abundant across Indonesia," Devi said during a Focus Group Discussion (FGD) titled "Biochar for Soil Improvement: Sustainable Innovation to Build the Future of Agriculture", held at Kadin Tower, Jakarta recently.

The discussion highlighted three main themes:

1. The role of biochar as a future-oriented agricultural technology;
2. The application of microbial and humus-based soil treatments;
3. The implementation prospects and challenges of biochar usage in Indonesia.

Biochar is a stable, carbon-rich form of charcoal produced through the pyrolysis of organic materials such as wood, straw, or leaves. It is known to improve soil fertility by enhancing its physical, chemical, and biological properties. Additionally, biochar helps sequester carbon in the soil, significantly contributing to the reduction of greenhouse gas emissions.

Kadin plans to formally recommend the adoption of biochar to key government stakeholders.

â??We will send a recommendation letter to the Ministry of Agriculture, the House of Representatives (DPR), and other relevant policymakers. Biochar cannot work in isolation; it requires synergy with fertilizers and microbial technology to successfully restore degraded land,â?• Devi explained.

She iterated that, Indonesia must urgently address land degradation to achieve its food security goals. Restoring the soil is the top priority, as improved land productivity will drive economic benefits, particularly for farmers.

To support this agenda, Kadin Indonesia has established a research and development site in Lebak, Banten, spanning 180 hectares. The facility is open for collaboration with the Ministry of Agriculture, the National Research and Innovation Agency (BRIN), and private sector stakeholders.

Echoing Devi's remarks, Dedi Nursyamsi, Senior Expert at the Ministry of Agriculture, emphasized the crucial role of biochar in promoting productive and sustainable farming. According to research, biochar can enhance soil productivity, rehabilitate contaminated land, and reduce dependence on chemical fertilizers.

"Biochar is a game-changer. It serves as a habitat for beneficial microbes, improves soil aeration, water retention, nutrient availability, and helps remediate soils contaminated with pesticides or heavy metals," Dedi explained. He also pointed out that biochar holds great potential in the emerging carbon trading market, offering both environmental and economic value.

One such innovation is Biotron, a 3-in-1 biochar formula developed by the Ministry of Agriculture, enriched with microbes and liquid organic fertilizer.

Indonesia is actively promoting Biotron to farmers in Kalimantan, Sumatra, and Java, with plans to scale up the initiative through industry collaboration. However, Dedi noted that the supply of biochar is still limited, calling for greater support from the business sector.

Etty Pratiwi, Researcher at BRIN, highlighted the potential to utilize agricultural waste as raw materials for biochar production. â??There are agricultural waste hotspots in various regions that can be harnessed through farmer education and community engagement programs,â?• she said. Etty stressed the need for an integrated approach, combining biochar with organic fertilizers and microbial treatments to tackle critical land degradation issues caused by soil quality decline and climate change.

Maria Wahono, CEO of PT Bhetochar Energi Nusantara, discussed the untapped potential of Indonesia's biomass waste, which produces millions of tonnes annually. â??Through pyrolysis technology, this waste can be transformed into high-value biochar that lasts in the soil for centuries and contributes to long-term carbon sequestration,â?• she said.

Biochar, Maria noted, is also effective for post-mining land rehabilitation and contaminated soil remediation. However, the growth of this industry depends on an enabling ecosystem, including product standardization, production infrastructure, and market education.

Yuventius Nicky, Director of R&D at PT Bhetochar Energi Nusantara, highlighted the significant economic potential of biochar, noting that it directly benefits farmers by utilizing raw materials sourced from them and increasing yields once degraded lands become productive. He pointed out that addressing Indonesia's 12.7 million hectares of critical land requires collaboration beyond individual companies, emphasizing the need to work with fertilizer producers and microbiologists. Nicky also stressed the importance of raising farmer awareness and establishing demonstration plots, as farmers are more likely to adopt new technologies when they see tangible results.IPJ.

Arnawa from PT Nex Bio Tech International emphasized that biochar can gain widespread acceptance if properly introduced and explained, stating, "It all depends on how we educate and socialize the concept." His company has partnered with Kadin to launch the Next Bio Academy, a hybrid educational platform designed to reshape farmers' perceptions by highlighting the importance of soil health, the consequences of degraded land, and the potential of biochar and advanced technologies. Arnawa also introduced nano-technology-based solutions that deliver nutrients directly through plant stems or leaf pores, bypassing the soil entirely. He concluded, "Practical innovations like this can shift the perception that organic farming is expensive. Over time, farmers will see that it's actually more cost-effective and leads to better yields."

The FGD, organized by Kadin Indonesia in collaboration with PT Bhetochar Energi Nusantara and PT Nex Bio, attracted over 100 participants, including business players, researchers, and agricultural experts, attending both in-person and online. The event served as a platform for sharing concrete solutions to the complex challenges facing Indonesiaâ??s agricultural sector.