Biochar Briquettes: Alternative to Firewood and Charcoal Fuel in Kenya

Executive Summary

Every time we enjoy a hot meal, a well heated room or a warm shower, we rarely pause to think about what is at stake. For those that use renewable sources such as solar and wind there is not much at stake. There are however those that use wood fuel that have to contend adverse effects on the environment and also the effects of depletion of forests has on their livelihoods. Wood fuel accounts for as high as 72% of the fuel needs in Kenya and its main sources are mature trees from forests and woodlands. These ecosystems provide a wide range of benefits to the economy and the society and must therefore be guarded from further depletion.

Working with Ecocare Africa, an environmental consulting company keen to initiate grassroots sustainability initiatives, we came up with the vision "to provide "affordable, efficient and sustainable energy solutions for households and light industries in Africa". We identified biochar briquettes as one such alternative targeted at low income communities most of whom live on a dollar a day. The use of briquettes would help reverse the depletion of the forests and also enhance the social and economic wellbeing of communities.

For our project to succeed, we needed to debunk the misconception that the best charcoal must be made from mature trees and demonstrate that agricultural waste such are rice husks, bagasse, coconut shells, when burned in oxygen deprived conditions can produce biochar (charcoal dust), which when mixed with appropriate binders and then compacted, would yield briquettes that are as good as charcoal from mature trees. We set up a plant with a capacity to produce up to 3 tons of briquettes per hour and which is scalable to accommodate demand as more awareness is created.

The project has a number of sustainability outcomes, most of which, especially the environmental outcomes are long term in nature. The social and economic outcomes are already being felt by the communities around the project site. The project has provided them with direct labor in the factory and indirectly as producers of biochar and in the distribution of the briquettes. The affordability and the energy efficiency properties of the briquettes have enabled households, channel more of their income to other competing needs such as food, clothing, shelter and education of their children, thereby enhancing the communities' social and economic wellbeing.

The project has not been without challenges. The biggest challenge has been resistance to change especially from the charcoal vendors, as they see it as a threat to their businesses. This initially slowed down the uptake of the briquettes. With the continued community sensitization, their influence is slowly going down. The other challenge is the availability of enough biomass to satisfy the demand as it continues to increase. The solution to this lies in the scaling the process of biochar production from the current use of kilns to high capacity pyrolysis equipment.

The success of the project has given Ecocare Africa impetus to drive the vision of sustainable fuel in Africa. The next step is to scale the project to national reach, and to other regions in Africa. This project will not in itself lead to the attainment of the company's vision for sustainable energy. Other initiatives such as provision of energy saving cooking stoves to further enhance briquettes' efficiency and solar lighting solutions will ensure that targeted low income communities have comprehensive energy solutions. The project has also taught us that sustainability solutions do not have to be mega projects and that grassroots innovations like this one can be scaled and create global impact.