



## Green Cohesive Agricultural Resource Management The WEBSOC Project

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## Introduction and objectives

The present growth in Ghana's food and energy production to support an increasing population is not sustainable as it depends on deforestation with little increase in productivity per unit of land.

The overall objective of the WEBSOC project is to promote growth and employment through research on green, cohesive Water, Energy-from-Biomass, Soil, Organics, and Crop management to devise ways to reverse this trend and enhance livelihood in rural communities by increasing agricultural productivity and employment.

## **Results so far**

We haves developed a low-cost stove using oil palm residues to produce biochar and wood gas for artisanal palm oil refining in order to lessen the pressure on forests for firewood and charcoal and as an intelligent way of recycling organics and reducing  $CO_2$  emissions.



Oil refinery near Kade, before and after new biochar stove deployment (Photos: Selorm Y. Dorvlo)

An additional effect of the stove was an appreciable improvement of the working environment (Dorvlo et al.).

The application of the biochar to agricultural fields increased soil carbon sequestration and improved soil friability and amount of water stable aggregates (Amoakwah et al.). Biochar amendment therefore represents a  $CO_2$ -negative approach to sustainably increase physical as well as chemical dependent soil fertility (Eduah et al.).

Biochar application thus resulted in substantially increased crop yields and carbon storage.



Further intensification has been achieved by developing small-scale low-cost solar drip fertigation systems allowing one to two more growing seasons per year to produce high-value crops.



Thus the project has devised a triple-win situation where farmers get sustained higher yields (from irrigation and improved soil fertility), CC gas emissions are reduced (from increased carbon sequestration), and small scale industries and households get energy (from pyrolysis of crop residues).

Agricultural value chains, both on the supply and processing side, are under development in cooperation between local SMEs and universities. The research into these options for sustainable intensification has been pursued within a framework designed to educate PhD students and young scientists









