Community biochar trial field in Aduamoah, Ghana

Intensive organic vegetable production using biochar, outside Wuhan, China

Biochar: Socio-Economic and Biophysical "Fit"

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UK-China
Sustainable Agriculture
Innovation Network

What is biochar and why is it relevant for SAIN?

Biochar is recently living plant-derived biomass that, by a process of charring, has been converted into a form which is essentially non-degradable, and which is created for the purpose of its addition to agricultural soil. In addition to storing plant-derived carbon, biochar appears to offer benefits to soil performance, crop nutrient use efficiency and control of plant disease propagation or transference. It can also be a way of converting unwanted organic residues into a product that sequesters carbon and is good for the soil/future productivity.

Thus this project links to SAIN working groups 1 (nutrient management) 3 (Climate change) and 4 (circular agriculture).

Project focus

This project addresses the current weak understanding of the socio-economic context of biochar in developing countries and in China. Despite the claims of widespread relevance of biochar to livelihoods and food security, there is currently little understanding of the farming systems, economic and livelihoods-related constraints that limit its usefulness in many areas. This work builds on our knowledge of the biophysical characteristics of biochar, attempting to integrate this with a deeper understanding of the socio-economic context relevant for biochar deployment. It takes a comparative approach, examining a number of contrasting environments to deliver a comprehensive assessment of where biochar-related applications have potential and where they do not.

Experimental "lids" developed to make biochar using cooking stoves in Ghana.

Purpose/Objectives

i. To investigate, from both biophysical and socio-economic perspectives, the applicability of different biochar technologies in rural, peri-urban and other locations in sub-Saharan Africa, south Asia and China.

ii. To investigate the likelihood of unequal socio-economic impacts, positive and negative, at different scales (within households, between households, between socio-economic groups, communities, between rural and urban areas, between countries and regions) arising from biochar production and use.

iii. To test and refine "purposeful selection" tool(s) that help the user match the biochar technology to the site-specific biophysical and socio-economic environment.

iv. To investigate sustainable use of biochar for improved food security and energy access.

Activities

- The project is linking with partners who have already initiated research programmes or other activities involving biochar and who are interested in exploring some of the important socio-economic, farming system and livelihoods questions around biochar. These partners are primarily in China and Ghana, with representation in other countries also (e.g. Sri Lanka, Tanzania).
- In the field the project is conducting community level surveys and associated interviews in addition to working with partners on the design of field trials testing biochar activities.
- Other activities include a review of current literature addressing the technical and particularly the socio-economic context of biochar use and the development of a framework for assessing the biophysical and socio-economic "fit" of biochar technologies in different situations.

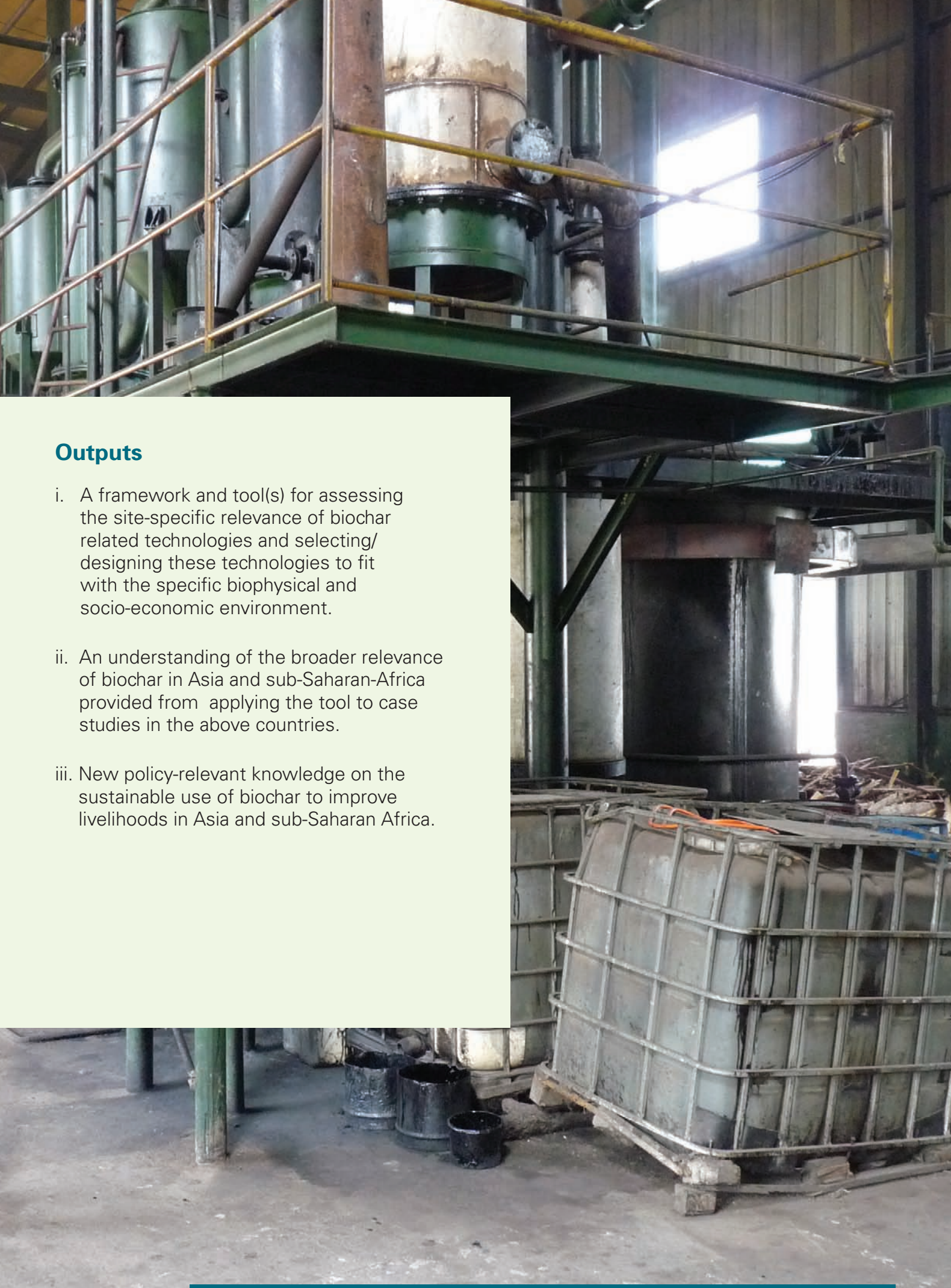
Biochar from different feedstocks: rice husk, bamboo and brickettes made from compacted rice straw mixed with sawdust

Outputs

i. A framework and tool(s) for assessing the site-specific relevance of biochar related technologies and selecting/ designing these technologies to fit with the specific biophysical and socio-economic environment.

ii. An understanding of the broader relevance of biochar in Asia and sub-Saharan-Africa provided from applying the tool to case studies in the above countries.

iii. New policy-relevant knowledge on the sustainable use of biochar to improve livelihoods in Asia and sub-Saharan Africa.



Medium scale pyrolysis system in China. Feedstock is rice straw/sawdust brickettes with "biogras" as main product and biochar produced as a by-product

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UK-China Sustainable Agriculture Innovation Network (SAIN) is a platform for UK-China collaboration on sustainable agriculture. Its aim is to contribute to the achievement of a resource efficient, low carbon economy and an environmentally friendly society. SAIN will do this by: (i) Stimulating innovative thinking and research on all aspects of sustainable agriculture; (ii) Communicating information on sustainable agriculture issues and opportunities; and (iii) Contributing to global sustainability through wider sharing of experience.

Policy Innovation Systems for Clean Energy Security (PISCES) is led by the African Centre for Technology Studies in Kenya, with partners in Sri Lanka, India, Tanzania and the UK. Through action research, it is contributing to innovation and providing new policy-relevant knowledge on bioenergy- leading to better practices and widening energy access to the rural poor in East Africa and South Asia.

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