

## End of project popular science description

### Introduction

Charcoal is the primary energy source for cooking for many households in urban and peri-urban areas of Ghana. Compared to firewood, it has a higher calorific value per unit of weight; it is easier to transport and produces comparatively less smoke. The use of charcoal requires lower capital investments compared to electric and gas stoves. The production and trade of charcoal is an important source of livelihood for many households. Government agencies and development organizations link charcoal production to deforestation, environmental degradation, biodiversity loss and climate change. To improve on the current situation, government agencies want to further regulate and formalize the sector. Yet, the knowledge on the economic importance of the sector, who actually benefits and how, and the impact of charcoal production on the stock of trees is shallow. This holds for Ghana as well as many other SSA countries. The AX project set out to examine these knowledge gaps.

Development objective: *Pro-poor and environmentally sustainable charcoal production in Ghana*. Under this overall objective was four specific objectives:

1. Processes of access and exclusion in the charcoal commodity chain in Ghana and their dynamics in time and space understood;
2. Environmental sustainability of charcoal production in Ghana analyzed;
3. Capacity for research and dissemination on access and exclusion and commodity chain analysis and its link to environmental sustainability enhanced;
4. Project's results and implications disseminated to, and discussed with, international scientific community, policy-makers at national level and actors in the commodity chain.

The project applied an interdisciplinary approach using a wide range of methods from both the natural sciences (remote sensing, vegetation analysis, tree inventories) and the social sciences (surveys, semi-structured interviews, participant observation, focus groups and PRA methods). Three PhD students and 11 MPhil/MA/MSc students, aided by numerous field assistants, were responsible for collection of the primary data.

### Results

#### Livelihood, profit distribution and access (objective 1)

The project quantified the economic importance of charcoal to rural households through a survey with 400 households, semi-structured interviews and focus group discussions. Two-thirds of all households were involved in some form of income generating activity with charcoal. Combined income from charcoal production, charcoal trade and wages for labour works on charcoal constitute 17% of total household income, which makes charcoal the second most important source of household income after crops (46%). Charcoal production is an important source of income in the lean agricultural season. The study further shows that most of the studied households produce charcoal to mitigate economic shocks from sickness, death of a family member, destruction of food crops and the need to attend social events like funerals and weddings.

The profit distribution in the charcoal commodity chain is highly skewed. The project examined the chain through 150 interviews with actors along all nodes. Merchants (mainly female) and transporters have an average annual incomes that are ten times higher than the average producer. Merchants have bargaining power over charcoal prices, and control access to labor opportunities and markets. They have access to credit, information on production areas, and cultivate relations with transporters, urban wholesalers, and retailers. Producers lack credit and therefore depend on advances from merchants to run the production. They pay back the advance with an equivalent number of bags of charcoal at the price set at the time the credit was

received. Few producers organize own transport and marketing of their charcoal because they face multiple challenges, including access to credit and information.

#### Environmental sustainability (objective 2)

The project examined the impact of charcoal production on the woody vegetation (tree cover, tree species composition and tree sizes) through remote sensing (satellite images analysis), tree inventories, analysis of contents of charcoal bags, a survey and semi-structured interviews. Our results do not support the claim of charcoal as main driver of deforestation. Charcoal production is selective, that is, it does not use all tree species. Most charcoal is produced on farms; closely integrated with the agricultural production in a bush-fallow system. First, yam is cultivated and, subsequently, groundnuts. Farmers leave the land fallow to regain its fertility, and charcoal is produced when the land is again brought into cultivation from the trees that have grown on the fallow. Our research shows that the fallow lands hold a large number of trees, and that farmers actively manage the fallows, e.g. through tree cutting techniques, to nurture the preferred tree species, including those that are preferred for charcoal production.

#### Capacity building and dissemination (objectives 3 and 4)

The project has produced three PhD candidates, and 11 MPhil/MSc students have produced their thesis within the project. The project has produced scientific papers, policy briefs and a documentary. The project has organized national level and district/community level fora for dissemination of results.

### **Conclusions**

The results of the AX project challenge interventions currently implemented or proposed by Ghanaian government institutions. These include a centrally controlled permit system for charcoal production, increased taxation of the sector and promotion of planted woodlots for feedstock. The proposed policies do not build on scientific evidence. If implemented, in full or in part, they will compromise rural livelihoods, will lead to enclosure of farming land for woodfuel plantations with a bleak likelihood of survival. The proposed interventions appear to be designed more with the aim of maintaining current institutional powers and authority rather than addressing sustainability. For policies to be successful, they need to move away from standard, yet inaccurate, narratives and discourses about charcoal production and take point of departure in detailed and contextualized information and data. We hope that the AX project has made a contribution in this regard.

### **Recommendations**

There is a need for a new take and approach to the governance of the sector. Charcoal will form part of the energy mix of Ghana for many years to come. Rather than sweeping strategies, we advocate for a step-by-step approach to policy change, one that builds on consultation and participation of all parties in the sector, and on scientific evidence. The AX project has pointed out weaknesses in current policy, suggested changes, and pushed for such changes through scientific papers, policy briefs and a documentary broadcasted on national television in Ghana. The project has also organized district and national fora and had informal discussions with key policy makers.