



Factors influencing participation and income from charcoal production and trade in Ghana



Woodfuel Value Chains in Africa: Governance, Social, Economic and Ecological Dimensions

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Presentation outline

- Background and problem statements
- Aim and research questions
- Conceptual framework
- Methodology
- Results and discussions
- Conclusions and recommendations



Background and problem statements

- Charcoal is the main source of energy for heating and cooking for many urban households (HHs) in developing countries (Arnold et al., 2006; IEA, 2014; Zulu & Richardson, 2013).
- Charcoal production and trade create employment, reduce poverty and provide HH income (Ainembabazi et al. 2013; Khundi et al. 2011; Obiri et al. 2014).
- Limited knowledge on factors that drive HHs to engage in charcoal production and/or trade.



Aim and research questions

Aim

To investigate the factors that shape households' participation and income from charcoal production and trade in Ghana.

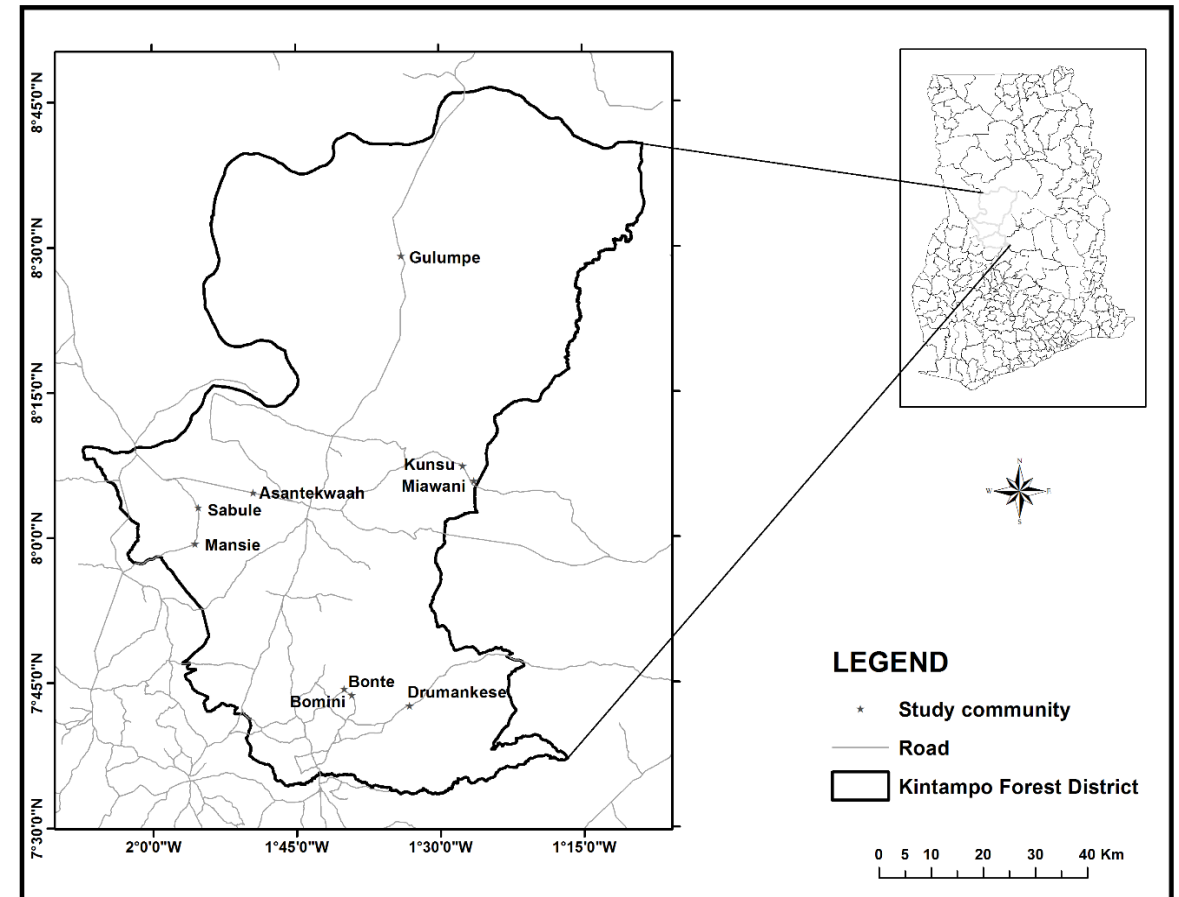
Research questions

1. What factors determine whether or not households produce and/or trade in charcoal?
2. What factors are associated with high income from charcoal production and trade?



Methodology

- **Analytical framework**
 - Sustainable Livelihood Framework
- **Study areas**
 - 10 communities in the Kintampo Forest District
 - Asantekwaah
 - Bomini
 - Bonte
 - Cheranda
 - Drumankese
 - Gulumpe
 - Kunsu
 - Mansie
 - Miawani



Methodology con't

- Quantitative data – adapted the Poverty Environment Network (PEN) questionnaire (CIFOR, 2007)
 - Household survey in 400 HHs with ODK Collect
 - Cost and income on all sources of economic activities (2016 calendar year)
 - ✓ Agriculture – crops, livestock, livestock products
 - ✓ Processed and unprocessed environmental products
 - ✓ Rural businesses
 - ✓ Wage work
 - ✓ Remittances, rent, gift, gov't support



Methodology con't

➤ Qualitative data

- Stakeholder analysis
- Participatory Rural Appraisal techniques
Resource map, seasonal calendar, Venn diagram and trend analysis
- Interviews
- Community, district and national charcoal fora

➤ Data analysis

- Net income = gross income - total cost of all purchased inputs
- All income values converted to per capita income
- Heckman selection and outcome model





1.1 Income share, by income quartile

Income source	Low income HH (n=100)	2 (n=100)	3 (n=100)	High income HH (n=100)
Total income	286.76 ^a	605.67 ^a	1,145.04	3,427.90
Charcoal business	1.91 ^a (0.7%)	0.85 ^a (0.1%)	33.39 ^a (2.9%)	467.45 (13.6%)
Charcoal production	32.39 ^a (11.3%)	71.05 ^a (11.7%)	134.38 ^a (11.7%)	515.24 (15.0%)
Charcoal wage	0.55 (0.2%)	0.78 (0.1%)	7.07 (0.6%)	5.00 (0.1%)
Crop	147.80 ^a (51.5%)	332.29 ^a (54.9%)	554.69 (48.4%)	1,009.59 (29.5%)
Fish	0.92 (0.3%)	0.82 (0.1%)	11.43 (1.0%)	3.17 (0.1%)
Livestock	13.41 (4.7%)	22.67 (3.7%)	46.58 (4.1%)	152.15 (4.4%)
Livestock products	2.12 (0.7%)	3.53 (0.6%)	6.20 (0.5%)	6.26 (0.2%)
Processed env pdts	5.87 ^a (2.0%)	13.10 ^a (2.2%)	34.29 ^{ab} (3.0%)	126.68 ^b (3.7%)
Rural businesses	12.78 ^a (4.5%)	26.27 ^a (4.3%)	156.41 ^a (13.7%)	821.93 (24.0%)
Unprocessed env. pdts.	46.09 ^a (16.1%)	72.35 ^a (11.9%)	83.37 ^a (7.3%)	135.21 (3.9%)
Wage	10.52 ^a (3.7%)	46.35 ^a (7.7%)	53.78 ^{ab} (4.7%)	132.35 ^b (3.9%)
Other income	12.39 ^a (4.3%)	15.62 ^a (2.6%)	23.46 ^{ab} (2.0%)	52.89 ^b (1.5%)

➤ High income HHs obtained higher income from charcoal than low income HHs

1.2 Determinants of participation in charcoal production and trade

Charcoal production	Charcoal trade
Positively influenced by	Positively influenced by
Young and/or male headed HHs – human capital	Education of head of HH – human capital
Owning a bicycle – physical capital	Owning a chainsaw – physical capital
Ethnicity (being Sissala) – social capital	Membership in a charcoal association – social capital
Payment of traditional charcoal levy – institutions	
Negatively associated with age of head of HH – human capital	Negatively associated with age and shock

1.3 Determinants of income from charcoal production and trade

Charcoal production	Charcoal trade
Positively influenced by	Positively influenced by
Total HH income	Total HH income
Owning a motor bike	Owning a bicycle and/or motor bike
Membership in a charcoal association	Membership in a charcoal association
	Ethnicity (being Sissala)
Negatively associated with crop income	Negatively associated with crop income, accessibility and payment of traditional levy

Discussion

- Dominance of high-income HHs in charcoal trade attributed to high entry barrier in charcoal trade (Arnold and Perez, 2001).
- Finding that high-income HHs get higher income from charcoal production and trade attributed to the role of financial and physical capital, and is consistent with Khundi et al. (2011) and Ribot (1998).
- Gendered nature of charcoal production and trade consistent with most studies (Agyei et al., 2018; Ainembabazi et al., 2013; Butz, 2013; Jones et al., 2016; Khundi et al., 2011).
- Dominance of female in charcoal trade contradicts Fisher (2004) report that lucrative and commercial economic activities like charcoal production and trade are the domain of men in Malawi.



Conclusions

- Participation and income from charcoal production and trade are **not associated with any specific income group**. However, high-income HHs get higher income from charcoal production and trade than low-income HHs.
- Young and male-headed HHs are also more likely to produce charcoal than are old and female-headed HHs.
- Participation in charcoal trade, on the other hand, is positively associated with young and female-headed HHs, education, owning a chainsaw, and membership in a charcoal association.



Recommendations

- The strong role of customary institutions (chiefs) in governing charcoal production and trade, needs to be reflected on in the on-going charcoal formalization efforts.
- The state could fall on charcoal associations in its attempt to reform the charcoal sub-sector. E.g., the promotion of kilns to increase production efficiency.
- The study documents a perception among producers of a sharply declining resource base, which may jeopardize future income and livelihoods. This provides an incentive for the promotion of woodlots and plantations.



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Thank you for your attention

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