Value Chain Analysis for Development: providing evidence for better policies and operations in agricultural value chains

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REDUCING TENSIONS BETWEEN SOCIAL AND ENVIRONMENTAL SUSTAINABILITY IN SMALLHOLDER RAINFED CROPS IN SUB-SAHARAN AFRICA: INSIGHTS FROM 6 VCA4D STUDIES

Alistair Sutherland and Ricardo Villani

Questions

TENSIONS BETWEEN SOCIAL AND ENVIRONMENTAL SUSTAINABILITY – IN SMALLHOLDER RAINFED CROP VALUE CHAINS

1. **What are the main environmental and social impacts in these VCs (based VCA4D methodology)?**
2. **What are the main trade-offs, or tensions, between social sustainability and environmental sustainability in these VCs?**
3. **What options are there for reducing the impact of these trade-offs: win-win options?**
4. **Implications for policy and programme support?**

List of VCA4D studies used

Onumah, G., Plaisier, C., Villani, R., Komlaga, G., 2020, **Sorghum Value Chain Analysis in Ghana**. Report for the European Union, DG-DEVCO. Value Chain Analysis for Development Project (VCA4D CTR 2016/375-804), 167 p

Onumah, G., Dhamankar, M., Ponsioen, T., Bello, M., (2021), **Maize Value Chain Analysis in Nigeria**. Report for the European Union, INTPA/F3. Value Chain Analysis for Development Project (VCA4D CTR 2016/375-804), 155p

Fusillier J-L, Sutherland A., Villani R., Chapoto A.., 2021. **Maize Value Chain Analysis in Zambia**. Report for the European Union, DG-INTPA Value Chain Analysis for Development Project (VCA4D CTR 2016/375-804), 222p

Kleih, U., Bosco, S., Kumar, R., Apeeliga, J., Lalani, B., Yawlui, S., 2020, **Groundnuts Value Chain Analysis in Ghana**. Report for the European Union, DG-DEVCO. Value Chain Analysis for Development Project (VCA4D CTR 2016/375-804), 150p + annexes.

Fok, M., Meier, M., Nicolay, G., Balarabe, O., Calaque, R., 2019**. Cotton value Chain Analysis in Cameroon**. Report for the European Union, DG-DEVCO. Value Chain Analysis for Development Project (VCA4D CTR 2016/375-804), 122p

Nicolay, G; Estur, G; Walsh, C; Desalegn, P, 2020. **Cotton Value Chain Analysis in Ethiopia**. Report for the European Union, DG-DEVCO. Value Chain Analysis for Development Project (VCA4D CTR 2016/375-804), 128 p

VCA4D studies used

Maize – food staple – public investment (subsidies)

Cotton – private investment in processing – smallholder services for Cameroon

Groundnuts – food crop – limited public investment. **Sorghum** – food staple in north & brewing – limited public investment

SMALLHOLDER VC CONTEXT- RAINFED FIELD CROPS

Production mainly reliant on household labour (including women and children)

- **Medium to high production risks - climatic, pest and diseases**
- **Lower input, more extensive**
- **Geographically extended input supply and crop marketing networks - weak bargaining position of smallholders,**
- **Historical reliance on government research and extension services,**
- **“Customary/Traditional” land tenure and land-use systems**

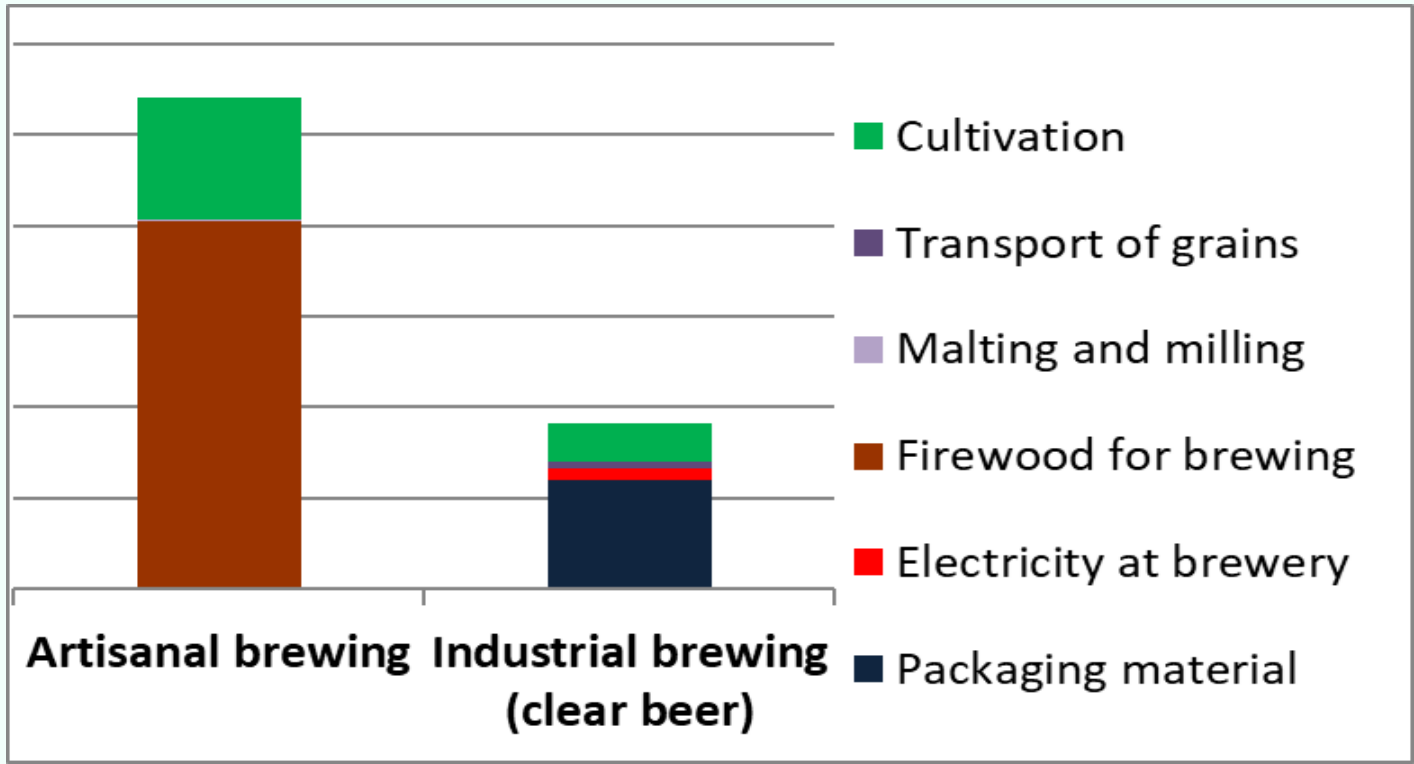
Northern Ghana: agricultural plot scattered with trees

SMALLHOLDER VC CONTEXT - POST FIELD PRODUCTION

- **Smaller-scale processing enterprises, adding value important for many rural households**
- **Small-scale processing operations in urban and peri-urban households - especially women**

Artisanal brewing site in Northern Ghana (malted sorghum beverage processing)

Sorghum VC: environmental impact per life cycle stage of artisanal and industrial brewing (inventory data based on industry-wide averages for clear beer production)



Main Social and Environmental Impacts - 1

MAIN POINTS OF ENVIRONMENTAL IMPACT

- Land use (crop cultivation, clearing of new land/deforestation, biodiversity)
- Global warming potential, mainly derived from land use change
- Particulate matter formation (unhealthy local processing methods)
- Toxicity and ecotoxicity (unsafe use of agro-chemicals)
- Soil health depletion

MAIN POINTS OF SOCIAL IMPACT

- Gender inequality (household decision making on land access, women's workloads, crop choice, crop use/disposal, access to credit and technical advice)
- Household food and nutrition security
- Social capital low levels rural communities

Main trade-offs – Cultivation of grains- 1

- **Social reproduction of small-scale farming households is a way of life which typically requires continuous cultivation using low levels of external inputs to meet household food and nutrition needs, resulting in negative environmental impacts:**
  - Low input extensive cultivation potentially increases environmental impact (land use change and occupation causing reduction of carbon stock and of biodiversity).

- **Where land for growing food crops is scarce, customary land tenure systems enable households to more easily move to where there is more land available:**
  - Land clearing for cultivation negatively impacts the environment (contributes to climate change due to soil and biomass C loss, reduces biodiversity)
  - it also reduces the availability of wood for fuel and construction in the medium term.

Main trade-offs – Cultivation of grains - 2

- **There are technologies which do reduce the labour burden for women and children (mainly hand weeding), but have negative environmental impact:**
  - Burning of crop residues helps to reduce competition from weeds and pests and adds patches of soil fertility, but has negative environmental impacts (emissions of particulate matter),
  - Use of fertilizer and herbicides carry some environmental risks (in the longer term fertilizer use may reduce soil quality; suspected links between herbicide use and human health)
  - Use of fertilizer and herbicides enable higher levels of production per unit area, which may have a positive environmental impacts (potential reduction of cropland expansion into virgin land).

- **Use of external inputs can reduce female labour burden, but low levels of social capital in rural areas limits access to affordable inputs and reliable markets for produce –**
  - Low input extensive production methods are a less risky option for small-scale farmers – but with higher environmental impact (especially in cases where the pressure on virgin land for cropland expansion is high).

Main trade-offs – Processing stage of Grain VCs

- **Processing grains for food and beverages both for household use and for sale is very important for rural women, and particularly and female headed household livelihoods – but negatively impacts the environment and in some cases human health:**
  - Consumes firewood and charcoal, negatively impacting the environment (Carbon loss and biodiversity decrease caused by forest degradation due to fuelwood collection),
  - Groundnut roasting / artisanal brewing of malted grains beverages in confined conditions has a negative environmental impact (respiratory health risks due to particulate matter emissions in the site of fuelwood combustion mainly impacting women doing the processing).

- **Post-harvest grain loss grains and aflatoxins (groundnuts) negatively impact household food and nutrition:**

  Indirectly increases environmental impact as more land is cultivated to make up for these losses.

Maize – PH Loss (%) in Ghana, Nigeria and Zambia: 17 to 18% in 2021
Source: African Postharvest Losses Information System (APHLIS)

Main trade-offs – Smallholder Cotton VCs

- **Smallholder cotton generally impacts the environment due to land-use effects,**
  - Small-holder low input extensive cultivation methods compared with higher input cultivation methods potentially increases environmental impact (due to the lower yield per hectare)

- **Smallholder cotton can assist with aspects of social sustainability:**
  - Household food security improved indirectly; through improved soil fertility for food crops, income for purchase of food,
  - Income used for welfare benefits (health, education),
  - Risk reduction (crop diversification to reduce climate, pest and market risks),
  - Social capital, local infrastructure and political stability (N. Cameroon case),
  - Household food security improved indirectly; through improved soil fertility for food crops, income for purchase of food.

- **Commercial cotton mono-culture carries more local environmental risks longer term than smallholder cotton (Ethiopia)**

Options for reducing the impact of trade-offs-1

WIN-WINs:

Integrated approach to supporting smallholder production and marketing, including:

- Lower level intensification using improved inputs (seeds, seed dressing, fertilizer and herbicides at adequate rates) - provided on time and affordable,
- Locally tailored technical advice (elements of conservation agriculture, post-harvest practices, local processing),
- Labour saving technology to reduce female labour burden (improved tools, herbicides at adequate rates),
- Quality standards for produce (e.g. aflatoxin identification),
- Social contracts (with input suppliers and traders),
- Gender sensitive extension education ("household approach"),
- Minimise culture of free "hand-outs" and unsustainable subsidies,
- **Smallholder cotton** Support (technical advice, inputs, market options, group formation) for fuller integration with food-crops and "adding on" other cash crops.

To reduce the negative environmental impact of low input extensive cultivation while improving social sustainability.

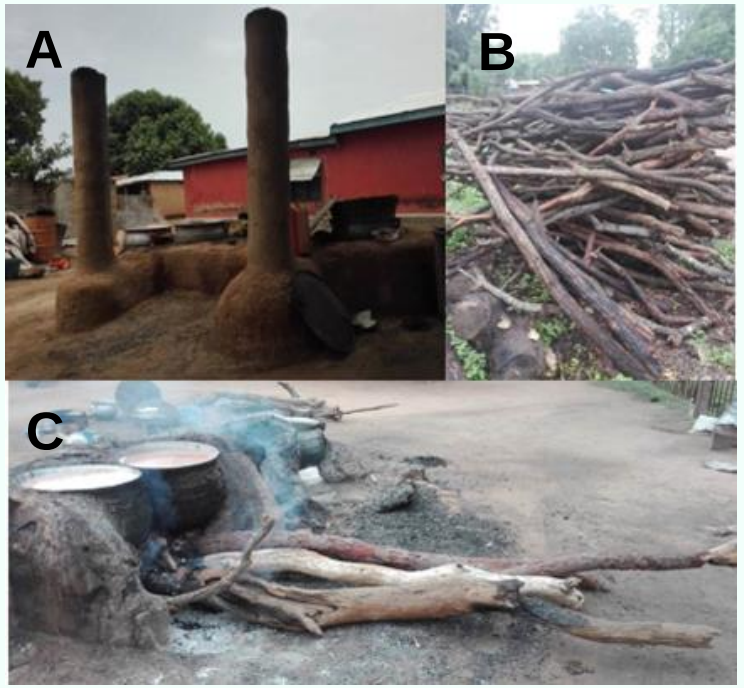
Options for reducing the impact of trade-offs-2

WIN-WINs:

Measures to reduce loss of tree cover (and biodiversity) and to improve human health outcomes arising from harmful practices during grain processing:

- Support for planting of trees on farm holdings (boundary planting, woodlots, appropriate agro-forestry species),
- Promotion of energy saving technology for household cooking and local processing activities (more efficient stoves or ovens),
- Loans for purchase of small scale processing technology, particularly energy saving.

Traditional charcoal stove (left) and a fuel saving stove being promoted in Zambia (right)



Pito brewing sites in Ghana. energy-saving brewing site (A), pile of firewood for brewing (B), below: open-fire brewing site (C).

Implications for investment in smallholder rainfed crop VCs

- **Decisions informed by good understanding of the investment context for smallholder service delivery (balance of public and private involvement - current priorities and future opportunities) in any rainfed crop value chain being considered,**
- **Investment "conditions", and advice, relating to social and environmental sustainability in public-private investment partnership agreements.**
- **Continue Investment in strengthening social capital in rural areas;**
  - Capacity within communities, and
  - Trust between producers and other key stakeholders (input suppliers, traders),
- **Question use of public funds to support unsustainable input subsidies, more creative and sustainable subsidy strategy,**
- **Encouraging alternative use of Agriculture budget for support of high quality research, advisory and regulatory services which benefit small-holders,**
- **Give consideration to investment in smallholder cotton programmes which offer win-wins for social and environmental impact,**
- **Creative policies to reduce deforestation and improve tree cover combined with support for in-field conservation and planting of trees on family land holdings (woodlots, boundaries),**
- **Investment in promotion of energy saving methods for food processing,**
- **Investment in promotion of affordable post-harvest loss reduction technology.**

Thank you for your attention!

https://europa.eu/capacity4dev/value-chain-analysis-for-development-vca4d-/events/conference-value-chain-analysis-development-providing-evidence-better-policies-and-operations