VCA4D
VALUE CHAIN ANALYSIS FOR DEVELOPMENT

agrihatura for European Commission

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

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CONTRIBUTION OF PROCESSING TO INCLUSIVE AND SUSTAINABLE GROWTH IN AGRI-FOOD VALUE CHAINS

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Some definitions as introduction

Processing: product transformation to a more desirable or valuable state

➔ Change of form to align to consumer needs (direct consumption or/and to cook)

➔ Better conservation storage (lengthen the shelf-life of seasonally-produced foods like fruits and vegetables)

Product transformation through processing creates tangible value added in VCs but is not the only source.

Our analysis is not limited to **Economic, social and environmental impacts of the processing stage** **but also to similar effects on**

Farm-level value added
impact on demand for output and adoption of practices to improve quality and value

Investment in services delivery and logistics systems in VCs

Question and issues

A. What economic contribution does processing make in the selected VCs?

Is processing contributing to inclusive and sustainable growth in the selected VCs?

B. What are the social effects of processing in the selected VCs?

- Is processing contributing to inclusiveness and social sustainability of selected VCs?
- What differences exist in terms of social effects due to operations of different types of agro-processors in the selected VCs?

C. What environmental damages to ecosystems quality, human health and resources depletion are associated with processing?

- Compared to other stages (production, trade, etc) how is processing having impacts over the environment?
- Which are the main sources of environmental impact of processing ?

D. What are the policy implications of the above on actions to promote inclusive and sustainable growth in the selected VCs?

Selected VCA4D studies

To represent diversity of products and VC :

- **Staple crops VCs:** Maize (Nigeria and Zambia) and Sorghum (Ghana)
- **Export crops VCs:** Mango (Burkina Faso and Dominican Republic); Cashew (Sierra Leone); and Pineapple (Togo and Dominican Republic)

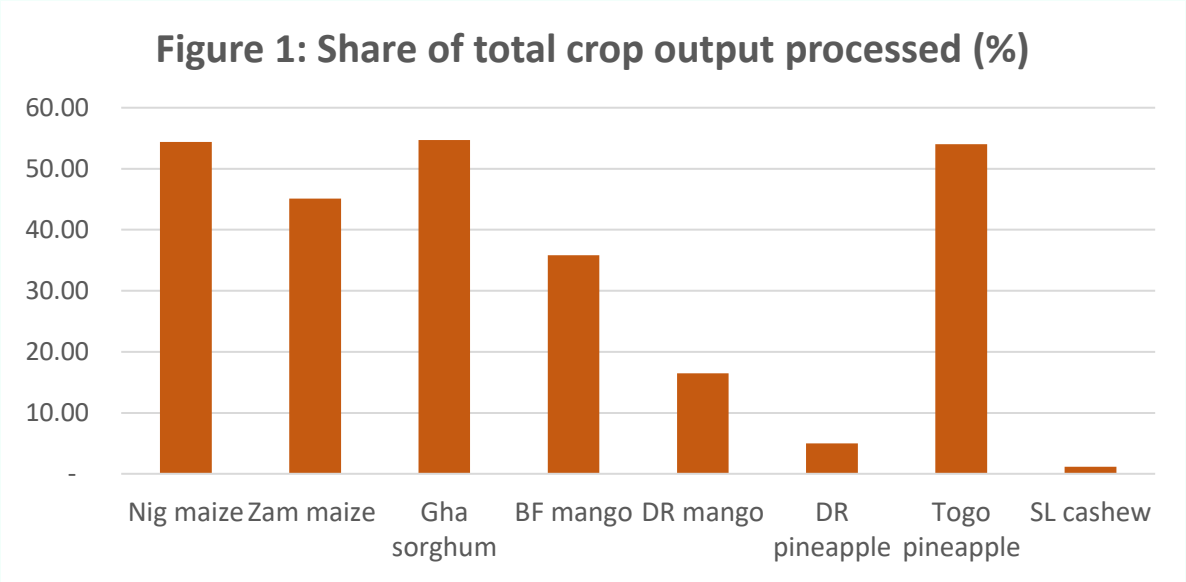
PARTICULARS	AVERAGE FOR STAPLE CROPS	AVERAGE FOR EXPORT CROPS
Contribution of smallholders to primary output	82.3%	54.7%
Large-scale farmers contribution to primary output	9.2%	32.3%
Postharvest losses	12-15%	15% plus
Share of locally-sold output processed	**51.4%**	**28.2%**
Contribution of SMEs to processing	43.6%	Below 25.0%
Large-scale processors' contribution	56.4%	75.0% plus

Source: Computed from various VCA4D studies.

Finding 1: Contributions by processors in selected VCs

- Average processors' contribution to value added in staple crops VCs more than double that of exports crops (the bulk of which is exported unprocessed as shown below in Figure 1)
- Contribution to wages about the same level in both categories but staple crops generate more jobs per tonne of primary output than exports
- Average contribution to public finance surprisingly higher in staple crops VCs, possibly because bulk of transformation occurs in importing countries
- No surprise that contribution to net foreign exchange generation is higher for exports crops, though for maize in both Nigeria and Zambia export restrictions is a factor.

PARTICULARS	AVERAGE FOR STAPLE CROPS	AVERAGE FOR EXPORT CROPS
Contribution of primary producers to total VA	35%	45%
Contribution of traders & service providers to total VA	29%	41%
Contribution of processors to total VA	**36%**	**14%**
Jobs created per tonne of primary output	1.03	0.8
Wage to total VA ratio	**22.5%**	**19.3%**
Wage at primary production	44%	44%
Wage at trade & service provision	33%	32%
Wage at processing	23%	24%
Average VC net contribution to public finance per tonne (€)	**13.6**	**11.20**
Average VC net contribution to forex generation per tonne (€)	-2.75	165.00



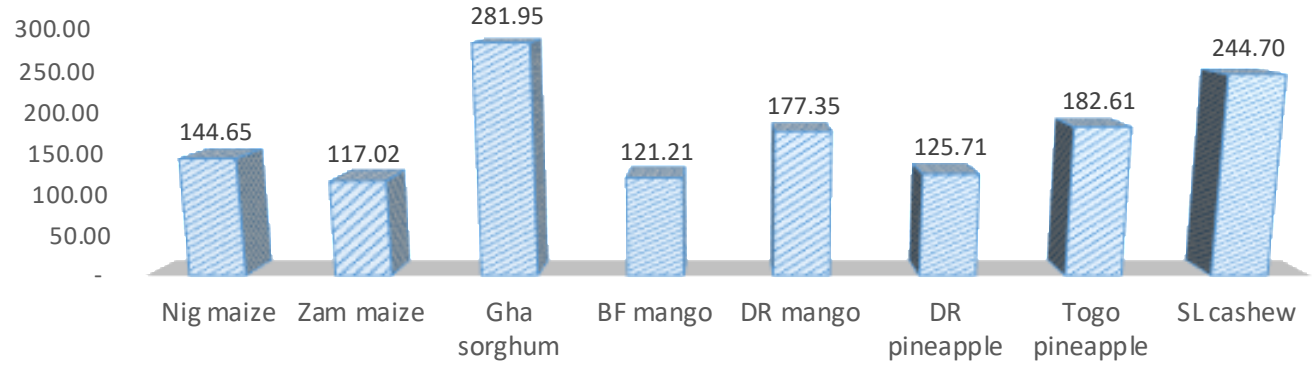
Finding 2 Incremental value added

- **Evident export crops are higher value** average value per tonne estimated at €600 compared to about €360 for staples**; but**
- **Incremental value added (IVA) higher for staples than export crops, and derived by:**
  - Computing ratio of total value added of primary production (total volume of output x average producer price or farmgate price) provides an indication of incremental value added from primary produce flows at farmgate to markets ➔ Processors/exporters plus service providers linked to their activities e.g. aggregators, transporters, and other service providers in the VCs. (e.g. Nigeria IVA about 45% and Sierra Leone cashew 145%)
- **Average IVA for staple crops is about 181% and 170% for export crops, implying:**
  - Operations of service providers and processors can make significant contribution in terms of driving growth in value added in agricultural VCs.

Growth more than increased output → optimise the contribution of all actors

Increased activities by service providers "compensate" loss of value added of low level of processing in the export crop VCs.

Figure 2: Ratio of total VA to value of crops output (%)



Finding 3 Social impacts

- **Processing, especially in staples VCs, usually consists of (formal) large or medium-scale and informal (micro/small-scale)**

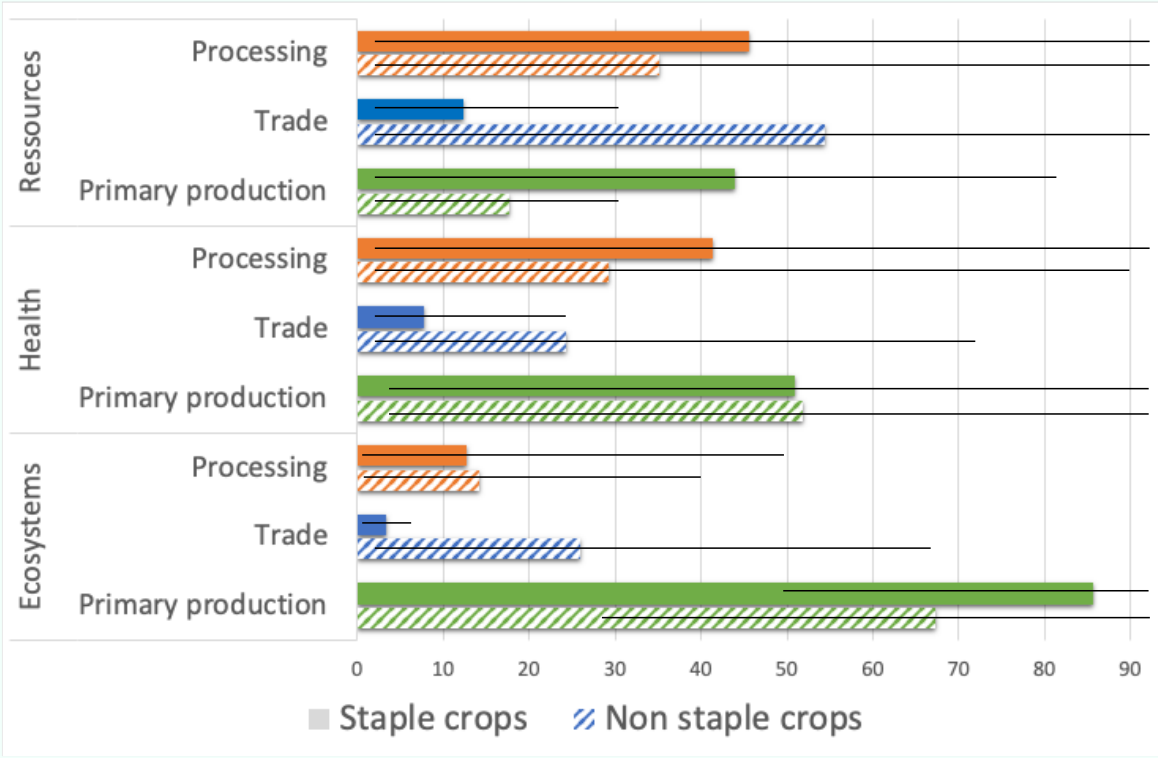
- **Social impact of formal processing:**
  - Limited direct rural employment though indirect positive rural income effects through uptake of raw produce.
  - Usually maintain good food and health safety standards as well as offer attractive remuneration (often through collective bargaining) – usually regulated.
  - Supply chains linked to formal processors creating opportunities for sustainable access to inputs and credit by smallholders

- **Social impact of informal processing:**
  - More inclusive in terms of generation of income in rural and low-income households
  - Major food safety challenges due to poor state of processing equipment
  - Processors/workers exposed to significant health and safety risks; wages and terms of employment may be uncertain due to lack of collective bargaining
  - Usually lack offtake contracts which can be used to leverage inputs credit.

Finding 4 Environmental impacts of processing

Main stages of VC: Comparative analysis of primary production, trade/logistics and processing damages in areas of protection

- Staple crops: primary or agricultural production is the main contributor to the 3 areas of protection →shift if processing needs important amounts of energy (human health and depletion of resources).
- Export crops: trade and the processing stages are the main contributors to damages on human health and resources depletion.
- Reducing environmental footprint of processing VC: cumulative environmental impacts between actors and stages (Production, processing and trade)



Comparative analysis of the environmental damages of VC stages

Agricultural production : improve yields and agroecological practices to avoid land use change and ensure efficiency inputs (product quality)

Processing stages in farm (post-harvest practices and storing). Energy efficient technologies

Improve efficiency of transport, inputs production and logistics (include international transport)

Finding 5 Importance of the technology efficiency of processing

- **Environmental, social and economic results are linked to the efficiency of the technology used in processing**

➢ Main contribution of **environmental impact** from processing are energy resources and inefficient transformation (processes that require a lot of energy of biomass such as wood or gas)

➢ Gap of the efficiency of transformation processes between artisanal and industrial units, as well as a more prevalent **formality** in the latter (better working conditions).

➢ Micro/small-scale processors VCs rely old and inefficient technology (noise pollution as well as heavy air **pollution** e.g. electric generators) increasing **total operating costs** substantially (e.g. 30% of total operating costs in pito brewing sorghum)

➢ Better processing, better **sanitary conditions and lifespan** of products for consumers (food safety and food security), better quality (**higher prices and new markets**)

Small-scale maize milling/processing unit in Kaduna State, Nigeria
Source: Nigeria Maize VCA4D Study Report (2021

Implications for decision making process 1

Evidence reviewed shows the following :

a) **Processing contributes to IVA** – not only **directly but also through activities** of service providers involved in delivery of raw materials or distribution of processed products

b) **Role in IVA generation** more **crucial in staples than in export crops VCs**. In latter services needed to ensure access export markets (usually quality related) create space for value added by logistics and other service providers. Building on that may be a more feasible option than aiming for upscaling export of processed products.

c) **Processing by informal actors** (usually micro/small-scale processors) may be more inclusive in terms of income and social effects; and their operations expose workers to poor working conditions as well as health and safety risks. Need to be addressed but may difficult to institutionalise.

Implications for decision making process 2

Evidence reviewed shows the following :

a) **Environmental impacts of processing** in staple and export crops VCs depend deeply on the **energetic source** and the **efficiency** of the fuel use **technologies**

b) **Agricultural production** is the main hotspot affecting the **ecosystems quality**. In several cases the first action should be to increase yields using agroecological practices (**Synergy of agricultural and industry Ministries**)

c) **Technological efficiency** is a key factor to reduce the environmental hotspots and improve economic and social conditions ➔ Access to "cleaner", technology and credit access

d) **Potential impact of transport for international trade**. The export of raw products adds value, but it supposes import of processed products. International trade environmental impacts needs further analysis. (air travel which multiply the environmental damages per 30…)

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