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The Role of the 'Hidden Middle' for Agri-food Value Chain Dynamics

Ruerd Ruben & Youri Dijkxhoorn

The European Commission has developed a standardised methodological framework for analysis of value chains (The Value Chain Analysis for Development (VCA4D) methodology https://europa.eu/capacity4dev/valuechain-analysis-for-development-vca4d-/documents/methodological-brief-eng), which has been applied to more than 45 value chains since 2016. VCA4D aims to understand to what extent the value chain allows for inclusive economic growth and whether it is both socially and environmentally sustainable.

The high-level conference 'Value Chain Analysis for Development: providing evidence for better policies and operations in agricultural value chains' which took place on 18th and 19th January 2023 took stock of lessons learnt from evidence on how knowledge on value chains can support decision-making. All documents and videos from the Conference are available here: https://capacity4dev.europa.eu/projects/value-chain-analysis-for-development-vca4d/info/5-conference-documents-value-chain-analysis-development-providing-evidence-better-policies-and-operations-agricultural-value-chains_en

The transversal analyses presented at the Conference have analysed a minimum of three different VCA4D studies, providing cross-cutting analyses on thematic issues of interest to policy-makers. The analyses and knowledge briefs are produced with the financial support of the European Union (VCA4D CTR 2017/392-416). Their content is the sole responsibility of the authors and do not necessarily reflect the views of the European Union nor of Agrinatura/ the VCA4D project.

Abstract

This transversal analysis highlights the role and importance of midstream actors (in processing, logistics, storage, packaging and handling) in the agri-food value chains (VCs), drawing on experiences from cash crops, fruits and vegetables, animal products and food staples. Main attention is given to the value added (VA) and employment creation by midstream actors providing insights into the efficiency (resource use), equity implications and welfare effects.

Differences in structure and performance of agri-food VCs are explained by characteristics of products (i.e. opportunities for investments in scaling and risks of perishability), the conditions for realizing transactions between VC activities (prices, wages, etc.) and the type of interactions between stakeholders (spot exchange or contractual agreements). Gender implications (opportunities for female entrepreneurship) and the environment (emissions) receive special attention.

The analysis contributes to the debate on the role of the 'hidden middle' for upstream activities and identifies critical possibilities for enhancing VC dynamics through midstream innovation.

Commercial and modernizing VCs for capital-intensive commodities generate higher midstream employment and value added (VA). Demand-side motives are driving the midstream transition: urbanization and a favourable business environment support investments in inclusive and sustainable midstream activities. Higher midstream VA shares are accompanied by a gradual increase in profitability. Midstream capital investments are associated with VA operations, even while several midstream processing activities are still fairly labour-intensive and therefore contribute to employment generation.

These findings have both theoretical and policy implications. System approaches are necessary for a full understanding of midstream VC dynamics, identifying both market and governance drivers to enhance inclusiveness. Policy instruments for supporting midstream investments and VC performance should rely on instruments for risk reduction and lower transaction costs to reduce access constraints and to enable broad participation.

Funded by the European Union

Materials and method

8 VCA4D studies that cover different categories of products and production systems were selected with a focus on cases from the sub-Sahara region (to control for major variation from contextual sources): cotton (Ethiopia), cocoa (Cameroon), green beans (Kenya), pineapple (Benin), beef (Zimbabwe), maize (Nigeria), groundnut and sorghum (Ghana). The transversal analysis compares information of these VCs with respect to their VA and employment structures. It identifies structural VC determinants and key performance outcomes (productivity; profitability) to understand causes for variation in the midstream agri-food VC structure and to assess which factors influence midstream performance.

A mixed methods approach has been used to identify the relationship between key performance variables (i.e. VA distribution and employment generation) with major supply chain characteristics, such as factor intensity (capital use, labour intensity), factor productivity (profit ratio), scale of operations, exchange relations and governance structure. The employment data are calculated from the salaries (divided by wage rate) and self-employment on smallholder farms. Due attention is given to a qualitative assessment of differences in social relationships in agri-food VCs, prospects for employment creation, opportunities for female entrepreneurship and welfare effects that result from these midstream dynamics.

Findings

Midstream dynamics vary according to the prevailing type of agri-food systems (see Figure 1). In traditional agri-food systems, VCs generate a major share of VA and employment in primary production activities. In commodities like cocoa (Cameroon) and cotton (Ethiopia), primary production is labour-intensive but VA generation takes place in midstream activities (sorting, grading). In transitional agri-food systems (maize-Nigeria, groundnut-Ghana), VA and employment are created between primary production and midstream segments. VCs for perishable commercial products such as pineapples (Benin), beef (Zimbabwe) and green beans (Kenya) midstream activities like quality grading, product selection and packaging are critical for maintaining a competitive position in demanding export markets.

For the internal organization and profitability of midstream VC segments (Figure 2), a rising share of the midstream VA is accompanied by a gradual increase in profitability. Rising capital-intensity of midstream operations is strongly associated with the higher midstream share in total VA. This is likely to be related to asset-specific investments for trade and processing activities that require greater control of midstream stakeholders over VC operations. Greater midstream capital investments thus deliver clear returns in terms of VA generation.

Performance

Most midstream activities are highly profitable, but there is large differentiation at the recollection stage and sometimes a monopolistic situation in final marketing. Despite the strong capacity for employment generation, labour productivity remains low in the midstream segments of food staple production (maize, sorghum, groundnut) for local and national markets. Both land-extensive production systems (beef) and capital-intensive processing (green beans) guarantee higher midstream labour productivity. Even while employment in cash crop production (cocoa, cotton) remains high in primary production, return to labour is challenged by high self-employment (sometimes including children) and limited options for labour-saving practices and technologies.

On the other hand, most midstream operations require substantial capital, i.e. long-term capital for infrastructure investment (transport, warehouses, processing plants) and short-term capital for operational use (pre-finance). Commodities with a longer supply chain and a larger scale of operations usually need more capital resources (cocoa, green beans, pineapple) while commodities that rely on low-input processing and are oriented towards local and (sub)regional markets are likely to be less capital intensive (maize, sorghum, meat).

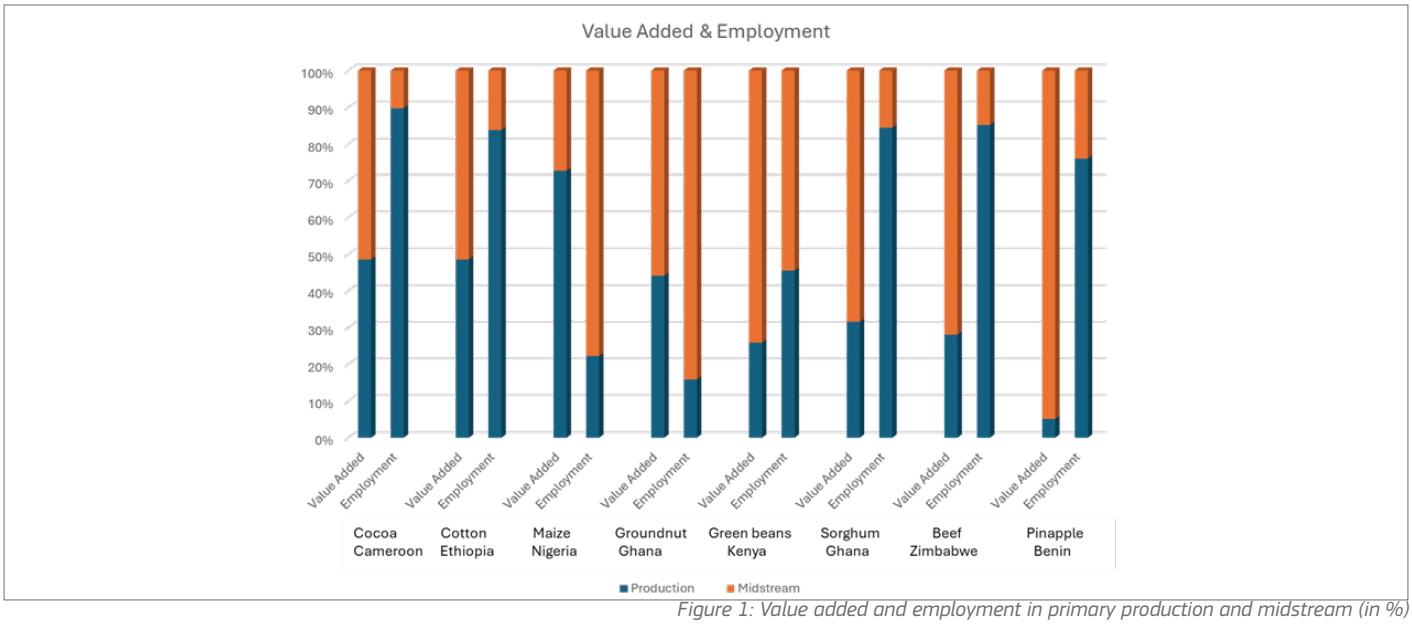

Figure 1: Value added and employment in primary production and midstream (in %)

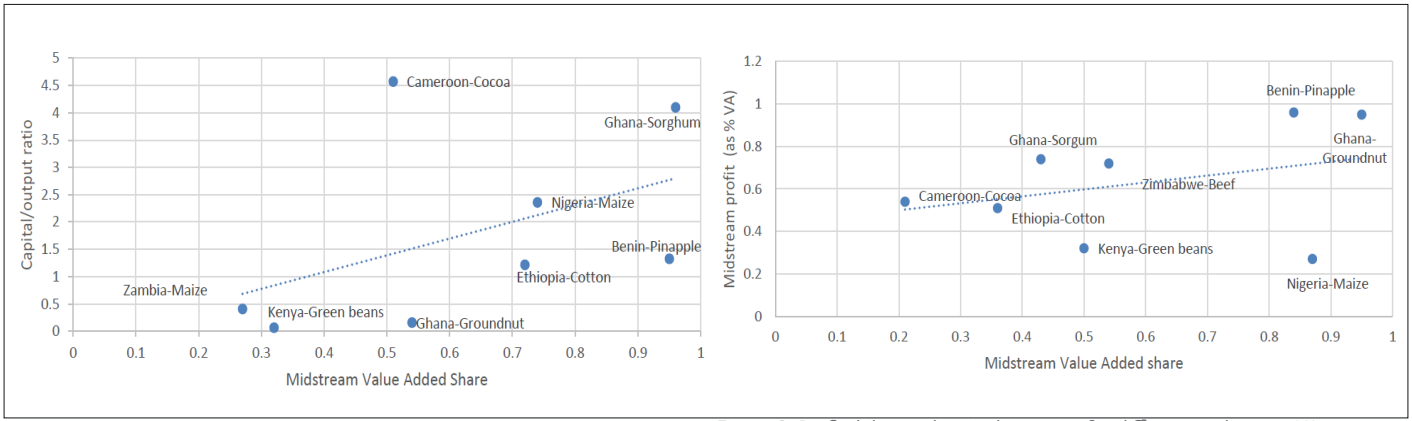

Figure 2: Profitability and capital intensity for different midstream VA segments

Food VCs (maize & groundnut) offer wide opportunities for female engagement in small and medium-sized enterprises (SME) trade and processing activities. Generally, production-dominated VCs (cocoa and cotton) face barriers of entry for SMEs due to oligopolistic production structures and high public levies. Thus, they pay lower wages and offer their labour force fewer options for reaching nutritional adequacy. While cocoa still offers limited opportunities for women outside primary production, women's self-employment remains important for cotton ginning and weaving. Midstream oriented VCs of green beans (Kenya), pineapple (Benin) and beef (Zimbabwe) offer female employment and demonstrate positive effects for reaching nutrition adequacy, but occupational health hazards and high energy and plastic packaging materials may threaten social and environmental sustainability.

Comparison of the different VA and employment structures for the 8 VCs according to three different archetypes (see Figure 3):

1. Production-oriented VCs generate a major share of VA (> 60%) and most wage and self-employment (> 80%) in primary production activities: cash crops such as cocoa (Cameroon) and cotton (Ethiopia) that are traded on (inter)national markets meeting rather stringent buying conditions.
2. Balanced VCs, with an equal division of VA between primary production and midstream VC segments, and midstream employment creation in local processing: primary food staples such as maize in Nigeria and groundnut in Ghana.
3. Midstream-dominated VCs with important midstream VA (> 60%) and employment generation (20-50%) through post-harvest activities: perishable VCs like green beans (Kenya), pineapple (Benin) and beef (Zimbabwe) that focus on global markets and need selection, packaging and processing.

The variation in midstream VA shares is related to differences in the composition of midstream activities, the degree of market competition and the leading role of specific stakeholders. In most VCs, processing activities are creating and capturing a growing share of VA (the case in perishable commodities VCs like green beans, pineapple, and to a minor extent beef), while raw materials (cotton, cocoa) require more investment in equipment and thus rely on a minimum scale in processing).

On the other hand, in VCs of basic food commodities (maize, groundnut, beef) the role of traders in recollection and distribution remains strong. Thus, more short-term credit is required for traders' operations and their profits depend mainly on the swiftness of transactions. Recollection activities generate important VA in cocoa and groundnuts VCs that only require basic processing and long-distance transactions.

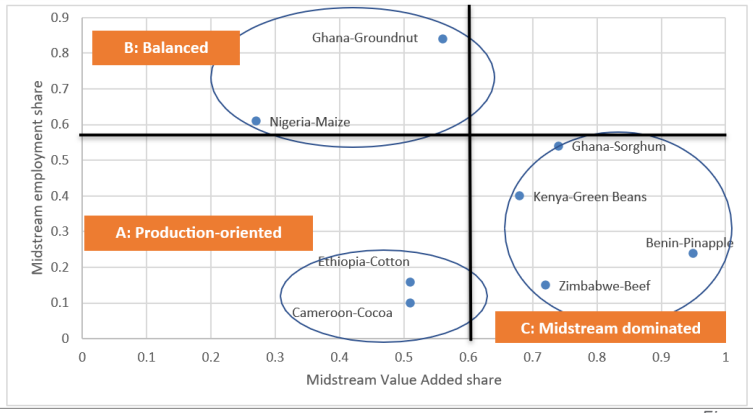

Figure 3: Different types of midstream dynamics

Conclusions

Despite the diversity of midstream VC operations in terms of scale, technologies and profitability, the analysis identified three archetypes with different configurations of employment and VA generation between primary production and midstream activities.

First, several country-level factors influence midstream VC development. Stronger urbanization and a more favourable business environment are supportive for investments but only have a minor effect on midstream profitability. Fastly growing urban food markets in sub-Saharan Africa offer a wide scope for midstream development. Further midstream development can be supported with lower entry barriers (easier permits, concessional loans), market information (transparency) and scale-neutral technological innovations.

Second, the analysis revealed the impact of commodity characteristics on the organization of midstream VCs. Production-oriented VCs dominate in commercial commodities (cocoa and cotton), where primary production is labour-intensive and VA generation requires investments in transformation (drying, fermentation and spinning/ginning). Balanced VCs are typical for staple foods (maize and groundnut) that focus on local and regional markets and use small-scale processing facilities. Midstream-dominated VCs are mainly found in perishable commodities (pineapples, beef, green beans) where downstream activities for quality grading, product selection and packaging are critical for maintaining a competitive market position.

Third, the analysis marked differences in midstream firm organisation and economic performance and discussed their implications for agri-food system development. A growing midstream VA share is accompanied by a gradual increase in midstream profitability. This is mainly due to the shift in bargaining power in favour of midstream firms. Moreover, midstream processing activities are fairly labour-intensive and therefore result in additional off-farm employment generation.

Policy implications

Midstream VCs provide important leverage points for agri-food policies. Instead of focusing on investments in agricultural intensification, it could be more effective to support midstream actors and strengthen VC governance to support backward linkages and delivery contracts. Reduction of risks and transaction costs should become key components of public policy toward more inclusive and sustainable agri-food VCs. Public investments in external infrastructure and for strengthening the market environment are helpful for the transition from subsistence to commercial agriculture. Further investments made by private VC actors that enable the upgrading of operations need a more specific commodity focus.

Production-oriented VCs still have large opportunities for reducing yield gaps and improving labour-productivity creating positive effects for farmer's incomes and enabling the gradual transfer of employment to midstream operations. Balanced VCs should focus on opportunities for increasing VA through investments in processing equipment, better management of material flows (loss reduction and energy savings) and the use of sub-products. Finally, midstream-dominated VCs give priority to quality improvement, opportunities to increase profits in higher-end market segments and closer linkages with consumers (Figure 4).

Midstream archetype	Policy focus	Instruments
Production-oriented	Increase labour-productivity	Education, training and extension, agricultural implements, good agricultural practices (GAP)
Balanced/mixed	More VA	Investment in equipment, reduction of losses, resource use efficiency, certification.
Midstream-dominated	Better quality	Input use, testing and control measures, packaging, branding.

Figure 4: Differentiated strategies for VC development

Value Chain Analysis for Development (VCA4D) is a tool funded by the European Commission / INTPA and is implemented in partnership with Agrinatura. Agrinatura (http://agrinatura-eu.eu) is the European Alliance of Universities and Research Centers involved in agricultural research and capacity building for development.

The information and knowledge produced through the value chain studies are intended to support the Delegations of the European Union and their partners in improving policy dialogue, investing in value chains and better understanding the changes linked to their actions. VCA4D uses a systematic methodological framework for analysing value chains in agriculture, livestock, fishery, aquaculture and agroforestry. More information including reports and communication material can be found at: https://europa.eu/capacity4dev/value-chain-analysis-for-development-vca4d-

This document is based on the VCA4D Conference transversal analysis "The role of the 'hidden middle' for agri-food systems value chain dynamics" prepared by Ruerd Ruben and Youri Dijkxhoorn for the European Union, DG-INTPA. Value Chain Analysis for Development Project (VCA4D CTR 2017/392-416). The document is available at: https://capacity4dev.europa.eu/library/vca4d-conference-session-2-role-hidden-middle-agri-food-systems-value-chain-dynamics_en