

How Informal Self-Employment and Value Addition Can Create a Rich Variety of Food Products

A Case Study About Informality in the Cassava Sector in Ghana



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Authors

Kennedy Adams Gedo¹, Nancy Ayesua Otu² November 2024
Reviewed by: Ted Schrader and Thies Reemer³

¹ Agribusiness Unit of Policy Planning, Monitoring and Evaluation Directorate (PPMED), Ministry of Food and Agriculture, Ghana,
² Nana Oduraa Women and Children Development Foundation, Ghana,
³ Wageningen University and Research, Wageningen Centre for Development Innovation, The Netherlands.

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Erika Endrődiné Benkő

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Cassava plays a significant role in the food systems of most regions in Ghana and is of high importance in the employment and nutrition of millions of Ghanaians. This article explores the diversity, contributions, and the challenges and opportunities of informal actors along cassava value chains, from input supply to consumption. The aim is to outline the dynamics of the cassava sector and the relations between formal and informal actors, and to suggest options for improving food system outcomes, taking the roles and livelihoods of informal actors into account.

The food system context

Cassava is the major staple crop in Ghana

Cassava (*Manihot esculenta*) is cultivated in all 16 regions of Ghana. Between 2019 and 2021, the total average area cultivated for cassava was more than 2.4 million hectares (e.g. >24,000 square kilometres, which is almost the size of the country of Rwanda). In the same period, production was 22–24 million metric tons (SRID-MoFA, 2021). With these figures, Ghana ranks as the fourth largest cassava producer in the world, the third largest in Africa and second largest in West Africa (FAOSTAT.org, 2019). Per capita cassava consumption is around 570 kg per year. The cassava sector contributes about 22% of agricultural GDP. The average rural wholesale price was around 190 USD (1175 Ghanaian Cedi) per metric ton (MT) in 2021. According to the Ghana Cassava Industrialization Partnership Project (GCIPP), the demand for industrial processing is projected to grow by 1.6 million MT per year, encompassing both domestic demand from Ghanaian industries and regional demand from other Economic Community of West African States (ECOWAS) markets.



Figure 1: Fresh cassava ready to be used (Konko, in the Eastern region).

More than 70% of the Ghana's farming households are involved in the cultivation of cassava roots, both for consumption and/or sale. Cassava is frequently eaten by all Ghanaians, as boiled cassava or one of the many processed products (see Figure 3 below), such as 'Gari' (fermented roasted cassava), 'Kokonte' (cassava flour), 'Fufu' (cassava flour mixed with plantain or cocoyam), or 'Agbelima' (fermented cassava dough). *Agbelima* is the basis for famous Ghanaian dishes, such as 'Akple', 'Banku' and 'Yakeyake'.



Figure 2: Fresh cassava on the farm.

Cassava is the basis for a huge variety of food products

As a staple crop that is processed into various food products, cassava plays a pivotal role in sustaining livelihoods in Ghana, providing food for local consumption, and for national and export markets. The list below explains the processing steps required for different cassava products.

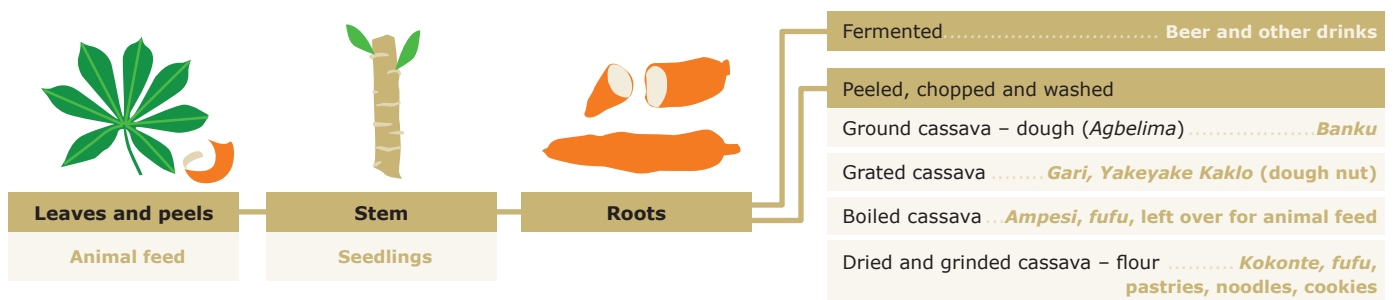


Figure 3: Different types of products made of cassava in Ghana.



Gari (fermented and roasted cassava)

Gari is a very popular processed cassava product in all cassava-producing regions. Multiple processing steps are required to produce it. Firstly, the cassava is peeled. Then it is thoroughly washed and grated using a wooden board and metal sheet. The grated cassava is then pressed in jute bags with added weight for juice extraction. The grated and pressed cassava undergoes fermentation for about two days and is then sun-dried, sieved and roasted on an open fire until it becomes crisp. After roasting, the product undergoes another sieve to ensure a smooth texture before being packaged for storage and sale (James et al. 2012, Quaye et al. 2009).



Kokonte (cassava flour)

Compared to *gari*, making '*Kokonte*' is more straightforward. Peeled cassava roots are cut into small pieces, sun-dried for three to six days and fermented during drying to enhance aroma. Rapid drying reduces mold growth, resulting in a longer shelf life. The dried chips are ground into flour, which is used for preparing a traditional cooked meal (cf. Quaye et al. 2009 for more details).



Fufu (cassava flour mixed with plantain or cocoyam flour)

Peeled cassava roots are boiled. Peeled or unpeeled plantain or cocoyam is added before boiling, and it is boiled until it is well cooked. It is assumed that boiled unpeeled plantain or cocoyam has medicinal value. It is then pounded using a mortar and pestle until a paste is obtained that can be rolled into small balls. It is eaten with soup. *Fufu* pounding machines are available that blend the cassava and cocoyam or plantain to the required texture. Cassava and plantain flour are blended to make *fufu*. The difference between *Fufu* and *Kokonte* is the processing and the addition of plantain or cocoyam flour to cassava flour to make *fufu*.



Ampesi (boiled and salted cassava)

Ampesi is peeled cassava that has simply been boiled with salt added to taste. It is not mashed or pounded. It is normally eaten with stew, sauce or soup.



Agbelima (fermented cassava dough)

Agbelima is processed in a similar way to *gari* production but excludes frying. Pressing and fermentation enhance short-term storability. In local cuisine this dough is popular because it doesn't need to be fried. *Agbelima* is used in Ghanaian dishes, such as '*Akple*', '*Banku*' and '*Yakeyake*'. It is sometimes used in preparing '*Agbeli kaklo*' (doughnuts).



Cassava in pastries

Cassava flour is used in pastry-making as a substitute to wheat flour (especially when wheat prices rise) in various proportions: 75% in sponge and chiffon cakes, 50% in butter cakes and cookies, and 25% in doughnuts and spaghetti. In addition, cassava flour is used in noodle production to replace 25–50% of rice starch, resulting in noodles with a softer and more elastic texture (Dziedzoave et al., 2003).

Cassava use in industries other than the food industry

In Ghana's brewing industry, cassava flour is used to make beverages, such as beer. High-Quality Cassava Flour (HQCF) can act as binding agent in the food and plywood industries and can replace maize starch in starch-based adhesives.



By-products

Cassava by-products (which include peels, pulp, leaves, and boiled residues) are a valuable sources of animal feed.

Cassava stems are mainly used as planting material for subsequent planting seasons (cassava cuttings).

The actor network from input supply to consumption

Input supply

Formal input dealers serve as intermediaries between input manufacturers and farmers, facilitating the distribution of agricultural inputs, such as seeds, fertilisers, pesticides, and machinery. Examples are: *Wienco Ghana Limited*, *Chemico Ghana Limited*, *Yara Ghana Limited*, *RMG Ghana Limited*, *Calli Ghana*. These suppliers are generally based at the district level, and not in easy reach for most farming communities. They do not organise transport for their clients nor offer after-sales services. Except for some larger companies, most do not bring cassava production expertise. The 'Planting for Food and Jobs' initiative of Ghana's **Ministry of Food and Agriculture** provides subsidised seeds and inputs. This benefitted more than 1.6 million farmers in 2021.

Informal local input dealers and small-scale vendors function outside formal regulatory frameworks. They offer various agricultural inputs to farmers in rural- or remote areas, such as planting materials (cassava cuttings), fertilisers (especially organic), pesticides, tools and equipment. The presence of informal input dealers within the input supply chain ensures that agricultural inputs reach the hands of those who need them the most, particularly in remote or marginalised areas.

Farmers organised in groups (both informal associations and registered cooperatives), collaborate to pool resources for collective purchase of inputs. Some **commercial farmers** play a vital role by providing credit facilities or input financing schemes to smallholder farmers, enabling them to access inputs even when they lack immediate financial resources. Non-Governmental Organisations (**NGOs**) support **smallholder farmers' organisations** with grants, credit, training, and inputs.

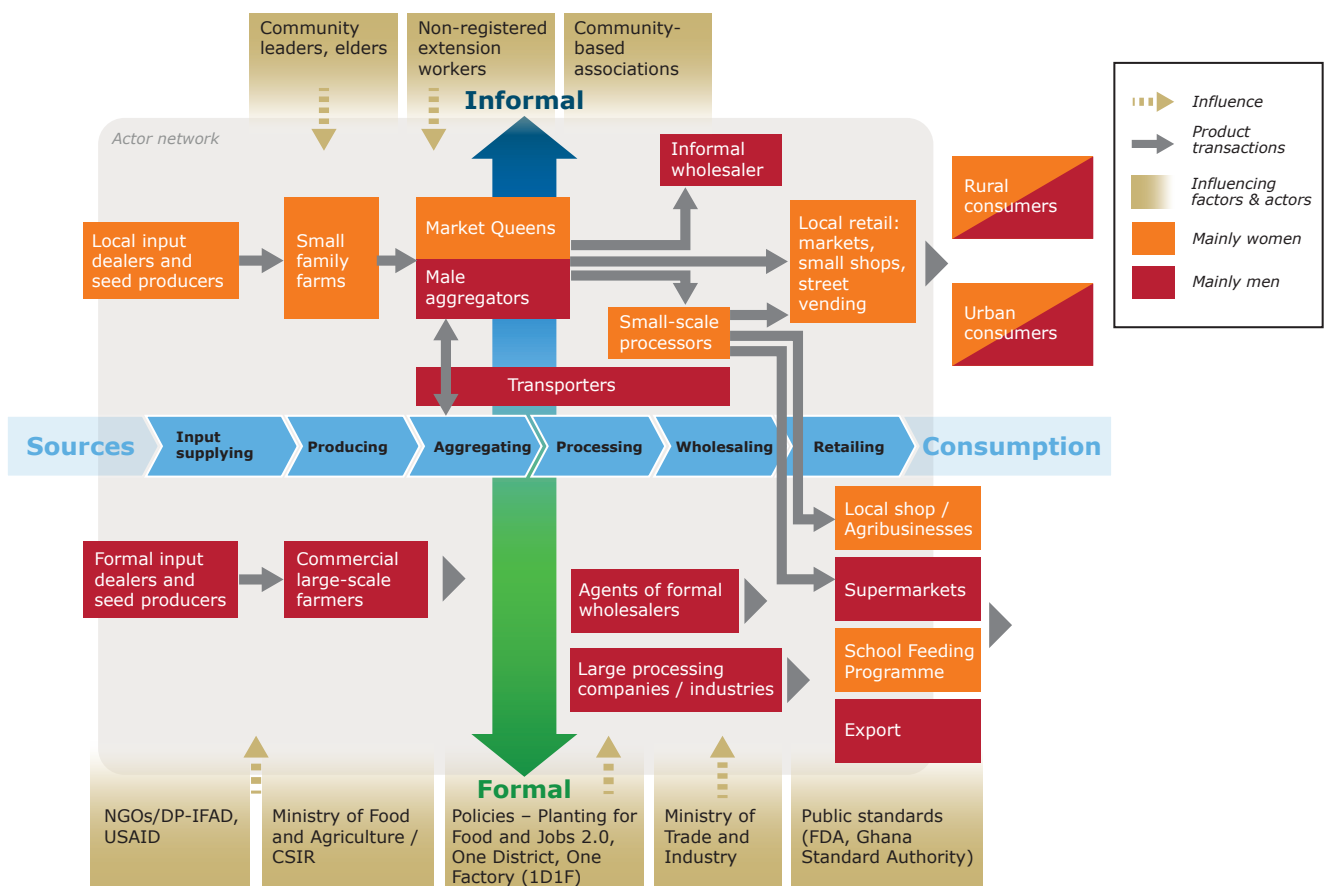


Figure 4: Cassava value chain actor map on a scale from informal to formal.

Production

Smallholder farmers are the backbone of Ghana's food system and play crucial roles in food security. They cultivate crops, such as cassava, maize, yams, and vegetables. Smallholdings are often the primary livelihood for rural communities. Seventy percent of the Ghana's farmers are involved in cassava production, and most of them are **small family farms**.

Community leaders and elders informally often play important roles in guiding and influencing agricultural activities. Their input can be significant in mobilising community support for cassava farming initiatives. **Community-based associations** share knowledge and labour for production. Examples are *the Bonsua Cassava Farmers*, *Twumia Nkwanta Cassava Growers Association* and *the Pokuase Cassava Production and Processing Association*. Women often form informal groups to engage in production, planting, harvesting, and processing, contributing to socio-economic development of their communities.

Informal extension workers may operate at the community level to provide technical advice and information to farmers, without formal employment by agricultural agencies.

Government agencies and non-governmental organisations provide **formal extension services** to assist cassava farmers in adopting optimal practices, improved varieties and sustainable farming methods. For instance, the IITA African Cassava Agronomy Initiative (ACAI) has introduced electronic agricultural extension services to provide cassava farmers with access to research and innovation. The Ministry of Food and Agriculture, along with various government bodies (f.e. Ghana Standards Authority, GSA, and Plant Protection and Regulatory Services Division, PPRSD), are engaged in policy development, regulation and the implementation of support initiatives for cassava farmers, such as subsidies.

Aggregation and market relations

Aggregation and collaboration between **farmers, processors, and traders** are key to move cassava from farms to markets with efficiency. Farmers play a vital role, harvesting cassava and organising transport, often working with **intermediaries and collection centres**. Reducing transport and transaction costs is essential for maximising farmers' profits.

Market queens (see Textbox 1) are notable figures in local markets and play an essential role in the aggregation of cassava, and for shaping retail transactions. They facilitate communication, negotiation, and exchange between parties, ensuring smooth and efficient transactions. Their reputation and relationships within the market community make them trusted mediators, capable of resolving disputes and conflicts that may arise during the trading process.

Textbox 1: The Ghanaian Market Queen

Market queens are informal traders who usually aggregate produce for wholesale. They are elected by traders in the market to control how and when food products are sold in the market. They play a central role in the cassava trade and are able to set and standardise prices for cassava sacks. Retailers adhere to these standardised prices, paying commissions to the market queens. To streamline the flow of produce, there are specific days designated for transporting goods from villages or regions to central markets. Market queens usually own shops or spaces where products are sold, and they rent or use their own trucks to buy from farmers, offering payment in cash, mobile money transfers or partial payment methods.

Market queens have influence in the governing systems within markets. They approve or prevent individuals who want to operate in the market for example through permits to sell. They approve and guarantee loans and grants to market women and organise saving- and loan associations. They are involved in welfare services, such as supporting traders or other people with critical illness who have difficulties funding treatment and medication. Because of these influential roles, market queens have very high political power. Politicians depend on them to win votes from the market women. Market queens can influence the political agenda.

Processing

The many different options to add value to basic cassava tubers explain why cassava processing can create so many employment and income generating opportunities, which can contribute to food security and economic development in Ghana. Although there are agro-industrial units, cassava processing is predominantly artisanal and mostly carried out by women (IFAD, 2007).



Figure 5: Picture of women processing cassava into gari.

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Processors contribute enormously to reducing cassava losses.”



Figure 6: Cassava processing (boy helping his mother after school).



Figure 7: Woman frying gari in Volta Region.

Informal actors, mostly women, engage in small-scale cassava processing and undertake tasks, such as peeling, washing, chipping, grating, fermenting, sieving, frying, drying, roasting and milling to produce various end products (see Figure and Table above). Through their meticulous efforts, they enhance the marketability and economic value of cassava, thereby contributing to increased incomes for themselves and their communities.

Local women artisans often directly supply gari to primary schools in **Ghana’s School Feeding Program**.

Larger cassava processors engage in trade activities by selling their processed products to local and urban markets in Ghana, and even beyond its borders. This trade contributes to the country’s economy by generating revenue through exports and stimulating domestic consumption.

Storage and conservation

Large-scale farmers delay harvest until transport ready. Fresh cassava preservation techniques, such as burying, sacking, or immersion in water, which last about 10 days, are commonly practiced by **retailers**. All **processors** contribute enormously to reducing losses by transforming raw tubers in products that can be better and longer stored and conserved. In terms of food storage, the **National Food Buffer Stock Company** collects excess produce (processed cassava) to mitigate post-harvest losses. **Private companies** such as *Maphlix Trust Ghana Limited* and *Janefal Farms* have robust storage and transport networks. They contribute to trade by buying raw cassava, processing it, and then distribute the products to markets.

Transport and distribution

The cassava finds its way to the final consumer through many kinds of **transport**, including motorbikes, tricycles (which are known as 'Aboboyaa' or 'Pragia'), wheelbarrows, trucks, passenger vans and human carriers. Most often roads leading to farms are impassable by larger vehicles, and so farmers or traders hire individuals, motorbikes or tricycles to carry products from the farm to an accessible roadside for onward transport by the trucks and vehicles.

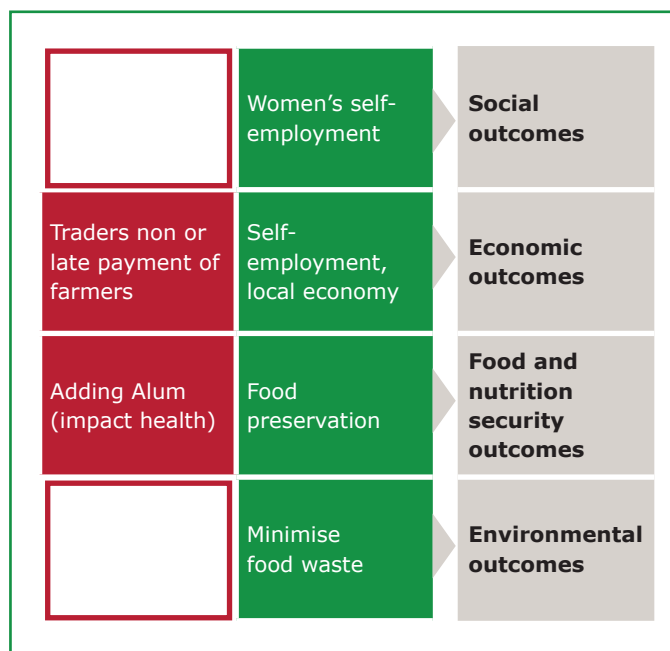
Local shops and local markets are mostly the final destination for consumers to purchase their products. They are the source for further retail services via restaurants, chop bars and mini markets. Retail chains and supermarkets are also final outlets, which source and sell cassava products through established supply chains.

Food system outcomes

Following the journey of cassava from input supply to consumption, it is clear that informal sector actors play vital roles in the cassava sub-sector in Ghana. They are large in number and include input resellers, smallholder farmers, processors, transporters, large traders, market queens, market vendors and retailers. The cassava sector offers many income generating opportunities that form an important foundation for the livelihoods of millions of Ghanaians.

Together with many formal actors and stakeholders, informal actors contribute to a complex network that drives cassava production, processing, marketing, transport and distribution across the country. They are very important for extending the reach of input supply, information and services to rural areas (which are often remote and marginal) and for facilitating trade at the local level. In addition, informal actors are particularly important for transforming cassava tubers into a range of food products and distributing these to final consumers.

The presence and complementary roles of formal and informal actors lead to the availability of the broad range of cassava-based products, contributing to improved food and nutrition outcomes.



'What if questions' – Informal actors' roles and contributions

When considering improvement of the performance of the Ghanaian cassava sector, "What if?" questions can be useful in extracting relevant information: What if the informal actors were not part of the food system? What if their roles and performance could be improved?

What if the informal actors were not part of the cassava sub-sector?

It is clear that the local economy would be affected due to reduced self-employment, decreased market activities and less income generation among smallholders, processors, informal traders and other informal actors. This would result in heightened poverty levels and reduced livelihood opportunities in rural areas.

Without informal actors, local farmers would be more isolated, and this would make access to inputs more difficult, reduce information sharing and problem-solving capacities, and make access to markets more difficult due to a lack of cassava collectors and transporters.

Without informal groups, women would be less empowered and resourced to invest in activities along the value chain and earn income. Informal actors, including local processors and market vendors, also play a crucial role in minimising post-harvest losses through efficient handling and processing of cassava products. The reduction of the current roles of informal actors could result in a less resilient, less flexible and more vulnerable cassava sub-sector, impacting the livelihoods of many, as well as the overall socio-economic fabric of rural and urban communities.

What if current positive roles were improved?

The informal sector is very instrumental in minimising post-harvest losses, by processing raw tubers into many food products and into intermediary products that are further processed into semi-finished and finished products. Processing methods could, however, be much improved, as they are often time consuming, unhealthy or unhygienic.

However, many processors have either limited knowledge on the effect of their actions or are compelled to stick to their old ways of doing things due to the cost involved. For example, peeled cassava are supposed to be washed with clean water before further processing. Very few villages and communities have access to portable water, especially within and around farms. If processors and farmers have access to clean water closer to their farmhouse and processing sites, they would be able to produce healthy and hygienic food.

What if current negative roles were addressed?

Some operators process cassava into *agbelima* and *gari* add **alum to whiten the endproduct**. The alum is mixed with water and added in the machine when grinding the cassava. Consumers often prefer whitened dough and *gari*, believing that it constitutes a well-cleaned product. Very few consumers are aware of this practice and its health effects. Very few know that many cassava species are not white in nature.

Artificial colouring is also used to create yellow fried *gari*, making it appealing to customers (who believe that it is a specific cassava variety). Ghana does indeed produce yellow-fleshed cassava, but only on a very limited scale. *Aunty Efua*, a processor in the Central Region, is convinced that most yellow-coloured *gari* is based on artificial colouring, as large scale *gari* producers can never source enough yellow-fleshed cassava. Her information is very relevant since the source, quality and risks of the yellow-colouring is not yet known. Investigation and public awareness is needed on these practices to address the situation. There should be more training of these processors on healthy and hygienic processing.

Informal traders and aggregators sometimes take **a long time to pay** farmers, or they sometimes never pay at all. This, of course, has a huge impact on farmers and trading relations. This problem is more pronounced among occasional business partners, and more often a problem when providers and off-takers know each other. Farmers should be more alert about the risks of their transactions, have witnesses, operate in informally regulated markets (cf. Market Queens) or engage in collective marketing of farmer groups or cooperatives.

'So what?' – General conclusions and recommendations

Maintaining and recognising the positive contributions of informal actors is crucial for sustaining and improving the performance of the cassava sector in Ghana. The knowledge and skills of informal actors enhance the capacity of the cassava sector to adapt to changing environmental and market conditions. A balanced approach that recognises the strengths of both formal and informal actors is essential for sustainable development in the cassava value chain.

The recognition of the roles of informal actors would be a first positive step, as an indication of awareness of their existence and contribution. An important next step is the active participation of informal actors in the formulation of policies and interventions. In this, the perspectives, experiences, and on-the-ground insights of informal actors are currently not adequately considered. Due to this mismatch, policy objectives and practical results are not obtained in practice. And many options for action, which are often 'low-hanging fruits', are not perceived. It is, thus, indicated to solicit the input of informal actors and to integrate their perspectives in the design- and decision-making processes.



Figure 8: Ghana women fry gari.

Without doubt, informal actors can bring in a wealth of experiences and practical insights. Proactive action to invite transporters, womens' processor groups, smallholder farmers, market queens and others to the table is important, albeit not easy, as informal actors are often not strongly organised. However, a collaborative synergy can lead to the development of policies that are not only more responsive to the realities of the cassava sector, but also capable of fostering growth, resilience, and positive outcomes for both informal- and formal actors, as well as the broader socio-economic landscape. Some guidelines for engaging with informal actors include:

- Acknowledge and value the indigenous knowledge of informal actors. Integrate farming and processing practices to enhance the resilience and sustainability of the food system, respecting and preserving local heritage.
- For social inclusion and gender equity, an informality lens is needed when intervening in the value chain. Many functions are performed in informality by large numbers of people.
- Encourage community-led initiatives, cooperatives, and self-help groups, fostering a sense of responsibility, collective action, and shared benefits.
- Strengthen informal actor groups (such as farmers' associations, womens' groups, transporters), to amplify their voice in policy discussions and ensure that policies align with the needs of those actively involved in the commodity sub-sector and value chains.
- Develop platforms for effective information sharing and communication.
- Utilise a combination of mobile technology, community meetings, and local networks to disseminate pertinent information on market trends, weather patterns, and best agricultural practices, to ensure that informal actors stay informed and connected.
- Include informal actors in capacity development to enhance their skills and knowledge on sustainable agricultural practices, food safety standards, and business management. Empowered informal actors contribute to improved efficiency and productivity within the food system.
- Create an enabling environment for informal small entrepreneurs (often women) to operate well with some regulatory measures, where required for improving the quality and safety of products.

Practical options for action

The engagement of informal actors is pivotal in achieving positive food system outcomes and addressing existing deficiencies. A comprehensive approach involves a range of strategies aimed at empowering and integrating informal actors into the broader cassava food system landscape. There are many challenges that can be addressed, with involvement and collaboration of both informal and formal actors (from both private and public sector).

Challenge 1: Planting material

Cassava is susceptible to viruses. Access to well-adapted varieties and healthy cuttings pose a challenge.

- **Opportunities for practical action:** Collaboration of research, formal input dealers, informal input dealers, farmers and farmer groups to improve access to disease-resistant healthy cassava cuttings, particularly varieties that are most preferred by consumers and buyers. To respond effectively to growing market demand.

Challenge 2: Yield gap and production risks gap

Production per hectare could significantly grow. Smallholder farmers face challenges related to climate change.

- **Opportunities for practical action:** Collaboration of formal- and informal extension workers to promote the adoption of sustainable, climate-smart agricultural practices to improve yields and mitigate environmental impacts.

Challenge 3: Low prices and high losses for farmers

Cassava farmers are risk-takers and often have high losses of produce and money.

- **Opportunities for practical action:** Improved storage and value addition, as well as strengthened collective action of farmer cooperatives and associations offer opportunities for increased income and livelihoods.

Challenge 4: Product quality and diversification

Product quality and diversification are challenges for informal actors due to limited resources and insufficient market prospection. Maintaining product quality is crucial for market acceptance and competitiveness.

- **Opportunities for practical action:** Processors and farmers could be supported with basic processing equipment, hygienic and healthy processing to reduce turnaround time, hence reducing post-harvest losses.

Challenge 5: Colourants and food safety risks

Some processors add colourants, which may lead to unhealthy food products.

- **Opportunities for practical action:** Inspection of processing procedures and tests of cassava products that (are suspected) to have added colourants. Governments, NGOs, and farmers' organisations can train processors.

Challenge 6: Market access roads

Poor road connections between farmlands and market centres increase transport costs and time and lead to high post-harvest losses and exposure to armed robbery.

- **Opportunities for practical action:** Collaboration of rural communities with local governments to open, broaden and maintain access roads, f.e. by communities providing labour, marram and wood, with engineer capacity, machinery and budget provided by District Government.



Figure 9: Grinding mill, Ghana.

Challenge 7: Trade (volatile market prices)

Informal actors face fluctuating market prices for cassava products. This makes financial planning and investment decisions challenging and impacts on income security and financial stability.

- **Opportunities for practical action:** Involve Market Queens, large traders and Government in the development of systems to inform farmers and small processors about market demand and market prices.

Challenge 8: Market infrastructure

Informal actors face difficulties accessing larger markets due to a lack of certification, quality assurance, and compliance with formal market requirements.

- **Opportunities for practical action:** The market centres could be improved with basic social amenities, cemented floors, sheds and storage facilities to avoid exposing food products direct to sunlight.

Challenge 9: Limited market access

Informal actors may face difficulties accessing larger markets due to a lack of certification, quality assurance, and compliance with formal market requirements. This limitation constrains their potential for growth and profitability.

- **Opportunities for practical action:** Informal actors can explore value addition and product diversification, to align with evolving consumer demands. Government and NGOs should facilitate linkages between informal actors and formal markets and provide certification support for compliance with quality standards to open up new avenues for market access and premium pricing.

Challenge 10: Limited access to finance

Informal actors often find it challenging to secure financing for their operations, hindering their ability to invest in modern equipment, technology, and capacity building. This limits their potential for growth and innovation.

- **Opportunities for practical action:** Encourage the development of appropriate financial products, allowing informal entrepreneurs to invest in seeds and inputs, processing equipment, means of transport, storage facilities, and market infrastructure to facilitate the smooth flow of cassava produce from rural areas to urban markets.

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Wageningen University & Research
P.O. Box 47
6700 AB Wageningen
The Netherlands
T +31 (0) 317 48 07 00
www.wur.eu

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