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VCA4D
VALUE CHAIN ANALYSIS FOR DEVELOPMENT

Groundnuts value chain analysis in Ghana

Value chain analyses assist in informing policy dialogue and investment operations. They help the understanding of how agricultural development fits within market dynamics. They permit an assessment of the value chains' impact on smallholders, businesses, society and environment.

The European Commission has developed a standardised methodological framework for analysis (https://europa.eu/capacity4dev/value-chain-analysis-for-development-vca4d-/wiki/1-vca4d-methodology). It aims to understand to what extent the value chain allows for inclusive growth and whether it is both socially and environmentally sustainable.

The value chain context

Groundnut (GN) is a high-value crop with potential to create employment and improve the living standards of the rural poor. It contributes to ensure the food security and nutritional needs across all social classes. It is produced mainly for domestic consumption in the form of products that are a key ingredient in local dishes such as groundnut paste, snacks (roasted), oil, flour, and kulikuli (fried cake). Leaves, stems and roots are used to feed animals during the dry season. Rotated with maize, the crop is an integral part of the mixed cropping-livestock system. However, the country is increasingly relying on imports to meet its domestic demand.

The European Union intervention

The European Union (EU) is investing €147 million of the 11th EDF National Indicative Plan in Ghana to promote sustainable agribusiness development in order to increase the incomes of small-holder farmers and expand opportunities for the most vulnerable, notably youth and women.

In line with the priorities of the Northern Development Authority (NDA), the EU policy targets the Upper West, Savannah and North East Regions via 3 interconnected programmes: (i) the Productive Investments Programme, which focuses on improving access to water for agricultural production; to physical market infrastructure, roads and storage facilities; and to energy for productive uses in value chains (VCs); (ii) the Resilient Agriculture against Climate Change (REACH) focusing on protection of natural resources to foster sustainable and inclusive improvement in the rural economy; (iii) the Market Oriented Agricultural Programme (MOAP) under which €25 million is being invested in high-value crop VCs including groundnut. The MOAP is being implemented by the Ministry of Food and Agriculture (MoFA) and GIZ, initially in Southern regions of Ghana, but has been extended to the northern regions since 2017 with the support of the EU.

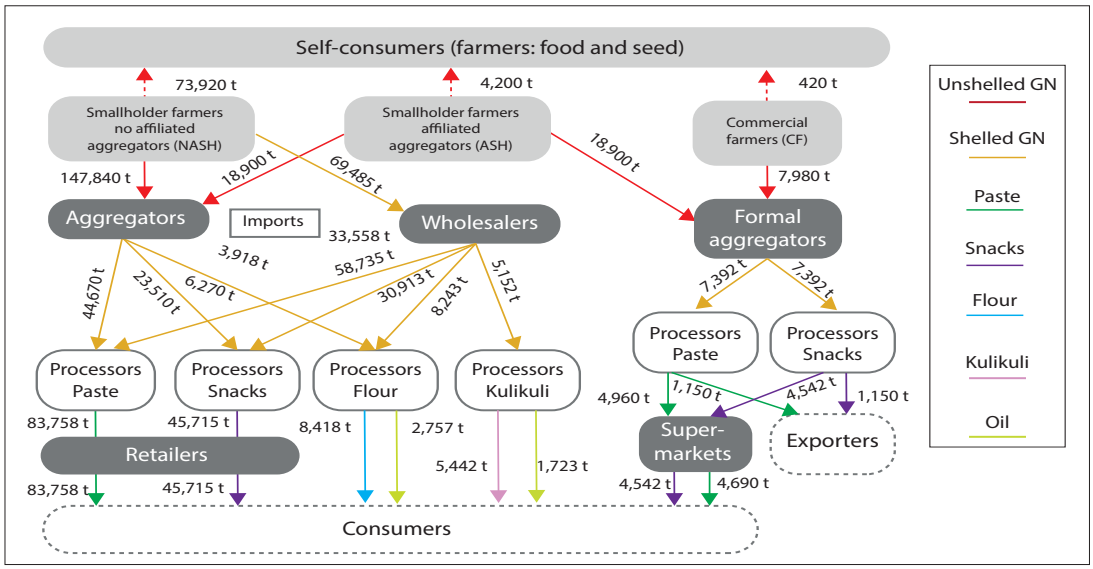

Figure 1 : Flowchart of the groundnut value chain in Ghana

Functional analysis

Production and imports

The bulk of GN production (85%) takes place in Northern parts of the country. **In 2017, the annual production (with shell) was around 420,000 t,** or 201,000 t of shelled GN. In addition, approximately 34,000 t of shelled GN are imported from neighbouring ECOWAS countries such as Nigeria, Burkina Faso, and Niger. About 60% of sold GN are consumed within the South of the country.

Farmers and practices

There are three main types of farmers (Figure 2): **smallholder farmers not affiliated with an aggregator** (NASH), **smallholder farmers affiliated with an aggregator** (ASH) who in addition to purchasing farmers' produce can also provide services such as input supply and extension, and **commercial farmers** (CF), who operate on a larger scale than smallholder farmers.

Agricultural practices are extensive with little fertiliser applied. Despite the availability of herbicides in input stores, only a few farmers apply them for weed control. Harvesting is done by hand, requiring hired labour.

Storage is often done on-farm and **GN are shelled either by farmers manually or by traders** who may hire shelling services, which are mostly mechanised, from service providers. In particular, sellers of roasted GN and snacks usually prefer to buy manually shelled GN as their quality is considered better due to less damaged kernels.

	NASH	ASH	CF	Total
Average area (ha/farmer)	0.76	0.96	3.12	
Average yield (t/ha/yr)	0.8-1.3	1.6	2.2	
On-farm consumption (%)	20	10	5	
Shelling ratio	0.47	0.55	0.55	
Number of farmers	=374,000-608,000	=27,000	=1,200	403,000 -636,000
Total area of production (ha)	=284,000-462,000	=26,000	=3,800	314,000 -492,000
Total production unshelled GN (t/yr and %)	=370,000-88%	=42,000 10%	=8,400 2%	420,000 100%

Figure 2 : Features of the different types of farmers

Processing

Processors prepare a range of products, including **paste, snacks, roasted GN, flour, oil, etc**. (Figure 1). The by-products of processing the nut into oil are further processed for human consumption as **"kulikuli"**, a fried cake made from defatted GN paste, which is popular in Northern Ghana and also used for producing animal feed. The GN flour is used for preparing various foods.

The bulk of the processing takes place in the **informal sector**, mostly consisting of micro or small-scale enterprises.

In addition, there is a **formal sector** preparing mostly GN paste or snacks, which are either sold in supermarkets or marts, or exported to Nigeria or North America. The formal sector is characterised by a range of factories, the majority of which are small to medium-scale enterprises.

According EU standards and limits, kulikuli shows **high aflatoxin levels**. GN paste is also well above the limit set. Although the fungus resides in the soil and infects crops in the field, it is then passed on into the processed products, often through inappropriate post-harvest and processing practices. With improved aflatoxin control, the crop could become a major export commodity to both the regional and European markets.

Trading

Traders include **aggregators**, **wholesalers**, and **retailers**. Aggregators and wholesalers can operate one after the other (aggregators collect GN, and wholesalers then buy and transport them to centres in Southern Ghana). They can also operate in parallel whereby traders assemble and sell produce to processors in Northern Ghana. Wholesalers also can buy produce on rural markets (from farmers or small aggregators), transport it to Southern Ghana and sell it to processors.

Importers can be relatively large-scale traders based in Southern Ghana who import shelled GN from countries within the region.

The processed products, which form an important part of the Ghanaian diet, are sold through **retailers, street vendors, restaurants, or institutions (e.g. schools)**. Retailing is usually undertaken by women.

In the formal sector, **supermarkets** or **mini marts** are mainly frequented by middle-class consumers with higher prices compared to informal markets.

Governance and policies

The groundnut VC is largely atomistic in that there are many, mostly smallholder farmers, and plenty of processors, retailers and consumers. Margins are low, competition is high and the micro or small-scale enterprises have problems of accessing funds.

Aggregators and wholesalers (in particular large-scale ones) **play an important role in the market**, representing the hub of the VC. They are the best informed and connect the production areas of the country with centres of consumption.

Since 2018, GN is one of the crops supported by the Government through the **"Planting for Food and Jobs" (PFJ) flagship programme** which is expected to attract youth to agriculture. Moreover, international development partners, NGOs and now the MoFA, largely play a facilitating role, in that they provide information, extension services and support to the agricultural sector and rural households.

Economic analysis

Financial viability for the actors

The net operating profit is positive for all types of farms ranging from **€85-210 per season for a NASH farmer, €360 for an ASH farmer and €2,300 for a commercial farmer** given their larger farm size and higher yield as a result of good agricultural practices and more input use (fertiliser or certified seeds).

The **informal processing company** has a net operating profit of **€1,300 to €3,800 per year** depending on the product. A paste processing company being based more on family labour, has a higher net operating profit. In the formal sector, it is estimated at **€223,000 for a paste company and €167,000 for a snack company** (producing snacks is more costly due to the use of condiments, transport, sachets).

The annual net operating profit is **€9,450, €126,250 and €2,300** respectively for **an aggregator, a wholesaler and an informal retailer**.

Impacts on the national economy and competitiveness

The **total value added (VA)** of the VC is estimated at **€397 million**. Farmers create 44% of the direct VA, processors 30% and traders 26%. NASH farmers who are the majority of GN farmers contribute the most to direct VA in the VC (39%). The contribution of the VC to the national GDP is 0.7% and **4.3% to the agriculture sector GDP in 2018**. The contribution of the groundnuts VC to the public finances is positive (€ 18 million) as there are no subsidies to the VC activities. However, the VC adds to the trade deficit with € 40 million (taking into account the value of exported products minus the imports of GN and inputs).

The **Domestic Resource Cost (DRC) ratio of 0.28** (<1) indicates that the VC uses goods and services that add a large value to the economy when measured at international prices. The Nominal Protection Coefficient (NPC) is of the order of 1.1 indicating that the actors in the VC are slightly protected and do not have a comparative advantage.

Income distribution

Net operating profits constitute the main element of the VA (76%), mainly reflecting the income of the large number of self-employed, small-scale entrepreneurs in the VC, mostly women. The 3 main beneficiaries are the NASH farmers for which the profit is 26% of the whole direct VA, retailers (20%) and paste processors (15%). Wages for workers employed as part or full-time in production, processing, and trading amount to 20% of the direct VA (Figure 3). NASH farmers constitute a large employer of hired labour for cropping tasks. Other important employers include the ASH farmers, and informal processors of paste and snacks. **About 800,000 to 1,000,000 people work in the groundnuts VC**, including 300,000 to 400,000 entrepreneurs plus about 358,000 waged workers.

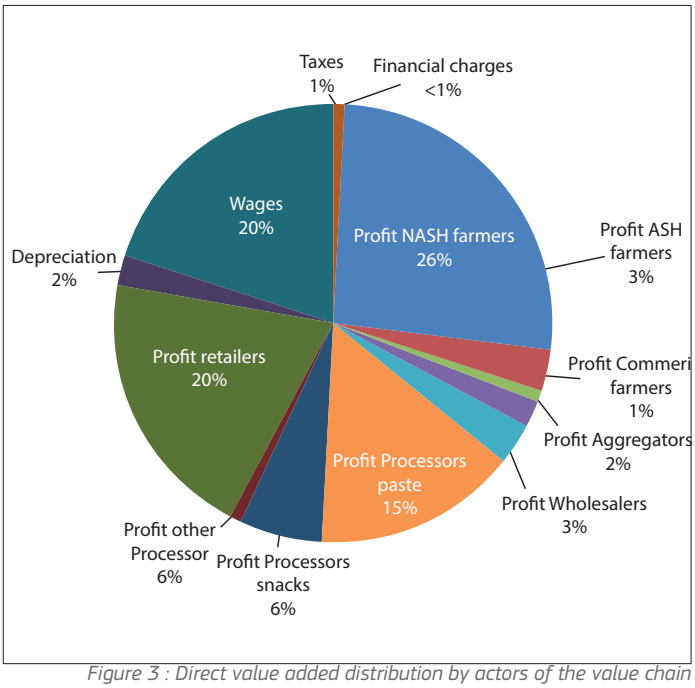

Figure 3 : Direct value added distribution by actors of the value chain

WHAT IS THE CONTRIBUTION OF THE VALUE CHAIN TO ECONOMIC GROWTH?

The groundnut value chain is significant for the Ghanaian economy and in terms of generated employment. It gives income, even at a low level, to a large number of smallholder farmers, but also to many processors, retailers and workers. The value chain activities are sustainable for the entities involved, in that all actors are making a profit. The formal sector uses 7.5% of the volume of groundnuts but generates 11% of the direct VA, through the improvement of the quality of products (e.g. technology, packaging). The contribution to the agricultural GDP is far from being negligible, but the value chain adds to the trade deficit due to GN imports.

IS THIS ECONOMIC GROWTH INCLUSIVE?

The value chain provides income and employment for smallholder actors (farmers, artisanal processors, retailers...). The farmgate price in the case of shelled groundnuts is 34% of the retail sales price (example of roasted groundnuts) showing a fair distribution of incomes with processors and traders. The farming sector accounts for an estimated 70% of wages, followed by the processing sector. Women play an important role in the value chain (90% of all actors in the VC). Overall, the groundnut VC in Ghana is showing signs of exemplary pro-women, pro-poor and pro-youth development but many constraints need to be addressed for inclusive and sustainable expansion for which a very large potential exists.

Social Analysis

Figure 4 and the table to the right provide a picture of the main social implications of the VC activities in 6 strategic

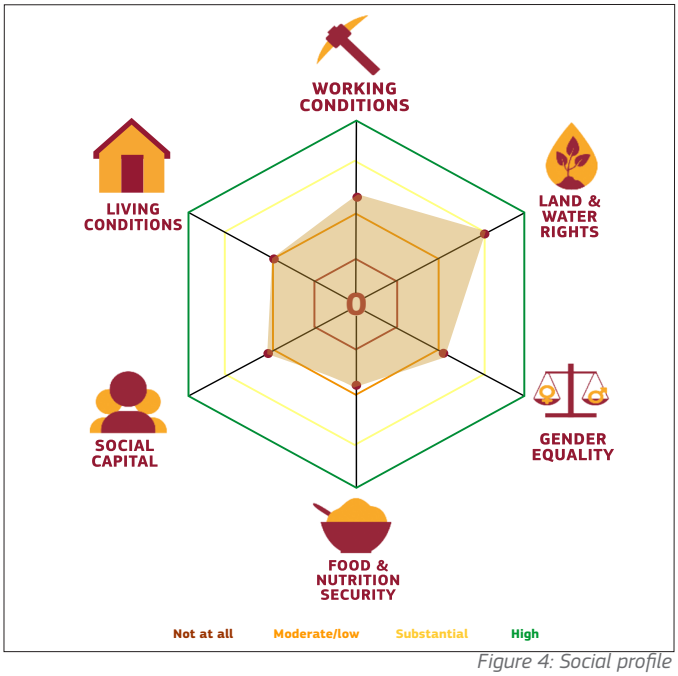

Figure 4: Social profile

IS THIS VC SOCIALLY SUSTAINABLE?

As 90% of all actors (workers included) in the value chain are women, any initiative for value chain upgrading has significant likelihood of benefitting women and consequently health, education and food and nutrition security of a large number of families in Ghana. The groundnut value chain, at the present juncture, carries moderate to low social risks and offers vast opportunities for pro-poor and inclusive economic development in the country.

To improve social sustainability there is a strong need for measuring aflatoxin levels across the value chain as this can guide design of appropriate responses – both regulatory (including policy enforcements) and at market level. Similarly, all development programmes and initiatives in the value chain would need to measure and improve their nutrition sensitiveness. Also, roasting technologies and equipment demand urgent review and up-grading to improve health conditions.

Working Conditions	• Women, at processing sites, suffer harm due to excessive heat and smoke. Farmers and workers only earn about 15-20% of the living wage benchmark from their GN production. Most workers are temporary workers, paid on a daily or weekly basis.
Land and Water Rights	• No large-scale land acquisition by 'non-natives' and respect of VGGT. • The development of commercial farms with large-scale land acquisition could be a possible future scenario if the demand for GN continues to increase and along with the higher returns from the investments. • Learning from bad experiences in jatropha or mango will help to avoid violations of land rights.
Gender Equality	• Groundnuts provide self-esteem, and financial independence to women. • However, their access to resources and services is not commensurate. Women do not have any formal rights to their land and women tend to get marginal or non-premium lands for their groundnut cultivation. • Barriers to a greater decision-making role of women in the VC are related to their weak access to resources and to their lack of opportunities for education.
Food and Nutrition Security	• The areas under production of highly nutritious food crops (groundnut, millets and sorghum) have gone down over the years. The country is increasingly relying on groundnut imports to meet its domestic demand. • Malnutrition is widely prevalent especially in the Northern, Upper East and Upper West regions where GN is mainly grown. Aflatoxin has been implicated in the occurrence of stunting and underweight among children.
Social Capital	• Farmers-based organisations providing support to GN farmers is currently limited. • Farmers with lack of support are facing serious challenges in getting certified seed, fertiliser, and support for improved agricultural techniques and marketing.
Living Conditions	• Basic health infrastructure in rural areas especially in Northern Ghana is limited. • Majority of GN farmers and processors live in compound houses. • Access to safe water and improved sanitation is poor. Most GN farmers are illiterate, and most GN processors are literate only up to secondary level. However, most of the children of farmers and processors attend school.

Environmental analysis

The sub-chains compared are: i) informal artisanal production, mostly depending on NASH farmers and in part on ASH farmers, on artisanal processors and local markets, mainly located in the North of the country, ii) formal semi-industrial production, based on both ASH farmers and commercial farmers, on small and medium processors and national market. Globally, **there are no important differences in terms of environmental impacts between the two sub-chains** and, overall, between all products (Figure 5).

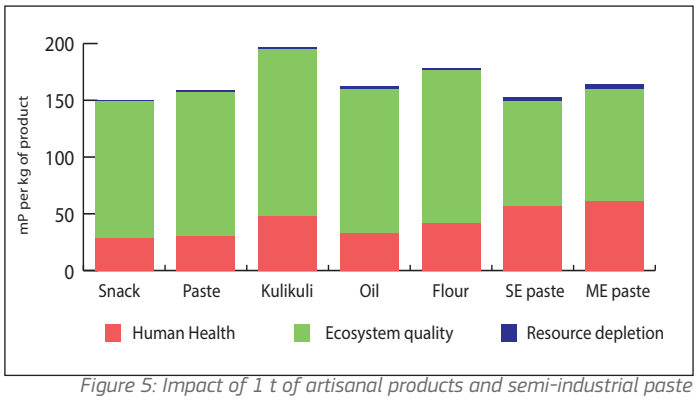

Figure 5: Impact of 1 t of artisanal products and semi-industrial paste (SE: small enterprise, ME: medium enterprise) on the areas of protection

Impacts at the stages of the value chain

Cultivation had a major contribution, because of land occupation as a result of low crop yields, and freshwater eutrophication due to phosphorus emissions from agricultural soil erosion. Nevertheless, GN has a positive impact on the soil by fixing nitrogen. **Shelling and sorting have low impact**, even if these stages can affect the VC since there are important losses of GN. **Roasting is responsible for most of the impact due to climate change**, given the firewood use, that includes land use changes and deforestation for firewood extraction. **For kulikuli, the impact due to firewood use is doubled**, since it is used also at the frying stage. Conversely, for formal paste produced in medium enterprises, the roasting has a very low impact, since firewood is substituted by natural gas and electricity, that have a lower impact on climate change.

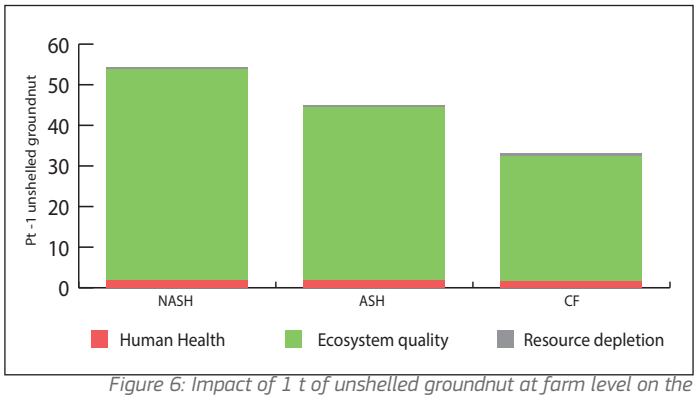

Figure 6: Impact of 1 t of unshelled groundnut at farm level on the areas of protection

Impacts on the areas of protection

On average for all the products, **main impacts are on ecosystem quality** (73% of total impact) **and human health** (26% of total impact), while **resource depletion showed very low impacts** in all products (1% of total impact) (Figures 5 and 6).

Land use has the highest potential impact both on ecosystem quality and on the total impact, followed by freshwater eutrophication. The impact on human health is related to the effects of global warming, which is mainly linked to the GN roasting stage, or to the frying stage for kulikuli. The VC has a low impact on resource depletion since very few materials or energy inputs are required for the GN products. Slightly higher impacts come from formal enterprises products.

IS THE VC ENVIRONMENTALLY SUSTAINABLE?

The potential impact on ecosystem quality is the most important, being responsible of the 78% of impact in artisanal products and the 60% in formal semi-industrial products. Land use is the major contributor to the impact on ecosystem quality; therefore, any improvement in crop yields, in particular through the availability of quality (certified) groundnut seed, would massively lead to a potential reduction in land use. However, it is important to highlight that high land use is also due to the significative groundnut losses across the value chain, due to storage conditions, sheller type, overall quality of grain. Thus, it is fundamental to work on reducing the groundnut losses to effectively reduce the land occupation. The impact on human health is highly related to the effect of global warming. The substitution of open fire roasting drums fed by firewood used in almost all products with improved oven or roasting machines fed by electricity and natural gas can have a very positive consequence on ecosystem quality, contributing to the reduction of firewood consumption and deforestation.

Conclusions

Main constraints

At input level	At aggregation level
• Limited amount of certified seeds available. • Labour shortage during key months of the production cycle. • GN fertilisers expensive and not always available.	• Majority of business takes place in the informal sector. • Big distance between the main production areas in the North and the main consumption areas in the South of the country.
At production level	**At processing level**
• Water shortage. • Increase of pests and diseases. • Declining soil fertility. • Little mechanisation. • Good agricultural practices not always followed due to lack of extension. • Lack of support for smallholder organisations.	• Most of the processing takes place in the informal sector. • Working condition for women at processing sites are not acceptable. • Aflatoxins are a very critical issue. • Difficulty to enforce food safety and other regulations.

Recommendations

Place priority on groundnuts VC development: many interventions can improve the inclusiveness and economic impact of the VC. These could be business incentives, favourable financing arrangements, seed market development, addressing quality constraints related to aflatoxin. Given the impact of aflatoxins on human health and development, it is important to enforce standards and protocols on aflatoxin to reduce contamination. There is also an enormous potential for environmental and human health improvement in artisanal production of GN products, through improved artisanal process machinery. Under right conditions, a segment of youth looking to start their agribusinesses would find the groundnuts VC attractive for their new ventures.

Better coordination between farmers and aggregators: this is to convey technical information as well as information about price, quantity, and quality requirements on GN. It is suggested to train aggregators and other traders on fair trading practices and that better-quality produce should induce higher buying prices. Further modernisation of the VC would entail shelling and roasting of GN, using more mechanised equipment for a good quality output. Further training of equipment manufacturers and engineers in Ghana is recommended in this context.

Good agricultural practices: a wider adoption of improved practices for GN cultivation among farmers can help both in increasing GN yield and reducing the risk of aflatoxin contamination. The production and use of certified GN seed are to be encouraged. The availability for farmers and aggregators of subsidized fertilisers, suitable for legume crops, can help in increasing GN yield. New farming systems as agroecology for example can also be investigated.

Increase efforts for greater inclusion and participation of women as members and leaders of farmer organisations: Gender policy framework could provide minimum (and mandatory) representation of women in different groupings. The action could be at grassroots in terms of promoting and supporting women's participation and capacities in groups, as this will enhance their access to services and resources. It should be the need to establish social protection funds for women and their families who slide into further 'impoverishment' due to extraneous circumstances.

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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 report "Groundnuts Value Chain Analysis in Ghana" 2020, by Ulrich Kleih (NRI), Simona Bosco, Ravinder Kumar (NRI), Joseph Apeeliga, Baqir Lalani (NRI) and Seth Yawlui. Only the original report binds the authors.