European Commission

[VCA4D]
VALUE CHAIN ANALYSIS FOR DEVELOPMENT

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Value chain analysis of maize in Georgia

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/valuechain-analysis-for-development-vca4d-/documents/methodological-brief-eng). It aims to understand to what extent the value chain allows for inclusive economic growth and whether it is both socially and environmentally sustainable.

The value chain context

Maize value chain (VC) in Georgia plays a key role in sustaining rural livelihoods, supporting livestock, and preserving culinary traditions. While the humid climatic conditions in Western Georgia enable maize to be produced under rainfed systems, production in Eastern Georgia is characterized by larger-scale, irrigated systems. The maize varieties are also important to consider. For centuries, white maize has been strongly linked to household food systems, traditional cuisine, and smallholder livelihoods, particularly in Western Georgia, while over the last two decades hybrid yellow maize production has emerged as more commercially oriented and linked to livestock feed markets, especially in Eastern Georgia. The national production of maize in the reference year 2024 was 211,500 t, which gives average yield around 3t/ha on nearly 70,000 ha of harvested area, for this Georgia's largest single-crop area among annual perennial crops. Average yield has increased over the years but they are generally stated to be rather low and varied throughout the regions.

The maize VC currently faces several challenges. Climate change is increasing the frequency of droughts, threatening irrigated systems, while fragmented land parcels, demographic trends -such as an ageing rural population, and relatively low financial returns contribute to high outward migration from rural areas and the decline of smallholders cultivating maize. These factors may weaken the country's capacity to meet food and feed demand but also increase the risk of continued dependence on external yellow maize supplies.

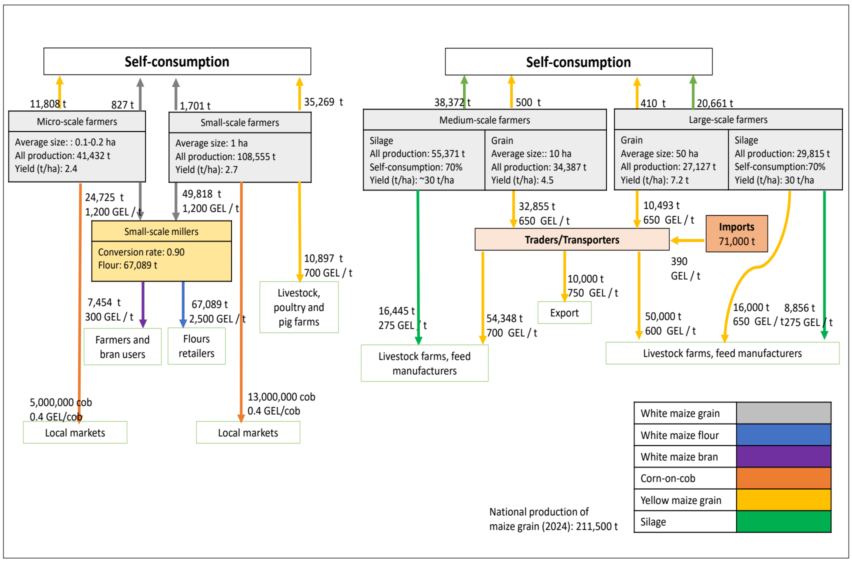


Figure 1: Flowchart of the maize VC in Georgia

The European Union intervention

The European Union Delegation (EUD) in Georgia has requested this VCA4D study on maize in the aim of reflecting on the bottlenecks that hinder its sustainable development. The findings of the study will help the EUD to support Georgia's irrigated crop management systems, particularly under the "Sustainable and Inclusive Irrigated Agriculture Development programme in Georgia", co-funded with AFD, EIB and ADB. The study will also align with ENPARD evaluation recommendations, focusing on VC and regional development approaches to unlock the agricultural sector's full potential. The findings of the VCA4D study will also support the EU in potentially structuring new action on Sustainable Food Systems and Rural Development, in alignment with the national development strategies for the sector.

Functional analysis

Typology of farmers and production

Maize farmers are classified into four categories based on average farm size (Figure 2). **Micro farms** (<0.5 ha), mainly in western regions, are subsistence-oriented, using low inputs and family labour. They grow mostly white maize for household consumption and some yellow maize for livestock feed. **Small farms** (around 1 ha) dominate much of the western lowlands but are widespread and account for about 50% of total maize production. They cultivate both white local and yellow hybrid maize and sell part of their output through informal or semi-formal markets. **Medium-scale farms** (around 10 ha), largely in Eastern Georgia, operate under more commercial conditions, often with monocropping. Yellow hybrid maize dominates, with production split between grain for sale and silage for livestock. Irrigation is common, especially furrow systems. **Large-scale farms** (around 50 ha), also concentrated in the east, are highly capitalized, with the highest yields. They primarily grow yellow hybrid maize, selling most grain through traders while using silage on-farm. Each category encompasses a variety of farming systems including associated crops and livestock husbandry.

The national production of maize in the reference year 2024 was 211,500 tonnes. Georgia also imports maize grain at cheaper price, mainly from Russia, which amounted to 71,000 tonnes in the reference year 2024.

	Micro farms	Small-scale farms	Medium-scale farms	Large-scale farms	Georgia
Estimated number of maize farms	172,155	44,877	839	75	217,947
Total agricultural land holding (ha)	17,216	40,389	7,552	3,743	68,900
Production (t)	41,432	108,555	34,387	27,127	211,500
Yield (t/ha)	2.4	2.7	4.5	7.2	3
Average area per farm (ha)	0.1-0.2	1	10	50	
Production share (%)	19.6	51.3	16.3	12.8	100

Figure 2: Typology of maize farms

Silage production

Silage maize covers around 2,800 hectares and produces approximately 90,000 tonnes annually. Production is concentrated in medium and large-scale farms in eastern Georgia, particularly Kakheti (63% of national output), followed by Kvemo Kartli (23%), Shida Kartli (11%) and other regions (3%). Production is closely linked to livestock intensity, land consolidation, irrigation and machinery access. The silage market remains largely informal, with most output consumed on-farm, produced through bilateral agreements, or sold locally to nearby livestock farms. Due to high transport costs and the bulky nature of silage, trade is mainly regional, although some exchange occurs between eastern and western Georgia.

Processing and marketing

White maize holds strong cultural importance as a staple food, mainly consumed as flour, in dishes, such as mtchadi, ghomi and elarji. It is traditionally processed by small local millers who provide services to households, though industrial milling and supermarket sales by medium-scale farmers are increasing. In contrast, yellow maize is vital for the livestock and poultry sectors, forming the main component of animal feed. Its demand is rising alongside growth in poultry production. Livestock farms, including dairy and beef, use maize in both grain and silage forms. As a key input for meat, egg, and milk production, yellow maize plays a crucial role in supporting food security, while white maize remains one of the key ingredients of the Georgian diet.

Like production, maize grain marketing also benefits from economies of scale, as medium and large-scale farmers supply larger quantities. In contrast, small-scale farmers sell yellow maize in smaller volumes and therefore incur higher transport costs per tonne. Many traders of various sizes are involved in the trade of imported maize.

Sub-chains

The maize VC consists of two interconnected sub-chains shaped by regional conditions and maize varieties. The **food-maize sub-chain** in Western Georgia focuses on white maize for human consumption, mainly produced by micro and small-scale farmers, and carries strong socio-cultural importance linked to Georgian cuisine. The **feed sub-chain** in Eastern Georgia centers on yellow maize and silage for animal feed, involving mainly medium and large-scale farms, with traders playing a key role in imported maize distribution. Farming practices also differ: western regions are humid, less mechanized, and characterized by smaller farms requiring drainage, while eastern regions are drier, larger-scale, and more dependent on irrigation systems.

Governance of the value chain

The maize VC is dominated by short, private marketing circuits based on semi-commercial relationships among farmers and traders, while imported maize follows longer routes from Russia. Farmers prioritize high yields for household consumption and income generation, but micro and small-scale producers face limited access to inputs, machinery, extension services, and fragmented land. Medium and large-scale farms show greater potential for improved cultivation techniques, storage, and drying facilities. Coordination within the VC remains largely informal: small farmers rely on household labour and local networks, while larger farms cooperate on inputs and machinery. Weak producer organizations and informal exchanges limit common interest action, bargaining power, and knowledge sharing. The role of governmental extension services is also extremely limited and largely substituted by consultations provided by agro-input supplier representatives.

What is the contribution of the value chain to economic growth?

Financial viability for the actors

All actors in the maize VC generate positive Net Operating Profits (NOP) (Figure 3). Micro and small-scale farmers earn lower operating profits, but maize remains important for their food security and complements other income sources. Medium, large-scale, and silage farms achieve higher profits due to greater mechanization and combined use of family and hired labour. However, large-scale farms have the lowest return on turnover (ROT) because of higher production costs linked to mechanization, hired labour, and depreciation expenses. Overall, farm size and mechanization improve output and profits, but also increase operational expenses and lower profit margins.

For small village millers, electricity is the main expense, while maize contributes only part of their income as they also process other cereals. Traders earn substantial profits through high sales volumes despite narrow margins (0.02–0.03 GEL/kg), but their operations require significant labour, machinery, and capital investment.

Actors	Annual Net Operating Profit (NOP)	Return on turnover (ROT)
Micro farmer	235 GEL (€ 80)	64%
Small farmer	1,218 GEL (€ 415)	43%
Medium-scale farmer	12,415 GEL (€ 4,215)	33%
Large-scale farmer	81,429 GEL (€ 27,645)	31%
Silage farm	179,902 GEL (€ 61,076)	44%
Miller	3,020 GEL (€ 1,025)	18%
Small/ medium-scale trader	23,436 GEL (€ 7,956)	5%
Large-scale trader	130,458 GEL (€ 44,290)	3%

Net Operating Profit (NOP): Net income of the actor (excluding depreciation)

Return on turnover (ROT): Operating profit / Value of production

Figure 3: Profitability for the individual actors

Impacts on the national economy

Total value added (VA) created by the maize VC (sum of direct and indirect VA) in Georgia is around 200 million GEL (€ 68 million) for the reference year 2024. The contribution of the farmers to this total VA accounts for 63%, whilst the remaining 37% represents the contribution from other VC actors and suppliers of goods and services (seeds, fertilizers, pesticides, fuel, electricity, water, transport, packaging, etc.) (Figure 4).

The total VA is composed mainly of NOPs generated by direct and indirect actors (73%), followed by wages paid to workers (13%) (Figure 5). The maize VC contributes **4% to the agricultural GDP**, with **farmers accounting for 2.7%** of this contribution.

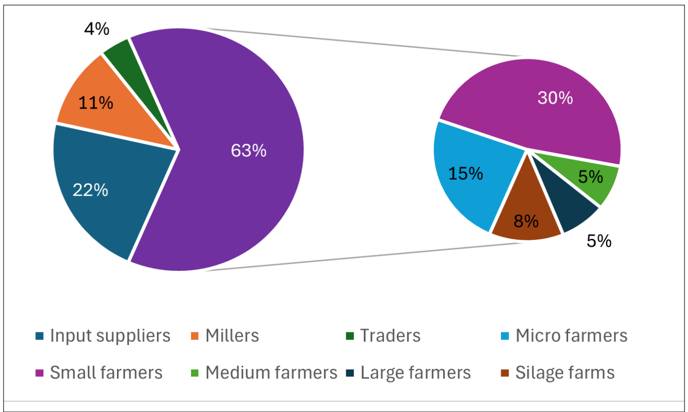
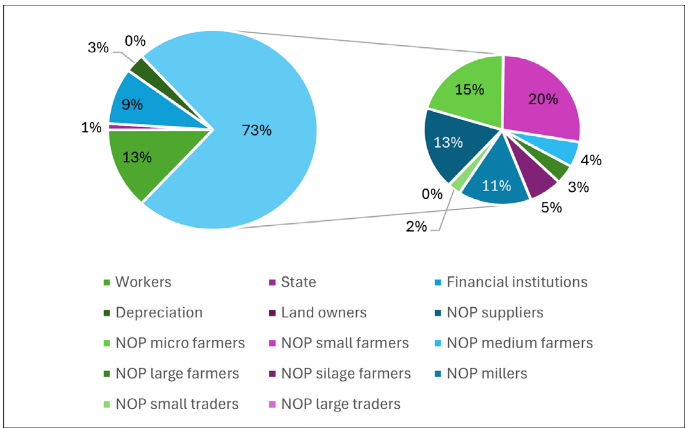


Figure 4: Creation of the income (total VA) by direct and indirect actors

The maize VC generates limited fiscal revenues due to low taxation and low import tariffs, although medium and large-scale farms contribute through land and property taxes. Local primary agricultural production is exempt from VAT. While there are no direct subsidies, government programs support farmers through mechanisms such as co-financed agricultural credit. Overall, taxes collected exceed public spending on the VC generating positive public finance balance. However, the VC negatively affects the trade balance by 31.6 million GEL (€ 10.7 million) as the value of the VC's imported goods and services is higher than the value of exports. The integration rate is 73%, meaning that 73% of production value remains in the national economy, while 27% covers imported yellow maize grain, agricultural inputs, and other goods and services (a foreign currency outflow).

Viability in the international economy

The Nominal Protection Coefficient (NPC) of 1.21 indicates that Georgian yellow maize is priced above imported maize, reducing its international competitiveness. However, the Domestic Resource Cost (DRC) ratio of 0.18 shows that the maize VC has a strong comparative advantage, as the value it generates for the national economy exceeds the cost of domestic resources used.



**Depreciation: the amount allocated to compensate entrepreneurs for the depreciation of capital invested in VC activities*

Figure 5: Distribution of the income (total VA)

Maize contributes less than 1% to Georgia's national GDP but plays an important role in agricultural GDP and national food security. The value chain generates income for all actors involved, yet it relies heavily on imported maize, inputs, and machinery, while limited exports fail to offset foreign currency losses. In addition, Georgian yellow maize remains less competitive due to higher prices compared with imported maize.

Is the economic growth inclusive?

Distribution of income among the actors

The VC distributes 73% of the total VA as net profits to direct and indirect actors (of which 46% derives from white maize and 14% from yellow maize) and 13% in wages (15% generated by white maize and 37% by yellow maize) (Figure 5). Vulnerable actors, particularly micro- and small-scale farmers, receive nearly 35% of total VC profits, indicating that income generation partly benefits small-scale actors despite their fragmentation and weak collective organization. However, significant disparities remain in per capita income: while many small actors share relatively low profits, a limited number of large actors capture substantially higher returns from VC activities.

Job creation and employment

Employment in the maize VC is mainly concentrated at farm level, despite existing mechanization. Micro farms rely primarily on family labour, while large-scale farms provide skilled and unskilled jobs. Temporary employment mainly involves cultivation and harvesting activities.

Women, as part of vulnerable groups, are actively involved in farming activities, particularly in micro farms. They also occupy skilled positions in medium and large-scale farms, although their representation remains lower than that of men. A notable wage gap exists between women and men. Overall, the maize VC generates 912 Full Time Equivalent (FTE) jobs in the reference year. Women employment accounts for 20% of total FTE jobs.

The value chain is important for the livelihoods and food security of many smallholders. While it benefits small actors overall, larger actors earn significantly higher per capita profits and returns. Employment is concentrated at farm level and consists mainly of temporary and permanent unskilled jobs, although larger actors also provide skilled positions. Women remain underrepresented and face significant wage gaps.

Is the value chain socially sustainable?

Figure 6 and the following table provide an image of the main social consequences of the VC activities in six strategic domains.

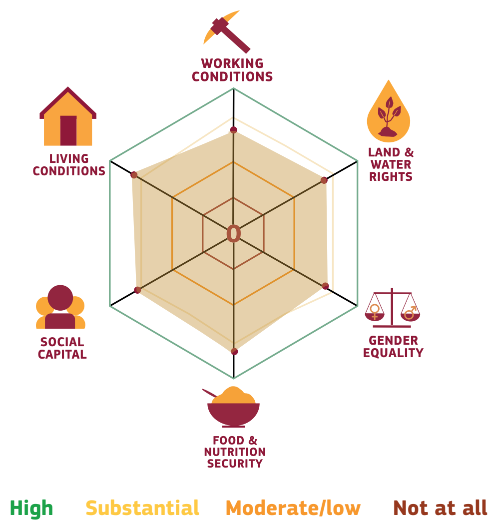


Figure 6: Social profile of the maize VC

Working conditions	▪ High informality, low wages, weak social protection ▪ Verbal employment agreements, limited access to paid leave and employer-based health insurance ▪ Poor occupational safety standards, inadequate infrastructure, limited use of protective equipment ▪ Ageing workforce and labour shortages
Land and water rights	▪ Legally secure land and water rights, but constrained effective use due to structural factors ▪ Land fragmentation and informal short-term rental practices, limiting technology adoption and long-term investment ▪ Uneven access to irrigation and drainage infrastructure, reducing productivity and sustainability across regions and farm types
Gender equality	▪ Significant gender disparities in VC roles, with women concentrated in labour-intensive, lower-paid and informal activities, and men dominating mechanized operations, land access and higher-value segments ▪ Presence of women in downstream processing and trade, alongside emerging examples of women's leadership and inclusion potential
Food and nutrition security	▪ Significant role of maize in food security as a staple food, particularly white maize in western regions, and as a key input for livestock production through yellow maize and silage
Social capital	▪ Presence of strong community-based social capital among micro- and small-scale farms ▪ Concentration of institutional and market linkages among medium and large farms ▪ Weak formal farmer organizations and predominantly informal cooperation, limiting common action and VC coordination
Living conditions	▪ Rural–urban disparities in income, infrastructure and access to basic services, with persistently lower living conditions in rural areas ▪ Limited access to specialised healthcare, education and training opportunities in remote areas, and disproportionate impacts on women reinforcing inequality and youth disengagement ▪ Extremely limited living conditions (water access, hygiene, kitchens, etc.) for workers on most medium and large farms.

The maize value chain is only partially socially sustainable, contributing to jobs, livelihoods and food security but facing key gaps in labour formalisation, safety, land fragmentation, gender equality, farmer organisation strength and rural infrastructure and services, which must be addressed for more inclusive and resilient development.

Is the value chain environmentally sustainable?

The environmental impacts of the maize VC are assessed using Life Cycle Assessment (LCA), covering three areas of protection; **resource depletion**, **ecosystem quality** and **human health**, as well as impacts on **climate change** and **water consumption**.

Impacts on areas of protection

Impacts on **resource depletion** are moderate and mainly driven by diesel use for field operations and mineral fertilisers. Improving input efficiency through better fertiliser management, precision application and improved agronomic practices would reduce pressure on fossil and mineral resources while enhancing productivity.

Impacts on **ecosystem quality** are driven primarily by land occupation and nutrient-related emissions from fertiliser use. Low yields observed in smallholder systems increase land requirements per unit of output, leading to higher ecosystem impacts per kg of product (Figure 7). Improving crop productivity through better soil fertility management, improved locally selected seeds, and enhanced agronomic practices limiting pesticides' use would reduce environmental impacts while increasing production efficiency.

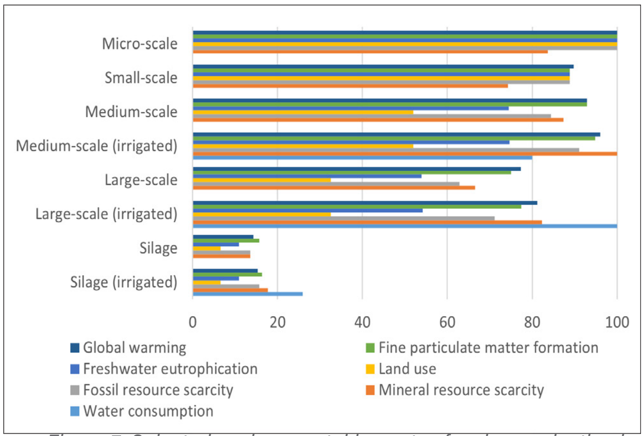


Figure 7: Selected environmental impacts of maize production by farm typologies (per kg of grain at farm gate)

NB: The highest score in the comparison is shown as 100%.

Human health impacts from the maize VC are relatively low, mainly driven by air emissions such as ammonia and nitrogen oxides from fertiliser use and fuel combustion during cultivation. However, evidence from field missions shows that the use of personal protective equipment (PPE) when handling pesticides and herbicides remains limited, suggesting a need for improved awareness and enforcement of safety practices among agricultural workers.

Climate change and water consumption

Regarding **climate change**, greenhouse gas emissions are primarily generated during the cultivation phase, driven by nitrogen fertiliser application and fuel use in field operations. Emissions from maize grain production are relatively low (0.34-0.44 kg CO_2eq per kg of grain), placing Georgia at the lower end of international benchmarks and reflecting moderate input use in many production systems. Further reductions could be achieved by improving nitrogen use efficiency, which would lower emissions while maintaining productivity.

Water consumption in rainfed maize systems is minimal and largely limited to indirect consumption from input production. In contrast, irrigated systems—mainly in the drier eastern regions—account for significantly higher water use, particularly where furrow irrigation is common, which can also increase risks of soil erosion (Figure 8). Recent policy reforms introducing volumetric pricing for irrigation water are expected to promote more efficient use and improved irrigation management.

Biodiversity

A GIS analysis using Corine Land Cover 2023 and the Emerald Network (restricted to Kvemo Kartli and Kakheti due to data limits) finds that cropland rarely intersects protected habitats, with only small localized overlaps in Gardabani district, indicating low direct biodiversity pressure from maize cultivation.

Figure 8: Soil erosion caused by furrow irrigation in maize field (rock

The maize value chain in Georgia exhibits relatively low to moderate environmental impacts per unit of output, particularly when compared with more intensive maize production systems internationally. Nevertheless, targeted improvements in agricultural practices could significantly enhance the environmental sustainability of the sector. Priority areas include improving fertiliser management and nitrogen use efficiency, strengthening soil and water management practices, Integrated Pest Management systems as an alternative to preventive use of pesticides and improving awareness and enforcement of safety standards in agrochemical handling.

Main findings and recommendations

The maize VC is an important part of Georgian agriculture, supporting food and feed security while generating income and employment, with notable participation of women in smallholder activities. However, land tenure, reliance on imports, low smallholder yields, weak producer organizations and limited youth engagement constrain its sustainability. In addition, poor water management increases soil erosion risks, exacerbating climate vulnerability in a country highly exposed to climate change.

STRENGTHS	WEAKNESS
• Significant contribution of maize production to food security • Availability of local varieties • Suitable climatic and environmental conditions for maize cultivation in some regions • Significant role of white maize production in country's gastronomy and culture	• Fragmented small and micro farms limiting mechanization and modernization, with labour shortages from labour-intensive practices, in contrast to more mechanized medium and large farms. • Dependency on imported agricultural inputs and exposure of farmers to price volatility • Limited capacity for storage and access to machinery and equipment, particularly in small-scale farms • Poor infrastructure for effective irrigation systems • Weak soil fertility management practices and a lack of high-quality organic compost and fertilizers • Farmers' limited connection with downstream actors • Absence of effective organizations for maize VC
OPPORTUNITIES	**THREATS**
• Increased demand of livestock industries for maize • Presence of feed miller companies, that are also oriented to export • High demand for maize flour by the HoReCa sector	• Price and quality competition with the imported maize • Non-diversified import market (solely dependent on Russia's risky market) • Climate change impacts • Soil degradation due to continuous maize cropping • Lack of effective water and wetland management • Abandonment of farming activities by young generation

Recommendations

- Developing a national strategy for the maize VC reflecting the specificities of both the food and feed sub-chains while preserving their complementarity within integrated farming systems.
- Adopting differentiated strategies for white and yellow maize, combining cultural-product promotion and quality branding for white maize with competitiveness, scale, for fair and competitive market access measures, including for yellow maize (grain and silage).
- Undertaking a detailed analysis of maize VC imports to identify and reduce unnecessary imports while promoting investment in related sectors (seed, fertilizer, packaging, etc.) under a comprehensive national maize strategy.
- Supporting family farmers through improved access to finance, machinery-sharing schemes, crop insurance and training.
- Improving post-harvest handling, storage and processing through better drying facilities, moisture testing systems, storage capacity and local collection centres to reduce losses and improve market timing.
- Improving efficient use of resources (through better fertiliser management, precision application and improved agronomic practices) to reduce environmental impacts and strengthen the long-term sustainability.
- Enhancing irrigation efficiency and water management, particularly in eastern Georgia, through improved technologies, better infrastructure maintenance and policies promoting efficient water use.
- Strengthening VC data and information through updated agricultural census data, improved statistical distinction between white and yellow maize systems (grain and silage), and stronger dialogue among MEPA, the Rural Development Agency, private agribusiness actors, and producer organizations to support strategic planning.

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 report "Maize Value Chain Analysis in Georgia" 2026, by Yildirim, H., Shubitidze, G., Villani, R., Gelashvili, N., Kochlamazashvili, R. 2026. Maize Value Chain Analysis in Georgia. Report for the European Union, DG-INTPA Value Chain Analysis for Development