Food and Agriculture organization (FAO)

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Market Study
Ouémé Climate Resilient Initiative (OCRI)
Upper and Middle Ouémé basin

Study report

Cotonou, March 2022

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Brief Summary

The main objective of this study is to analyze the market for maize, cashew nuts, shea nuts, mangoes and market garden crops and the financing system in the Upper and Middle Ouémé Basin (UMOB), particularly in the communes of Djougou, Copargo, Glazoué, Zogbodomey and Zagnanado in order to best address smallfarmer needs in the context of the development of the Ouémé Climate Resilience Initiative (OCRI) project. The study was conducted between February-March 2021 and February-March 2022. The specific objectives of the study were to:

- Provide an overview of the key value chains for each target crop, current crop productivity, impacts of climate change on value chains, , market demand and main actors, impacts of Covid on production, strengths and barriers small farmers face in producing and accessing markets ;
- Conduct an assessment of microfinance institutions by describing the main financial entities and their services, barriers to accessing and extending credit ;
- identify the support needed to provide buyers and farmers with enhanced market access;
- identify the support needed to provide farmers with enhanced finacial access

The results of the analysus has informed the definition of measures that will support smallholder farmers in the Upper and Middle Ouémé best increase their resilience to climate change by improving market access and access to credits. The key results of the assessment are as follows :

Access to market

The study has identified that the key barriers related to access to market are related to poor quantity and quality of products (because of poor and non resilient production techniques/technologies, inadequate infrastucture and equipment) resulting in difficuties in selling and negotiating appropriate prices as well as poor organization and market knowledge of producers and cooperatives around the VCs and main buyers.

In order to improve access to market for the idnetified crops, OCRI project will ensure adquate production and quality levels in consideration of climate change impacts through CRA (output 1.2) and waterworks/restoration activities (output 1.1) (including trainings, access to adapted seeds/ crop varieties, access to tools, improved irrigation, improve fertility, flood protection etc) as well as improved post-harvest infrastructure (processing, packaging, stocking equipment) for key VCs. In addition, the project will support cooperatives organisation, strenghten knowledge on market, negotiation and financial skills and work through existing

networks with pre-identified buyers while also improving connection between producers and buyers. Facilitation to access to grants (output 3.2) and credit (output 2.1) will also support producers to continue investing in climate resilient activities (see signed committment letter from FNEC, MFIs and FNDA). Finally, OCRI will support a favorable institutional framework for the climate-resilient production of food crops and key VC culture (output 3.1) while will compile and disseminate good practices for CRA in order to scale up the project's impacts (output 3.3)

Access to finance

Access to finance is a pillar for agricultural production in the communes of UMOB. There are at least three (03) microfinance institutions in each commune of UMOB. Micro-finance institutions (MFIs) are reluctant to offer agricultural credits in the current context becasue of: the high risk of failure of agriculture becasue of climate change impacts ; the weak organization of producers,) ; and the lack of financial education and technical support to farmers to develop business and financial plans, and to ensure regular loan repayment. While the difficulties for producers to access credit are mainly related to the complexity of the administrative formalities as well as the costs, the lack of business management capacity and the risks of not being able to repay loans as agricultural yields can be affected by climate change.

In order to improve access to agricultural credit, OCRI project will provide technical support and training to facilitate farmers' organisation into cooepratives, the developmemnt of business plans and financial management skills to ensure smooth loan repayment. In addition, partnership with FNDA will ensure farmers receive regular technical assistance and are capacitated to develop loan application for a FNDA-supported loan. By accessing a FNDA-supported loan, farmers or cooperatives benefits from (i) a guarantee covering a maximum of 50% of the initial capital borrowed (which will be repaid by FNDA if the farmer cannot do so); and (ii) a maximum interest rate of 12% per year instead of 24% in the case of classic MFI loans. Promoters can also benefit from a bonification of 2% per year.

1. METHODOLOGY

1.1 Preparation of the field phase

Three types of activities were carried out during the exploratory phase: methodological framing, development of data collection tools and literature review.

1.1.1 Development of data collection tools

Interview guides were the primary data collection tools used in this study. Thus, an interview guide was developed to:

- focus groups with socio-professional groups (notably farmers, breeders, processors, etc.) in the study villages;

- Interviews with actors operating at the Commune or Regional level (notably the Communal Cells of the Territorial Agricultural Development Agencies (CeC/ATDA), the management of ATDA, forestry agents, Non-Governmental Organizations (NGOs), Producers' Organizations (Association Karité Bénin, Fédération Nationale des Producteurs d'Anacarde du Bénin, etc.), the Town Hall (services in charge of the environment, agriculture), etc.);
- Interviews with Microfinance Institutions (MFIs) or Decentralized Financial Systems (DFSs) in the five project communes.

These interview made it possible to address the main questions necessary to achieve the objectives of this mission. The data collected is , in particular, related to:

- the main economic activities practiced in the communes of the project;
- the value chains of the targeted crops, namely mango, shea, cashew, maize and market gardening. These include productivity/yields of the various target crops, average annual income (CFA/year) per household for each of the target crops, perceptions of changes (decrease, increase, unchanged) in income compared to 10 or 20 years ago and reasons for the changes observed, movement of each product from the place of production to the final destination, buyers to whom producers sell/who are the main buyers of the products, how sales are conducted, prices, etc;
- impacts of climate change. The information collected here covers the impacts of climate change on the production of the target crops, the impacts of climate change on the production practices of the target crops, the impacts of climate change on: harvesting, storage/preservation and storage/preservation techniques/practices, processing of agricultural products, packaging of products, producers' incomes, production costs of the target crops, movement/marketing of products, strategies put in place to cope with these impacts/problems, etc. ;
- the impacts of Covid-19 on agriculture, the prices of agricultural products, access to agricultural inputs, the sale of your agricultural products, as well as the reasons for these different impacts;
- the private sector: main problems/difficulties encountered with products currently sold by farmers, approaches to solutions, their intention to accompany the OCRI project, etc.
- Financial services: DFS in the project sites, the existence of partnerships with the Fond National pour le Développement Agricole (FNDA types of services provided by FNDA, the conditions to take out a loan for agriculture, what the loans are for and the link in the value chain supported by the loan (e.g., harvesting, production, transportation, etc.), the amount of the loan, interest rate and repayment terms, the challenges faced by farmers, the average percentage of unpaid loans, reasons and consequences, their potential reluctance to lend money, and the extent to which they are willing to pay back loans.), the loan amount, interest rate and repayment terms, the challenges farmers face, the average percentage of loans not repaid, reasons and consequences,

their potential reluctance to lend money to smallholders, reasons for this reluctance and conditions to increase their willingness to provide agricultural loans;

- Producers' perceptions as well as the proportion of farmers in each commune who have taken out a loan (currently or in the past), what they used the loan for, what problems they encountered in accessing and repaying the loans, and why (link to climate change), and whether they would be willing to take out a loan for agriculture under OCRI, and on what terms.

1.1.2 Review of the literature

The document review was conducted both in the libraries of national institutions (MAEP, Institut National des Recherches Agricoles du Benin, National Universities of Benin, etc.) and on the Internet. The main documents consulted were related to the crops grown in the project area, the value chains of these crops, the strengths, weaknesses, opportunities and threats to the development of these value chains, the constraints and obstacles to obtaining good quality products and accessing the market, the microfinance institutions operating in the project area and the difficulties in accessing these institutions. Climate change issues were also addressed, in particular the manifestations of climate change, its effects and impacts on value chains and agricultural practices.

1.2 Field data collection

Data collection took place not only in the project area (Djougou, Copargo, Glazoué, Zagnanado and Zogbodomey) but also outside this area, notably in Cotonou, Porto-Novo, Parakou, Bohicon and Tchaourou. The surveys lasted about ten days in 2021 and two weeks in February-March 2022. These surveys made it possible to conduct interviews with resource persons or key informants, public institutions (Agence Territoriale pour le Développement Agricole (ATDA) 4 and 5, the Communal Cells (CeC/ATDA) of the project's intervention communes, the Departmental Directorates of Agriculture, Livestock and Fisheries (DDAEP) of Donga, Collines and Zou, private structures (Africa Green Corporation, the National Federation of Buyers of Tropical Products (FENAPAT), etc.), organizations and cooperatives of the project's partners, and the private sector.), organizations and cooperatives of producers of different crops, buyers' groups (in particular the Groupement d'Achat des Produits Agricoles), etc.

Focus groups were also conducted in one village per commune. Each focus group was made up of 6 to 12 people from various socio-professional categories in the village. Various issues were discussed during the focus group interviews, including the main crops grown in the village, the main means of subsistence of the village population, their perceptions of climate change and its effects on their means of subsistence, their perceptions of the effect of the Covud-19 on agricultural production and prices, etc.

Finally, during the field phase as well as during the literature review, secondary data were also collected on the production and productivity of the different crops.

In total, 114 actors (individuals and public/private structures) were interviewed in February-March 2022, compared to 85 in February-March 2021. This gives approximately 200 actors interviewed for the two missions.

Table 1.1 Number of actors interviewed during the mission (in February-March 2021)

		Djougou	Copargo	Glazoué	Zagnanado	Zogbodomey	Others (Parakou, Bohicon, Dassa-Zoumé, etc.)	Total
Focus group	Number	3	1	1	3	2	0	10
	Participants	18	6	11	12	15	0	62
Communal cell (CeC/ATDA)		1	1	1	1	1	0	5
Departmental Directorate of Agriculture, Livestock and Fisheries	Structure	1					1	2
	Number of people	1					1	2
Territorial Agency for Agricultural Development	Structure						2	2
	Number of people						2	2
Total		24	8	13	16	18	6	85

Table 1.2 Number of stakeholders interviewed during the mission (in February-March 2022)

		Djougou	Copargo	Glazoué	Zagnanado	Zogbodomey	Others (Parakou, Bohicon, Dassa-Zoumé, etc.)	Total
Focus group	Number	1	1	1	1	1	0	5
	Participants	6	9	8	6	7	0	36
Communal cell (CeC/ATDA)		1	1	1	1	1	0	5
Departmental Directorate of Agriculture, Livestock and Fisheries	Structure	1	0	0	0	0	2	3
	Number of people	4	0	0	0	0	6	10
Territorial Agency for Agricultural Development	Structure	0	0	0	0	0	2	2
	Number of people	0	0	0	0	0	5	5
MFI/SFD		7	3	6	2	3	0	21
POs/Cooperatives		4	3	3	3	3	4	20
City Hall		1	1	1	1	1		55
Municipal Water and Forestry Section		1	1	0	0	0	0	2
Total		26	19	20	14	16	19	114

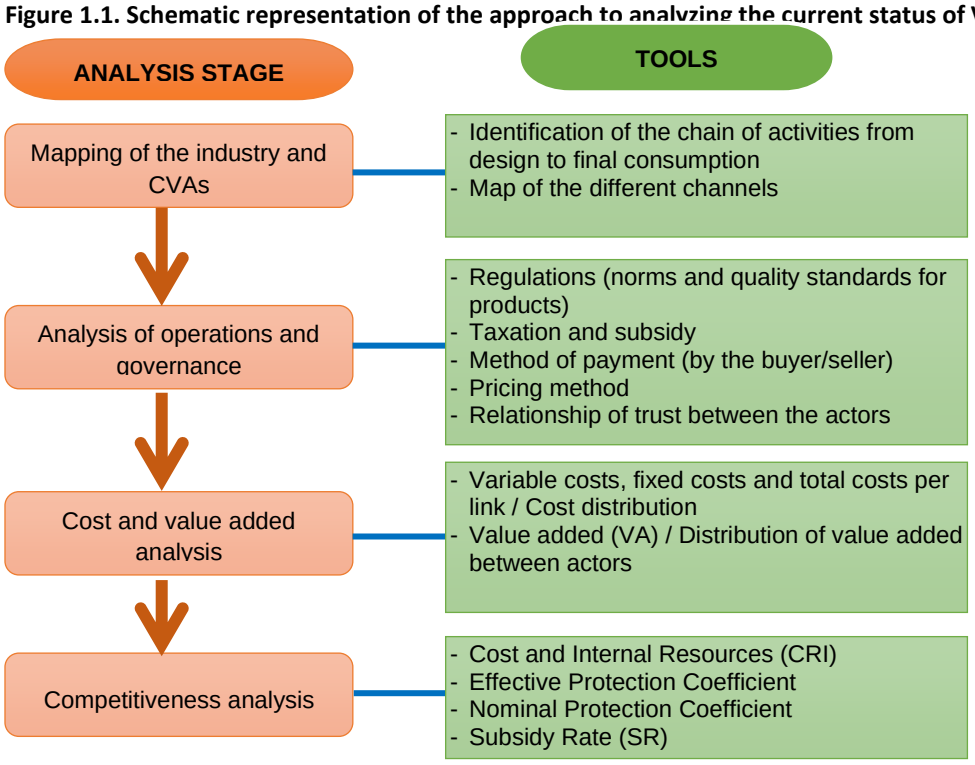
1.3 Data processing and analysis

Data analysis was conducted according to the type of data collected. For example, qualitative data were primarily subjected to content analysis. The primary quantitative data collected was on crop classification and constraints and crop productivity. The classification of crops was

done by the interviewed actors and allowed for the selection of three main crops based on criteria such as profitability, the existence of a market at the national/local level, the existence of a market at the regional/international level, the existence of a partnership for its development, and the contribution to the economy of the commune.

Next, the value chains of the three main crops selected (in each commune) as a result of this prioritization process were analyzed. The analysis of the current status of the VSCs of the selected crops is based on both secondary data and field data. In practice, the analysis of the current situation of the CVAs was done in four main steps (see Figure 2.1), namely, updating the mapping of the CVAs, analysis of the functioning of each CVA, financial analysis (analysis of costs and value added in financial terms), and analysis of the strengths, weaknesses, opportunities and threats (SWOT) in each CVA. In this study, because most of the elements found overlap across different value chains, the strengths, weaknesses, opportunities, and threats were instead grouped together unless otherwise specified. In addition, financial analysis and competitiveness analysis were not addressed in this study.

Figure 1.1. Schematic representation of the approach to analyzing the current status of VADs.



2. VALUE CHAINS: OVERALL ANALYSIS

2.1 Main economic activities in the project municipalities

The main economic activities on which the populations of the 5 targeted communes depend for their survival include: agriculture, livestock, trade, fishing, agricultural processing, logging,

and gathering. The following paragraphs provide a description of these activities and the level of involvement of the populations of the study communes.

2.1.1 Plant production

Various plant species are produced in the project area, including cereals (corn, rice, sorghum/millet), legumes (soybeans, cowpeas, peanuts), roots and tubers (cassava, yams, sweet potatoes), cotton, perennial crops (cashew nuts, citrus fruits, papaya, mangoes, oil palm) and vegetable crops (tomatoes, chili peppers, leafy vegetables).

Analysis of the classification of the different crops by the different actors interviewed in the project communes (see Table 3.1) indicates that in all five communes, maize is the main crop with high sales potential according to the perception of the actors interviewed. Among perennial crops, cashew nuts, shea nuts, and mango are also are noted, particularly in the communes of Djougou, Copargo, and Glazoué. Mango is also present in Zogbodomey and even Zagnanado, although it does not appear in the crops cited by interviewees. This could be due to the fact that mango promotion activities in this zone really started in 2018 with the import (by the Beninese state) of *kent* mango plants from Mali.

Table 2.1. Result of the classification of the main crops grown in the project area

Crops	Zagnanado		Zogbodomey		Glazoué		Djougou		Copargo		Set	
	Average rank	Order	Average rank	Order	Average rank	Order	Average rank	Order	Average rank	Order	Average rank	Order
But	1,46	1	1,50	1	3,67	3	3,91	1	4,17	2	2,94	1
Sorghum	-		-		12,88	13	11,94	15	13,42	14	12,74	16
Rice	3,67	3	4,13	3	2,88	2	10,50	11	13,42	13	6,92	5
Soybeans	7,17	7	7,46	7	2,46	1	4,09	2	3,75	1	4,99	3
Cowpea	7,00	6	6,96	6	7,08	5	11,69	14	13,17	12	9,18	11
Peanut	5,50	4	5,50	4	7,54	6	10,66	12	9,08	8	7,66	7
Cassava	6,88	5	6,88	5	8,96	9	9,81	8	12,42	11	8,99	10
Yam	-		-		8,33	8	6,63	4	7,25	4	7,40	6
Cashew nuts	-		-		6,21	4	4,34	3	4,75	3	5,10	4
Cotton	8,29	8	7,58	8	10,21	10	7,78	6	8,83	7	8,54	8
Shea	-		-		10,79	12	7,50	5	7,67	5	8,65	9
Tomato	10,63	9	10,63	9	10,54	11	10,47	10	11,96	10	10,84	13
Chilli	12,04	12	12,04	12	8,17	7	8,03	7	8,38	6	9,73	12
Okra	11,13	11	11,13	11	13,25	15	11,47	13	13,54	15	12,10	15
Vegetables												
Leaves	10,63	10	10,67	10	13,17	14	10,34	9	10,92	9	11,14	14
Mangoes	-		-		14,69	16	13,38	16	14,69	16	14,25	17
Papaya	-		-		-		17,25	17	-		17,25	18
Orange	3,42	2	3,46	2	-		-		-		3,44	2
Oil palm	17,50	13	17,25	13	-		-		-		17,38	19

Source: Survey results, February 2021

The analyses of this report will focus on four main crops: maize, cashew, mango, and shea (and to some extent, vegetable crops). Maize is the main food crop consumed in Benin. It is both a cash crop and a subsistence crop (Baco, 2019). Cashew is a crop that was initially introduced to combat environmental degradation in the savannah regions. It has now become a real cash crop. Mango plays a strategic role in the household economy of the sector's actors,

particularly by providing monetary resources, especially during the lean season (Parrot *et al.*, 2017). The mango tree is also a valuable ornamental and shade tree that contributes to soil protection against erosion (Bokonon-Ganta and de Groote, 2002). The mango industry is also a promising sector with growth potential. Finally, shea is a harvested forest product, unlike mango and cashew. This sector is essentially dominated by women.

Figure 2.1 shows the project communes in which each of the selected crops is grown. Table 3.2 shows that, regardless of the commune, maize production (with 82% of the populations involved) and cashew nuts (with 46% of the populations involved) rank first among the crops grown in the project communes. 28% of the population is involved in mangoes production. These results obtained in February-March 2022 confirming overall those obtained in February-March 2021.

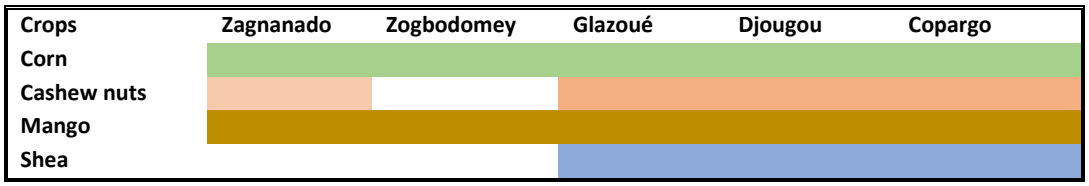


Figure 2.1. Main crops with high sales potential in the Project area

Source: Survey results, February 2021

Table 2.2. Share (in %) of the population of the study municipalities involved in the different crops

Crops	Copargo	Djougou	Glazoué	Zogbodomey	Zagnanado	Average
Corn	80	70	70	100	90	82
Mangoes	40	30	20	40	10	28
Cashew nuts	80	70	50	10	20	46
Rice	40	20	40	30	20	30
Soybeans	70	50	30	30	40	44
Cowpea	30	25	30	40	30	31
Peanut	30	25	40	70	20	37
Cassava	60	25	20	70	30	41
Sweet potato	20	10	20	20	20	18
Vegetable crops	50	20	20	30	30	30
Cotton	30	50	30	20	30	32
Yam	40	20	20	0	20	20
Oil palm	0	0	0	60	20	16

Considering a scale of 10, with 0=no household produced and 10= produced by all households

Source: Survey results, February-March 2022

2.1.2 Animal production

Generally, goat, sheep, cattle, pig, rabbit and poultry farming are practiced in the 5 communes (Table 3.3). Poultry is the most common livestock type, with 66% of the populations involved, followed by goats and sheep with 42% and 40% of the populations involved respectively.

Table 2.3. Share (%) of the population in the study communes involved in livestock farming

Breeding	Copargo	Djougou	Glazoué	Zogbodomey	Zagnanado	Average
Goat	60	50	30	30	40	42
Ovine	50	60	40	20	30	40
Cattle	30	40	20	10	20	24
Pork	10	0	20	20	30	16
Rabbit	15	10	10	10	10	11
Poultry	90	80	50	50	60	66

Considering a scale of 10, with 0=Not at all high and 10= 2nd highest by all households

Source: Survey results, February-March 2022

2.1.3 Processing of agricultural products

Table 3.4 shows that in the 5 communes, people are interested in agri-food processing. The most common processing products are maize derivatives (Akassa, porridge, pancake, flour), cassava (gari, cossette, pancake, tapioca), soybeans (soybean cheese, soybean porridge) and to some extent Néré mustard.

Table 2.4. Share (in %) of the population of the study municipalities involved in the processing of different products

Products	Copargo	Djougou	Glazoué	Zogbodomey	Zagnanado	Average
Shea Butter Almond	20	20	10	0	0	10
Cassava derivatives	30	10	20	20	20	20
Corn derivatives	40	20	30	30	30	30
Mango derivatives	10	10	10	10	0	8
Soybean derivative	30	30	20	20	20	24
Néré mustard	20	20	20	20	10	18
Yam Cossette	40	30	20	0	10	20
Palm oil	0	0	0	30	30	12

Considering a scale of 10, with 0=not produced and 10= produced by all households

Source: Survey results, February-March 2022

2.1.4 Forestry/Fishing

In the study communes (Table 3.5), logging and fishing are also sectors in which people are interested as economic activities and for direct household needs. Fish farming is not widely practiced in the communes of Djougou, Copargo, and Glazoué.

Table 2.5. Share (in %) of the population of the study communes engaged in logging, fishing and fish farming

	Copargo	Djougou	Glazoué	Zogbodomey	Zagnanado	Average
Collection of shea nuts	20	30	20	0	20	18
Firewood	55	30	10	50	80	45

Lumber	10	15	10	30	40	21
Charcoal production	20	25	30	20	30	25
Hunting	20	40	20	20	20	24
Medicinal products (leaves, roots, bark, etc.)	20	20	20	20	20	20
Non-timber forest products	10	0	10	20	20	12
Fishing	10	10	10	20	10	12
Fish farm	10	10	10	20	10	12

Considering a scale of 10, with 0=not at all exploited and 10= exploited by all households

Source: Survey results, February-March 2022

2.1.5 Trade

Trade in agricultural products is an important in the 5communes. Maize, cashew nuts, market garden produce and livestock are the products most commonly traded by actors (Table 3.6). Overall, 54% of the populations in the 5 communes are involved in the maize trade.

Table 2.6. Share (in %) of the population of the study communes trading in agricultural products

	Copargo	Djougou	Glazoué	Zogbodomey	Zagnanado	Average
Corn	50	70	60	30	60	54
Mangoes	20	30	10	20	30	22
Cashew nuts	50	40	60	10	30	38
Shea nut	20	30	20	0	20	18
Vegetable products	30	30	30	30	30	30
Livestock	50	30	20	20	20	28
Processing products	40	20	20	20	20	24

Considering a scale of 10, with 0=no households practicing and 10= practiced by all households

Source: Survey results, February-March 2022

2.1.6 Other sources of income adopted in the communes

Table 3.7 shows that several other sources of income are developed by the populations of the 5 communes. Handicrafts, small businesses and services (management of mobile money points, etc.) represent important secondary activities for local residents, especially women.

Table 2.7Other source of income according to the population involved

	Copargo	Djougou	Glazoué	Zogbodomey	Zagnanado
Handicraft	3	3	2	3	3
Small business	4	6	2	3	3
Provision of services	2	3	1	2	2
Plant production	1	1	1	1	1

Considering a scale of 10, with 0=no households practicing and 10= practiced by all households

Source: Survey results, February-March 2022

2.2 Average production and income of producers

2.2.1 Average production of project crops

Maize production is very high in the communes of Djougou (21,717 tons in the 2021-2022 season) and Glazoué (27,481 tons), while the lowest production is observed in the commune of Zogbodomey (7,816 tons). Of the five communes in the project, Glazoué and Copargo have the highest cashew nut production. With respect to vegetable crops, tomatoes and peppers are produced more in the commune of Zogbodomey, while vegetable production, especially cabbage and lettuce, is very dominant in the commune of Djougou.

Table 2.8. Area (in ha) and production (in tons) of target crops in the project communes

Crops		Zagnanado	Zogbodomey	Glazoué	Djougou	Copargo	Benin(1)
Corn (2020-2021)*	Sup. (ha)	9 112	11 546	29 664	15 929	5 787	1 267 159
	Prod. (ton)	7 816	10 316	27 481	21 717	8 139	1 611 615
Cashew (2018-2019)*	Sup. (ha)	1 357	0	25 533	12 526	11 181	293 485
	Prod. (ton)	557	0	8 313	4 084	5 827	115 590
Mangoes (2018-2019)**	Sup. (ha)	ND	18,45	9,80	136,75	46,00	3 620
	Prod. (ton)	ND	230,37	76,13	1502,47	505,40	16 317
Shea	Sup. (ha)	ND	ND	ND	ND	ND	7 961
	Prod. (ton)	ND	ND	ND	ND	ND	13 910
Tomato (2020-2021)*	Sup. (ha)	2 175	384	1 010	370	10	39 429
	Prod. (ton)	5 884	1 069	3 255	1 881	73	261 103
Pepper (2020-2021)*	Sup. (ha)	2 250	366	704	261	9	30 345
	Prod. (ton)	1 088	183	387	335	22	108 934
Vegetables (Cabbage, Lettuce, Gboma and Crincrin)	Prod. (ton)	14	2 508	0	145	241	

Source: *MAEP (2022); **ATDA5 (2019);

(1) National values for shea and mango are from FAOSTAT (2021), those for other crops are from MAEP (2022)

2.2.2 Average annual income per household for each of the target crops

During the field surveys, producers were asked to give estimation of their annual income (current and 10 years ago) per hectare for the crops targeted by the project. The results obtained and presented in Table 3.8 indicate that the average annual income per hectare for maize increased in all communes, except in Zagnanado, where it decreased slightly. The same trend was observed for shea. The situation observed for maize income in Zagnanado is thought to be due to a decline in productivity as a result of soil impoverishment and irregular rainfall.

For mango, income per hectare decreased in Glazoué and Zogbodomey, but increased in Djougou and Copargo. For cashew nuts, decreases in income were noted in Zagnanado and Djougou.

In all cases (see Table 3.10), the improvement in annual income per hectare would be due not only to an increase in the price of products but also to improved maintenance techniques (in

the case of mango and cashew) and the adoption of improved varieties. Decreases in income would be the consequence of increased production costs resulting from higher input costs. This would also be the result of the drop in yields due to climatic change and the low quality of products due to pest infestations.

Table 2.9. Average annual income (FCFA/year) per household for each of the target crops

Crops		Zagnanado	Zogbodomey	Glazoué	Djougou	Copargo
Corn	Current income	100 000	300 000	500 000	120 000	160 000
	Returned 10 years ago	120 000	125 000	300 000	90 000	90 000
Mangoes	Current income	-	50 000	200 000	150 000	400 000
	Returned 10 years ago	-	60 000	250 000	60 000	240 000
Cashew nuts	Current income	175 000	70 000	135 000	165 000	115 000
	Returned 10 years ago	200 000	40 000	80 000	250 000	85 000
Shea nut	Current income	25 250	0	150 000	60 000	50 000
	Returned 10 years ago	45 000	0	100 000	50 000	35 000
Tomato	Current income	5 000 000	550 000	2 000 000	2 250 000	1 600 000
	Returned 10 years ago	1 600 000	199 500	600 000	800 000	800 000
Chilli	Current income	2 400 000	450 000	1 200 000	3 000 000	900 000
	Returned 10 years ago	1 000 000	150 000	300 000	1 500 000	1 000 000

= Decrease = Increase

Source: Survey results, February-March 2022

Table 2.10. Reason for changes in income

Crops	Djougou and Copargo		Glazoué		Zogbodomey		Zagnanado	
	Variation recorded	Reasons	Variation recorded	Reasons	Variation found	Reasons	Variation recorded	Reasons
Corn	Increase	Price increase,	Increase	Price increase,	Increase	Price increase, GAP	Decrease	Decrease in productivity
Mangoes	Increase	Price increase,	Decrease	Decrease in productivity	Decrease	Decrease in productivity	-	-
Cashew nuts	Increase	Price increase,	Increase	Price increase,	-	-	Decrease	Decrease in productivity
Shea nut	Increase	Price increase,	Increase	Price increase,	Increase	Price increase, GAP	Decrease	Decrease in productivity
Vegetable crops	Increase	Price increase, GAP, Chemical fertilizers	Increase	Price increase, GAP	Increase	Price increase, GAP	Increase	Price increase, GAP

*GAP= Good Agricultural Practices

Source: Survey results, February-March 2022

2.3 Value chain analysis of the project's main crops

Please refer to Annex 2: FS, Section 4.4 for a description of cultivation practices, and current (baseline) crop productivity in the Oueme Basin, focusing on the four target VC cultures.

2.3.1 Analysis of the overall market demand

The level of demand for the various crops in the project communes was assessed on a scale ranging from very high to very low and is presented in Table 3.15. This assessment by the actors interviewed indicates that demand is relatively high for maize in all communes. The same is true for cashew nuts, mangoes, and shea nuts in the communes of Glazoué, Copargo, Djougou, and even Zogbodomey for mangoes.

The analysis of market demand for the various targeted products shows that demand for **maize** is strong, particularly for human consumption and for exports. There is strong demand for maize grain in neighboring countries, particularly in Nigeria and Niger. This tends to push up the price of maize in Benin well beyond the limits observed in more distant countries such as Mali, Burkina Faso and Ghana. In animal feed, maize is partially used in the manufacture of feed for poultry, pigs, and others. The demand for poultry feed is increasing, with requirements for yellow corn.

Among Benin's food products, maize is the one that is the subject of the greatest number of food transformations. There are four traditional primary processing products of socio-economic importance: two flours (lifin and Gambari-lifin) and two fermented pastas (ogui and mawê). Secondly, maize starch, which does not exist in its original state on the market, constitutes a fifth intermediate product common to various beverages (Gowè, Tchakpalo, etc.). Most secondary products are derived from these five intermediate products (ordinary cooked dough "owo" and similar products, porridges, akassa, lio, akpan, etc.).

Table 2.11. Level of market demand for project crops

Crops	Copargo	Djougou	Glazoué	Zogbodomey	Zagnanado
Corn	+++	+++	+++	+++	+++
Mangoes	+++	+++	++	++	+
Cashew nuts	+++	+++	+++	+	+
Shea nut	++	+++	++	+	+
Vegetable crops	++	+++	+++	++	++

+++= High demand; ++= Somewhat high demand; += Low demand for the product

Source: Field data, 2022

The demand for **cashew nuts** is at national level especially for local units and processing industries and also at the international level. Located in the commune of Zogbodomey, the company Fludor launched a cashew nut shelling plant in 2016. The plant is expected to process about 4,000 tons of cashew nuts initially and should see its capacity increase to 15,000 tons in 2017. Other large cashew nut processing units exist such as GEBANA, AFOKANTAN and TOLARO. However, all processing units as well as producers and traders have been hit by the

drop in world cashew nut prices in 2018 or even 2019. As a result, the demand for cashew nuts declined in the following two years (2019 and 2020). This year, cashew industry stakeholders are still struggling to recover from the adverse effects of the crisis generated by this drop in world cashew prices in 2018. The economic and sanitary crisis in Covid-19 disrupted supply chains, while several processing units had closed due to the volatility of raw nut prices and the lack of adequate financing. However, strong competition has been noted (in 2020 and 2021) between different buyers in local cashew markets. This could be the result of the recovery in global demand, particularly in Europe and the United States.

For **mango,** demand exists at the national level as well as at the regional and international levels. At the national level, demand comes mainly from households that like fresh mangoes, but also from processing units. After the orange, the mango is the second most preferred fruit by consumers, followed by the pineapple, papaya and avocado. Mango is generally consumed in various forms by consumers: about 35% of consumers take mango juice and about 10% consume mango jam (Sodjinou, 2020).

In world trade, the demand for fresh mango (and its derivatives such as dried mango) is one of the few products that is growing positively in a still uncertain economic context. The United States and Europe are the main importers of fresh mangoes in the world. For the past few decades, U.S. demand has always been far greater than European demand (Gerbaud, 2017). The United States imported nearly 465,000 tons in 2016 while the demand from European markets is globally estimated at nearly 336,000 tons of mangoes adding the productions of Spain. In Europe, the main mango importing countries in 2016 were respectively the United Kingdom (68,533 tons), Germany (63,139 tons) and the Netherlands (54,887 tons). Other European importing countries are France, Portugal, Belgium, Scandinavia and Italy. In all these countries, the mass distribution buys about 70% of the total sales of mangoes, and we note the great dominance of the Kent variety (at least 90% of imports). The other mango varieties admitted for export are mainly Keitt, Valencia and Amelie (Tossou Lokossou et *al.* , 2019). Exports from the West African sub-region represent about 10% of the European market (between 20 and 25,000 tons annually) with a product quality recognized and appreciated by consumers (Parrot et *al.* , 2017). Côte d'Ivoire, with a production of about 180,000 tons per year, is the leading mango exporting country in the sub-region.

At the **shea** level, demand exists at the national, regional, and global levels. At the national level, shea is in high demand (Sodjinou *and* Kouton-Bognon, 2019). FLUDOR is the leading demander (15,000 to 20,000 tons), followed by KNARR (approximately 4,500 tons of kernels) and AAA (2,000 to 4,000 tons of kernels). Demand for cosmetics (NATURA, ZIKORA, KARITIC, etc.) represents about 10,000 tons of almonds and local markets (human consumption and ointment) about 5,000 tons of almonds (Figure 3.3). A portion is also exported to Nigeria, Togo, Burkina Faso and Ghana.

The different markets have requirements in terms of standards and quality. Predominantly, the quality requirements relate to, odor, acidity, moisture content etc. (Faladé, 2018c). The

general evolution of Benin's shea butter exports to the European Union market seems to obey periodic or random needs, which makes Benin a marginal supplier with a low level of positioning of its product (Faladé, 2018c).

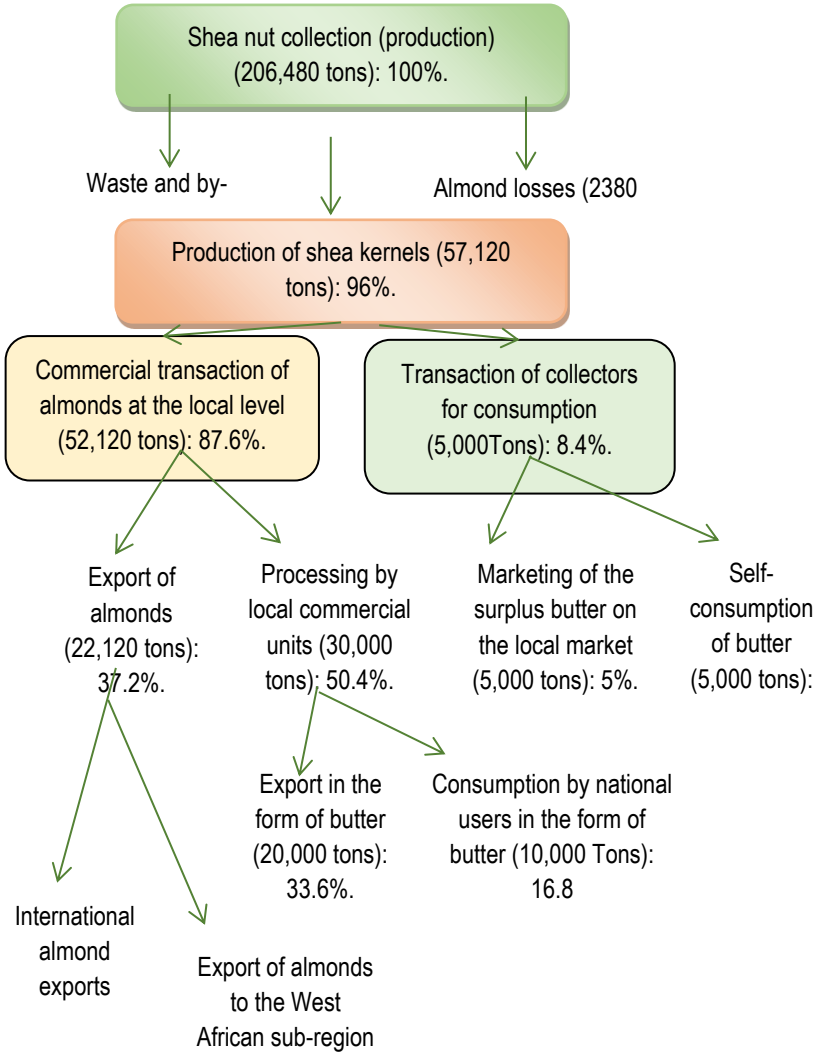


Figure 2.2. Global view of the distribution of shea nut production in Benin
Source: Sodjinou and Kouton-Bognon (2019)

World demand for shea is estimated at 5 million tons, but production does not exceed 4.2 million tons. It comes from the food industry essentially composed of the chocolate industry (90% of global demand) and the cosmetology (5% of global demand) and pharmacology (less than 5% of global demand) industries (Kepler, 2008, Konnon, 2011, Gnanglè, 2017). Europe is

the destination where shea and its derivatives are most prized (Faladé, 2018c). Sweden and the United Kingdom purchase 97% of the shea nuts offered on the international market. Other importing countries include India, Indonesia, France, Denmark, and the Netherlands (Konnon, 2011). However, it is difficult to obtain up-to-date statistics on exports or use of shea within or outside of Africa. The international trade in shea kernels and butter is concentrated in the hands of a few operators and traders, the most dominant of which are the Swedish-Danish AAK and the Dutch IOI Loders Croklaan. Nevertheless, USAID's West Africa Trade and Investment Hub estimated the market value of almonds exported from Africa in 2012 to be around $120 million (Faladé, 2018c).

2.3.2 Mapping of target crop value chains

Several value-added chains (VACs) exist within each of the four selected commodity chains (see Table 3.15). For maize, there are CVAs for grain maize, fresh/roasted maize, and yellow maize for poultry farming. For cashew nuts, the main CVAs that currently exist are: the cashew nut CVA, the roasted/roasted almond CVA and the cashew apple juice CVA. For mango, two value added chains currently exist, namely the "Fresh Mango for the local and regional market" CVA and the "Processed Mango (mango juice, jam, dried mango, puree) for the local and regional market" CVA. In addition to these two VAS, two other potential VAS can be added, namely the CVAS "export of fresh mangoes and fresh-cut mangoes for the international market" and the CVAS "export of fresh organic mangoes and organic mango derivatives (dried organic, fresh-cut organic, etc.) for the international market" (see Sodjinou, 2020). Finally, for the shea chain, the CVAs that currently exist are "shea kernel for the local and international market", "shea butter for the local and sub-regional market", "improved shea butter for export" and "organic shea kernel and butter".

Table 2.1211. Main VADs identified in the selected sectors following the classification

Corn	Cashew nuts	Mangoes	Shea
Grain corn	Cashew nuts	Fresh mango for the local and regional market	Shea kernel for the local and international market
Fresh/roasted corn	Roasted almond	Processed mango for local and regional markets	Shea butter for the local and sub regional market
Yellow corn for breeding	Cashew apple juice	Export of fresh mangoes and fresh cut mangoes for the international market	Improved shea butter for export
		Export of fresh organic mango and organic mango derivatives for the international market	Organic almond and shea butter

Generally speaking, the actors involved in the value chains of the targeted crops include input suppliers, producers (collectors for shea), producer organizations/pickers, collectors, wholesalers/purchasers, consumers, advisory structures (ATDA, DDAEP, etc.), projects/programs (e.g., PADAAM, ProFina, ProAgri, PAIA-VO, PADMA), and MFIs/SFDs. There are, however, some particularities with respect to cashew nuts, shea nuts and mangoes. There

are also organizations in the national research system (INRAB, universities, etc.) that interact with the various stakeholders to help develop solutions to the various constraints in their fields. We should mention the communal union of producers (for each crop) which is a member of a pyramidal network of organizations around the sectors (communal platform of actors, departmental union of producers, national federation and interprofessional organizations).

Cashew nuts

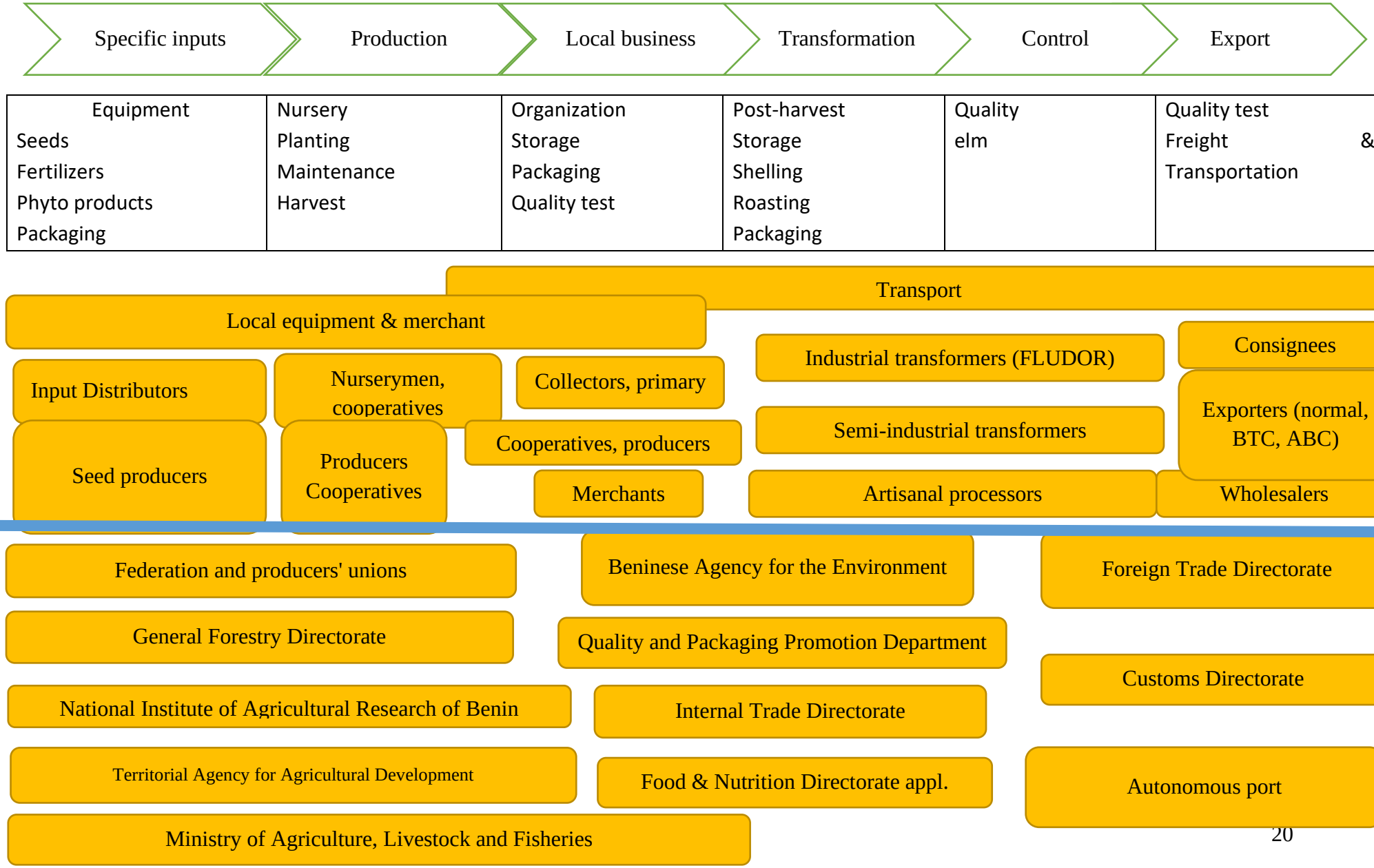
Nationally produced cashew nuts follow two main channels.A marketing circuit for raw cashew nuts and one for the by-product: cashew kernels. The former remains the most important in terms of the quantity of nuts drained. The marketing circuit for raw nuts essentially supplies the Asian markets. The quantity of raw nuts processed locally is still very low. The kernels produced from local processing are destined for local, regional and European markets.

Brokers sometimes intervene between producers and collectors on the one hand and producers and wholesalers on the other. Producers deliver 97% of their raw cashew production directly to collectors.

In the cashew almond marketing circuit, between the processing units and the consumer markets, there are, on the one hand, retailers and supermarkets that essentially serve the local (national) market. On the other hand, the regional and European markets are directly supplied by the processing units themselves.

Cashew apples are also marketed. At harvest, the apples are separated from the nuts and then sold entirely to retailers. These retailers supply the local market with cashew apples. A part of these apples is transformed into juice. Figure 3.4 shows the diffrent steps of the value chains and, in yellow, the different actors involved in each step.

Figure 2.3. Mapping of the cashew nut sector



Mango

Four CVAs are considered, namely two current CVAs ("Fresh mango for the local and regional market" and "Processed mango for the local and international market") and two potential CVAs ("Export of fresh mango and fresh cut mango for the international market" and "Export of fresh organic mango and organic mango derivatives for the international market")

The function of the "***Fresh Mango for the Local and Regional Market***" CVA or traditional CVA is to transport fresh mangoes to local and regional consumers (Figure 3.4). It is driven by four main categories of actors, namely, the supply of equipment and inputs, production, marketing and consumption. The supply of equipment and inputs is the upstream link in the chain whose role is to make the equipment and inputs needed available by the other links. This link is mainly made up of nurserymen, equipment suppliers (craftsmen, etc.) and input suppliers (NPK, urea, insecticide, etc.). The producers sell their mangoes to traders who run the third link, the marketing link. The actors in the third link perform the functions of collecting mangoes from the plantations, purchasing, grouping, transporting and bringing the mangoes closer to the consumers. There are four types of traders in this link: rural retailers, rural wholesalers, urban wholesalers and urban retailers. Thus, the number of trader categories between the producer and the final consumer can vary from 1 to 4 types of traders. Fresh mangoes are sold in local markets, urban/modern markets and regional markets (Burkina Faso, Nigeria, Niger etc.).

According to Sodjinou (2020), this CVA is characterized by a **low level of coordination** both at the level of each link and at the CVA level. In particular, **the level of cooperative action by smallholders is very low or even non-existent** and the interventions of external actors (MFIs, TFPs, NGOs, etc.) are very low. In addition, the level of contractualization (oral and/or written) is relatively low in this CVA. As a result, producers do not have a fixed buyer and the fresh produce put on the market is not subject to strict quality requirements. Consumers are relatively unsatisfied in this CVA in terms of both quantity and quality of mangoes. This CVA is the most important in Benin because small-scale producers and other actors in the mango sector in Benin often lack the resources to access emerging markets.

The "***processed mango"*** value chain is composed of six links (Figure 3.5). The transaction objects of this VAM are the products of mango processing for the local and international markets, but it is mainly the local (mostly urban) market that is much more supplied. The level of requirements in terms of quality is moderately strict (van Melle and Buschmann, 2013). The level of investment is relatively higher than that of the "fresh mango" VAM. The mango products considered are: mango juice, mango jam, dried mango, mango purees and mango nectars.

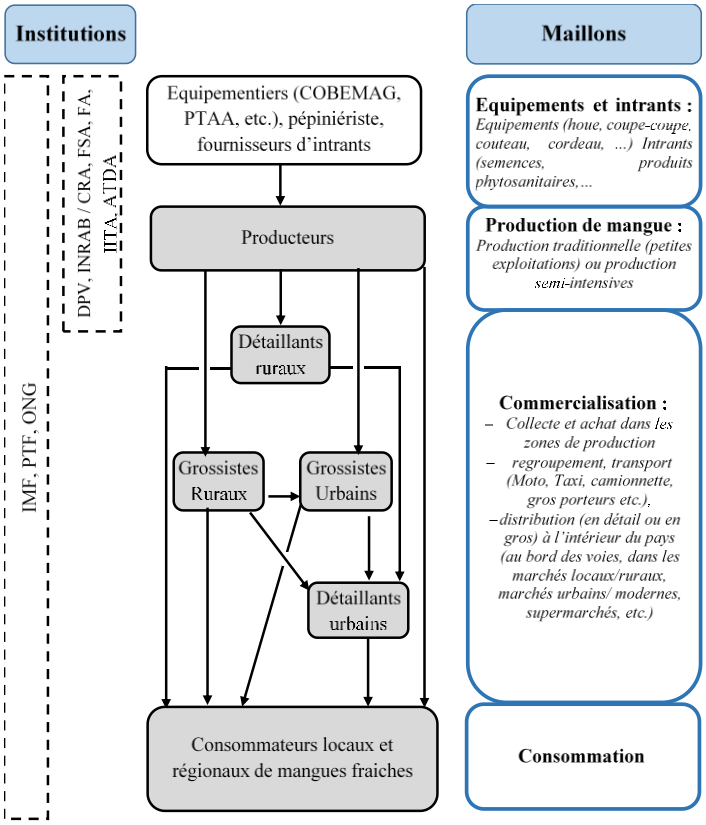
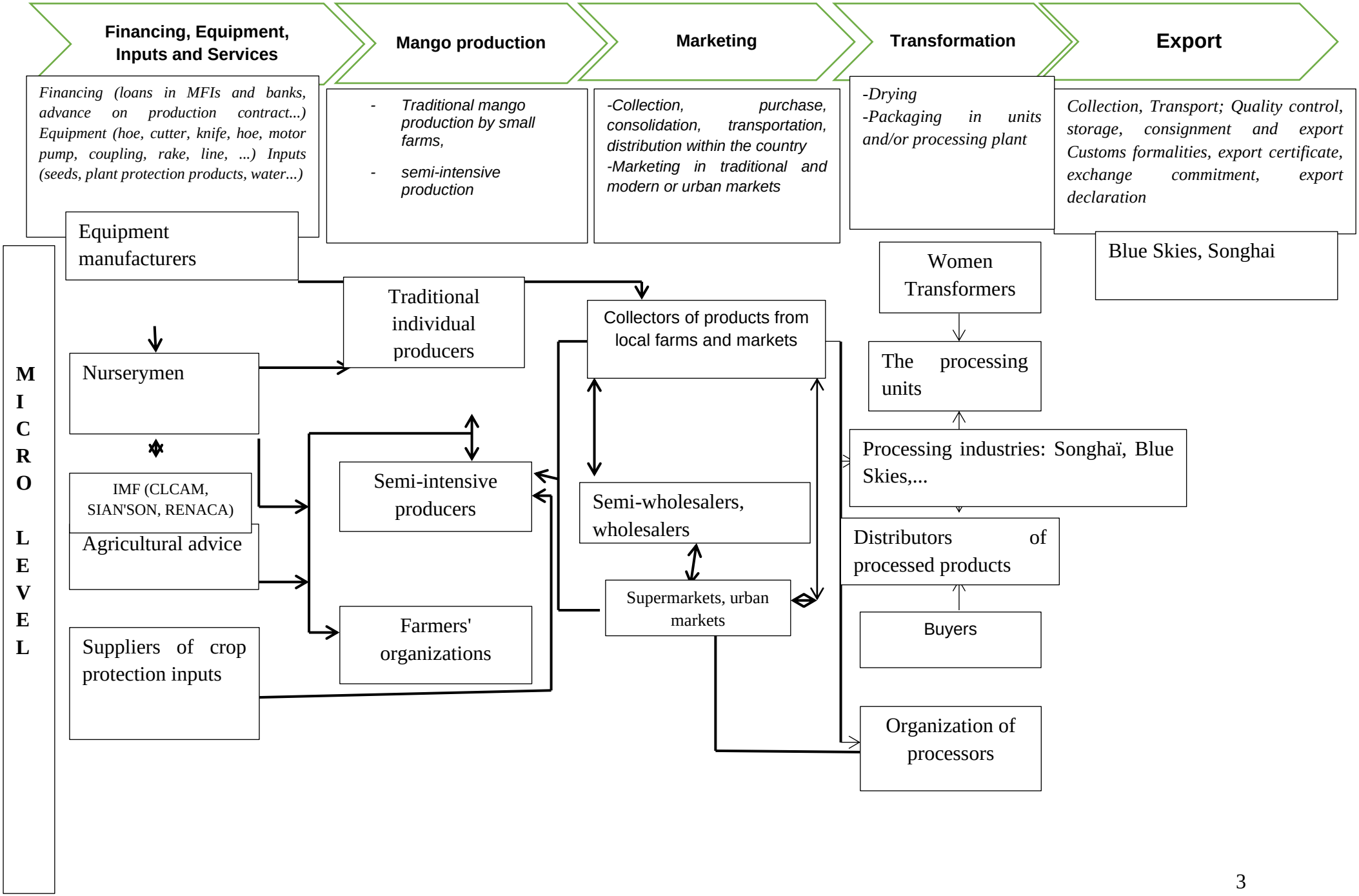


Figure 2.4. Map of the "Fresh Mango for the Local and Regional Market" CVA

Source: Sodjinou, 2020

Upstream, there is the "equipment and input supply" link. This link is driven by the nurserymen who supply mango trees, the equipment suppliers (craftsmen, etc.) and the input suppliers. The second link concerns mango production, which is mainly carried out by small producers. The third link in this chain is marketing. The processors are the main actors in the fourth link: processing. In their activities, the processors first source mangoes while checking their quality beforehand. They obtain their supplies from producers as well as from different types of traders (rural retailers, rural wholesalers, urban wholesalers and urban retailers). After the production of the different mango derivatives, the processors proceed to the packaging which can be bottles (for juices, jams, nectar and mango purees) or bags (for dried mangoes). The sale is progressively done in wholesale and retail. Processors sell finished products directly to consumers, either at their production sites or in stores. They also deliver to supermarkets, hotels and restaurants, which constitute the fifth link. These points of sale offer greater visibility to the different products. The access to these points of sale is often conditioned to the certification of the products especially at the level of the supermarkets and the hotels of great standing.


Financing, Equipment, Inputs and Services
Mango production
Marketing
Transformation
Export
Financing (loans in MFIs and banks, advance on production contract...) Equipment (hoe, cutter, knife, hoe, motor pump, coupling, rake, line, ...) Inputs (seeds, plant protection products, water...)
- Traditional mango production by small farms,
- semi-intensive production
-Collection, purchase, consolidation, transportation, distribution within the country
-Marketing in traditional and modern or urban markets
-Drying
-Packaging in units and/or processing plant
Collection, Transport; Quality control, storage, consignment and export Customs formalities, export certificate, exchange commitment, export declaration
MICRO LEVEL
Equipment manufacturers
Blue Skies, Songhai
Women Transformers
Traditional individual producers
Collectors of products from local farms and markets
The processing units
Nurserymen
Processing industries: Songhaï, Blue Skies,...
IMF (CLCAM, SIAN'SON, RENACA)
Semi-intensive producers
Semi-wholesalers, wholesalers
Distributors of processed products
Agricultural advice
Supermarkets, urban markets
Buyers
Farmers' organizations
Suppliers of crop protection inputs
Organization of processors

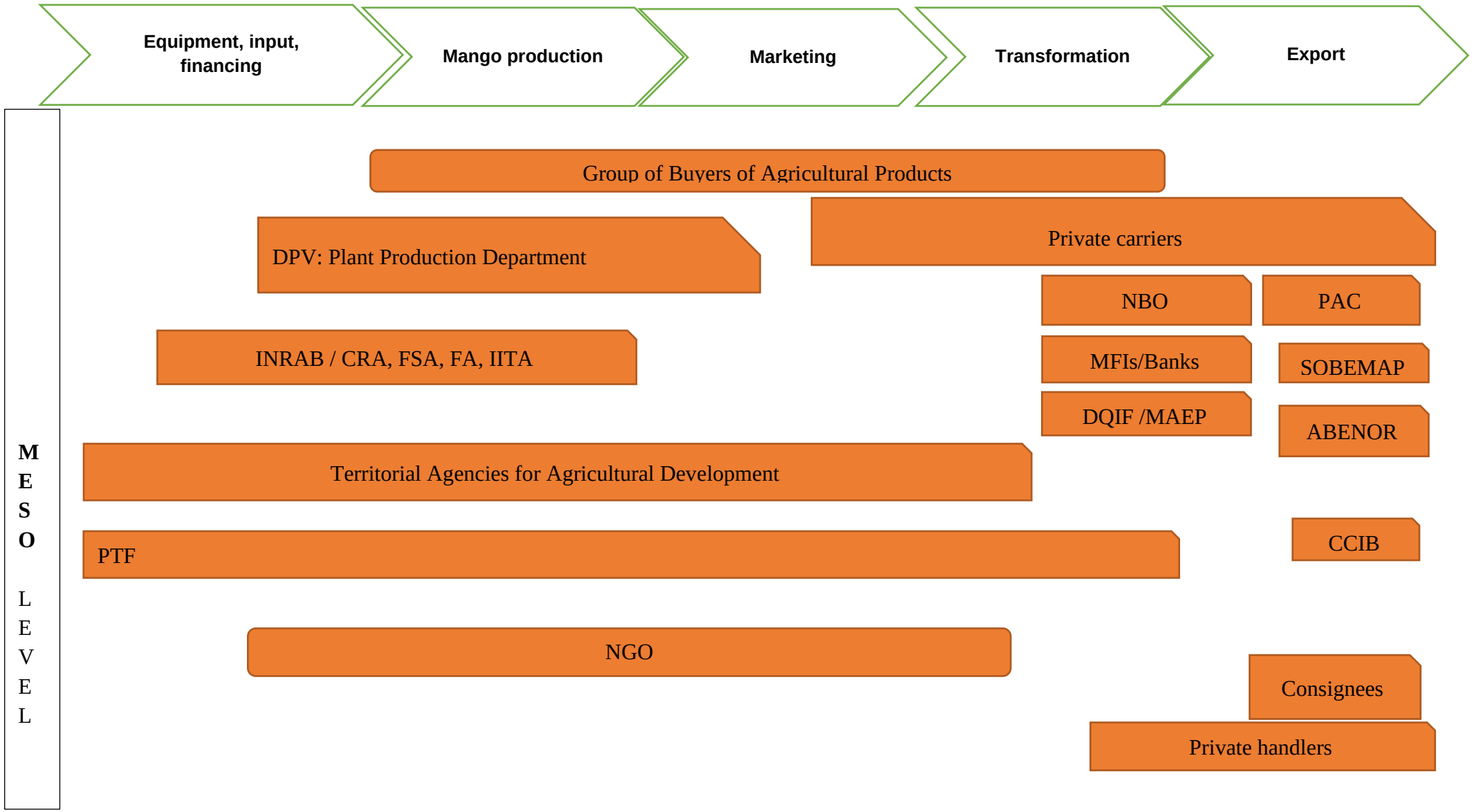


Figure 2.5. Map of the CVA "Mango processed for the local and international market

Source: Sodjinou (2020)

With regard to the CVA "***Fresh mango for the international market***", apart from small quantities of mangoes exported to neighboring countries, Benin is not present on the international market, where demand is still unsatisfied. However, the difficulty of selling all the mangoes in time during the production period is one of the main causes of the high loss rate observed. In this context, the international market, especially in Europe, has potential to be explored. The "Fresh Mango for the International Market" CVA could therefore be set up and developed. The transport could be done by plane or by boat.

However, certain steps will need to be taken in order for production to meet the very stringent requirements of the international market. First, a very high level of coordination of the CVA is needed, with the presence of dedicated buyers or companies and formal or informal contracts. To reduce the expected effect, it will be necessary to think about **strengthening the level of cooperative action of small producers**, not only to **improve their cultivation practices** and thus the quality of the fresh mangoes produced, but also so that these producers can **better negotiate** the transfer prices. Other actions by the various support institutions (MFIs, public structures, PTFs, NGOs, etc.) should enable the various actors to contribute to the effective supply of good quality fresh mangoes on the international market.

It should be noted that the regulatory framework on imports of agricultural products in Europe is very strict. Indeed, the legislation in force in Europe establishes a regulatory framework to protect crops from harmful organisms and to avoid their propagation on the European territory. As a result, the mango export sector is going through a period of phytosanitary crisis linked to the excessive number of interceptions of lots in Europe due to the presence of non-European fruit flies. Thus, during the last mango campaigns, several interceptions of consignments from West and Central Africa have been noted. To this end, the European authorities (Directorate General for Health and Food Safety) have put in place new rules that must be respected by all countries exporting mangoes to the EU. These rules provide that, any pitted fruit cannot be imported into Europe, at the risk of rejection and total destruction of the batch of mangoes by the European phytosanitary services at the exporter's expense. On March 21, 2019, new rules were officially adopted as Commission Implementing Directive (EU) 2019/523, amending Annexes I to V of the Plant Health Directive 2000/29/EC. The new directive entered into force on March 31 and has been applied since September 1, 2019.

The new rules present four possible options, but only one is possible in West and Central Africa: "*The mango must have been subjected to an effective treatment to ensure that it is free of Tephritidae, and the treatment data must be included in the phytosanitary certificate. In addition, the method of treatment must be communicated in advance in writing to the European Commission by the NPPO*. Exports of mangoes will only be allowed into the EU if "they have been subjected to an effective treatment". Before the start of the mango season, the NPPO of each country must send a dossier to the EU detailing the treatment that will be applied. This treatment may include post-harvest fruit fly control and/or a pre-harvest "systems approach" that covers control and management of the pest in the field.

The CVA "***Organic Mango and derivatives for the international market***" will have as its objective the transaction of organic mangoes and their derivatives (juice, jam, dried mango, purees and nectars). The requirements of the international market in terms of quality of organic products are very strict. Thus, the actors who will be active there will have to go to the certification of the products since it is one of the conditions to integrate this CVA. This CVA will have to count on fixed buyers while taking into account strong degrees of external interventions in particular of the structures of certifications. It will be necessary to **develop the cooperative actions** of small producers in order to meet the requirements of the CVA on the one hand, and to reduce the effect of lead

companies on small producers on the other. The CVA is very high risk with low competitive advantages and higher selling prices. However, the market is growing steadily with strong potential.

Shea

For shea, three value chains (CVA) are to be considered: CVA "Shea kernel for the local and international market", CVA "Shea butter for the local and sub-regional market", and CVA "Shea butter for the international market".

CVA "Shea kernel for the local and international market

The "Shea Kernel for the Local and International Market" CVA (Figure 7) concerns the production and marketing of shea kernels in their raw state at the national and international levels. This CVA is composed of five (05) links.

Upstream, there is the "equipment and input supplies" link. This link is driven by: nurserymen who supply nursery plans and equipment manufacturers such as COBEMAG and artisans who supply equipment such as the barate, the crusher, the mortar. The second link concerns the "Management of shea parks". This link includes activities such as reforestation, maintenance and protection of shea agroforestry parks and natural shea stands (tree/shrub savannahs, fallow fields) against bush fires and abusive cutting of shea trees. The actors involved are the managers of the various shea parks and the individual producers who own the land on which the shea trees are located. The third link, "almond production," consists of collecting shea nuts and transforming them into almonds. There are both traditional and modern transformation processes (popularized by actors such as AKB). Nevertheless, the production of almonds generally follows the following steps: pulping, washing, drying, cooking and drying the nuts, shelling the nuts, and storing the almonds. Essentially, it is the women who collect the shea nuts who are involved in the production of shea kernels. However, there are men from the Betamaribè who also collect the nuts. In the fourth link, "marketing," the women sellers are responsible for collecting (purchasing and grouping) the kernels. In the local market, they sell the shea kernels to both traditional and industrial processing units (only FLUDOR). For the international market, these women sellers deliver the kernels to collectors who deliver them to professional buyers gathered within the "GAPA" association. These almonds are finally delivered, according to contracts, to exporters such as KNAR-Benin, HENWOOD, EEE Trinity, AFOKANTAN-BENIN, AIGLON IMPORT-EXPORT, ANIKE TRADING SARL. These exporters are in charge of conveying these almonds to the international market.

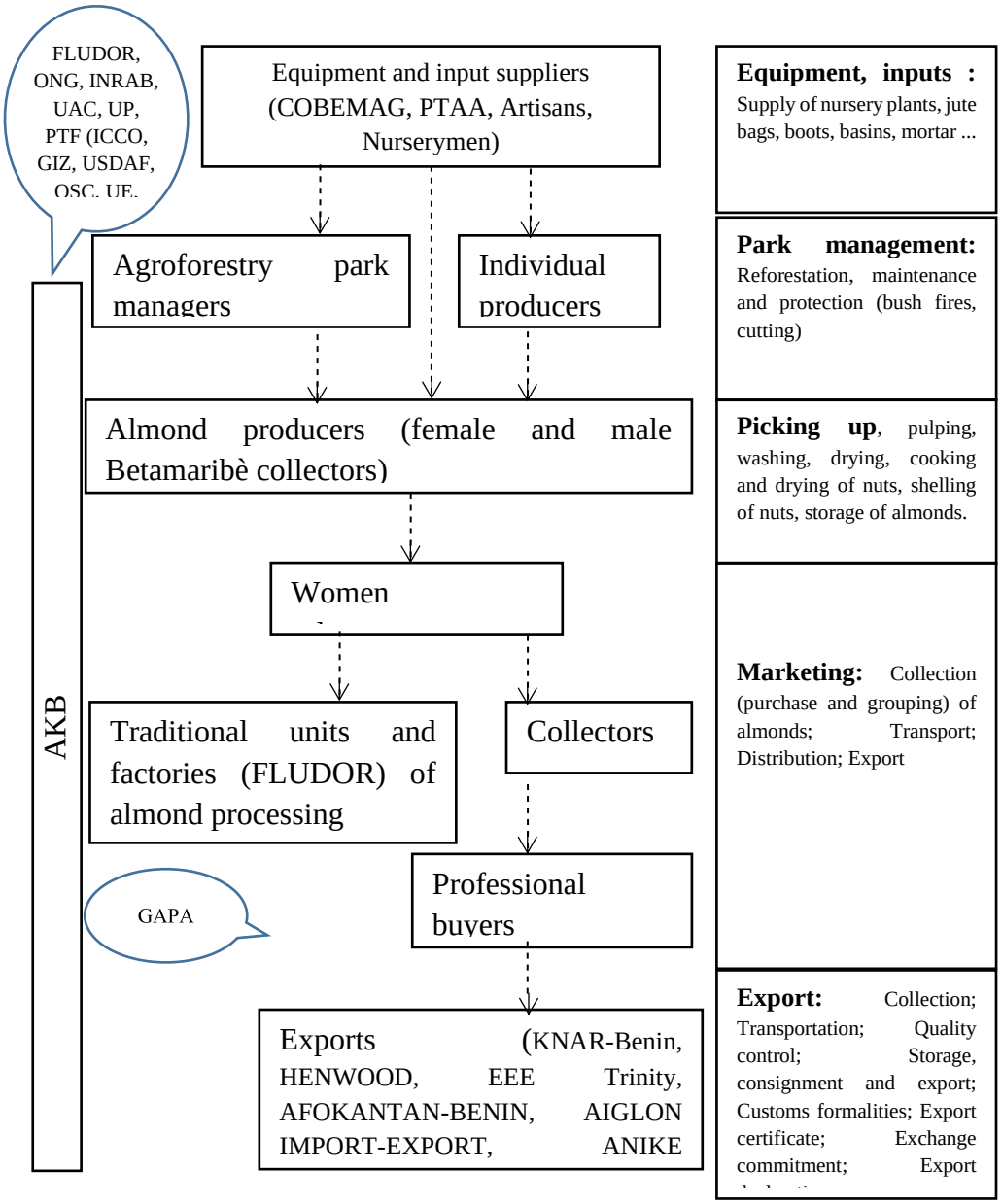


Figure 2.6. Map of the CVA "Shea Kernel for the Local and International Market

In addition to the direct actors, several actors are involved in the sector through various research projects and support projects for training and development of the sector, particularly through AKB. These include : FLUDOR, NGOs (APIDEV, GERED, etc.), INRAB, Universities (UAC and UP), Technical and Financial Partners (ICCO, GIZ, USDAF, CSOs, EU, AFD, etc.). Also, the AKB establishes commercial relations with the large exporters of shea almonds present on the Beninese territory.

CVA " Shea butter for the local and sub regional market ".

The CVA "Shea butter for the local and sub-regional market" (Figure 8) is one of the most important components of the entire shea butter industry in Benin. It covers more than 75% of the total butter production. Seven (07) links make it possible to animate this chain, the first of which, "equipment and input supplies", makes it possible to produce and make available to the other links the equipment and inputs they need. The main actors in this link are: nurserymen and equipment manufacturers. The second link, "Almond collection and storage", consists of collecting the almonds produced by the women nut pickers, drying them, carrying out quality control and storing them. The direct actors in this link are the women shea nut collectors and the shea kernel collectors. Intermediaries, brokers and transporters allow the kernels to converge towards the third link, which is

"processing. The main actors in this link are the shea butter almond processors. The main steps in the transformation of almonds into shea butter are: crushing, mixing and churning. The butter obtained at this stage is packaged (packaging, marking, quality control). Then, the "wholesale" and "retail" links follow. It should be noted that at the marketing stage, several channels are distinguished. Among others, there are the following channels: (i) Processor-Consumer; (ii) Processor-Wholesaler-Consumer; (iii) Processor-Wholesaler-Retailer-Consumer and (iv) Processor-Retailer-Consumer. At the level of the last link, "Consumption", several types of consumers can be distinguished. Among them, there are the supermarkets and SMEs that use shea butter as a raw material in the cosmetics and food sectors.

Other actors intervene in the sector either for quality control, technical and financial support, or for the regulation of marketing, etc. It is in this context that MFIs, commercial banks (BOA, BRS, FECECAM, etc.), ministries (MAEP, MI, MC, MPME, MMFEJF) and their specialized departments and institutes (such as DAGRI, DANA, INRAB, CCIB, etc.), AKB and its partners intervene.

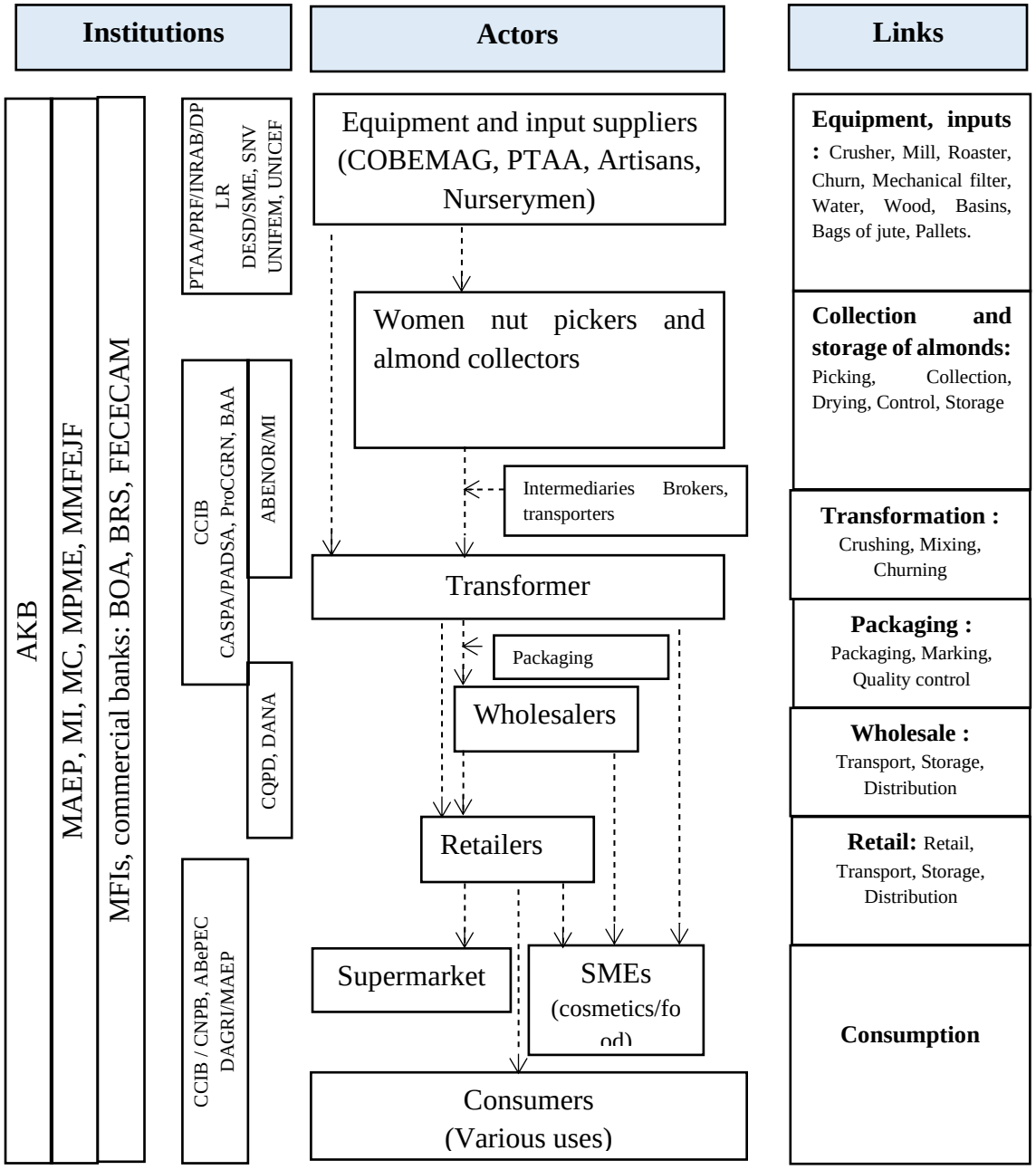


Figure 2.7. Map of the CVA "Shea butter for the local and sub-regional market

CVA "Shea butter for the international market

The "Shea butter for the international market" CVA (Figure 9) is an important component of the sector in terms of growth potential. Structurally, the map of this VAM has five essential links: inputs and specific equipment, collection and storage of kernels, processing, packaging, and finally the export of butter. The "supply of equipment and inputs" link makes the necessary equipment and inputs available to the direct actors in the sector. The main actors in this link are: nurserymen and equipment manufacturers. The second link, "Almond collection and storage", consists of collecting the almonds produced by the women nut pickers, drying them, carrying out quality control and storing them. The women shea nut collectors and shea kernel collectors are the direct actors in this link. The third link concerns processing. At this level, two types of processors can be distinguished: traditional units dominated by women and industrial units, essentially FLUDOR. The butter produced goes through the "packaging" link (quality control, packaging, labeling, transport, storage) before being exported. The main exporters of shea butter are : ANTEMANA, FLUDOR-BENIN, 3F BENIN SARL, KALA Karité, KARETHIC, Natura SARL, Société ATHALIE-OTHNIEL SARL, Société Phare Bénin. The intermediaries (forwarding agent, carrier etc.) are solicited for the various operations (weighing, transit, phytosanitary test, air or sea transport) linked to the export.

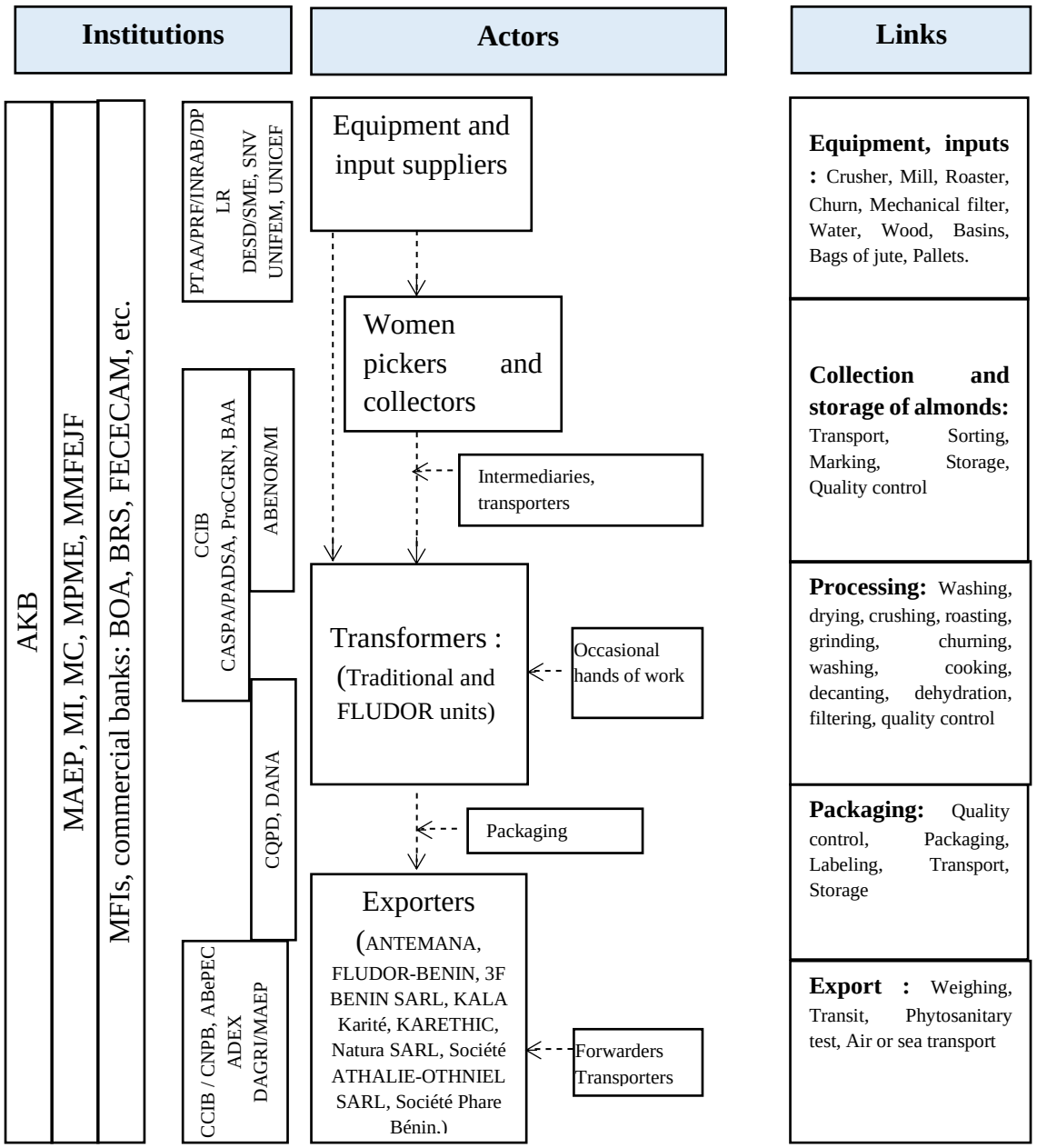


Figure 2.8. Map of the "Improved Shea Butter for Export" CVA

In order for the production to meet the requirements of the international market and the demand of its consumers, the actors of this chain benefit from the support of various institutions such as the ministries (MAEP, MI, MC, MPME, MMFEJF) and their directions and specialized institutes (such as DAGRI, DANA, INRAB, CCIB etc.), the AKB and its partners. In addition, in the marketing process, various services are also called upon to ensure that the products arrive at their destination on time. In this sense, MFIs and commercial banks (BOA, BRS, FECECECAM, etc.) play an important role.

2.3.3 How value chains work

The situation varies according to the crops considered. Table 3.16 provides an overall summary of the situation in the five study communes. It should be noted that networks between producers and buyers are already in place in the target communes, organised per value chain. The OCRI project will work with these existing networks, strenghten them to ensure the products of the four taget VC scan be sold through these networks. The main producers-buyers networks are AKB (for shea) and FENAPAB (for cashew). OCRi farmers and cooperatives involved in these two VCs will be integrated into these networks, which organise group sales of

shea and cashew using their market stands in the target commune. Further details are provided below in the VC description.

Table 2.13 Mechanism of value chain operation

Crops	**Copargo, Djougou and Glazoué**	**Zogbodomey**	**Zagnanado**
Corn	Non-formalized business links between actors	Non-formalized business links between actors	Non-formalized business links between actors
Mangoes	Non-formalized business links between actors	Non-formalized business links between actors	Non-formalized business links between actors
Cashew nuts	Coexistence of "Non-formalized business links between actors" and "Development of business links between producers, UCCPA, FENAPAB and processing plants	The sector is much less developed Each actor acts for his own profit	The sector is much less developed Each actor acts for his own profit
Shea nut	Coexistence of "Non-formalized business links between actors" and "Development of business links between pickers and AKB	-	No organization between actors. Each actor acts for his own profit
Vegetable crops	Weak development of business links	Weak development of business links	Weak development of business links

- *For corn*

Several maize marketing channels exist in the project area and their operation depends on the type of maize considered (grain maize, yellow maize for livestock, fresh maize). For fresh maize, producers sell either directly to processors, i.e. to people producing roasted or boiled maize, or to collectors who in turn sell to processors. This channel is not often controlled, but is becoming more widespread these days.

In the second type of flow, producers sell their crops to collectors or wholesalers. The collected maize is largely delivered to urban wholesalers and consumers respectively. Rural collectors are local traders who are often linked to producers. They travel to the villages with rented collection trucks and buy the surplus from the producers.

In turn, wholesalers supply retailers, the external market in the sub-region, consumers and, in part, maize grain processors. They own or rent trucks and trade maize on a large scale. Retailers downstream of this link supply consumers and processors. About 24% of the corn in this marketing channel is put on the regional market by exporters. It is important to note that at the level of each actor, like the producers, part of the product is reserved for self-consumption.

- *For cashew nuts*

In the cashew nut sector, we note the coexistence of "Non-formalized business links between actors" and "Development of business links between producers, UCCPA, FENAPAB and processing factories". In the latter, various clusters exist to facilitate the production and sale of nuts. In the case of the communes of Djougou and Copargo, this is a system that has been in place for about ten years by the Regional Union of Cashew Nut Producers' Cooperatives of Atacora and Donga (UCRPA-AD) and its member organizations (communal unions, village cooperatives) in order to sell raw nuts in groups. In 2012, the union set up a complementary pre-collection and pre-financing scheme for the purchase of nuts. According to Baranon (2015), the entire system is based on a working capital fund made available to the regional union by the Facilité d'Appui aux Filières Agricoles de l'Atacora et de la Donga (FAFA-AD). It allows the regional union to pre-collect, before the start of the marketing

campaign, volumes of nuts from producers with cash flow difficulties in exchange for an advance and their commitment to market the nuts through group sales.

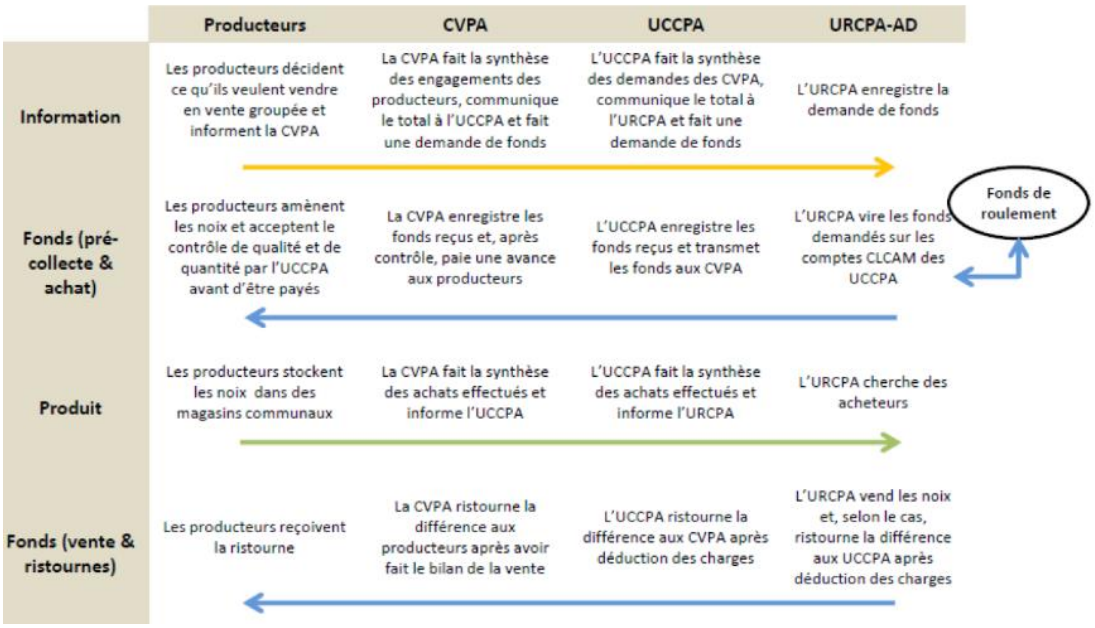


Figure 2.9. Pre-collection, purchase and grouped sale of raw cashew nuts

Source: Baranon (2015)

We also note the existence of a cluster set up by DEDRAS ONG. In this cluster, Agri Finance, the financial structure of DEDRAS ONG, makes loans to producers who sell nuts to the Afokantan Benin Cashew (ABC) unit. The credit granted is used for the maintenance of the plantations by the producers. It is granted for a period of eight (08) months and repaid in kind. The amount of the credit is between 30,000 FCFA and 60,000 FCFA. ABC deposits a financial guarantee which is the amount of the credit and the interest that Agri Finance must receive. DEDRAS ONG plays a role of facilitator in this system. It provides the training service to the producers and ensures that they repay the credit in kind.

PADME also grants credit to producers in groups. There are two types of credit: maintenance credit and pre-collection credit. Producers must repay the credit in cash with an interest rate of 1.9% per month to PADME at maturity. In fact, the Union Régionale des Producteurs d'Anacarde (URPA) and the Projet de Financement Agricole (ProFinA) play a facilitating role so that producers have access to financing. In return, they must ensure that cashew producers repay the credit. URPA and ProFinA serve as a moral guarantee for PADME to extend credit to cooperative producers (Akounnou et al., 2019).

Producers who do not belong to these different schemes sell their nuts to private traders (non-formalized business links between actors). The latter are already circulating in the villages even before the official start of the nut marketing campaign. Along the roads and in the fields, there are many scales and collectors are already buying nuts at low prices. The collectors who operate there are mostly informal. The sale of nuts is done in houses, along the roadside, in buyers' stores or in those of producers' groups. The markets are organized spontaneously by the actors (producers, traders, exporters). They are held outside the days and places of formal markets. Home sales are the dominant mode (statistics from our survey). The advantage of this method of sale is that it allows producers to limit the transport costs associated with marketing the product. More than 80% of the products are sold at home or at the roadside (Akomagni and Ichola, 2017).

The cashew marketing season officially begins in March and ends around July-August of the current year. However, there is usually a pre-collection period from January to March during which traders make good deals because the price charged is often lower than the minimum price.

OCRI will insure the integration of trained farmers and cooperatives into FENAPAB network, in order to facilitate sale of cashew nuts. In the target communes, FENAPAB facilitates the marketing of products and the signing of sale contracts with potential buyers. Cashew nuts are often sold through group sales organized by the FENAPAB network. At the end of the grouped sale, FENAPAB charges a commission of 25 FCFA per kg of nuts sold.

- *For the mango*

At the producer level, mango sales take place in three different ways. First, some producers have a sales contract with their buyers. This contract is either written or oral. Sales based on a contract offer the best price to the producer compared to the other two sales methods. However, very few producers are able to negotiate contracts for the sale of their mango. In cases where producers do contract, mango losses are often very limited.

The second way is to sell the products on the field. In this case, the buyers come to buy the mangoes already picked by the producer, but in some cases it is the buyers themselves who take care of the harvest. The third method used by producers is to bring the mangoes to the roadside, either themselves or with the help of a family member. In both of these cases, where there is no contract, the selling price of the mango is often very low and generally imposed by the buyers. One of the reasons cited by buyers is the poor quality of the fruit. However, growers often feel that buyers exaggerate the importance of quality problems in order to lower prices or refuse payment for fruit sold on credit (van Melle and Buschmann, 2013). In some cases, mangoes are often left on the trees until they are fully ripe with the result that the mangoes are vulnerable to pests including fruit flies. According to van Melle and Buschmann (2013), if marketing efficiency were sufficiently attractive, the fruit would be harvested before ripening reached the stage of maturity, i.e., when mangoes are not yet attractive to insects.

The harvested mangoes are mainly sold to customers, with the final destination of the products being essentially the large cities of southern Benin. However, a small portion is exported to neighboring countries such as Niger and Nigeria. Nearly 48% of producers believe that the selling price of mangoes was not remunerative during the 2019-2020 season (Sodjinou, 2020). In other words, they were not satisfied with the price at which they sold mangoes.

The five mango varieties most in demand by traders are Eldon, Mangotine, Gouverneur, Kent and Brooks. Apart from these varieties which are very popular with consumers, the other varieties are La Camerounaise, Zil, Palmer, false governor, smith, IFAC3 and springfels.

Figure 2.10. Freshly harvested mangoes being packed (left) and mangoes already packed before transport (right)

Four main categories of mango marketing agents were identified: rural retailers, rural wholesalers, urban wholesalers and urban retailers. To these should be added transporters and processors. The majority of mango retailing, collection and wholesale activities in rural and urban areas are carried out by women in 96% of cases (Sodjinou, 2020). It is only at the level of urban wholesalers that a few men (11%) are involved in the mango marketing circuit.

The rural retailer buys from the producer and resells in rural areas, mainly along major interstate highways. They sell either to consumers, processors or urban retailers. Residing in the production areas, rural wholesalers buy from the producer in most cases or from collectors. They then transport the mangoes to the stores or to their homes in order to ship them to other communes (Malanville, Cotonou, Parakou, Porto-Novo) once the desired quantity has been reached. They generally resell the mangoes to urban wholesalers, urban retailers, processors and consumers.

Originating in Cotonou and other urban centers (Parakou, Porto-Novo, Malanville, etc.), urban wholesalers come to obtain supplies from producers in rural areas or from rural wholesalers. He generally resells the mangoes to urban retailers, processors and consumers.

The processing of mangoes into finished products is done much more by small processing units in Benin. The mango by-products produced include mango juice, dried mango, mango jam, mango concentrate, mango alcohol, mango cuts, mango puree, mango syrup and mango butter (made from mango core). These small processing units are found all over the country and sell most of their finished products on the local market. They produce much more mango juice in 93% of cases (Sodjinou, 2020). The jams produced are of more or less heterogeneous quality in terms of color, acidity, sugar content and taste, according to the assessment of the resource persons interviewed. This would be due to a poor mastery of the technical processing itineraries.

The finished products are marketed essentially on the local market, with a small quantity exported to the countries of the sub-region such as Niger, Burkina Faso, Togo, Nigeria and Mali. The "CENTRE d'ESPERANCE HOKAN DE LABEL BENIN" also exports small quantities of dried mangoes to Morocco. Mango butter is still produced in very small quantities. However, it is a product to be developed not only because it valorizes the by-products (mango pits) of mango processing but especially because there is an international market for this product. Mango butter is indeed used in the cosmetic industry because it moisturizes, nourishes, soothes and protects the skin and hair. It is also rich in antioxidants, and is therefore recommended for mature skin, but also in case of skin or hair dryness[1] .

[1] Source: https://www.doctissimo.fr/beaute/beaute-naturelle/autres-ingredients-naturels/beurre-de-mangue . Accessed 07/19/2020.

Table 2.14. Markets currently exploited by processing units, by type of finished product

Processing products	Markets
Mango juice	National (55%) Regional market (Burkina, Nigeria, Niger, Mali, Senegal): 45%.
Dried mango	National: 40%, EU (TILLOU brand): 60%.
Mango jam	National
Mango puree	Continental (Congo), National (main market)
Mango syrup	National (80%), Regional (Burkina and Niger) (20%)
Mango wine	National
Mango alcohol	National
Mango butter	Used in comedies, National
Preserved mango	National
Mango nectar (= juice + water + sugar)	National
Mango fruit	National, Regional (Burkina, Niger, Nigeria)

- *For shea butter*

After collecting the nuts in the forests and fields, the women proceed to processing, i.e., the production of shea kernels. The women processors sell the kernels obtained either through their groups/cooperatives, or to collectors, or to shea butter production units. The collectors are actors located between the collectors and the local processing units or professional buyers of the kernels. Buyers are professionals accredited in the sector, working for exporters or large processing units at the national level. They are very limited in number and generally operate by positioning the collectors in the production areas.

The almonds collected at the village and even commune level by the collectors are delivered to professional buyers gathered within GAPA. These professional buyers deliver the almonds to exporters such as Fludor, Knar Benin, 3F, Henhood and Afokantan-Benin. Exporters are very limited in number throughout the country. The company Knar-Benin is the leader in the export of shea kernels.

The processing of almonds into butter is done by individuals as well as by women's groups. The processing units are artisanal, semi-modern or modern. Even companies that are recognized as shea butter processors and exporters rely on women's groups and group unions (as in the case of Antemana and Karetic). The traditional process uses exclusively manual labor. The semi-mechanized system differs from the traditional system by the use of corn mills for grinding, replacing the stone millstone.

Shea butter traders can be grouped into three categories: collectors, wholesalers and retailers. To these should be added the traders and exporters who work primarily for the export of butter. Between processors/exporters and input suppliers, business links are almost systematically formalized. This is related to compliance with the standards required to bring shea butter to the international market. Some exporters are in an ordering relationship with certain groups of processors.

At the national level, according to Sodjinou and Kouton-Bognon (2019), the shea industry is essentially run by three (3) major operators, namely KNAR Benin, Fludor Benin and 3F. This sector functions globally in the form of large clusters, one of which is led by AKB with a network of 256 groups that lead small clusters at the local or communal level. A second large cluster is formed by FLUDOR, also with a network of shea kernel producing groups. The third cluster is that of organic shea butter, led by the WAKAPOU company, but the production from this cluster had not yet been commercialized at the time of the inventory conducted as part of this work. Other networks are led by large professional buyers. The company Fludor Benin is currently practically the only

industrialist active in the Benin shea sector (Faladé, 2018c). It has yet to reach its full capacity to process/transform shea butter estimated at 30,000 tons for export. The company's current processing level does not exceed 15,000 tons of shea kernels per year. Currently we note the arrival of a new operator Arica Agro (AAA) which intervenes in the export of shea butter since 2018 in Benin in partnership with AKB.

OCRI will strengthen the existing AKB cluster to facilitate the sale of shea on domestic and international markets. The AKB has set up a system for the grouped sale of shea kernels from the women collectors it accompanies, in Djougou, Copargo and Glazoué.

- AKB has built stores in some villages in the shea production areas including Djougou, Copargo and Glazoué (as far as the OCRI project sites are concerned), with the support of its partners (GiZ, ICCO cooperation, PARASEP, etc). In Djougou, the AKB has 3 stores, compared to one in Glazoué and one in Copargo.
- Each store brings together several groups of 10 to 15 women, generally located within a radius of around 40 km around the store, managed by a management committee (Seidou, 2018). The role of the committee is to proceed with the management of the joint sale using the management documents. The management committee is supported in the management of the grouped sale operation by a manager who is recruited in the village. This entire store system is accompanied by a Network Manager who is a technician deployed by AKB. It can cover two to three Management Committees sometimes spread over several municipalities. Overall, in Djougou, the AKB has 5 cooperatives mainly of women collectors: Kolokondé, Aféou (with a shea park created with the support of GiZ), Bariénou 1 and 2, Gnonri, Kakin gori (with a shea park created with the support of GiZ), and Monmongou). In Copargo, AKB has 3 cooperatives: Anadana, Copargo center, Babanzouré. The harvester cooperatives are equipped with tricycles, moisture meters, shellers, boots; with USADF support
- AKB negotiates with buyers. Thus, the products are collected by AKB services and accepted after a physical quality check. Products judged to be of poor quality are removed from the group sale circuit before grouping. The products collected are stored in stores identified for this purpose before being delivered to buyers/commercial partners (Fludor, KNAR, etc.) who have made a firm request (contract) requiring a very specific quality standard. The main buyer during the past season was KNAR (80% to 90% of the ABK network's shea kernel production).
- The grouped sale of shea kernels takes place around stores rented or built by the AKB. The credits taken by the cooperatives are deducted from the amount of the grouped sale.
- Upstream of the grouped sale, the groups benefit from training on the technical routes of production in order to produce almonds and butter of good quality, this in compliance with the requirements of the commercial partners of the AKB. PARACEP had supported the AKB cooperatives in their formalization.

Finally, it should be noted that various cooperatives have been set up either by the producers themselves or by their umbrella organizations, or by development projects/programs or by private companies interested in the products. The situation varies from one crop to another and from one commune to another, as shown in Table 3.18.

Table 2.15. Approximate number of cooperatives operating in the project communes according to crops

Municipalities	Corn	Cashew nuts	Mango	Shea
Djougou	45	92	3	28
Copargo	38	51	2	20
Glazoué	27	45	2	25
Zagnanado	28	0	1	0

Zogbodomey	23	0	0	0

2.4 Main buyers of the target crops in the project communes

Various actors are involved in the production or purchase of agricultural products in the Project communes. Indeed, the progressive organization of the commodity chains in Benin has led several private individuals and structures to become interested in purchasing agricultural products**. In the communes of Djougou and Copargo, the buyers identified include the Groupement d'Achat des Produits Agricoles (GAPA), CC Services, Kai-deïdeï, Benin-Cajou, traders (resellers, wholesalers), households, cooperatives and restaurants or processors. Nigerian, Togolese and Burkinabé buyers operate in almost all the 5 communes**. There are also supermarkets, especially for market garden products.

The buyers focused on cashew nuts are more much the factories (Afokantan, Tolaro) and the Indians. In addition, commissioned on July 30, 2016 in Cana in the Zou department in the south of the country, the cashew nut shelling plant of Fludor in Benin is operational and is interested in cashew nuts produced in Benin. According to Commodafrica (2020), its processing capacity was 4,000 tons per year to be increased in 2017 to 15,000 tons. In sum, Fludor, Afokantan and Tolaro are the main buyers of cashew nuts in the project's communes.

In the commune of Glazoué, these are the UCCPA, the Maïserie de Bohicon processing unit, SOBEBRA, traders (resellers, wholesalers), households, cooperatives, and restaurants or processors. In the other communes, maize buyers are GAPA members, individual traders (resellers, wholesalers), households, restaurants and processors.

For shea, the private actors operating in the project's communes are those who also drive the shea kernel market at the national level. The company Knar-Benin is the leader in the export of shea kernels. There are also companies such as Afokantan-Benin, Fludor-Benin, Henhood. The Africa Green Corporation is mainly involved in organic shea. Shea kernel applicants also include producers of shea butter and derivatives such as Antemanna, Zikora, Karethic, Société Concert-Benin, SOBEKA SARL de Kala-Karité.

Table 2.16. Private actors involved or interested in purchasing crops that will be produced with OCRI support

Pathways	Zagnanado and Zogbodomey	Glazoué	Djougou and Copargo
Corn	GBEMONTIN Center of the sisters, SOCIA-Benin (Bohicon), Véto-Service, SODECO, PAM, Provenderie, Processing unit, Local merchants, SOBEBRA, Consumer	SOCIA-Benin (Bohicon), Véto-Service, Processing unit, Local merchants, Consumer	GAPA, SOCIA-Benin (Bohicon), Véto-Service, Merchant, Consumer
Cashew nuts	Fluidor , KOROCHO-Sarl, BPS Sarl, Traders, processors, civil servants	Benin-Cajou, CC Services and Kaid-deï-deï, Afokantan Benin Cashew, FLUDOR-Benin, Tolaro Global S.A.S., Africa Negoce Industries, ZANCLAN	GAPA, Benin-Cashew, CC Services and Kaid-deï-deï, Afokantan Benin Cashew, FLUDOR-Benin, Tolaro Global S.A.S., Africa Negoce Industries
Shea	Collectors, Traders	FLUDOR-Benin, Knar-Benin, Afokantan-Benin, Henhood, GAPA	Africa Green Corporation, FLUDOR-Benin, Knar-Benin, Afokantan-Benin, Henhood, GAPA
Mangoes	Processing units, Private merchants, Blues Skies	Processing units, Private traders	Processing units, Private traders
Vegetable crops	Restaurants, Supermarkets Shopkeepers	Retailers, Consumers	Retailers, Consumers

In order to mitigate the market malfunctions by mitigating the various risks, **the establishment of partnerships between producers and these private companies appeared necessary ; OCRI (Output 2.2) will support these**

through the regular organisation of municipal forums that will link farmers and cooepratives with potential buyers in the key VCs. Producers will need to ensure that they produce crops with value chains that meet the demand of the private sector – a process to be supported through OCRI's Farmer Business Schools (see output 2.1). The organization of producers into cooperatives and the creation of a space for dialogue between producers and buyers, will be key to ensure the contractualization of sales.

2.5 Process of contact, communication and payment between buyers and sellers of targeted products

2.5.1 Strategies for connecting producers with buyers

There are various strategies for connecting producers with buyers. First, there is the traditional approach in which producers seek buyers after harvesting. Some producers seek out the market through other producers. Other producers keep in touch with former buyers regardless of the product. This general situation is especially true for maize and shortage.

Some buyers make field trips to buy at the edge of the field or in the producers' homes or villages. Some producers said that they use advertising strategies such as WhatsApp forums to find actors. This practice was noted in the communes of Zogbodomey and Zagnanado.

In the case of cashew nuts and shea nuts (see Table 2.17), some producers who are members of cooperatives/groups are put in contact with buyers through their umbrella organizations. This strategy is mainly used in the case of clusters, group sales, or stores built by the producers' umbrella organizations with the support of technical and financial partners.

Table 2.17 Strategies for connecting producers with buyers

	Copargo	Djougou	Glazoué	Zogbodomey	Zagnanado
Corn	Keep in touch with the buyers Research information from peer producers	Keep in touch with the buyers Research information from peer producers	Positioning of the product at the point of sale in the market, Search for buyers through peer producers	Positioning of the product at the point of sale of the market	Keep in touch with the buyers Research information from peer producers Information in the production area by the buyers
Mangoes	Keep in touch with the buyers Research information from peer producers	Keep in touch with the buyers Research information from peer producers	Maintained contact with buyers	Keep in touch with the buyers Research information from peer producers Information in the production area by the buyers	Keep in touch with the buyers Research information from peer producers Information in the production area by the buyers
Cashew nuts	Sales contract with the factories through FENAPAB Keep in touch with the buyers Research information from peer producers	Sales contract with the factories through FENAPAB Keep in touch with the buyers Research information from peer producers	Market research through the cooperative Market research through peer producers Maintained contact with previous buyers	Market research through the cooperative Market research through peer producers Information in the production area by the buyers	Keep in touch with the buyers Research information from peer producers Information in the production area by the buyers
Shea nut	Sales contract with AKB Keep in touch with the buyers Research information from peer producers	Sales contract with AKB Keep in touch with the buyers Research information from peer producers	Local collectors are indigenous and in constant contact with the pickers	-	Keep in touch with the buyers Research information from peer producers Information in the production area by the buyers
Vegetable crops	Keep in touch with the buyers Research information from peer producers	Keep in touch with the buyers Research information from peer producers	Advertising the product to restaurants and potential consumers Maintained contact with potential buyers	Positioning of the product in WhatsApp forums, Advertising through Radio Maintained contact with buyers	Product positioning in WhatsApp forums

	Descending buyers in the gardens	Descending buyers in the gardens	Market positioning	Buyers' visit to the production sites	

Source: Field data, 2022

- AKB Experience

AKB has set up a system for the group sale of shea kernels by the women collectors it accompanies.

- AKB has built warehouses in some villages in the shea production zones, including Djougou, Copargo, and Glazoué (as far as the OCRI project sites are concerned), with the support of its partners (GiZ, ICCO cooperation, PARASEP). In Djougou, AKB has three stores, compared to one in Glazoué and one in Copargo.
- Each store groups together several clusters of 10 to 15 women usually located within a radius of about 40 km around the store managed by a management committee (Seidou, 2018). The committee's role is to manage the group sales using management documents. The management committee is supported in the management of the group sale operation by a manager who is recruited from the village. The whole store system is supported by a Network Manager who is a technician deployed by AKB. He or she can cover two to three Management Committees, sometimes spread over several communes. Overall, in Djougou, AKB has 5 cooperatives, essentially of women collectors: Kolokondé, Aféou (with a shea park created with the support of GiZ), Bariénou 1 and 2, Gnonri, Kakin gori (with a shea park created with the support of GiZ), and Monmongou). In Copargo, AKB has three cooperatives: Anadana, Copargo Centre, and Babanzouré. The cooperatives are equipped with tricycles, moisture meters, hullers and boots; with the support of USADF
- AKB facilitates loans from MFIs on behalf of women's groups. However, last season, the cooperatives were put in direct contact with the MFIs. In principle, an account opened at a local MFI should receive the almond collection funds. The partner MFIs are Alidé, RENACA and CLCAM. Interest rates vary between 18% and 24%. However, this season, the cooperatives plan to take loans from the FNDA, whose rate is 12%, through the Alidé MFI.
- AKB negotiates with buyers. Thus, the products are collected by the AKB services and accepted after a physical quality check. Products judged to be of poor quality are removed from the group sale circuit before being grouped together. The collected products are stored in the warehouses identified for this purpose before being delivered to the buyers/trading partners (such as Fludor, KNAR) who have made a firm request (contract) by requiring a specific quality standard. The main buyer in the past season was KNAR (80% to 90% of the ABK network's shea kernel production).
- The group sale of shea kernels takes place around stores rented or built by AKB. The credits taken by the cooperatives are deducted from the amount of the group sale.
- Upstream of the group sales, the groups receive training on technical production itineraries in order to produce good quality almonds and butter, in compliance with the requirements of AKB's commercial partners. The PARACEP had accompanied the cooperatives of AKB in their formalization.

The main problems encountered are related to the acidity of the kernels (ideally around 2%), the moisture content (so a moisture meter is needed for control), the presence of foreign bodies, and the distance from the shea nut collection areas. The main solution is the training of women collectors (or their cooperative), and their equipment with adequate means of collecting the nuts.

- Case of FENAPAB

The FENAPAB system works in much the same way as the AKB system.

- Facilitating the marketing of products by signing contracts with potential buyers. Cashew nut sales are often made through group sales organized by the FENAPAB network. At the end of the group sale, FENAPAB takes a commission of 25 FCFA per kg of nuts sold.
- Facilitation also of access to credit. Two types of credit: maintenance credit and pre-financing of the harvest.
- Training of producers in cooperative life, respect of the texts and quality standards.
- Credits taken by producers/cooperatives are deducted from the group sale amount.

➢ System of sale of market garden products in the commune of Djougou

In the commune of Djougou, the market garden products around which marketing is more or less organized are chilies and cabbage. For chili, the marketing system is based on group sales. This may involve chili produced by all the producers of a market garden site or the entire stock of chili from several market garden sites, depending on the demand expressed by the wholesalers. The wholesalers to whom the chili stock is sold come especially from Togo. This is often a verbal contract between the market gardening cooperatives and the wholesalers from Togo.

As for cabbage, the producers themselves organize themselves to transport the cabbage to Cotonou. A collection, transport, storage and sales committee is set up among the producers. This committee is responsible for collecting the product and loading it into transport vehicles. The products of several market gardeners from the same site or from several sites are grouped together and sent to Cotonou under the delegation of the committee. Each farmer has an idea of the number of bags (often recorded in a notebook) that his or her stock of cabbage contains. The distribution of the money from the sale is based on this and on the price obtained on the market. In addition, the expenses are also shared (handling, transport and other).

Market gardeners have access to credit through their cooperative. These are loans from CLCAM, BETHESDA and SIA-N'SON.

We also note that they have informal contracts with input suppliers, mainly with Benin-Semence and recently with SODECO-AGRI.

In short, in order to guarantee not only access to inputs and credit for producers, but also the sale of their products, it is necessary to enhance the system already put in place by AKB and FENAPAT for shea and cashew nuts. Consequently, the creation of cooperatives for the project's producers, the formalization of these cooperatives and their integration into the existing network could make the project's achievements sustainable.

2.5.2 Communication strategies between the producers and the buyers

Current communication strategies between producers and buyers include meeting at the physical market, exchanging information by word of mouth or via telephone calls, liaising through formal or informal contracts, and sometimes commissioned programs. **There is currently no space – e.g. municipal forums – in the target communes where farmers and buyers can meet, discuss market demands and supply availability, and to facilitate the conclusion of sale contracts.**

Table 2.18 Communication strategies between producers and buyers

	Copargo	Djougou	Glazoué	Zogbodomey	Zagnanado
Corn	-Prospecting visit	-Prospecting visit			

Mangoes Cashew nuts Shea nut Vegetable crops	Word-of-mouth information exchange -Information exchange via telephone	Word-of-mouth information exchange -Information exchange via telephone Liaison through formalized and non-formalized contracts	-Meeting on the physical market Word-of-mouth information exchange -Information exchange via telephone	-Meeting on the physical market Word-of-mouth information exchange -Information exchange via telephone -Control programming	-Meeting on the physical market Word-of-mouth information exchange -Information exchange via telephone -Control programming

2.5.3 Terms of payment at the end of the sale of the products

In the face of weak business linkages, after-sales producers are mostly paid in cash. In the study communities, most sales are made individually, i.e. from producer to buyer. Nevertheless, we note the development of new sales methods such as group sales, which are most often the work of producers' cooperatives. This practice is more common in the sale of cashew nuts, shea nuts and market garden crops. The most common method of payment is cash sales. However, for certain products sold in groups, payment by check is used, especially for cashew nuts.

For cashew nuts, the system put in place allows producers (members of cooperatives in the Atacora Donga region) to place their harvested nuts in the cooperative stores, in exchange for an advance of 400 CFA per kilogram of nuts, hoping for a discount after the sale (this is the pre-collection). As soon as the campaign begins, the producer's nuts are sold at a price higher than the advance given, after which some charges are deducted and a discount is given to him. Another pillar is the facilitating role of the regional union which puts in contact the walnut buyers and the communal unions.

Table 2.19 After-sales payment terms

Crops	**Copargo**	**Djougou**	**Glazoué**	**Zogbodomey**	**Zagnanado**
Corn	Cash payment	Cash payment	Cash payment	Cash payment	Cash payment
Mangoes	Cash payment	Cash payment	Cash payment	Cash payment	Cash payment
Cashew nuts	Cash and bank payment	Payment by bank account	Cash payment and payment by check	Cash payment	Cash payment
Shea nut	Cash and bank payment	Cash payment in installments (75% and 25%)	Cash payment	-	Cash payment
Vegetable crops	Cash payment	Cash payment	Cash payment	Cash payment	Payment on account

2.5.4 Reasons for price movement between buyers

According to the interviews conducted, the price of products in all the study communes varies according to the buyers (Table 2.20). Several parameters explain this state of affairs. First, the quality of the product and its cleanliness play a role in the bargaining process. Some affect the price, given the cost of transport. Nevertheless, it should be noted that some products, such as cashew nuts and shea nuts, are not sometimes subject to this situation, since the price is set by the state.

Table 2.20. Reasons for product price movement between buyers

Products	Copargo	Djougou	Glazoué	Zogbodomey	Zagnanado
Corn	Quality requirement Transportation cost requirement	Quality requirement Transportation cost requirement	Grain cleanliness and quality, volume purchased	Depending on whether the producer transports to the market or the buyers come to the producer	Distance, cleanliness, quality
Mangoes	Quality requirement Transportation cost requirement	Group Sales	Cleanliness and quality of fruit, volume purchased	Cleanliness, Quality, Provenance	Distance, cleanliness, quality
Cashew nuts	Quality requirement Transportation cost requirement	The price is known and according to the KOR of the product	The price is set by the state	Quantity, Quality	Distance, cleanliness, quality
Shea nut	Quality requirement Transportation cost requirement	The price is set by the state	Cleanliness and quality of nuts, volume purchased	-	Distance, cleanliness, quality
Vegetable crops	Quality requirement Transportation cost requirement	Quality requirement Transportation cost requirement	Cleanliness and quality of fruits/vegetables, volume purchased	Period, Quality, Quantity Provenance	Distance, cleanliness, quality

Source: Field data, 2022

2.6 Government intervention in value chains

2.6.1 Direct government and project/program interventions

In recent years, the State has gradually disengaged from production to concentrate essentially on its regalian role in the various CVAs. However, the State retains a margin of intervention through its public structures. The role of controlling agricultural products, both domestically and for export and import, is assigned to the Direction Départementale de l'Elevage et de la Pêche (DDAEP). The Agences Territoriales pour le Développement Agricoles (ATDA) are mainly involved in providing support and advice to producers through their Cellules Communales, but also in centralizing data on interventions taking place in their areas of competence.

Government interventions relate to :

- Definition of the agricultural strategy, with emphasis on coherence with national policy in areas impacted by agricultural development, such as food and nutritional security, food safety, economic growth, poverty reduction and export promotion;
- programming, monitoring and evaluation of the implementation of the agricultural strategy, and the execution of accompanying measures;
- the improvement of the legislative and regulatory framework of the sector, in particular by the implementation of tax and customs incentives;
- the collection and dissemination of basic data on the agricultural sector;
- strengthening the dialogue between the various actors and partners at all levels, as well as supporting capacity building; and
- definition, programming and implementation of environmental and social protection measures, including the strengthening of compliance control of chemical inputs (fertilizers, insecticides, veterinary products) and seeds, facilitation and monitoring of the implementation of the land code, etc.

Shared functions include:

- agricultural research, extension and advisory support;
- improving the availability and quality of basic services provided to agricultural producers and entrepreneurs, including the three essential services of water, energy and telecommunications;
- institutional support to the PNOPPA for the organization of agricultural sectors, by facilitating their structuring and the creation of inter-professions by the actors themselves;
- prospecting and identification of business opportunities, provision of the corresponding commercial information;
- facilitating access to financing for farmers. This involves supporting operators in the preparation of their credit applications to banks and assisting them in analyzing the risks inherent in agriculture; and
- strengthening and setting up collective market and road infrastructures (rural tracks) to facilitate access to markets for agricultural producers.

The State also intervenes through projects and programs. Specifically for **maize** :

- The Direction of Plant Production (DPV) is in charge of seed control and seed certification;
- The Institut National des Recherches Agricoles du Bénin (INRAB) is not only involved in the production of basic seeds, particularly for maize. For maize in particular, INRAB, through the National Maize Specialization Center (CNS-Maize), with funding from the West African Agricultural Productivity Program (WAAPP) through the Framework Program for Support to Agricultural Diversification (ProCAD), is involved in the production of improved seeds and in the development of processing technologies,
- Other projects working on maize in the project area including PAIA-VO, PAPVIRE-ABC, PADAM, PADA-FA.

For **cashew nuts**, we find :

- the Direction de la Production Végétale (DPV) which is in charge of the control of the seedlings, and proceeds to the certification of the cashew and mango seedlings;
- The National Institute for Agricultural Research of Benin (INRAB), through its Centre for Agricultural Research (CRA-Centre), is involved in supporting nurserymen in the production of certified cashew seedlings.

In terms of **mango**, several interventions have taken place or are taking place in the mango sector in Benin. These interventions range from the production of seedlings to processing through the production of mangoes. Firstly, in order to revive the promotion of the mango sector in Benin, especially the export CVA, the Beninese State encourages the production of quality grafted plants. Thus, the existing producers of grafted seedlings have been identified; which allowed to notice that few nurseries were specialized in fruit trees and mango trees in particular. Moreover, the origin of the plant material, in particular of the grafts, is poorly known and its sanitary quality is ignored. Labeling is very generally absent from the transplanting and grafting blocks, which complicates the identification of the material because the leaves of mango trees, the only organs visible in nurseries, are sometimes very similar (Tossou Lokossou et *al.* , 2019).

To correct this situation, ATDA5, in collaboration with other actors (INRAB and DPV), proceeded to the selection of new nurserymen. The professional nurserymen selected for the production of mango grafted plants are 20 in number, including eight (8) in PDA5 and four (4) in each of PDAs 2, 3 and 4. In addition, four pilot nurserymen of grafted mango plants were selected in the communes of Abomey, Covè, Zogbodomey and Lalo.

Among the actions implemented in the mango sector in the last decade, we can mention :

- the installation of a new mango processing plant in Natitingou in the early 2010s. The choice of location for this new plant was guided by the existence of mango plantations that had been established in the 1990s during the construction of the old mango pulp/juice factory by the Beninese government. Unfortunately, contrary to the old factory which had functioned for a few years and then closed because of bad management, the new factory has never even functioned since its construction;
- the project to support the Regional Plan for Fruit Fly Management and Control in West Africa (PLMF). This project, implemented between 2014 and 2019 and carried out in 10 West African countries, worked mainly on fruit flies. The PLMF has contributed to a decline in fruit fly infestation rates. Orchard owners who say they are satisfied with the trials that have achieved these results, however, deplore the emergence of Bacteria Black Spot (BBS) that can lead to large losses in the orchards (nearly 70%) and the negative influence of neighboring orchards that are not treated (Yanclo, 2018) ;
- the import of 4,000 mango plants of the kent variety from Sikasso in Mali. Indeed, in order to diversify the export channels in Benin, the APRM proceeded in August 2019, to the import of 4,000 mango plants of kent variety for planting in pure culture of 40 hectares at a rate of two hectares per producer beneficiary;
- Actions carried out or underway at the ATDA5 level. These initiatives include (i) the acquisition of equipment (tank, motor pump, cans) from pilot producers to ensure the supply of water to grafted mango seedlings planted in 2019 during the long dry season; (ii) the acquisition of 12,000 grafted Kent mango seedlings for producers in Pole 5 for the establishment of 60 ha of plantations; (iii) the local production of 200,000 Kent mango grafted seedlings for the installation of 800 ha of plantations in poles 2, 3, 4 and 5; (iv) the training of nurserymen for the production of Kent mango grafted seedlings; (v) the elaboration of a mango plantation management sheet; (vi) the elaboration of the Technical Regulations and Annex (RTA) for mango with a view to its validation, in particular in order to guarantee the quality of mango grafted plants; (vii) the acquisition and installation of kits (products and materials) for producers trained in mango fruit fly control in poles 2, 3, 4 and 5; and (viii) the organization of a session with the DPV involving INRAB and the DDAEP for the implementation of a pest and disease control system for mango plants;
- The Programme Cadre d'Appui à la Diversification (ProCAD) granted this year an amount of 50 million CFA francs to ATDA5 to support the production of grafted mango seedlings of Kent and Amélie/Gouverneur varieties;
- the organization of a mission to Côte d'Ivoire and Mali. The general objective of this mission was to contribute to the development of a national policy for the promotion of the mango sector in Benin by drawing on the most successful experiences in the development of the mango sector in two mango exporting countries: Côte d'Ivoire and Mali (Tossou Lokossou et *al.* , 2019)
- mango fruit drying trials by the Agricultural and Food Technology Program (PTAA of INRAB) within the framework of the Agricultural Sector Development Support Program (PADSA);
- The Swiss Cooperation in Benin has integrated the mango sector into the third phase of its Rural Development Sector Support Program (PASDeR), which is scheduled to start in the second half of 2020.

There is considerable enthusiasm in the public and private sectors and among the TFPs for the development of the mango sector, particularly for export. ATDA5 and even the Government's actions are directed primarily at promoting the Kent variety, particularly with the aim of developing the export value chain to European countries. This is due to the fact that, despite a few national and sub-regional projects, Benin is absent from the

international mango market because of the lack of quality of the mango and the inorganization of the sector (Tossou Lokossou et *al.*, 2019).

Finally, with respect to shea, recent interventions and ongoing actions in the shea sector can be grouped into two broad categories, namely those specifically targeting shea and those relating to several sectors including shea. Among the recent interventions and ongoing actions specifically targeting shea, the following can be cited

- ICCO Cooperation one of the important supporters of the shea sector in Benin through the project "Lobbying and advocacy for the inclusive development of the shea sector in Benin". Indeed, ICCO Cooperation has been supporting AKB since 2016 for the development of a positioning document for the shea sector in Benin. This tool will serve as an advocacy tool for the actors in their struggle for the revalorization of the shea industry as a priority sector by the Government;
- ProCGRN and then ProAgri, which have been supporting the shea industry since the 2000s. In the last five years, their interventions have been more concrete through the AKB, notably in training, organization, equipment, trade of shea kernels, shea butter and shea products that are economically viable, environmentally and socially responsible. The AKB actors also benefited from training in ValueLink and contract farming. According to Sodjinou and Dakin (2017), the ValueLink has helped to emphasize, the internal responsibility of each actor in his link and also the co-responsibility in relation to the promotion of the value chains or the entire value chain concerned. In addition, ProAgri is implementing an integrated and sustainable management approach for shea parks through local conventions. Under the authority of the town halls, local conventions aim to protect shea parks and promote natural regeneration. This unique experience began in 2016 in the department of Borgou and is currently underway in the departments of Atacora, Donga and Collines;
- FLUDOR, which for two years has been developing training (on group work) and subsidizing certain groups with materials in Djougou and Bassila. These groups bring together nearly 3,000 women. FLUDOR's support has had positive effects because the trained women are able to supply almonds with an acidity level of 3%, unlike other professional buyers who have acidity levels of up to 7%;
- The USDAF of the United States, which has contributed in a very large measure to the construction of commercial infrastructures, including the stores which today constitute the very basis of the AKB system, the importance of which is no longer to be demonstrated;
- The Association Karité Benin (AKB) is a national umbrella organization of professional agricultural organizations (OPA) of shea in Benin. With the help of various development partners (PARASEP, ProAgri, REBACA, etc.), AKB has been involved in training and advising on good practices for collecting and processing shea nuts and turning the kernels into butter for over five years. It is also involved in facilitating access to credit and organizing the group sale of shea kernels (Seidou, 2018). The AKB also intervenes in the marketing of shea butter, organizational strengthening of actors at the grassroots level and infrastructure and equipment.

Another project that also focuses on the shea industry is the Projet d'Appui au Développement des Acteurs du Secteur Privé (PARASEP). Funded by the European Union and the French Development Agency (AFD) with the Ministry of Planning and Development as the project manager, this project intends to place particular emphasis on the empowerment of women for the sustainability of the shea industry in Benin through two approaches. The first is to help structure the sector. This has allowed the actors of the shea industry to form an

interprofession. The second approach is to strengthen the competitiveness of the products, the positive differentiation through labeling.

2.6.2 Main national regulations around value chains

As noted above, the role of controlling agricultural products, both domestically and for export and import, is assigned to the Direction Départementale de l'Elevage et de la Pêche (DDAEP). Some national regulations around value chains

- For the shea tree, according to the provisions of Law 93-009 of July 2, 1993 on the forest regime in the Republic of Benin, and its implementing decree Decree No. 96-271 of July 2, 1996, the shea tree is a protected species. It is also because of its importance that since 1997 the FAO has classified it among the food species to be conserved.
- Law No. 93-007 of March 25, 1993 made importation free. Article 30 specifies that the importation of goods from all origins or sources with or without the transfer of currency is free in Benin.
- the creation by decree n°2006-301 of June 27, 2006 of the National Microfinance Fund (FNM) which aims to improve the living conditions of the population by giving everyone the means to take care of themselves;
- DECREE No. 82-435 of December 30, 1982, on the prohibition of bush fires and plantation fires in the People's Republic of Benin. Its article 1 clearly states that bush fires and plantation fires are prohibited throughout the territory of the People's Republic of Benin;
- DECREE N° 2018-174 OF MAY 16, 2018 on the creation, attributions, organization and functioning of the national committee of plant seeds in the Republic of Benin;
- Regulation C/REG.4/05/2008 on the harmonization of rules governing quality control, certification and marketing of seeds in the ECOWAS region adopted on May 18, 2008 is the basic text of seed regulation in Benin

2.7 Summary of difficulties encountered by producers and buyers, and support needed

2.7.1 Strengths and obstacles encountered by producers

The selected VCs offer strength, opportunities, threats and weaknesses as detailed in the table 25.

Table 2.2112 VCs analysis

Strengths	Weaknesses	Opportunities	Threats
Cashew nuts			
- Favourable conditions especially in Upper Oueme and the transition area (Glazoue) - Prioritised for export by the Government of Benin. - Can be produced in orchards or within agricultural fields (agroforestry) to contribute to restoring soil fertility. - Combines well with locally-appreciated crops like maize, yam, cassava and sorghum. - Increasing global demand for cashew nuts. - There are regional cooperatives in Upper Oueme, which collect and sell cashews from municipal and village-based cooperatives - Improved plants are available (limited quantity)	- Limited organisation of farmers at local level - Limited price negotiation capacity - Limited productivity of cashew trees - Lack of processing equipment and technical capacity amongst most communities to add value to cashew nuts. - Lack of skills amongst local communities for developing businesses based on cashews. - Lack of storage facilities for nuts. - Lack of relationships with trading companies, currently raw cashews are sold to Indian traders).	- Capacity amongst local communities for establishing cashew nut cooperatives. - Opportunity to cultivate in forested areas along Oueme River (to reforest) or on private land (agroforestry; intercropping; private/community plantations). - Potential to increase yield - Potential to improve local value through processing and storage. - Potential for international export through national companies. - Inter-cropping with cashew trees, maize, yam and sorghum has high market value, up to CFA 395,370/ha[2].	- Recurring fires in orchards - Influx of foreign capital for trading in raw nuts to the detriment of local processors[3] - increased flower and fruit abortion due to reduced rain and increseas temperature (Bello et al., 2016)[4] - reduced productivity and quality of fruits (Ballogoun et al., 2016)[5]
Shea			
- Prioritized for export by the Government of Benin. - Shea trees occur throughout the central and northern parts of the country, either within the forests or in cultivated fields. - Nuts can be processed as oil or butter; used in direct consumption or sold on local, regional and international markets. - Adapted to arid, less fertile soils - Natural regeneration - Tree lasts for 200 yrs	- Low price negotiating capacity among producers - Limited knowledge of production techniques (shea is often collected from wild trees) - Lack of processing equipment and technical capacity amongst most communities to add value to shea. - Lack of skills amongst local communities for developing businesses based on shea nuts. - Lack of storage facilities for nuts and processed products.	- Resilient to climate change - Potential for strengthening capacity of local cooperatives. - Opportunity to produce shea nuts in forested areas or on agricultural land (intercropping). - Potential to improve add value locally through processing. - Potential for international export through national companies (to be identified by CCIB). - High potential for women's involvement in shea cooperatives as the processing of shea nuts into oil and butter is typically a women's task.	- Increasing aridity in the north of Benin as a result of climate change is predicted to decrease the recruitment of seedlings, which will affect the natural regeneration of

[2] Crinot et al. (2015)

[3] Analysis of the Benin Cashew Sector Value Chain. African Cashew Initiative, 2010. Available at: http://www.africancashewinitiative.org/files/files/downloads/aci_benin_gb_150.pdf

[4] Bello, O. D., P. B. I. Akponikpè, E. L. Ahoton, A. Saidou, A. V. Ezin, G. E. Kpadonou, I. Balogoun, and N. Aho. "Trend Analysis Of Climate Change And Its Impacts On Cashew Nut Production (Anacardiumoccidentalel.) In Benin." Octa Journal of Environmental Research 4, no. 3 (2016).

[5] Balogoun, I., L. E. Ahoton, A. Saïdou, D. O. Bello, V. Ezin, G. L. Amadji, B. C. Ahohuendo, S. Babatounde, D. C. Chougourou, and A. Ahanchede. "Effect of climatic factors on cashew (Anacardium occidentale L.) productivity in Benin (West Africa)." Journal of Earth Science & Climatic Change 7, no. 1 (2016).

Strengths	Weaknesses	Opportunities	Threats
- Local know-how for valorizing shea products among women	- Lack of relationships with relevant traders (shea butter can be lost through spoilage if not sold on time).		shea tree populations[6]. Planting shea trees to maintain the production of shea nuts will thus become increasingly important. - Shea trees are often cut down as part of land clearing process for agriculture (because its use if agroforestry system is not well known) - Sensitive to bush fire
Mango			
- Market demand steadily increases especially for international market - It can be produced in orchards or in agroforestry system, associated with current crops like maize, sorghum or cassava. - Embedding mango plantations in the cultural habits of the population (as savings for retirement, and as a tool for securing land holdings) - Existence of well trained and supervised nurserymen - Suitability of the soil for mango production	- Farmers are not well-organised and sale is mostly done along the road where prices are subjected to buyers/ poor negotiating capacity - Production techniques are not well-controlled by the producers, therefore productivity is low, and the quality of the fruit is lacking - Poor accessibility to good quality plants - Lack of the practice of irrigation in the plantations - Insufficient or lack of advice and training on good practices in setting up and managing orchards, and on monitoring and maintaining mango orchards - Lack of skills at the level of actors (producers, supervisory staff) in harvesting techniques - Almost non-existence of phytosanitary products approved in Benin on mango, - Lack of control of pests or diseases (fruit flies, termites, anthracnose and physiological accidents) and emergence of Bacteria Black	- Mango collection and sale is a women-oriented activity - Given the increasing demand for mangoes on local to international markets, profits could be improved if production and processing techniques are better controlled - Availability of cultivable land and existence of possibility of extension of plantations - Agro-climatic conditions favorable to mango production - Socio-economic importance of mango as a source of income and food security - Existence of proven methods of controlling fruit flies - Current government policy favorable to the promotion of sectors - Enthusiasm of the State and certain TFPs to support the development of the mango sector - Existence of a National Development Strategy for Fruit Tree Cultivation in Benin	- Mangoes are sensitive to pest attacks which tend to increase with climate change - Difficulties in accessing land and land tenure insecurity - Influence of climatic hazards - Destruction of plantations by oxen; - Destruction of plantations for other crops (cotton, cashew nut) or for the manufacture of fuelwood; - Lack of adequate funding for the acquisition of packaging, storage and processing equipment.

[6] Glèlè Kakaï, R., Akpona, T., Assogbadjo, A.E., Gaoué, O.G., Chakeredza, S., Gnanglè, P.C., Mensah, G.A. and Sinsin, B., 2011. Ecological adaptation of the shea butter tree (*Vitellaria paradoxa* CF Gaertn.) along climatic gradient in Bénin, West Africa. *African Journal of Ecology*, *49*(4), pp.440-449.

Strengths	Weaknesses	Opportunities	Threats
	Spot (BBS) which can lead to large losses in orchards; - Low knowledge and low compliance with quality standards; - No mastery of the different pruning techniques for the rehabilitation of old orchards; - Lack of windbreaks around the mango plantations; - Poor knowledge of alternatives to chemical control for organic mango production; - Lack of adequate packaging, transport and marketing infrastructure and equipment (absence of packaging stations and quality control service); - High concentration of production over a short period of the year		
Maize			
- Most widely planted crop in Benin. - Many suitable soil - Production techniques well-known - Strong local, regional (Nigeria), and international demand for food crop and livestock. - Beneficiate from governmental support for production techniques and access to relevant seeds (from INRAB, DDAEP and ATDA/FNDA). - Staple food and used extensively as animal feed[7]. - Various improved varieties have been released in Benin[8] and these are adopted readily by farmers[9].	- Basic production techniques using hoe for soil preparation - Productivity is low at 700kg/ ha - Rural communities often lack proper facilities to store harvested maize and can therefore not wait until prices improve to sell maize. - Despite some local cooperatives, limited organisation of the value chains: individual producers sell directly to wholesalers, who are then selling on local and regional markets - No negotiating power for price among the producers - Lack of processing equipment	- Maize yield can be increased further in Benin despite climate change[10]. - Maize production is already part of rotation culture, which is climate-resilient - Short-cycle seed varieties are available in Benin (from INRAB) and in the neighbour countries, where farmers are already buying these seeds (Burkina-Faso). - Domestic, regional and international demands is increasing - Funding available from FNDA	- New pests such as the fall army worm[11]. - Access to markets limited because of degradation of roads from extreme rainfalls - Production affected by shift in rainfall patterns

[7] Elbehri, A., J. Kaminski, S. Koroma, M. Iafrate, and M. Benali (2013), West Africa food systems: An overview of trends and indicators of demand, supply, and competitiveness of staple food value chains, In: Rebuilding West Africa's Food Potential, A. Elbehri (ed.), FAO/IFAD.
[8] From 1970 to 2010, 36 maize varieties were released in Benin. Walker, T.S. and Alwang, J. eds., 2015. *Crop improvement, adoption and impact of improved varieties in food crops in sub-Saharan Africa*. CABI.
[9] Mahoussi, F.E., Adegbola, P.Y., Zannou, A., Hounnou, E.F. and Biaou, G., 2017. Adoption assessment of improved maize seed by farmers in Benin Republic. *Journal of Agricultural and Crop Research*, *5*: 32-41.
[10] Jalloh, Abdulai; Nelson, Gerald C.; Thomas, Timothy S.; Zougmoré, Robert and Roy-Macauley, Harold. 2013. West African agriculture and climate change: A comprehensive analysis. IFPRI Research Monograph. Washington, D.C. International Food Policy Research Institute http://dx.doi.org/10.2499/9780896292048
[11] FAO, 2017. Briefing Note on FAO Actions on Fall Armyworm in Africa. Available at: http://www.fao.org/3/a-bs183e.pdf

2.7.2 Difficulties encountered by buyers to access the best products and reach markets

Buyers experience certain difficulties in obtaining **quality products.** The various difficulties encountered are summarized in Table 15 according to the crops studied.

Table 2.22 Difficulties encountered by traders in obtaining quality products

Crops	Difficulties encountered
Corn	- Lack of storage structure to preserve crops and protect against attacks and climate hazards - Inexistence of preservatives - High cost of hangars in existing markets
Cashew nuts	- Poor quality of fruit sent by producers
Mango	- Low use of pest/fruit fly control - Inadequate storage conditions for mango which is a rapidly perishable fruit - Concentration of the production on a short period of the year (because of a lack of storage capacity) - Lack of support for good orchard management practices - Growers discouraged by fruit fly damage - Lack of infrastructure and equipment for packaging, transport and marketing - Poor knowledge of technical itineraries and good harvesting practices for mangoes - Low awareness of and compliance with quality standards
Shea	- The quality of the almonds produced is not always good (acidity problems in particular), which reduces the quality of the butter - Mechanical processing equipment is very expensive and does not always provide quality butter. - The mechanical equipment for processing shea butter is not made of stainless steel, which leads to the presence of metal residues in the product. - Seasonality of shea kernel availability. - Difficulty in acquiring packaging for the product - Low mastery of storage and preservation technologies - Insufficient storage facilities,

2.7.3 Conclusions : OCRI support for farmers' enhanced market access

Overall, the proposed OCRI project will target the identified weaknesses and threats in the selected VCs through the following interventions :

- Provision of processing, packaging, stocking equipment for key VCs under Activity 2.1.1;
- overall improved access to micro-credit for farmers to aquire such equipment through training in FBS provided under 2.1.1 and 2.1.2 (see committment from MFIs)
- Support to VC organisation and cooperatives under Activity 2.1.1
- Inputs will be provided to farmers to support CRA under Activities 1.2.3 and 1.2.4 - including access to adapted seeds/ crop varieties
- Connection between producers and buyers will be strenghtened udner Activity 2.2.2 and farmers' capacity to negociate prices enhanced through support to cooepratives under 2.1.1
- Training on CRA in FFS under output 1.2 will increase overall productivity as well as crop/ fruit quality to meet demand standards
- Access to financial services will be enhanced udner Output 2.1 (see signed committment letter from MFIs) as well as Output 3.1 as FNEC will provide grants for climate-resilient initiatives
- CRA technologies will include interventions or promotion of seed/ crop varieties that can help farmers respond to delayed rainfalls and methods to fight pests (Output 1.2).
- CRA technologies, as promoted under Output 1.2, will reduce the workload required on fields

- Training under output 2.1 will equip farmers and cooperatives with basic knowledge to weight/ measure their agri-products and sell them at adequate prices
- Output 3.1 & 3.2 will support afavorable institutional framework for the climate-resilient production of food crops and key VC culture; while Output 3.3 will compile and disseminate good practices for CRA in order to scale up the project's impacts.

2.8 Impacts of covid-19 on the four targeted value chains

2.8.1 Influenced Covid 19 on agricultural activities

According to the actors interviewed, the Covid-19 pandemic has had an impact on their agricultural activities. The impact of the pandemic on agricultural activities is likely to be similar in the five study communes and can be summarized as a scarcity or lack of agricultural labor due to restrictive measures preventing outside labor from coming to the production areas. This is particularly true of young Togolese and Burkinabe workers, and of young people from the Mono and Couffo departments. The producers also indicated that the advisory services had also reduced or even stopped their interventions during the period. It should be noted, however, that these constraints occurred during the 'lock down' period in Benin and neighboring countries (especially from March to September 2020).

2.8.2 Influenced Covid 19 on the price of agricultural products

With regard to the price of production inputs, the actors interviewed indicated that they had noted an increase in the price of inputs because of the restrictive measures through the closure of borders and the cordon sanitaire preventing the supply of inputs.

Unfortunately, the price of agricultural products has fallen due to the fact that traders are limited in their movements both nationally and internationally. This is the case of the Vietnamese and the Indo-Pakistanis who usually come during the cashew nut marketing campaign. It is the same of the buyers coming from the zones of the sanitary cordon (Cotonou, Porto-Novo and others). This situation was more observed from March to September 2020.

2.8.3 Influenced Covid 19 on access to agricultural inputs

With regard to access to agricultural inputs, the producers interviewed noted the poor access to agricultural inputs following the restriction measures. Local suppliers were out of stock and could not travel to cordon sanitaire areas such as Cotonou or to countries in the sub-region such as Nigeria, Togo and Ghana for their supplies. This situation has affected market gardeners more for inputs for off-season production in 2020 and buyers of nuts who usually get their supplies in jute bags from neighboring countries in 2020.

2.8.4 Influenced Covid 19 on the sale of agricultural products

For the stakeholders interviewed during this study, the measures taken as part of the management of the covid-19 pandemic have had effects on the sale of agricultural products. In particular, stakeholders noted the fluctuation of product prices, the lack of sales due to the absence of buyers from Togo and Nigeria on the market, the increase in transportation costs, the poor packaging of cashew and shea nuts due to the lack of access to

jute bags, and the drop in demand for products. All of this has resulted in a decline in the purchasing power of producers and difficulties in repaying the loans they have taken out.

3 FINANCIAL SERVICES FOR AGRICULTURE

3.1 Existing financial services in the project communities

3.1.1 Decentralized Financial Systems present in the communes of the project

In the project communes, the microfinance institutions in which the population is involved and which facilitate access to the population are mainly CLCAM, PEBCO-BETHESDA, SIA-N'SION (Table 18). There are also ASF, ACFB and CAVECA. It should be noted that CLCAM is the institution that grants the most credit to producers. This is followed by PEBCO, SIA-N'SON and to some extent CAVECA.

CLCAM is the leading institution for financing producers. Alongside CLCAM, PEBCo-BETHESDA is present in practically all the communes. Although SIAN-N'SON is interested in producers, it is more present in the northern communes such as Djougou and Copargo. ASF is found in all production areas of the UMOB communes. However, producers go there because of the low capacity of their credit portfolio. As for the ACFB, even though it is interested in agricultural actors and other segments of the community, it is less interested in producers directly. It should be noted that generally the facilities offered by the MFIs are the same.

Table 3.1. List of existing financial services in the project communities

Municipalities	**Microfinance institutions**
Copargo	CLCAM, ASF, SIA-N'SON
Djougou	CLCAM, ASF, SIA-N'SON, PEBCO, CECAC, AgriFinance and ACFB, PADME, FINADEV
Glazoué	UNACREP, CLCAM, PEBCO, ACFB, ASF, WITH
Zogbodomey	CLCAM, PEBCO-BETHESDA, ASF, CAVECA
Zagnanado	CLCAM, PEBCO -ETHESDA, CAVECA, WITH

Table 3.2. Microfinance institutions in the communes and proportion of producers who have taken out credit at least once in these structures

Microfinance institutions	Proportion (%) of farmers who have taken credit at least once	Easy access
Municipality of Copargo		
CLCAM	70	Proximity to rural areas, Funding for cooperatives
SIA-N'SON	20	Proximity to rural areas Payment terms more or less adapted
ASF	10	Proximity to rural areas Low administrative burden
Commune of Djougou		
CLCAM	30	Acceptance to the granting of agricultural credit
SIA-N'SON	15	Less complex administrative procedure
BETHESDA	20	Lower financial guarantee
ACFB	10	Group financing under joint and several guarantee
ASF	15	Proximity of producers
AgriFinance	10	Lower financial guarantee
Municipality of Glazoué		
CLCAM	30	Acceptance for agricultural credit under joint and several guarantee
BETHESDA	20	Acceptance of credit to individual producers

		Flexibility of access conditions
UNACREP	20	Flexibility of access conditions
ACFB	10	Flexibility of access conditions
ASF	15	Proximity to rural areas
WITH	5	Flexibility of access conditions Flexibility of loan access conditions
Commune of Zogbodomey		
CLCAM	40	Acceptance for agricultural credit under joint and several guarantee Payment period according to the production cycle
BETHESDA	30	Acceptance of credit to producers Considers that the producer will store his product before marketing it
CAVECA	15	Acceptance of credit to producers
ASF	15	Acceptance of credit to individual producers Flexibility of access conditions
Commune of Zagnanado		
CLCAM	50	Acceptance for credit under joint and several guarantee Payment period according to the production cycle
BETHESDA	25	Acceptance of credit to producers Flexibility of access conditions Considers that the producer will store his product before marketing it
CAVECA	25	-

The services offered by these institutions are oriented towards men and women in the agricultural sector, and some MFIs in particular prefer to finance women rather than men (table, 18). The majority of MFIs in these areas have coverage over the entire municipality, except for ASF, which establishes its branches in the districts. All these institutions are interested in agricultural loans.

Table 3.3. Microfinance institutions identified in the project communes

Names	Population involved	Coverage area	Easy access
Caisse locale de crédit agricole mutuel (CLCAM)	Mostly women	The entire municipality	Except for the agricultural sector
BETHESDA	Mostly women	The entire municipality	Except for the agricultural sector
Association for the Promotion of Development Initiatives (ALIDE)	Mostly women	The entire municipality	Except for the agricultural sector
Self-managed Village Savings and Credit Associations (CAVECA)	Men and women	The entire municipality	Except for the agricultural sector
National Network of Self-Managed Village Savings and Credit Unions (RENACA)	Mostly women	The entire municipality	Except for the agricultural sector
Bethel Actions United Members Cooperative (COMUBA)	Mostly women	The entire municipality	Except for the agricultural sector
Financial Services Association (FSA)	Mostly women	The entire municipality	Except for the agricultural sector
Community-Based Credit Savings Program (CBSPcO)	Men and women	The entire municipality	Except for the agricultural sector
SIAN SON	Men and women	The entire municipality	A little better for the agricultural sector
PADME	Men and women	The entire municipality	Except for the agricultural sector

3.1.2 The National Agricultural Credit Fund (FNDA)

The FNDA (Fonds National de Développement Agricole), a fund managed by the Ministry of Agriculture, Livestock and Fisheries (MAEP), is also active in the project's communes. This fund facilitates access to credit from banks and MFIs (microfinance institutions) for producers by guaranteeing 50% of the loans, subsidizing interest rates in certain cases, and supporting the preparation of bankable applications through its partnership with Non-Financial Service Providers (NFSPs) and projects and programs. Eligible activities for a FNDA-supported loan must be related to the priority sectors promoted by the Territorial Agricultural Development Agencies (ATDA), namely pineapple, cashew nuts, market gardening, corn, rice, cassava, soybeans, shea butter, cotton, aquaculture, oil palm, fruit trees, meat and milk, and eggs for consumption. The FNDA-supported loans can cover the acquisition of equipment and means of production, processing, storage, conservation, and transport/distribution; the acquisition of specific agricultural inputs; the strengthening of working capital; and the provision of marketing and/or export credits. The conditions for farmers or cooperatives to access FNDA-supported loans are :

- to be a Small and Medium Enterprises (SMEs) and agricultural Small and Medium Industries (SMIs); registered producers' or processors' cooperatives; economic interest groups; small farmers organized in registered cooperatives; small farmers/individual agricultural producers with an IFU ;
- to be affiliated with an FNDA partner microfinance structure ;
- to fulfill the conditions specific to the MFIs where they wish to take out credit, in particular
    - o open an account in the MFI,
    - o provide the administrative documents;
- develop a business plan. The FNDA can help the promoter in the drafting of the business plan, in particular by putting him in contact with a consultant specialized in the development of a business plan;
- have the letter of alienation at the level of the ATDA (the focal points of the FNDA can help for this purpose).

The services of the FNDA are offered through its three windows. They are of two categories:

- non-financial research, advisory support, training, capacity building, institutional support and technical assistance services;
- financial services, on the one hand in the form of full or cost-shared grants to finance infrastructure and equipment of general interest and those that enable farmers and entrepreneurs to start, consolidate, expand and/or professionalize their activities; and on the other hand in the form of credit on terms adapted to the specific needs and constraints of the agricultural sector, through the establishment of facilitation, refinancing, guarantee, interest rate subsidy funds or any other financial instrument deemed appropriate.

Table 3.4. The different FNDA windows

NADF windows	
Agricultural Investment Grant Offices	Sub-Window 1.1: Funds for Structuring Agricultural Investments of public interest oriented towards agricultural entrepreneurship
	Sub-Window 1.2: Private Agricultural Investment Fund
Non-Financial Services Access Points	Sub-Window 2.1: Applied Agricultural Research and Extension Fund
	Sub-Window 2.2: Facilitation and Capacity Building Fund
	Sub-Window 2.3: Certification and Marketing Support Fund.
Access to Financial Services Kiosks	Sub-Window 3.1: Interbank Guarantee Fund for refinancing between Financial Institutions
	Sub-Window 3.2: Guarantee Fund for access to credit for agricultural promoters/entrepreneurs
	Sub-Window 3.3: Interest Rate Subsidy and Facilitation Fund

Source: FNDA Development Plan (2018)

The maximum amount of FNDA credits is 50 million FCFA (USD3,500) for producers and farmers, and the maximum duration of the loan is 3 years. By accessing FNDA loans, the promoter (producers or farmers) benefits from (i) a guarantee covering a maximum of 50% of the initial capital borrowed, (ii) a maximum interest rate of 12% per year instead of 24% in the case of classic MFI loans. Promoters can also benefit from a bonification of 2% per year. While FNDA covers 50% of the borrowed amount, the promoter must provide a personal guarantee for the remaining 50%. This additional guarantee is defined by each MFI (and can be in the form of a joint surety, property, endorser, etc.).

FNDA 50% guarantee concerns only the loan amount, excluding the interest. However, the interest rate will be reduced to 12% instead of the usual 18 to 24% implemented by MFIs. Finally, FNDA reimburses 50% of the loans regardless of the reason why farmers or cooperatives cannot reimburse. However, the MFI must first use all means at its disposal to recover the loans. The FNDA will only reimburse after two years of unsuccessful attempts.

3.1.3 Other existing funding mechanisms in the study communities

In addition to the SFDs and the FNDA, other mechanisms for financing farmers exist in the project communes. These include warrantage (or storage credit[12]), clusters, financing through clusters and the contractualization system. In the project communes, warrantage is not well developed. However, warrantage has been organized in the communes of Glazoué and Zogbodomey for maize, while in the cashew nut sector it has been organized in the communes of Djougou and Copargo. It should be noted that this mechanism has also been tried on market garden products in the commune of Zogbodomey.

Table 3.5. Existence of the warrantage mechanism in the communes of the Upper and Middle Ouémé Basin

	Copargo	Djougou	Glazoué	Zogbodomey	Zagnanado
Corn	No	No	Yes Itchessan CVPM through ATDA under the pre-financing of BETHESDA	Yes, UCPC through ACMA2 and ATDA	No
Mangoes	No	No	No	No	No
Cashew nuts	Yes, FENAPAB through the UCCPA buys the product from the producers and stores it while waiting for the government to fix the price before selling it to the AFOKANTAN factory	Yes, FENAPAB through the UCCPA buys the product from the producers and stores it while waiting for the government to fix the price before selling it to the AFOKANTAN factory	No	No	No
Shea nut	No	No	No	No	No
Vegetable crops	No	No	No	Yes, UCCM through the	No

[12] Warrantage (or warrantage credit or storage credit or warranted credit) consists of granting producers a loan guaranteed by the placing of their production in storage, the value of which is likely to increase within a few months. It is a rural credit system which consists, for a farmers' organization (FO) and/or its producer members, in obtaining a loan by placing as collateral their production likely to increase in value.

				PDAAB project and ATDA	

The cluster mechanism exists mainly in the communes of Djougou, Copargo and Glazoué, especially for shea. It was set up by ProAgri/GiZ. There is also a cluster for market gardening in Djougou. Speaking of a system of financing by cooperatives, only cashew cooperatives in the communes of Djougou and Copargo have one. This system works thanks to the contract between FENAPAB and the AFOKANTAN processing plant. Indeed, the producers receive funds for the maintenance of the orchards and during the pre-collection phase to meet the various expenses.

Table 3.6. Existence of a system of financing by cooperatives (or producers' associations) in the communes of the Upper and Middle Ouémé Basin

	Copargo	Djougou	Glazoué	Zogbodomey	Zagnanado
Corn	No	No	No	No	No
Mangoes	No	No	No	No	No
Cashew nuts	Yes, the FENAPAB on pre-financing of the AFOKANTAN factory finances the producers of the UCCPA called expenses of pre-collection	Yes, the FENAPAB on pre-financing of the AFOKANTAN factory finances the producers of the UCCPA called expenses of pre-collection	No	No	No
Shea nut	No	No	No	No	No
Vegetable crops	No	No	No	No	No

3.2 Description of how the loan process works

3.2.1 Conditions for taking out a loan for agriculture

In the microfinance institutions studied, loans are granted individually or collectively with requirements. The mechanism for granting credit generally involves the formulation of a request that is studied by the board of directors. But before the credit is granted, the decentralized financing systems (SFD) organize awareness and training sessions on good credit management. The conditions for granting credit also include :

- opening an account to be moved at least one month before making the request;
- the deposit of a financial guarantee of 10-15% of the amount requested for loans below 200,000 or a joint and several guarantee or both in certain cases and for certain microfinance institutions;
- the deposit of a material guarantee for amounts of 200 000 [13];
- the deposit of valid documents.

In the case of group loans, the guarantee is not often required by certain microfinance institutions. Nevertheless, it is rather the joint and several guarantee that constitutes the guarantee for collective credits.

Any amount of credit at CLCAM/FECECAM requires a financial guarantee that varies between 15% and 20% of the amount requested, depending on the credit union. This financial guarantee is different from the minimum account balance required by the network to apply for a loan. On the other hand, the material guarantee for the granting of an agricultural credit is only required for a given amount. Thus, an individual agricultural credit of an

[13] FNDA can provide the financial and material guarantee for farmers and cooperative without the necessary resources.

amount less than or equal to 200,000 FCFA is not subject to the requirement of a material guarantee. However, a physical guarantee is required for any individual agricultural credit of an amount equal to or greater than 400,000 CFA francs; in such cases, the applicant's land, movable assets and other resources are listed to support his or her application. An "unofficial" formalization of the property title (with local administrative officials) is carried out to serve as a guarantee. Endorsers or persons serving as collateral are also required.

For loans granted individually under the cover of a group, the group's guarantee is used as a guarantee. For members of farmers' organizations (such as cotton production groups), the guarantee of the files by a commitment of the leaders of the PO and the group sale of the crops constitute a guarantee of recovery of the credit. Finally, members are required to take out a death insurance policy. The repayment of a loan is organized according to a single or split maturity depending on the type of activity financed and the loan granted. A great deal of flexibility has been observed at this level to adapt the credit schedule to that of the activity.

Table 3.7. Credit granting mechanisms by the institutions identified in the project communes

Names	Credit granting mechanisms
CLCAM	As a group
BETHESDA	Group and individual
ALIDE	As a group
RENACA	As a group
CAVECA	Group and individual
COMUBA	As a group
ASF	Group and individual
PEBCcO	Group and individual

Table 3.8. Reasons Respondents Could Not Take Out Loans, by Department

Reason	Collines	Donga	Zou
I have been denied or I am not qualified/eligible	5,0	4,0	6,0
I do not have any identification	6,0	9,0	19,0
I am not informed about loans or how to borrow money	7,0	9,0	10,0
I don't know how to get a loan	7,0	13,0	14,0
I never thought about it	12,0	13,0	9,0
The interest is too high	13,0	15,0	23,0
My salary is not enough to qualify for a loan	3,0	9,0	2,0
I am afraid to approach a bank or a structure where I can borrow money	8,0	12,0	8,0
I don't like to be in debt	30,0	25,0	26,0
I have done it in the past but it was a negative experience	9,0	5,0	7,0
I earn too little to be interested	7,0	10,0	7,0
I have a lot of debt	4,0	0,0	7,0
I don't have a job	0,0	12,0	1,0
I do not have a regular income	8,0	27,0	15,0
I can't afford it	5,0	6,0	4,0
I don't need it	11,0	8,0	5,0
I don't have a pay slip	6,0	20,0	6,0
I was recently hired by my employer	0,0	0,0	1,0
Debt makes you lose your peace of mind	20,0	33,0	31,0
I do not have the guarantees that the credit provider requires	9,0	9,0	10,0

Source: APRM (2019)

Cooperatives play several roles in the lives of their members (Table 5.9). For example, in accessing agricultural credit, cooperatives advocate with MFIs and accompany members in the process of accessing credit. It should be noted that cooperatives play a central role in the mechanism of warrantage of agricultural products.

Table 3.9. Role of cooperatives in farmers' access to credit

	Copargo	Djougou	Glazoué	Zogbodomey	Zagnanado
Corn Mangoes Cashew nuts Shea nut Vegetable crops	Facilitate the supply of inputs to members Facilitated the organization of producers to benefit from training on credit management	Facilitation of agricultural credit through good internal organization, advocacy and joint guarantee	Advocacy with MFIs Organizing producers for access to credit through joint and several guarantees	Organizing producers for joint and several guarantees Advocacy with MFIs and projects	Organizing producers for joint and several guarantees Advocacy with MFIs and projects

3.2.2 Use made of loans and links in the value chain supported by the loan

The producers for the most part make loans to support their agricultural activities and other accompanying requirements.

Specifically, the loans obtained are intended for the purchase of inputs, the payment of labor, the acquisition of other materials necessary to accompany and respond in real time to its operation. For certain crops such as cashew nuts, loans are made for harvesting operations.

3.2.3 Loan amounts, interest rates and repayment terms

The value of the loans varies greatly from one microfinance institution to another, from one producer to another and according to the areas of intervention. Similarly, the monthly interest rate on loans granted by MFIs to agricultural producers varies from one microfinance institution to another. In the communes studied, the amount of credit granted to producers, regardless of the MFI, varies from 5,000 to 15,000,000. The largest amount is granted by the PEBCo-BETHESDA MFI. The interest rate of these MFIs is between 1 and 2%. The lowest interest rate is borne by the Association Villageoise d'Epargne et de Crédit (AVEC) in the commune of Glazoué and to some extent the MFI AgriFinance in the commune of Djougou, which grants a rate of 1.5% to producers. The duration of the loan varies from 4 months to 12 months for all crops and for all microfinance institutions. However, it should be noted that the repayment method for producers is often a single payment after production. For traders, as for other agricultural actors, repayment is degressive, monthly, bi-monthly, quarterly or semi-annually.

Table 3.10. Characteristics of MFI loans to producers

	Copargo	Djougou	Glazoué	Zogbodomey	Zagnanado
Minimum amount granted	5 000	50 000	30 000	30 000	50 000
Maximum amount granted	5 000 000	5 000 000	15 000 000	15 000 000	5 000 000
Interest rate (%)	1.5 to 2 per month	1.5 to 2 per month	1 to 1.9 per month	1.58 to 1.7 per month	1.7 to 2 per month
Repayment term in months	4 to 12 months	4 to 12 months	4 to 12 months	4 to 12 months	4 to 12 months

Terms of repayment	Single payment	Single payment	Single payment	Single payment	Single payment

In all communes and regardless of the microfinance structure, it is the size of the farm, the history of past loans (the way in which the person has had to repay the last loans taken out), the type of guarantors or the credibility of the endorsers, the morality of the applicant and the experience of the producer in the activity that determine the amount of credit to be granted. Some microfinance institutions go as far as evaluating the producer's operating account to determine the amount to be granted.

3.2.4 Average percentage of loans not repaid, reasons and consequences

The percentage of loans not repaid by farmers is below 30%, except in the commune of Djougou where it is higher. The reasons for non-repayment include climatic hazards that lead to agricultural losses, and mismanagement of the financial assets for cooperatives.

3.3 Farmers' views on micro-credit

3.3.1 Proportion of farmers in each commune with credit

According to the Ministry of Agriculture, Livestock and Fisheries, the rate of access to credit in the project communes is still very low (Table 5.9). This rate is even lower when referring to credit granted by formal microfinance institutions. There are several reasons why most producers do not have access to credit. These include low financial education, reluctance, past credit history, lack of information and, to some extent, the complexity of the formalities.

Table 3.11. Access rates to credit/loans in the 2017-2018 crop year, by department

Department	Access to credit	Obtaining credit in a formal structure		
		Set	Bank	Microfinance institution
Collines (Glazoué)	37,7	20,6	1,0	20,0
Donga (Djougou and Copargo)	21,1	13,4	0,0	13,0
Zou (Zagnanado and Zogbodomey)	40,3	10,6	1,0	10,0

Source: APRM (2019)

Table 3.12. Proportion of different categories of actors among MFI clients

	Copargo	Djougou	Glazoué	Zogbodomey	Zagnanado
Farmers (%)	60-80	15-60	50-80	20-40	40-60
Processing of agricultural products (%)	1 -12	2-20	10-15	1-3	10
Agricultural Traders (%)	15-25	30-55	20-30	5-15	10-20
Producer cooperatives (%)	3-6	8-10	10-20	2-5	5-10

3.3.2 What the loans were used for

Generally, producers claim to have used the loans to support agricultural activities. As a result, the fees are mostly used for working capital needs for the acquisition of inputs, payment of hand in the process and some other salient operations in the line of agricultural activities.

3.3.3 Problems encountered by farmers in accessing and repaying loans

- Difficulties in accessing credit

Producers face enormous challenges in the process of accessing credit. Indeed, the current conditions offered by microfinance institutions are not conducive to the development of the agricultural sector and the improvement of the living conditions of rural populations (Sossou, 2015). The high interest rate, the financial guarantee rate, the lack of physical collateral, the delay in setting up the credit and the administrative formalities including the costs allocated to them are the difficulties that producers encounter in accessing credit. For example, some producers feel that credit is often late and not adapted to agricultural production.

The conditions that limit the farms' ability to obtain credit also include the period for releasing or disbursing credit, which is often unfavorable, the interest rate, the amount of the loan requested, the required collateral and, in some cases, the payment of application fees. The other difficulty is related to the illiteracy of certain actors. This makes the formalities of granting credit to them more complicated.

Access to agricultural credit is increasingly compromised by climatic hazards through irregular rainfall causing low production. In order to minimize the risk of non-payment, microfinance institutions conduct their own research on the behavior of rainfall during the season. This has an impact on the delay in setting up the credit and the amount of the credit. The same applies to the requirement of guarantees or sureties that can be used to recover the credit granted in the event of unpaid loans.

The difficulties encountered by CVA actors in accessing credit are mainly: problems related to guarantees or sureties, very high interest rates of microfinance institutions, repayment periods that are often not suitable or lack of short-term credit and the preparation of files.

Table 3.13. Difficulties in accessing credit by MFI

Names	Difficulties in accessing credit
CLCAM	-Unsuitable credit -Guarantee fund required -Complexity of administrative formalities
BETHESDA	-High interest rate Non-compliant repayment term -Very large distance of MFIs from production areas
ALIDE	-High interest rate -Financial security rate sometimes high
CAVECA	-High interest rate -Financial security rate sometimes high -Material warranty
RENACA	-High interest rate -Unsuitable credit -Financial security rate sometimes high
COMUBA	-Unsuitable credit
ACFB	Delayed credit set-up -Material warranty
ASF	-High interest rate

Names	Difficulties in accessing credit
	-Low financial capacity of the wickets

Source: Field data, 2021-2022

Table 3.14. Producers' difficulties in accessing credit, by commune

	Copargo	Djougou	Glazoué	Zogbodomey	Zagnanado
Corn Mangoes Cashew nuts Shea nut Vegetable crops	-Loan requested but not granted -No warranty -Delayed loan availability -Complexity of administrative formalities	-High cost of the parts to be gathered -Financial security rate sometimes high -High interest rate Credit not adapted to the agricultural context	High financial security Delayed credit set-up High interest rate Desired amount not granted	Complexity of the formalities Lack of Warranty Delayed credit set-up High interest rate	Very large distance of MFIs from production areas Binding administrative formality High rate of false fees (commission, insurance ...)

Source: Field data, 2022

- Repayment difficulties

Producers are experiencing difficulties in repaying the loans they have been granted (Table 3.15). The effects of climate change are one of the factors that cause producers to default on their loans. Indeed, following a long period of drought after the crops have been planted, or heavy rains during a period when the crops need less, yields fall and income drops drastically. This situation leads producers to default on payments when they do not have a potential secondary source of income to help offset the credit. The invasion of caterpillars is also a phenomenon that leads producers into unpaid bills. The use of credit for other purposes (health, ceremonies, etc.) is the cause of the malfunctioning of these agricultural credits. As far as these microfinance institutions are concerned, the main constraints are related to the non-repayment of loans granted and to liquidity problems.

Table 3.15. Credit repayment difficulties

Copargo	Djougou	Glazoué	Zogbodomey	Zagnanado
-Price fluctuations -Rainfall irregularities -Transhumant cattle Lack of financial management skills	High family load Lack of secondary activity Loss of production due to pest attacks and flooding	Crop loss after repeated drought porches Low crop maintenance Low credit culture education	Lack of sales in the period of COVID Irregularities in rainfall causing additional expenses in the case of reseeding or purchase of new fertilizers	Loss of production Crop loss due to flooding and transhumance Illness or death events with the producer

Source: Field data, 2022

3.3.4 Producers' perception of the link between loans and climate change

Access to agricultural credit is increasingly compromised by climatic hazards through irregular rainfall causing low production. Thus (Table 3.16), in order to minimize the risk of non-payment, microfinance institutions do their own research on the behavior of rain during the season. This has an impact on the delay in setting up credit and the amount of credit. The same applies to the requirement of guarantees or sureties that can be used to recover the credit granted in the event of unpaid loans.

The effects of climate change are an important part of the factors that lead producers to default on payments (Table 5.18). Indeed, following a long dry spell after the crops have been planted, or heavy rains during a period when the crops need less, yields fall and income drops drastically. This situation leads producers to default on

payments when they do not have a potential secondary source of income to help offset the credit. The invasion of caterpillars is also a phenomenon that leads producers to default on payments.

Table 3.16 Link between access to credit and climate change impacts

	Copargo	Djougou	Glazoué	Zogbodomey	Zagnanado
Corn	Irregularity of rainfall leads to poor production and will result in unpaid bills for the producer	Microfinance institutions are reluctant to provide agricultural credit in the absence of a substantial guarantee	Because of the effects of climate change, microfinance institutions make their own study to ensure the arrival of rain before setting up agricultural credits, which leads to the delay in setting up the credit for producers	In the absence of a guarantee, MFIs are reluctant to grant credit because of the irregularity of the rains	MFIs such as CAVECA make prior studies on the behavior of rainfall for the season, which explains why it watches out for hazards before providing credit to producers
Mangoes					
Cashew nuts					
Shea nut					
Vegetable crops					

Source: Field data, 2022

Table 3.17. Relationship between reimbursement and climate change impacts

	Copargo	Djougou	Glazoué	Zogbodomey	Zagnanado
Corn	Crop loss due to pest invasion or flooding will result in unpaid bills; The same is true	In case of drought or flooding the production drops considerably	Producers run a high risk of non-payment when rainfall seasons are delaid/ disappear	Due to rainfall irregularities, the productions fall, leading the producers to unpaid bills.	Due to rainfall irregularities, the productions fall, leading the producers to unpaid bills.
Mangoes					
Cashew nuts					
Shea nut					
Vegetable crops					

3.3.5 Farmers' readiness to take out an OCRI agricultural loan

In a context where production is determined by the accessibility of inputs and timely intervention, producers are in need of agricultural loans. During the interviews, several mentioned collateral issues as a bottleneck that most producers do not have a solution for. This is becasue they are often not aware of the fact that FNDA can play a role of guarrantor to secure their loan, and reduce the interest rate. It should be noted that regardless of the ethnic and religious group, the producers show a very good predisposition to go for credit and even more so within the framework of the OCRI project which could bring them relief on surety issues. **The field surveys indicate that Islam has no impact on the interest of producers in agricultural credit, nor on the type of credit institution they turn to.**

3.3.6 MFIs' views on agricultural credit

All the microfinance institutions in the study communes believe that agricultural financing through credit is an indispensable tool for producers, given that they are generally small farmers with low purchasing power. In this context, credit allows them to have enough money to meet the needs of their farms and their families.

Although the primary objective of each MFI is to maximize their profit, their motivation for granting credit to producers lies in their vision of contributing to the development of the local economy through poverty

eradication. For some MFIs, such as those in the Commune of Glazoué, the agricultural sector is full of opportunity.

Table 3.18. MFIs' Perception of the Role of Credit for Agriculture

	MFIs' perception of agricultural credit	Motivation of MFIs to grant credit to producers
Copargo	Agricultural loans are of paramount importance to accompany the producer to agricultural production and allow him to meet his expenses during production	Contribution to poverty eradication and local development
Djougou	Credit allows producers to meet the demands of their fields in a timely manner to increase yields	Contribution to the development of the rural environment
Glazoué	Agricultural credit is a tool for developing the agricultural sector in that it facilitates access to production factors and the intervention of operations in real time	The agricultural sector provides opportunities and is a risk sector that banks are not interested in
Zogbodomey	Agricultural production is not possible without agricultural credit in the Beninese context where the purchasing power of producers is very low	Contribution to poverty eradication and local development
Zagnanado	Indispensable for the real-time acquisition of production factors	Producers and merchants repay loans better when crops are good

However, MFIs are worried about the lack of collateral and the high risk of insolvency of farmers due to weather hazards.

Table 3.19. Barriers to Producer Credit by MFIs/DFSs

	Copargo	Djougou	Glazoué	Zogbodomey	Zagnanado
Corn Mangoes Cashew nuts Shea nut Vegetable crops	-High risk of insolvency -Weak organization of the actors of each sector -Climatic hazards No warranty	No Warranty Climatic hazards Lack of skills to build a credit file	No material or financial guarantee	Climatic hazards Lack of consistent warranty	Risks related to climatic hazards

The microfinance actors in the study communes emphasized that they have encountered difficulties in collecting credit to date. In general, the MFIs/SFDs mentioned that the problems of unpaid bills are becoming more and more recurrent. In fact, the campaigns between 2016 and 2021 have been more disrupted by climatic hazards that have led many producers to fall into arrears. This situation is observed in all the communes of the UMOB but in various production campaigns.

Table 3.20. Problems encountered by MFIs in collecting loans granted to producers

Municipalities	MFIs' perception of the role of CCs in the recurrence of loan default problems
Copargo	The 2016-2017 and 2019-2020 agricultural seasons in the municipality were characterized by droughts and floods that led to producers being in arrears
Djougou	The producers of the commune have experienced between the 2018-2019 and 2020-2021 campaigns invasions of caterpillars, drought porches more marked, floods and even the destruction of crops by transhumant cattle

Glazoué	The producers, especially the cooperatives that have had financing from the CLACM, have fallen into arrears for the 2015-2016 and 2020-2021 campaigns
Zogbodomey	Due to irregular rainfall, producers are losing production
Zagnanado	The 2019-2020 and 2020-2021 crop years were characterized respectively by a lack of rain and abundant rainfall, which was the source of unpaid bills for some producers

Faced with these situations, the MFIs request the building of capacity of producers on financial management and good agricultural adapted production practices. Providing a guarrantee for the producers and setting up a control and monitoring system over the repayment are also conditions to facilitate agricultural loans in the project areas.

FNDA support for OCRI farmers and cooperatives

- ***Type of support that the FNDA represents***

The FNDA, through its agricultural financing window, provides both technical and financial support to producers. FNDA and ATDA will inform the training sessions in FBS (OCRI Output 2.1) to ensure farmers put together bankable business plans that qualify for a FNDA-supported loan. FNDA offers a quality control review of the business plans used by farmers to benefit from financing at the partner MFIs. In addition, FNDA will provide a guarantee covering a maximum of 50% of the initial capital borrowed. It will also ensure a maximum interest rate of 12% per year instead of 24% in the case of classic MFI loans. Promoters can also benefit from a bonification of 2% per year. While FNDA covers 50% of the borrowed amount, the promoter must provide a personal guarantee for the remaining 50%.

- ***Operation of the FNDA in the municipalities***

Most of the MFIs/DFSs in the UMOB communes reported being in partnership with the National Fund for Agriculture (FNDA). The conditions for applying for a FNDA-supported loan do not vary according to the microfinance institutions. The most important thing is to elaborate a relevant business plan (which will be supported under OCRI Output 2.1), to have the letter of alienation from the ATDA and to be affiliated to a microfinance structure partner of the FNDA. It should be noted that the conditions specific to MFIs remain applicable even within the framework of the FNDA.

Table 3.21. Partnership and how to benefit from FNDA loans

	Partnership (Yes/No)	How to benefit from FNDA loans
Municipality of Copargo		
CLCAM	Yes	Elaboration and filing of business plans Have a material or financial guarantee depending on the amount requested Have the letter of disposition from the ATDA
SIA-N'SON	Yes	Development and submission of a bankable business plan Have a material or financial guarantee depending on the amount requested Have the letter of disposition from the ATDA Have an account with the MFI Have an MCCR
ASF	No	-
Commune of Djougou		
CLCAM	Yes	Elaboration and filing of business plans Have a material or financial guarantee depending on the amount requested Have the letter of disposition from the ATDA

SIA-N'SON	Yes	Development and submission of a bankable business plan Have a material or financial guarantee depending on the amount requested Have the letter of disposition from the ATDA Have an account with the MFI Have an MCCR Have an IFU
BETHESDA	Yes	Development and submission of a bankable business plan Have a material or financial guarantee depending on the amount requested Have the letter of disposition from the ATDA
ACFB	Yes	Development and submission of a bankable business plan
ASF	No	-
AgriFinance	Yes	Development and submission of a bankable business plan Have a material or financial guarantee depending on the amount requested Have the letter of disposition from the ATDA
Municipality of Glazoué		
CLCAM		Have experience in the activity Develop a business plan Have the ATDA letter of disposition
BETHESDA		Have experience in the activity Develop a business plan Have the ATDA letter of disposition
UNACREP		Have experience in the activity Develop a business plan Have the ATDA letter of disposition
ACFB	No	-
ASF	No	-
WITH	No	-
Commune of Zogbodomey		
CLCAM	Yes	Have experience in agricultural production activity Develop a business plan Have the ATDA letter of disposition
BETHESDA	Yes	Have experience in agricultural production activity Develop a business plan to be submitted to an MFI partner of the FNDA Have the ATDA letter of disposition
CAVECA	-	-
ASF	No	-
Commune of Zagnanado		
CLCAM	Yes	Have an account with the MFI To have the administrative documents Develop a business plan to be submitted to an MFI partner of the FNDA Activity Survey Have the ATDA letter of disposition
BETHESDA	Yes	Develop a business plan to be submitted to an MFI partner of the FNDA Have the ATDA letter of disposition Have an account with the MFI To have the administrative documents
CAVECA	Yes	Have experience in agricultural production activity Develop a business plan Have the ATDA letter of disposition

Field missions indicated a lack of understanding of the support FNDA can provide among farmers in the target communes.

3.4 How to improve the current mechanism

To improve access to agricultural credit (Table 3.22), stakeholders in the various study communes proposed a number of conditions. The conditions most often proposed relate to reducing administrative formalities, shortening the duration of the loan, reducing the interest rate (to 5%), revising the interest rate downward, and adapting the repayment period to the production cycle, with the possibility of allowing producers to sell their production during periods when prices are high, such as the months of December to February. Other necessary improvements include

- Support producers in submitting bankable projects;
- improve interest rates and guarantee funds;
- set up credits of 8 to 12 months at most ;
- Raise awareness of producers regarding reimbursement/raising awareness of producers regarding reimbursement compliance,
- implement grants as collateral;
- to make producers aware of the financial products available;
- create a platform that brings together producers and SFDs;
- to sensitize the producers on the window 3 created within the framework of the FNDA where there are :
    - Interbank Guarantee Fund for refinancing between financial institutions;
    - Guarantee fund for access to credit for agricultural promoters/entrepreneurs;
    - Facilitation and Interest Rate Subsidy Fund.

In addition, the implementation of coaching could also facilitate producers' access to financial services. To achieve this, it is necessary to :

- first, to put the producers (as well as the processors) in cooperatives.
- at the level of each intervention commune, cooperatives can be grouped into clusters around each value chain
- Set up a coaching service in each commune. A coach can be recruited and trained for this purpose, in collaboration with the ATDA concerned. The coach will have to stay at the level of the Communal Unit (CEC) of the ATDA
- The role of the coach will be to facilitate the identification of the company(ies) able to buy the production of the cluster members, to put in contact this (these) company(ies) with the cluster, to facilitate the signature of contract (between cooperative and the company(ies)), to put in contact the producers and the SFD, to evaluate the production intentions of the farmers, to facilitate the grouped marketing of the products, to facilitate the elaboration of business plan for the cluster.
- ATDA extension agents will be able to provide the necessary advisory services to obtain good quality products
- the project could support (pay for) the coaching service for the first three years and then gradually leave to let the aggregator (private company) take over.

In addition, since the FNDA works with a number of SFDs, access to financial services can be facilitated by supporting producer/processor cooperatives (and/or clusters) in developing a business plan. This business plan will be carried by either the cooperative or their umbrella organization, and will be submitted for funding to the

FNDA through the ATDA. Once the business plan is accepted by the FNDA, the producers can obtain credit from the SFD.

Table 3.22. Conditions for better access to agricultural credit for farmers in the project communes

	Copargo	Djougou	Glazoué	Zogbodomey	Zagnanado
Corn Mangoes Cashew nuts Shea nut Vegetable crops	- Strengthen the monitoring of producers on the good management of their farms - Accompanying producers in filling the conditions of access to credit (administrative formalities, deposit, guarantee, etc.) - Facilitate access to credit for cooperatives (train producers on how to put together a credit file, develop a business plan, etc.)	- Accompanying producers in filling the conditions of access to credit (administrative formalities, deposit, guarantee, etc.) - Strengthen the financial education of producers - Train producers on how to set up a credit file	- Accompanying producers in filling the conditions of access to credit (administrative formalities, deposit, guarantee, etc.) - Support producers in accessing accurate weather information	- Accompanying producers in filling the conditions of access to credit (administrative formalities, deposit, guarantee, etc.) - Accompanying producers in the timely filing of credit applications - Accompany producers in the development of their business plan	- Accompanying producers in fulfilling the conditions of access to credit (administrative formalities, deposit, guarantee, etc.) - Accompanying producers in good credit management

Source: Field data, 2022

For better repayment of agricultural credits (Table 3.23), producers propose training producers in financial management, strengthening the credit monitoring system, making credit available on time and the length of the payment period, which should be adapted to the crops and their marketing. It should be noted that the producers propose the development of warrantage as a mechanism to guarantee the solvency of producers.

Table 3.24. Conditions for better repayment of agricultural credits by farmers in the project communes

	Copargo	Djougou	Glazoué	Zogbodomey	Zagnanado
Corn Mangoes Cashew nuts Shea nut Vegetable crops	Strengthen the follow-up of farmers after the provision of credit Train producers in financial literacy Helping producers set up tools to manage their operations	Establishment of a committee within the producers for the follow-up of the credit and the grouped recovery of the loans Adapting MFI credit to the agricultural sector (payment terms, availability time)	Educate producers on credit management Strengthen the capacity of producers on the culture of credit Support producers in accessing credit in real time Develop warrantage	Strengthen the monitoring system for producers Strengthen the competence of producers on financial management in business Diversify production lines Develop warrantage	To make agricultural credit available in time for timely intervention in agricultural operations Organize the producers to pay in groups and according to the agreed deadline

Source: Field data, 2022

4 CONCLUSION

The upper and middle basin of the Ouémé River stretches from north to south in the Republic of Benin and includes several municipalities, including those of the project (Copargo, Djougou, Glazoué, Zagnanado and Zogbodomey). The populations living in this area depend on agriculture for 90% of their livelihood. The corn, mango, cashew, shea, soybean and vegetable sectors are the most developed in this area. Unfortunately, they are confronted with the problems of climate change, most notably the irregularity of rainfall, flooding and poor distribution of rain. In a context where most of the farms are small with low purchasing power, it is difficult to respond effectively given the increase in production costs. A need for financing is becoming very imperative for producers in order to produce efficiently. Current statistics show that only 6.9% of Beninese farmers have access to agricultural credit (MAEP, 2021).

This shows that more needs to be done to better support producers. Actions to facilitate access to credit and access to specific inputs seem to have a significant impact on agricultural production. It is true that the FNDA exists to deal with financing problems, but it is clear that this mechanism is struggling to take off and really meet the needs of small producers. In light of this vulnerability of agricultural production, we recommend :

- facilitate access to specific inputs and quality infrastructure for production
- Strengthen the technical capacity of men and women producers on good production practices resilient to the effects of climate change.
- improve the FNDA's financing mechanism to meet the financing needs of all producers.
- Facilitating access to markets for producers through the development of the cluster or the warrantage system
- train producers on good storage and conservation practices for agricultural products.

Table 4.1 Summary table of problems/constraints

Link in the chain	Problems/constraints
Corn	
Production	Insufficient means of harvesting and storage of the products/problem of conservation
	Poorly organized industry
	Unavailability of/difficult access to specific inputs (fertilizer, improved seeds, etc.)
	Low influence of producers on the transfer price (price setting by buyers)
	Lack of knowledge of the mechanism for accessing these markets;
	Decline in soil productivity;
	Seeds sometimes of poor quality;
	Poor product quality
	Rudimentary production tools
	Misuse of herbicides in crop treatment
	Low/inadequate access to climate change resilient varieties
	Negative impacts of climate change on productivity and production (low germination rate, wilting of seedlings, dwarf development of maize plants, poor cob development, development / proliferation of worms, development of parasitic attacks from inside the plants, destruction / rapid deterioration of products in the field, difficulty in harvesting at the right date, contamination of maize by molds and aflatoxin etc.).
Storage/ preservation	Lack of storage structure
	Low availability/ non-existence of preservatives
	Negative impacts of climate change (turgidity of grains when harvested in the rain, development of mold, etc.)
Transformation	Lack of processing equipment (gin, etc.)
	Negative impacts of climate change (early fermentation, poor quality of products from processing when grains are not of good quality, etc.)
Marketing/Sales	Low negotiation capacity of the producers' actors
	High tax at city hall level

	High cost of hangars in existing markets
	Negative impacts of climate change (transportation of products is difficult during periods of heavy rain, high cost of corn due to lower production, accelerated degradation of products, etc.)
Collecting (shea butter only)	Destruction of shea trees for the manufacture of mortar, coal, etc.
	Decline in productivity of shea trees
	Area of collection of shea nuts more and more distant in dwellings
	Difficulty of access or lack of means of access to shea nut collection areas
	Lack of reliable statistics on the number of stands and the actual production of shea trees
	Low negotiation capacity of the actors
	Low productivity of shea trees, in particular because of climatic hazards (violent winds leading to the fall of flowers and young fruits, rainfall below 600mm, heavy rainfall at the time of collection leading to rapid acidity of the kernels if the fruits are not collected within 24 hours of their fall, etc.)
	Cultivation techniques are not well known and it takes decades for the plant to come into production
	Lack of a clear and current map of the existing shea tree stand in the different communes of the project
	Destruction of shea plants due to land pressure, aging, and especially to strong parasite pressure and poor management of vegetation fires
	Cutting of trees for wood exploitation (firewood, timber).
	Low level of nut collection due to difficulties in accessing collection sites
	Poor protection of pickers against snake bites and other hazards
	Shea nut collection and processing techniques are inefficient and do not ensure the quality of the kernels
	Difficulties in accessing land and land tenure insecurity
	Influence of climatic hazards
	Aging of shea plants
	Adverse effects of wildfires and weather related to climate change
	Destruction of shea plants to meet the requirements of agricultural mechanization
	High fluctuation and lack of transparency in the price of shea kernels
	Seasonality of shea kernel availability.
	Negative impacts of climate change on productivity and production (poor nut development, early flower and nut fall, acidity of almonds due to heavy rains, etc.)
Storage/ preservation	Poor mastery of shea kernel storage/conservation techniques
	Low mastery of nut storage and preservation technologies
	Insufficient storage facilities,
	Difficulty in acquiring packaging for the product
	Negative impacts of climate change (mold development, blackening of seeds, increase in acidity of almonds, etc.)
Transformation	Lack of knowledge of the quality standards of shea kernels by some operators
	The quality of the almonds produced is not always good (acidity problems in particular), which reduces the quality of the butter
	Mechanical processing equipment is very expensive and does not always provide quality butter
	The mechanical equipment for processing shea butter is not made of stainless steel, which leads to the presence of metal residues in the product
	Negative impacts of climate change (nuts are not well dried and still have water, etc.)
Marketing/Sales	Lack of transparency of almond and butter prices in the markets.
	Negative impacts of climate change (transportation of products is difficult during periods of heavy rain, etc.)
Production	Poor control of parasitic attacks
	Attacks on mango fruits by diseases and pests (fruit flies and others)
	Poor cultural practices (poor plantation maintenance, lack of manuring, etc.)
	Low productivity of mango trees
	Poor access to good quality plants,
	Absence of irrigation in the plantations
	Insufficient advisory support and training on good practices in the installation and management of orchards, and on the monitoring and maintenance of mango orchards
	Lack of technical sheets on good production practices for mango exports,
	Insufficient skills among stakeholders (producers, supervisors) in harvesting techniques

	There are almost no registered phytosanitary products for mango in Benin,
	Non control of pests or diseases (fruit flies, termites, anthracnose and physiological accidents) and emergence of Bacteria Black Spot (BBS) which can cause big losses in orchards;
	Low knowledge and compliance with quality standards;
	No mastery of the different pruning techniques for the rehabilitation of old orchards;
	Absence of windbreaks around mango plantations;
	Low knowledge of alternatives to chemical control for organic mango production;
	High concentration of production in a short period of the year / Non-availability of mangoes in quantity and quality at all times.
	Insufficient organization within the different links and for the entire mango sector.
	Growers discouraged by fruit fly damage
	Difficulties in accessing land and land tenure insecurity
	Influence of climatic hazards
	Destruction of plantations by oxen
	Destruction of plantations for other crops or for fuelwood
	Little attention paid by national programs to the development of the mango sector
	Low use of pest/fruit fly control
	Concentration of the production on a short period of the year
	Lack of support for good orchard management practices
	Low awareness of and compliance with quality standards
	Negative impacts of climate change on productivity and production (poor fruit development, fruit acidity, etc.)
Storage/ preservation	Lack of adequate financing for the acquisition of packaging, storage and processing equipment
	Inadequate storage conditions for mango which is a rapidly perishable fruit
	Lack of infrastructure and equipment for packaging, transport and marketing
	Growers discouraged by fruit fly damage
	Poor knowledge of technical itineraries and good harvesting practices for mangoes
Transformation	Poor knowledge of/compliance with quality standards,
	Low awareness of and compliance with quality standards
	Negative impacts of climate change (early fermentation, difficulties in preserving fruit due to increased temperature, etc.)
Marketing/Sales	Low negotiation capacity of the actors
	Poor knowledge of/compliance with quality standards,
	Lack of infrastructure and equipment for packaging, transport and marketing adapted (absence of packaging stations and quality control service);
	Difficulty in moving fruit closer to roads that can be used by transporters' vans for landlocked fields
	Inadequate transport conditions for mangoes (inadequate packaging and rudimentary means of transport)
	Low awareness of and compliance with quality standards
	Negative impacts of climate change (poor sales when it is difficult for customers to come to the field, etc.)
Production	Non-availability of/difficult access to specific inputs (fertilizers, improved plants, etc.)
	Low productivity of cashew trees
	Damage caused by transhumant animals
	Damage caused by vegetation fires often resulting from human actions
	Difficulties in accessing land and land tenure insecurity
	Influence of climatic hazards (violent winds, irregular rainfall, extreme droughts, etc.) resulting in poor fruit development, flower and fruit fall, etc.
Storage/conservation	Negative impacts of climate change (mold development, blackening of seeds, increase in acidity of almonds, etc.)
Transformation	Negative impacts of climate change (nuts are not well dried and still have water, difficult to preserve when almonds are not well dried, breakage of almonds when seeds are not of normal size, etc.)
Marketing/Sales	Strong dependence on world cashew nut prices. Shocks are sometimes very strong with effects on the profitability of the production
	Low negotiation capacity of the actors
	Poor quality of fruit sent by producers
	Negative impacts of climate change (transportation of products is difficult during periods of heavy rain, etc.)

Production	Destruction of forests for new agricultural fields
	Land impoverishment
	Slash and burn agriculture
	Lack/scarcity of manpower
	Soil compaction due to the passage of oxen
	Destruction of crop fields by transhumant cattle
	Decrease in crop productivity
	Climatic hazards (irregular rainfall, strong winds, and long harmattan periods, etc.)
	Low access to specific inputs
	Social problems/conflicts (repression of Water and Forestry agents on the cutting of the shea tree and others, etc.)
	Permanent pressure from residents (on trees and forests) for wood needs
At the level of the actors of the sectors	Complexity of administrative formalities / difficulty in completing access formalities (lack of identification, lack of collateral, etc.)
	Poor information about loans or how to borrow money
	Interest rate too high
	Difficulty in obtaining the guarantees required by the credit provider
	Drop in production, loss of crops due to climatic hazards
	Delayed credit set-up
	Very important distance (remoteness) of the MFIs from the production areas
	Requested loan not granted (reduction in amounts requested by MFIs)
	Low credit culture education
At the MFI level	Lack of adequate information on borrowers' credit history in the system
	Reluctance of MFIs to grant agricultural loans, especially in the absence of a substantial guarantee
	High risk of insolvency
	Weak organization of the actors of each sector
	Climatic hazards
	No material warranty
	Lack of confidence
	Lack of credit culture
	Lack of skills to build a credit file
	Dispute the amount to be paid when the credit expires
	Opposition to the joint and several guarantee when the organization falls into arrears
	Flight of some producers from cooperatives
	Change of living environment by the lender
	Difficulty in putting pressure on producers with knowledge of the causes
	Bad faith of some producers
	Very distant overlap areas
	Impassability of access roads during rainy periods
Repayment of credits	Non-compliant repayment term
	Price fluctuations
	Decrease in production due to climatic hazards (irregular rainfall, repeated droughts, floods, etc.)
	Lack of financial management skills
	Destruction of crops by transhumant cattle
	Loss of production due to pest attacks and flooding
	Low education in credit and repayment culture
	Lack of sales in the period of COVID
	Illness or death events with the producer

Table 4.2 Barriers and solutions to access credit

Barriers to credit access	**Solution proposed by OCRI**

MFIs are more reluctant to provide loans to individual farmers than to farmers organised in efficient cooperatives	Support and training to organise and register farmers into local, municipal and regional cooperatives to organise the production and sale, and to develop business, finance/ access to credit, and marketing skills (Output 2.1)
MFIs have indicated that farmers often lack financial education, have limited capacity to put together bankable business plans, and to provide regular repayment	Busines and financial management training to ensure farmers develop bankable business plans; close follow up of OCRI farmers (through FNDA) to ensure they implement their financial and business plans (developed through FBS) and that they are following their scheduled loan repayment (Output 2.1)
MFIs and farmers indicate the difficulties for farmers to provide the required collaterals for a loan	FNDA will provide a guarrantee coving 50% of the loans for OCRI farmers and ensure lower interest rates (Output 1.2)
MFIs and farmers are aware of the negative effects of climate change on crop yields; changes in rainfall patterns and other climatic parameters have already caused lack of credit repayment	Technical training on increasing productivity and producing quality products – especially for maize, mangoes, cashews and shea nuts (Output 1.2)
MFIs and farmers are aware of the negative effects of climate change on crop yields; changes in rainfall patterns and other climatic parameters have already caused lack of credit repayment	Provide high-quality, climate-resilient seeds from national institutes (Output 1.2)
MFIs and farmers are aware of the negative effects of climate change on crop yields; changes in rainfall patterns and other climatic parameters have already caused lack of credit repayment	Training on climate-resilient production techniques ensuring pest control, irrigation, protection against strong winds and extreme rainfalls, among others (*Output 1.2*)
Farmers and MFIs are worried of a lack of credit repayment	Create bi-annual forums to connect producers/ cooperatives with wholesalers/ retailers to develop market opportunities, facilitate crop sale, and negotiate price and contracts (*Output 2.2*). This will not only enhance revenue but also ensure stable and increased income to repay credit
Farmers in the target communes have access to limited financial services for agriculture	Provide FNEC grants to finance the implementation of climate-resilient agricultural and ecosystem restoration micro-projects (Output 3.2)

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ANNEXES

Minimum and maximum prices in 2021-2022 for products along value chains

- **Grain corn (FCFA/kg) in 2021**

		Field edge (producer level)	Sale at the collector level	Wholesale	Retailer / consumer	Corn flour
Djougou	Minimum	150	170	-	170	-
	Maximum	220	250	-	220	-
Copargo	Minimum	150	200	200	165	-
	Maximum	280	300	300	265	-
Glazoué	Minimum	160	210	210	200	150
	Maximum	250	300	300	225	200
Zagnanado	Minimum	150	180	-	180	120
	Maximum	250	270	-	270	250
Zogbodomey	Minimum	125	240	180	150	150
	Maximum	200	340	270	250	300

- **Mango (FCFA/kg) in 2021**

		Field edge (producer level)	Sale at the collector level	Wholesale	Retailer / consumer
Djougou	Minimum	50	300	150	300
	Maximum	150	500	200	500
Copargo	Minimum	50	300	-	300
	Maximum	150	500	-	500
Glazoué	Minimum	75	150	150	200
	Maximum	125	300	200	300
Zagnanado	Minimum	30	300	210	300
	Maximum	250	400	225	400
Zogbodomey	Minimum	35	200	-	200
	Maximum	200	300	-	300
Mango juice (liter)	Minimum	1000	1200	1200	1200
	Maximum	1500	2000	2000	2000
Mango puree	Minimum	1000	1500	1300	1000
	Maximum	1500	2500	2100	1500
Dried mangoes	Minimum	800	1500	1500	800
	Maximum	1500	2000	2000	2000

NB

- The mango puree is sold in packaging which can estimate at 1 kilogram
- The estimate is made on the ordinary mango more represented in the municipalities

Mango prices by variety

	Urban Retailers	Rural Retailers	Rural wholesalers	Urban wholesalers	Set
Kent	178,3	.	45,8	135,7	134,6
Governor	145,0	50,0	85,6	95,5	111,4
Mangotine (regular)	32,0	12,5	40,6	22,5	28,4
Brooks	125,0	.	56,3	84,4	82,5
Eldon	150,0	56,0	69,1	106,7	106,3
Cameroonian woman	100,0	25,0	26,7	91,7	77,1
Dabshar	.	.	75,0	162,5	133,3
Smith	.	.	125,0	.	125,0
Amelie	200,0	.	50,0	150,0	150,0

Palmer	190,0	.	.	120,0	200,0
Zill	200,0	.	.	150,0	187,5
Springfels	200,0	.	.		200,0
Keitt	200,0	.	.	150,0	166,7

Source: Sodjinou (2020)

- **Shea (FCFA/kg) in 2021**

Stadium	Minimum	Maximum	Official floor price
Shea nuts	75	225	Not available
Shea almond	150	260	100
Shea butter	250	400	-
Almond export	-	-	-
Shea butter	-	-	-
Butter export	-	-	-

NB

- The almond is sold through the Boum measure estimated at 3 kg
- Shea butter is sold on a ball. Two balls can be equivalent to one kilo

Shea nut prices at the beginning and end of the season, 2000-2018

Campaign	Starting price (FCFA/Kg)	Final price (FCFA/Kg)
2000 - 2001	35	50
2001 - 2002	40	65
2002 - 2003	40	55
2003 - 2004	35	70
2004 - 2005	40	80
2005 - 2006	40	60
2006 - 2007	65	125
2007 - 2008	80	130
2008 - 2009	85	135
2009 - 2010	90	140
2010 - 2011	90	145
2011 - 2012	85	155
2012 - 2013		
2013 - 2014		
2014 - 2015	80	236
2015 - 2016		
2016 - 2017		
2017 - 2018		
2018 - 2019		

Source: Meadan (2009) and Sohinto and Akoha (2012), XXX (2018)

Butter produced in a traditional or semi-mechanized way, is generally sold at 100 FCFA per ball of about 250 g; but their weight is falling as almonds become scarce on the market. As far as potted butter is concerned, prices vary according to the capacity of the pots. Pots of about 170g of butter (net weight) are sold at 500 FCFA per unit. With regard to wholesale, processors use cans or metal drums of varying capacities. (see Sodjinou and Kouton-Bognon, 2019).

- **Anacarde (FCFA/kg) en 2021**

Stade		Minimum	Maximum	Prix plancher officiel
Pour les noix de cajou	Bord champ (niveau du producteur)	250	350	Pas disponible
	Vente au niveau du collecteur	250	350	-
	Grossiste	350	650	-
Pour les amandes cajou torréfiées	Amande de cajou marché local (selon le grade)	1500	4000	-
	Exportation amande (selon le grade)	6000	10000	-
Pour les amandes cajou blanches	Amande de cajou marché local (selon le grade)	2000	5000	-
	Exportation amande (selon le grade)	5000	8000	-

- **Tomatoes (FCFA/kg) in 2021**

		Field edge (producer level)	**Sale at the collector level**	**Wholesale**	**Retailer / consumer**
Djougou	Minimum	65	-	170	150
	Maximum	250	-	350	270
Copargo	Minimum	65	-	200	150
	Maximum	300	-	350	270
Glazoué	Minimum	90	-	150	125
	Maximum	300	-	450	325
Zagnanado	Minimum	70	-	175	200
	Maximum	300	-	350	250
Zogbodomey	Minimum	70	-	175	200
	Maximum	275	-	350	250

- **Pepper (FCFA/kg) in 2021**

		Field edge (producer level)	**Sale at the collector level**	**Wholesale**	**Retailer / consumer**
Djougou	Minimum	218	-	364	300
	Maximum	909	-	1273	1500
Copargo	Minimum	290	-	355	325
	Maximum	1000	-	1000	1500
Glazoué	Minimum	400	-	490	500
	Maximum	700	-	850	1100
Zagnanado	Minimum	210	-	300	300
	Maximum	1100	-	1400	1500
Zogbodomey	Minimum	300	-	350	450
	Maximum	700	-	800	1000

- **Okra (FCFA/kg) in 2021**

		Field edge (producer level)	**Sale at the collector level**	**Wholesale**	**Retailer / consumer**
Djougou	Minimum	255	-	-	300
	Maximum	510	-	-	750
Copargo	Minimum	250	-	325	400
	Maximum	630	-	755	950
Glazoué	Minimum	215	-	270	305
	Maximum	356	-	473	515
Zagnanado	Minimum	175	-	250	280
	Maximum	300	-	400	530
Zogbodomey	Minimum	200	-	240	265
	Maximum	300	-	370	440

- **Green leaves (10m/1.5m) in 2021: for amaranth vegetables**

		Field edge (producer level)	Sale at the collector level	Wholesale	Retailer / consumer
Djougou	Minimum	3000	-	3500	3700
	Maximum	5000	-	6500	6700
Copargo	Minimum	2000	-	2700	2900
	Maximum	7000	-	8200	8300
Glazoué	Minimum	1500	-	1800	-
	Maximum	3500	-	4000	-
Zagnanado	Minimum	2000	-	-	2800
	Maximum	3500	-	-	4700
Zogbodomey	Minimum	1200	-	1600	2000
	Maximum	4000	-	5000	5500

- **Cassava (FCFA/kg) in 2021**

		Field edge (producer level)	Sale at the collector level	Wholesale	Retailer / consumer
Djougou	Minimum	45	-	60	90
	Maximum	60	-	80	120
Copargo	Minimum	45	-	60	90
	Maximum	60	-	90	120
Glazoué	Minimum	60	70	80	70
	Maximum	80	100	100	110
Zagnanado	Minimum	50	60	-	70
	Maximum	120	130	-	160
Zogbodomey	Minimum	60	-	80	100
	Maximum	100	-	100	150

- **Yam (FCFA/kg) in 2021**

		Field edge (producer level)	Sale at the collector level	Wholesale	Retailer / consumer
Djougou	Minimum	400	510	475	600
	Maximum	650	570	700	1000
Copargo	Minimum	500	600	600	700
	Maximum	750	900	800	1000
Glazoué	Minimum	400	500	460	570
	Maximum	600	700	755	640
Zagnanado	Minimum	-	-	-	-
	Maximum	-	-	-	-
Zogbodomey	Minimum	-	-	-	-
	Maximum	-	-	-	-

- **Cowpea (FCFA/kg) in 2021**

		Field edge (producer level)	Sale at the collector level	Wholesale	Retailer / consumer
Djougou	Minimum	200	450	500	600
	Maximum	750	850	900	1000
Copargo	Minimum	283	600	650	700
	Maximum	666	800	900	1000
Glazoué	Minimum	250	700	800	800
	Maximum	830	1000	1000	1200
Zagnanado	Minimum	300	625	-	800
	Maximum	700	800	-	1000
Zogbodomey	Minimum	300	460	-	800

	Maximum	800	900	-	1000

Average expenses (in FCFA/Ha) for cultivation operations

Operations	Corn	Mangoes	Cashew nuts	Shea nut	Vegetable crops
Municipality of Copargo					
Soil preparation (clearing, weeding)	12000	12000	12000	-	12000
Labor (From semi to harvest)	44000	53000	53000	-	150000
Seed/plant	8750	50000	50000	-	150000
Chemical fertilizers	50000	-	-	-	50000
Organic fertilizer	5000	1000	10000	-	20000
Phytosanitary treatment	15000	15000	15000	-	35000
Herbicides	7500	7500	7500	-	50000
Transportation costs	10000	10000	10000	10000	35000
Commune of Djougou					
Soil preparation (clearing, weeding)	15000	25000	25000	-	40000
Labor (From semi to harvest)	60000	70000	70000	-	180000
Seed/plant	10000	50000	50000	-	80000
Chemical fertilizers	60000	-	-	-	60000
Organic fertilizer	00	00	00	-	5000
Phytosanitary treatment	00	20000	-	-	30000
Herbicides	15000	7500	7500	-	15000
Transportation costs	10000	10000	10000	10000	35000
Municipality of Glazoué					
Soil preparation (clearing, weeding)	37500	-	-	-	37500
Labor (From semi to harvest)	60000	70000	70000	-	180000
Seed/plant	7500	50000	50000	-	30000
Chemical fertilizers	60000	-	-	-	68000
Organic fertilizer	5000	10000	10000	-	15000
Phytosanitary treatment	5000	15000	15000	-	25000
Herbicides	14000	14000	14000	-	20000
Transportation costs	6000	10000	10000	-	20000
Commune of Zogbodomey					
Soil preparation (clearing, weeding)	12000	25000	25000	-	40000
Labor (From semi to harvest)	15000	70000	70000	-	180000
Seed/plant	12500	50000	50000	-	80000
Chemical fertilizers	50000	-	-	-	60000
Organic fertilizer	5000	00	00	-	5000
Phytosanitary treatment	3500	20000	-	-	30000
Herbicides	7500	7500	7500	-	15000
Transportation costs	8000	10000	10000	10000	35000
Commune of Zagnanado					
Soil preparation (clearing, weeding)	12000	25000	25000	-	40000
Labor (From semi to harvest)	15000	70000	70000	-	180000
Seed/plant	12500	50000	50000	-	80000
Chemical fertilizers	50000	-	-	-	60000
Organic fertilizer	5000	00	00	-	5000
Phytosanitary treatment	3500	20000	-	-	30000
Herbicides	7500	7500	7500	-	15000
Transportation costs	8000	10000	10000	10000	3500

Chronogram and itineraries of the field mission, and list of people and institutions met in February-March 2021

Date	***Municipality***	***Structure***	***People we met***	***Contact***
04/02/2021	*Departure from Cotonou to Parakou with stopover in Bohicon*			
05/02/2021	Parakou	ATDA4	CHABI SERO Inoussa	
05/02/2021	*Departure from Cotonou to Djougou and Copargo*			
05/02/2021	Djougou	Communal Cell of Djougou	Junias Lokonon (CCec of Djougou)	
05/02/2021	Djougou	DDAEP	Hounokou Eugene (C/DRCVPV-DDAEP)	
06/02/2021	Djougou	Producers' Cooperative	Group interview in Serou Village (participants: President Yaya arouna, Kpera issiaka, Inoussa abibou, Idrissou lawa, Mouhamed Albarka, Abdou karim)	
06/02/2021	Djougou	CVPA	Group interview in Soubouroucou Village (participants: Alidou (President CVPA), Inoussa Arouna, Adam Sanni, Temara Salifou, Soulé Aboubaka, Abdou Adam)	
06/02/2021	Djougou	Group of Buyers of Agricultural Products (GAPA)	Group interview in TAIFA Village/quartier (participants: Zakari YAO (President GAPA), Ali Yacoubou, Secretary GAPA, Aliou Setto, Sanni Idressou)	
05/02/2021	Copargo	Village Producers Cooperative (VPC)	Group interview in Babazaoré Village/neighborhood with CVP President Kpera	
05/02/2021	Copargo	Copargo Community Cell	Armel Hennou (CCec Copargo) Carlos (TS)	
06/02/2021	Copargo	Village Corn Producers Cooperative (CVPM)	Group interview in Katabam village/neighborhood (FOUSEINI (CVPM), Germain, Barki amaga, Adja, Agueî Barikissou)	
06/02/2021	*Departure from Copargo to Glazoue*			
07/02/2021	Glazoué	Agricultural producers	Group interview in AGOUAGON Village (Participants: Béatrice Houngbegnon, Egounbi Elisabeth, AMAKPE Justin, BOKO Lambert, AKODOSSI Adrien, KOUANAN Evariste, AMOLESSE, GANDE, KOUANAN, AFFOZIN Firmin, DOSSOU Cyprienne, Nazaire)	
08/02/2021	Glazoué	Agricultural producers	Group interview in OUEDEME Village (Gbedji Oscar, Victor, DOHOU Leopord, Jean DOGLUI, TOSSOU Patrice, DAHUI Robert, BAMEHOSSOU Adiviadon, N'KPEKINNI Augustin, TOSSOU VALENTIN, GBEDJI Yamode)	
08/02/2021	Glazoué	Glazoué Community Cell	Interview with the entire team of the Cellule Communale (CCec, TS Manioc, TS Maize, TS Cashew, TS Rice)	
08/02/2021	*Departure from Glazoué to Parakou*			

09/02/2021	Parakou	ATDA4	FASSINOU Désiré S. (Agricultural Diversification Program Officer / CPDA) CHABI SERO Inoussa
09/02/2021	*Departure from Parakou to Zangnanado via Bohicon*		
10/02/2021	Zangnanado	Agricultural producers	Group interview in Bamè Village (Participants: Bokodaho Georges, Aholoukpe Gilbert, Somassè Rigobert)
10/02/2021	Zangnanado	Agricultural producers	Group interview in Banamè Village and Don (Participants: Houessou Adrien, Hounyetè Bienvenu, Tchenagni Robert, Esseka Samuel)
10/02/2021	Zangnanado	Agricultural producers	Group interview in Zangnanado Village center (Participants: Hounlekoude Albert, Koudjekan Antoine, Satcha Martin, Hounoukon Jeacques)
11/02/2021	Zangnanado	Communal Cell of Zangnanado	Gawé Fadel (CCec Zagnanado)
11/02/2021	*Departure from Zangnanado to Zogbodomè via Bohicon (and overnight in Bohicon)*		
12/02/2021	Zogbodomè	Communal Cell of Zogbodomè	Dansou Pedro (CCeC Zogbodomey)
12/02/2021	Bohicon	ATDA5	ADISSO Crésus (Director of Programs; Head of Fruit Tree Program)
13/02/2021	Zogbodomè	Agricultural producers	Group interview of the villages of Hlangba-Denou Atcha, Denou Lissezin, Agoita, Bolamey, Djihizide, Domey, Tanwe Hessou (Participants: Adandogo Folly, Hassou Daagli Abel, KPadonou Bernard, Bonou Zachari, Tchaki Thamas, Dohoue Siaka, Houedjissin Claude, Adjihounme Ernest)
13/02/2021	*Departure from Bohicon to Cotonou*		

Chronogram and itineraries of the field mission, and list of people and institutions met in February-March 2022

Date	***Municipality***	***Structure***	***People we met***	***Function (Contact)***
07/02/2022	*Departure from Cotonou to Parakou*			
08/02/2022	Parakou	ATDA4	HOUETCHEGNON Towanou	PD Assistant (95287644)
09/02/2022	Parakou	Finalization/printing of collection tools based on suggestions/comments from the project team (including multiplication of tools)		
10/02/2022	Djougou	DDAEP Donga	BIO SABI TANON Christian	Director (96796578)
10/02/2022	Djougou	DDAEP Donga	NASSAM Rosaline	Head of the Monitoring, Institutionalization and Management Division of POs
10/02/2022	Copargo	Municipal Water and Forestry Section	GATTA Ibrahim	Responsible for the Community Section (96 14 10 72)
10/02/2022	Copargo	CeC/ATDA	HENNOU Armel	Head of the Communal Cell (97 11 50 22)
10/02/2022	Copargo	Focus group in the village Pabégou	YAROU Salifou	Maize, Yam, Soybeans, Vegetables (Village Delegate) 97 58 79 31
			BANKI Séïbou	Corn, Cashew90 80 00 03
			SARE Boukari	Corn, Cashew97 58 79 31

			YAROU Halalou	Maraichage67 88 18 04
			GORBA Rabiatou	Processing and Marketing of Yam Cossette 90 05 95 32
			ISSIFOU Fati	Processing and Marketing of Gari 90 80 00 03
			ISSA Séïdou	Mango, Vegetable, Cashew, Corn 97 25 37 11
			SARE Nassirou	Cashew, Corn, Soybean 66 57 63 62
			ISSAKA Sakina	Processing and Marketing of Akassa 97 58 79 31
10/02/2022	Copargo	UCPM (Mango)	KOUFEIWAOU Kossi	Community President (97 76 28 63)
11/02/2022	Copargo	UCCPA (Cashew)	BONI GAWE Sabirou	Community President (97 93 04 42)
11/02/2022	Copargo	UCP (Corn)	FOUSSENI Wahab	Community President (97 89 69 99)
11/02/2022	Copargo	CLCAM	KONDO SOUMANOU Tamimou	Counter Manager (96 01 02 42)
11/02/2022	Copargo	SIA-N'SON	BANI TOROU Ousmane	Head of Agency (66 59 69 39)
11/02/2022	Copargo	ASF	YACOUBOU Abdoulaye	Manager of Guichet (66 09 71 29)
11/02/2022	Copargo	City Hall	ASSAN Moutawakilou	General Secretary (96 13 34 98)
11/02/2022	Copargo	City Hall	SARE Prudence	Water, Hygiene and Sanitation Manager (66 65 66 64)
11/02/2022	Copargo	Municipal Water and Forestry Section	CHABI D. Judicaël	Deputy Head of Community Section (97 82 88 05)
11/02/2022	Djougou	Zoom meeting with the project team		
12/02/2022	Djougou	UDPM (Vegetables)	DOMOROU Issifou	Departmental President (97 24 07 17)
12/02/2022	Djougou	UCCPA (Cashew)	MAMOUDOU Abdoul	Secretary General Communal (97 88 65 01)
12/02/2022	Djougou	UCPM (Mango)	ABOROSSE Isaaak	Community President (66 92 42 75)
12/02/2022	Djougou	UDP (Corn)	ABDOU Madougou	Departmental President (97 64 86 92)
12/02/2022	Djougou	Focus group in the village Onclou I and II	BABOUKARI Moukaïla	Maize, Soya, Cashew (Village Delegate) 68 53 37 03
			ASSOUMANOU Ezéchiel	Corn, Cotton, Soybeans, Cashew nuts95 11 11 40
			OROU JEAN DJARA François	Corn, Cotton, Soybeans, Cashew 64 32 60 18
			OROU MOHAMED Fataou	Corn, Soybeans, Vegetables 91 25 45 79
			BAH SABi DJARA David	Corn, Soya, Mango 96 91 60 32
			TEWAMI Awali	Corn, Yam, Soybeans, Vegetables 96 53 94 06
13/02/2022	Bohicon	Mid-term review session with my collaborator		
14/02/2022	Djougou	CeC/ATDA	LOKONON Junias	Head of the Communal Unit (66 48 16 91)
14/02/2022	Djougou	CLCAM	AIHOUNHIN Aristide	Head of Agency (97 52 39 56)
14/02/2022	Djougou	SIA-N'SON	BANI TOROU Ousmane	Head of Agency (66 59 69 39)
17/02/2022	Djougou	City Hall	AROUNA Abdoulassidou	General Secretary (97 54 10 19)
14/02/2022	Djougou	City Hall	YAYA Bani Alain	In charge of Planning and Environment (96 37 67 86/94 38 10 45)
13/02/2022	Donga	DDAEP Donga	IBRAHIM Mouf	C/SSPDA (67 80 14 14)
14/02/2022	Donga	DDAEP Donga	TONOU SARE Youssouf	Head of Statistics and Monitoring and Evaluation (96 06 80 43)
14/02/2022	Donga	DDAEP Donga	MEHOBA Alain	Head of Regulations and Rural Equipment Department (97 47 19 11)
14/02/2022	Donga	DDAEP Donga	AKABASSI Baudelaire	Head of Services Animal Production Division (97 11 22 41)

14/02/2022	Donga	DDAEP Donga	HONKOU Eugène Coômlan	Head of Services Plant Production Division (62 93 84 09)
14/02/2022	Donga	DDAEP Donga	APANINI Adam	Head of Services Fish Farming Division (62 99 66 11)
14/02/2022	Bohicon	DDAEP Zou	DAHOUI Wilfried	Head of Agricultural Surveys Division (
14/02/2022	Bohicon	ATDA5	OBE Noel	Assistant Program Director (97548454)
15/02/2022	Bohicon	DDAEP Zou	AMOUSSOU Prosper Emile	Head of Statistical Surveys and Monitoring Evaluation Department (95567527)
15/02/2022	Bohicon	DDAEP Zou	AKEREBOUROU Anie	Head of Division Monitoring, Institutionalization and Management of POs (96493918)
15/02/2022	Bohicon	DDAEP Zou	TAMADAHO Sylvie	Head of the Agricultural Development Promotion Department (90026919)
15/02/2022	Djougou	AgriFinance	BASSEKOULOU Abraham	Manager of Guichet (97 33 37 41)
15/02/2022	Djougou	BETHESDA	TIMON Félicienne	Interim Agency Manager (96 50 79 15)
15/02/2022	Djougou	BETHESDA	OKRY Sylvain	Loan Officer (67 60 32 83)
15/02/2022	Djougou	ACFB	HOUNLENOU D. B. Amard	Head of Agency (97 58 25 03)
15/02/2022	Djougou	CECAC	KORA Zimé	Head of Agency (96 55 15 58)
16/02/2022	Glazoué	Focus group in Yagbo village	DADJEDJI Joseph	Maize, Cashew (Advisor to the Village Delegate) 97 49 15 40
			KANTCHEDE Rodrigue	Corn, Cashew nuts69 44 93 18
			ALODO Mathieu	Maize, Cashew (Advisor to the Village Delegate) 97 95 76 59
			TCHEGNONSI Léon	Corn, Cashew96 39 10 98
			BALOGOUN Albertine	Corn, Cashew, Vegetable farming 96 36 17 49
			HENADJE Bernadette	Corn, Trader 97 49 15 40
			EMEDEGNON Ulrich	Corn and Transport 69 88 45 66
			DEGNIDE Jean-Baptiste	Corn, Soybeans, Cashew nuts 97 92 56 83
16/02/2022	Glazoué	WITH	AFFORA Dorcas	President (69 89 31 85)
16/02/2022	Glazoué	WITH	BALOGOUN Albertine	Treasurer (96 36 17 49)
16/02/2022	Glazoué	BETHESDA	DAHOUI Inoua	Head of Agency (96 91 25 26)
16/02/2022	Glazoué	ACFB	KOUTANGNI Eric	Head of Agency (66 09 96 36)
16/02/2022	Dassa-Zoumé	DDAEP Hills	HOUNDANON L. Lazare	Head of Statistical Surveys and Monitoring Evaluation Department (96858131)
16/02/2022	Dassa-Zoumé	Zoom meeting with the project team and consultants		
17/02/2022	Glazoué	UComCP (Corn)	DJEGUI Damien	Community President (97 81 34 24)
17/02/2022	Glazoué	UCCPA (Cashew)	HOUINNOU Romain	Community President (97 38 35 83)
17/02/2022	Glazoué	UDM (Vegetable growing)	FEKOTAN Armand	Departmental President (97 08 72 37)
17/02/2022	Glazoué	CLCAM	KOUDJOUME Florent	Cashier Manager (96 97 44 65)
17/02/2022	Glazoué	UNACREP	HOUNTCHEME Euphrasia	Credit Officer (96 91 25 26)
17/02/2022	Glazoué	CeC/ATDA	AYEDEGUE Lionel	Head of the Communal Cell (97 60 35 39)
17/02/2022	Glazoué	CeC/ATDA	GBENANGNON Roseline	TS Cashew (96 36 13 06)
18/02/2022	Zogbodomey	CeC/ATDA	DANSOU Pedro	Head of the Communal Unit (95 84 05 35)
18/02/2022	Zogbodomey	UComCPM (Corn)	AHINON Michel	Community President (69 03 69 95)
18/02/2022	Zogbodomey	UCCM (Vegetables)	HASSOU DAAH Abel	Community President (95 25 39 59)
18/02/2022	Zogbodomey	UCPM (Mango)	KPADONOU	Community President (95 15 67 54 /60 45 29 27)
18/02/2022	Zogbodomey	BETHESDA	ADJE Moise	Head of Agency (94 32 11 62
18/02/2022	Zogbodomey	CLCAM	SOGLO A. Jacqueline	Credit Officer (66 41 11 89 / (95 35 92 44)

18/02/2022	Parakou	AKB (Benin Shea Association)	Armand KINGBO	AKB National Coordinator and Permanent Secretary of the Interprofession (96269768)
18/02/2022	Parakou	FENAPAB (National Federation of Cashew Nut Producers of Benin)	BARANO Mohamed	Director General (97113038)
19/02/2022	Zogbodomey	Focus group in the village Agoïta	YEHOUENOU Boniface	Corn, Peanut, Cashew, Mango, Vegetable (Village Notable) 97 11 00 29
			BODJRENOU Vincent	Corn, Rice 64 38 88 60
			ZINHOUNDJO Daniel	Palm, Corn, 98 03 65 02
			ZINHOUNDJO Sylvain	Corn, Rice, Vegetables98 03 65 02
			HOUNTON Justine	Processing, Corn 98 03 65 02
			DOHE Adidjatou	Processing, Vegetables, Rice 66 30 08 48
			ALADASSi Jean-Marie	Corn, Pepper 60 96 69 26
21/02/2022	Zagnanado	CLCAM	ATEKPAMI Catherine	Credit Officer (67 85 07 20)
21/02/2022	Zagnanado	UCCPA (Cashew)	ESSEKA Barthélemy	General Secretary Communal (51 88 25 68)
21/02/2022	Zagnanado	UCCM (Vegetables)	MONTCHO Deo-Gracias	Communal Secretary General (62 09 02 54)
21/02/2022	Zagnanado	CeC/ATDA	GAOUE Fadel	Head of the Communal Unit (96 58 82 94)
22/02/2022	Zagnanado	Focus group in the village Agoïta	AVOGBE Antoine	Corn, Peanut, Cashew (Village Notable) 69 61 92 64
			AVOGBE Gérard	Corn, Cashew nuts69 32 78 73
			DJOKPE Sébastien	Corn, Soybeans, Cashew97 83 52 97
			ESSEKA Raïssa	Corn, Vegetables, Processing 69 61 92 64
			TCHEGBE Monique	Corn, Vegetables, Processing, 96 72 34 00
			GANDO Alphonse	Corn, Cashew 67 89 30 44
22/02/2022	Zagnanado	UComM (Corn)	ESSEKA Samuel	Community President (90 26 46 09)
22/02/2022	Zagnanado	BETHESDA	SINGBE Gildas	Interim Agency Manager (60 57 71 73)
22/02/2022	Zagnanado	CAVECA	DISSONON Rachelle	Manager of Guichet (65 00 18 87)
23/02/2022	Cotonou	Enterprise Afruca Green Corporation	GLIN Laurent	General Manager (67372054)
24/02/2022	Porto-Novo	Zoom meeting with the project team and consultants		

Some images/photos from the field

Photo 1: Brush clearing practice with fire

Photo 2: Irrigation equipment

Photo 3: Mulching of boards

Photo 49: Targeted watering

Photo 5: Creation of wells in the lowlands to access water

Photo 6: Transport of products from the fields to the city by women traders

Photo 7: Cashew plantation without flowers due to the long harmattan period

Photo 8: Mulching technique for mango seedlings

Photo 9: Maize production in off-season

Photo 10: Heat pressure on hydromorphic soils

Photo 11: Teak plantation

	
Photo 12: Intercommunal transhumance	Photo 13: Intervention of the PAIA-VO project in the commune of Zogbodomey

	
Photo 14: Charcoal making	Photo 15: Bagging coal