

# Info Note

## Prioritizing value chains for climate-smart agriculture (CSA) promotion in Mali, Niger and Senegal

*Findings from a series of stakeholders' workshops conducted in Mali, Niger and Senegal under CCAFS- EU-IFAD-funded project "Building Livelihoods and Resilience to Climate Change in East and West Africa: Agricultural Research for Development (AR4D) for large-scale implementation of Climate-Smart Agriculture"*

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### Key messages

- Identifying priority value chains (VC) through a participatory approach is key for a successful development of climate-smart VCs to increase the resilience and adaptive capacity of community in West Africa.
- A total of twelve (12) priority agricultural VCs have been identified and validated through stakeholders' workshops in Segou (Mali), Tillabéri (Niger) and Kaffrine (Senegal).
- Priority VCs include sorghum/millet, goat, groundnut, non-timber forest products (NTFP) in Senegal, (ii) rice, millet, vegetable, cowpea, goat/sheep in Mali and (iii) rice, millet, red meat in Niger.
- The priority VCs have been selected according to three main criteria including the current and future resilience of the VC, the percentage of the population engaged in them and the involvement of poor people, women and youth in them.
- Women and men are differently engaged in the selected VCs. Women are more engaged in vegetable, cowpea, goats/sheep/red meat and NTFP value chains than the other VCs. They are also more engaged in the marketing than input supply for all the priority VC.

This series of briefs summarizes findings from stakeholders' workshops conducted as part of CCAFS-EU-IFAD funded project - Developing climate-smart value chains and landscapes for increased resilient livelihood in

West Africa" in Mali, Niger and Senegal. These workshops were conducted by researchers from CCAFS West Africa regional program and the Alliance Bioversity-CIAT.

### Introduction

Climate change is already having a significant effect on agriculture and food security in West Africa. Climate-smart agriculture (CSA) is proposed as a solution to transform and reorient agricultural systems to support food security under the new realities of climate change. To benefit from the positive gains arising from CSA, a wide scale adoption of CSA technologies and practices is required. The value chain (VC) approach is positioning as a major upscaling opportunity for agricultural innovations in general and CSA options in particular as it offers opportunities to address most of adoption constraints of CSA. Through ensuring an effective and efficient coordination among its actors and creating partnerships with other stakeholders (such as public-private, private-cooperatives and related organizations along the VC), the VC approach improves the access to input and product markets and support the development of business services, contributing to promote the uptake of CSA technologies and practices.

The Output 2 of the CCAFS- EU-IFAD-funded project "Building Livelihoods and Resilience to Climate Change in East and West Africa: Agricultural Research for Development (AR4D) for large-scale implementation of Climate-Smart Agriculture", aims at developing climate-smart value chains to increase livelihood resilience in West

Africa (Mali, Niger and Senegal). To reach this goal, the preliminary activity of the project was to conduct a series of stakeholders' workshops in order to select promising VCs for the promotion of CSA in Mali, Niger and Senegal.

## Study site, data collection and analysis

The prioritization of VCs has been conducted at regional level. Three regional stakeholders' workshops have been organized by CCAFS WA in Senegal (3-5 Nov 2020), Mali (24-26 Nov 2020) and Niger (9-11 Dec 2020) to identify and characterize the priority agricultural VCs for the regions of Kaffrine, Segou and Tillaberi respectively. Workshops gathered 25 to 30 participants, representative of rural development stakeholders in each region. Participants come from regional technical services (Agriculture, livestock, forestry, etc.), farmers' organizations, development projects/programs, private sector (banks, insurance companies, input suppliers), regional authority representatives, and researchers from national agricultural research system (IER, INRAN, ISRA) and CGIAR system (CCAFS, ICRISAT, Alliance Bioversity-CIAT).

The objectives of the workshops were to: (i) validate priority VCs, (ii) present and discuss climate trends and climate change projections, (iii) identify important hazards and risks for the key VCs, (iv) identify underlying vulnerability factors (v) identify adaptation options, (vi) identify and map institutions, their resources and capacities.

Only the results from the prioritization (objective 1) are presented in this info note. In line with this objective 1, a long list of VCs has been established by the participants. Then, they have been assessed through tree main criteria including: (i) current and future resilience of the VC, (ii) percentage of population engaged in the VC, (iii) inclusion of poor, women and youth in the VC.

From this assessment 3 to 5 VC have been selected as priority VCs in each region.

## Results

### Priority value chains in Mali

Twenty-eight (28) agricultural VCs have been inventoried by the participants to the stakeholder's workshop in Segou (Table 1). The analysis of these VCs according to the three criteria mentioned above led to the selection of 5 priority VCs for the region of Segou. The selected VCs are: rice, millet, goat/sheep, cowpea and vegetable.

Table 1: Value chains in Segou-Mali

Value chains	Resilience		% of population engaged in the VC L: 0-29% M: 30-60% H: 61-100%	Inclusion of poor people (Y/N)	Inclusion of women (Y/N)	Inclusion of youth (Y/N)
	Current L/H	Future L/H				
Rice	M	M	M	Y	Y	Y
Fonio	M	H	L	Y	Y	Y
Fish	M	L	L	Y	Y	Y
Sesame	M	M	L	Y	Y	Y

Milk	L	M	L	N	Y	Y
Millet	M	M	M	Y	Y	Y
Sorghum	M	M	L	Y	Y	Y
Cattle	L	M	L	N	Y	Y
Goat/sheep	H	H	H	Y	Y	Y
Poulet	L	L	H	Y	Y	Y
Cowpea	M	M	M	Y	Y	Y
Cassava	H	H	L	Y	Y	Y
Groundnut	M	M	M	Y	Y	Y
NTFP	M	M	L	Y	Y	Y
Wood-energy	L	L	L	Y	Y	Y
Maize	L	L	L	Y	Y	Y
Vegetable	M	M	M	Y	Y	Y
Seedling	M	M	L	N	N	Y
Melon	L	M	L	Y	Y	Y
Water melon	M	M	L	Y	Y	Y
Sugar cane	M	M	L	N	N	Y
Honey	L	L	L	Y	N	Y
Guinea fowl	L	L	L	Y	Y	Y
Turtle	H	H	L	N	N	Y
Cala-bash	H	H	L	Y	Y	Y
Pepper	H	H	L	Y	Y	Y
Okra	M	M	L	Y	Y	Y
Squash	M	M	L	Y	Y	Y

H=High, M=Medium, L=Low, Y=Yes, N=No, Selected VC (in green)

### Priority value chain in Niger

From fourteen (14) VCs inventoried by the participants in Niger, 3 VCs (rice, millet, red meat) have been identified as those which are resilient, involve directly or indirectly more than 60% of the population of Tillaberi region and engage more than 50% of the poor, women and young people (Table 1). Red meat VC refers to cattle, sheep and goat meat.

Table 2: Value chains in Tillaberi region - Niger

Value chains	Resilience		% of population engaged in the VC L:0-29% M:30-60% H:61-100%	Inclusion of poor people (Y/N)	Inclusion of women (Y/N)	Inclusion of youth (Y/N)
	Current L/H	Future L/H				
Millet	H	H	H	Y	Y	Y

Sorghum	H	H	M	Y	Y	Y
<b>Rice</b>	<b>H</b>	<b>H</b>	<b>H</b>	<b>Y</b>	<b>Y</b>	<b>Y</b>
Cowpea	L	L	H	Y	Y	Y
Groundnut	L	L	L	Y	Y	N
Sesame	H	H	L	Y	Y	N
Vegetable	H	H	M	Y	Y	Y
Fish	L	L	L	Y	Y	Y
Poultry	H	H	H	Y	Y	Y
<b>Red meat</b>	<b>H</b>	<b>H</b>	<b>H</b>	<b>Y</b>	<b>Y</b>	<b>Y</b>
Skin/leather	L	L	L	Y	N	Y
Milk	H	H	M	Y	Y	Y
Honey	L	L	L	Y	Y	Y
Moringa	H	H	M	Y	Y	Y

H=High, M=Medium, L=Low, Y=Yes, N=No, Selected VC (in green)

## Priority value chains in Senegal

Fifteen (15) agricultural VCs have been inventoried by participants to the stakeholders' workshop in Kaffrine, from which 4 have been selected as priority VCs. The selected VCs include: millet/sorghum, groundnut, goats and non-timber forest products (NTFPs). Millet and sorghum were merged to make one VC (millet/sorghum) because of the similarity of their production system in Senegal.

Table 3: Value chains in Kaffrine - Senegal

Value chains	Resilience		% of population engaged in the VC L: 0-29% M:30-60% H:61-100%	Inclusion of poor people (Y/N)	Inclusion of women (Y/N)	Inclusion of youth (Y/N)
	Current L/H	Future L/H				
<b>Groundnut</b>	<b>M</b>	<b>M</b>	<b>H</b>	<b>Y</b>	<b>Y</b>	<b>Y</b>
<b>Millet</b>	<b>H</b>	<b>H</b>	<b>H</b>	<b>Y</b>	<b>Y</b>	<b>Y</b>
Maize	M	M	M	Y	Y	Y
Sesame	H	H	L	Y	Y	Y
<b>Sorghum</b>	<b>H</b>	<b>H</b>	<b>M</b>	<b>Y</b>	<b>Y</b>	<b>Y</b>
Milk	L	M	L	N	Y	N
Water melon	H	H	L	N	Y	Y
Cowpea	H	H	L	Y	Y	Y
Vegetable	L	M	L	Y	Y	Y
Sheep	M	M	M	Y	Y	Y
<b>Goat</b>	<b>H</b>	<b>H</b>	<b>M</b>	<b>Y</b>	<b>Y</b>	<b>Y</b>
Poultry	L	M	H	Y	Y	Y
Rice	L	M	L	Y	Y	Y
<b>NTFP</b>	<b>H</b>	<b>H</b>	<b>L</b>	<b>Y</b>	<b>Y</b>	<b>Y</b>
Cattle	L	M	L	N	N	Y

H=High, M=Medium, L=Low, Y=Yes, N=No, Selected VC (in green)

## Characterization of priority value chains in Mali, Niger and Senegal

The VCs have been characterized based on the number of people engaged in them, the types of actors, the key activities, the involvement of poor, men and women in the VCs.

### Number of people engaged in the priority VCs:

A part from vegetable VC all the selected VC engage more than 50% of people (Figure 1). The red meat and millet VCs in Tillaberi, groundnut and millet/sorghum VCs in Kaffrine involve more than 80% of people while cowpea, sheep/goats and millet VCs engage more than 60% of people in Segou.

(1=1 - 20%; 2=21-40%; 3=41-60%; 4=61-80%; 5=81-100% of the population)

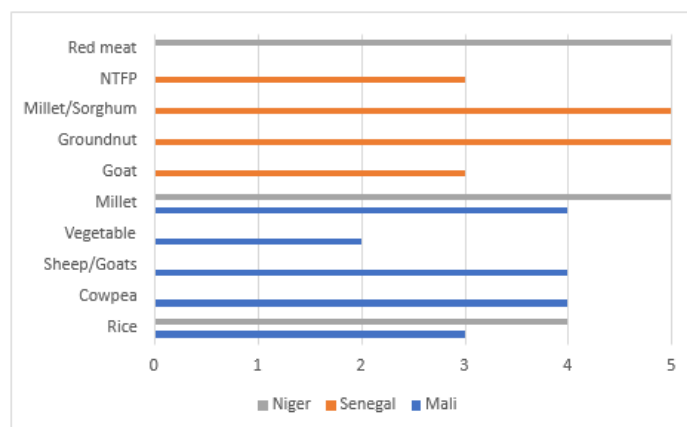


Figure 1: Number of people engaged in the selected VCs in Mali, Niger and Senegal

**Types of actors engaged in the VC:** Figures 2-4 show that post-harvest activities are not well developed in most of the selected VCs. They are characterized by small scale processing for cowpea and vegetables VCs in Segou as well as for goat, groundnut and millet/sorghum VCs in Kaffrine.

(1= Large-scale; 2= Medium-scale; 3= Small-scale)

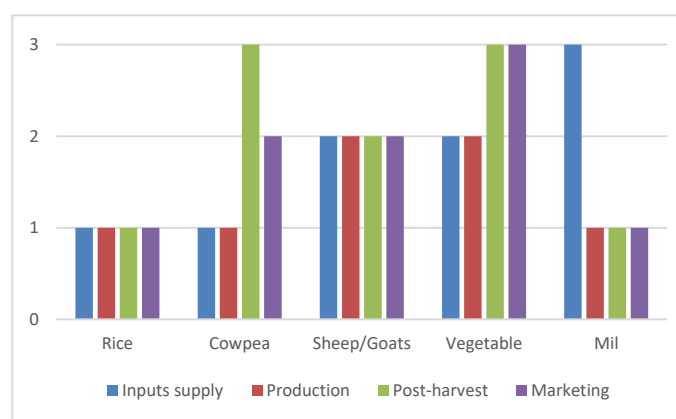


Figure 2: Type of actors of priority VCs in Segou

(1= Large-scale; 2= Medium-scale; 3= Small-scale)

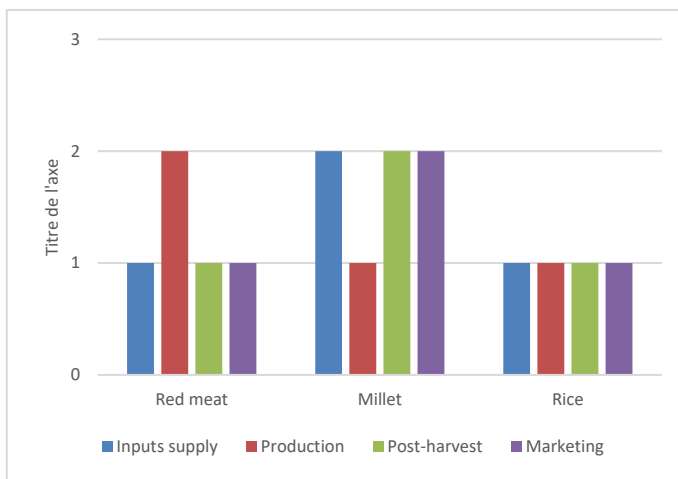


Figure 3: Type of actors of priority VCs in Tillabéri

(1= Large-scale; 2= Medium-scale; 3= Small-scale)

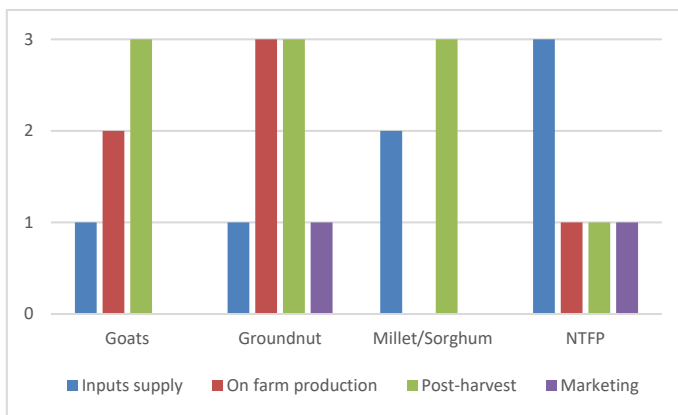


Figure 4: Type of actors of priority VCs in Kaffrine

**Inclusion of women and men in the VC:**

Figure 5-7 showed that women are very highly represented in production, processing and marketing for vegetable VC in Segou and highly engaged in NTFP value chain in Kaffrine. They are highly engaged in the marketing for rice, millet and red meat VC in Tillabéri.

(1 = very low; 2 = low; 3 = medium; 4 = high; 5 = very high)

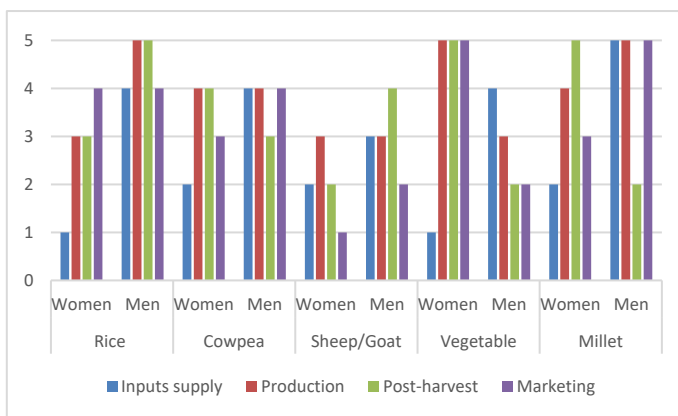


Figure 5: Inclusion women and men in priority VCs in Segou

(1 = very low; 2 = low; 3 = medium; 4 = high; 5 = very high)



Figure 6: Inclusion women and men in priority VCs in Tillabéri

(1 = very low; 2 = low; 3 = medium; 4 = high; 5 = very high)

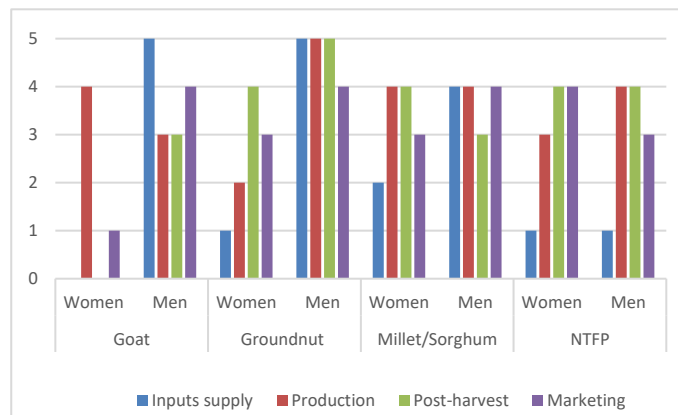


Figure 7: Inclusion women and men in priority VCs in Kaffrine

**Importance of priority VCs in Mali, Niger and Senegal**

- Millet is widely produced in the Sahel. In 2019, the harvested areas of millet were estimated at 6.8 million of ha in Niger, 1.9 million in Mali, and 0.8 million in Senegal for a total production of 3.2 million tons, 1.8 million tons and 0.8 million tons respectively (Table 4). The yield of millet is low (less than 500kg/ha in Niger).
- Rice is produced in irrigation system along of the Niger River in Segou and Tillabéri. The harvested areas of rice were 924 644 ha in Mali for a total production of 3 196 336 Tons.
- Goat and sheep are widely produced in the Sahel. In 2019, the number of goats were estimated at 26,4 million heads, 18,1 million heads in Niger, and 6,2 million heads in Senegal.

Table 4: Production of priority VCs in Mali, Niger and Senegal

Country	Value chains	Area harvested (Hectare)	Production (Tons/Head)
Mali	Cowpeas	454 274	215 436
	Millet	1 989 953	1 878 527
	Rice, paddy	924 644	3 196 336
	Vegetables	64 959	344 617
	Goats	NA	26 486 240
	Sheep	NA	19 183 500

Niger	Millet	6 831 217	3 270 453
	Rice, paddy	26 739	121 760
	Cattle	NA	15 225 408
	Goats	NA	18 108 124
	Sheep	NA	13 192 925
Senegal	Groundnuts	1 110 934	1 421 288
	Millet	880 408	807 044
	Sorghum	238 833	270 168
	Goats	NA	6 205 145
	Vegetables	48 807	209 751

NA: not applicable, Source (FAO, 2020).

## Conclusions and policy implications

The priority value chains have been selected through a participatory approach for their high current and future resilience to climate change and variability, their inclusiveness (involvement of poor, women, youth) and the high percentage of people engaged into them. The prioritized VCs covered agriculture in its broader sense including crops, livestock and forestry.

- Millet is a VC which is common to all the three countries. It is with sorghum the main staple and climate-smart crop in the Sahel as it requires less water (drought tolerant) and it is adapted to poor soils.
- Rice, cowpea, groundnut, and vegetables are positioning as cash crops with an increasingly growing demand in all the three countries.
- Livestock (goats, sheep and cattle) helps on family income, asset savings, agricultural diversification and intensification in the Sahel.
- Rice, cowpea, groundnut, vegetables, NTFP, goat, sheep are VCs which involve many women and youth. Therefore, they can contribute to empower women and youth.
- In view of their specific roles as described above (food supply, income, inclusiveness), the selected VCs deserve to be promoted as potentially climate-smart to increase the livelihood resilience of the communities in the Sahel.
- International (ICRISAT, ILRI, IITA, ICRAF) and national agricultural research systems (ISRA, IER, INRAN) have developed numerous climate-smart technologies and practices that can be used to develop climate-smart VCs in Mali, Niger and Senegal.

## Further Reading

- Ouédraogo M, Jaquet S, Sall M. 2020. Projet UE-FIDA « Développement de chaînes de valeur et de paysages intelligents face au climat pour accroître la résilience des moyens de subsistance en Afrique de l'Ouest » Rapport d'activité : Atelier des acteurs pour le développement de profil de risque climatique de Kaffrine. CCAFS workshop report. Dakar, Senegal:

CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) <https://hdl.handle.net/10568/111016>

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## About CCAFS Info Notes

The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) is led by the International Center for Tropical Agriculture (CIAT). CCAFS brings together some of the world's best researchers in agricultural science, development research, climate science and Earth System science, to identify and address the most important interactions, synergies and tradeoffs between climate change, agriculture and food security. Visit us online at <https://ccafs.cgiar.org>.

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