INITIATIVE ON
West and Central African Food Systems Transformation

Transforming Agrifood Systems in West and Central Africa Initiative

(TAFS-WCA)

VALUE CHAIN AND MULTICROP BASELINE OF TAFS-WCA:

Case of Burundi

Africa Rice Center

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Abstract

This report presents the results of the baseline survey of the Transforming Agrifood Systems in West and Central Africa initiative (TAFS-WCA) in Burundi. Six regions of Burundi were surveyed. Data were collected using a smart tablet with the CSPro application. A total of 572 actors in agricultural production and value chain were surveyed during the baseline data collection in Burundi. These are mainly rice, beans, cassava, banana and sweet potato producers, inputs dealer, traders, processors and service providers. All data analyses were carried out with the STATA 16 software.

Out of the surveyed population, 41.61% (238) are rice producers, 10.49% (60) bean producers, 10.49% (60) cassava producers, 11.01% (63) sweet potato producers, 11.66% (99) banana producers, 12.76% (73) traders, 2.27% (13) processors and 0.70% (4) service providers. The average age of actors is 43 years old and ranges from 18 to 79 years old, and the average household size is 6 persons. About 67% of actors are male and 88% are married. In addition, 77% of the actors have received formal education and 84% have crop production has main activity. Moreover, 76 % of producers produce during the rainy season, 9% during dry season while 15% in both seasons.

With regard to climate change information's, about 9% of producers have access to forecasts of extreme climatic events (drought, flood, strong wind, etc.) and 8% to information on seasonal forecasts (weather for the following 2-3 months).

In relation to food security and the poverty index, preliminary results show that the vast majority of actors have an acceptable level of dietary diversity, meal frequency and nutritional importance of the food groups consumed; and according to the poverty index, the rate of poor actors is 56%.

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Major abbreviations and acronyms

AfricaRice	:	Africa Rice Center
CGIAR	:	Consortium of International Agricultural Research Centers
FAOSTAT	:	Food and Agriculture Organization Corporate Statistical Database
GDP	:	Gross Domestic Product
IPCC	:	Intergovernmental Panel on Climate Change
SDG	:	Sustainable Development Goals
TAFS-WCA		Transforming Agri-Food Systems in West and Central Africa
WFP	:	World Food Program

1. Introduction

1.1. Context

In West and Central African, agriculture contributes 30-50% to GDP and provides income and livelihoods to 70-80% of the population[1]. Out of the 65% of the labor force in the rural areas, 42% of the women practice smallholder farming. Agriculture can contribute towards major continental priorities, such as eradicating poverty and hunger, boosting intra-Africa trade and investments, rapid industrialization and economic diversification, jobs creation and shared prosperity. It provides employment for about two-thirds of the African working population and for each country contributes an average of 30 to 60% of GDP and about 30% of the value of exports[2]. Agriculture, food and nutrition security, and the livelihoods of millions of people are affected by climate change (Yadav *et al.*, 2019). Climate Change is likely to trigger food insecurity, human migration, economic, and social depression, environmental and political crisis, thereby affecting development (IPCC 2007; World Bank 2010). Innovations, practices, or services that i) increase or sustain productivity over time, ii) boost farmers' climate resilience, and iii) reduce greenhouse gas emissions are considered climate-smart (Andrieu *et al.*, 2017). About 552 million people live in West and Central Africa (WCA), the majority in rural areas[1], but with some of the highest growth rates of urbanization in the world (>4% annually). Economic activity in 2020 contracted by 2.1%, due to a weaker external environment and measures to contain the COVID-19 pandemic and the climate crisis resulting in, high unemployment rates (AfDB, 2021).

To reduce the importation bills and to achieve Sustainable Development Goals (SDG) in West and Central Africa, improved technologies including high yielding and climate smart varieties, good agronomic and postharvest practices were developed and disseminated by CGIAR centers and other research and development center. The objective of the One CGIAR focused mainly on three action areas, namely: (i) Genetic Innovation, (ii) Resilient Agri-Food Systems, and (iii) Systems Transformation. Each of these action areas houses is home for a number of global theme-based Initiatives. There are six regional integrated initiatives, which are affiliated with the Resilient Agri-Food Systems action area. Among the six initiatives, we have the One CGIAR Regional Integrated Initiative for West and Central Africa (WCA). By focusing primarily on food and nutrition security and making agrifood systems more climate adapted,

[1] https://www.ifad.org/nl/web/operations/regions/wca
[2] https://www.britannica.com/place/Africa/Fruits-and-vegetables

the Initiative will make contributions to the five Impact Areas of the One CGIAR. Access to quality, nutrient-dense seed and climate-smart good agricultural practices (GAP) and reduced post-harvest losses will have a positive impact on food and nutrition and health security.

The objectives of the TAFS-WCA initiatives are: to develop a sustainable agro-food system; to overcome social barriers to accessing innovations; and to scaling of innovations. The five axes of the program were: (i) Making food systems more nutritious, safe and resilient to climate change; (ii) Promoting digitalized information systems in bundling innovations at landscape level; (iii) Develop a set of participatory tools for inclusive landscape management and citizen science for one health; (iv) Addressing social barriers to create equality for women and youth doing business in value chains; (v) Scale Innovations with proven impact in the region. The TAFS-WCA initiative is regional and aims to eventually benefit the 22 countries of the region. The start-up phase includes six countries, three of which are from Central Africa (DRC, Rwanda and Burundi) and three others from West Africa (Côte d'Ivoire, Ghana and Nigeria). Before the implementation of projects in West and Central Africa, a baseline survey is important in all target countries. Indeed, after the stakeholder's engagement and launch workshop in Abidjan (21-22 June, 2022), the baseline survey will aim to collect reference values on the impact indicators of the project. This document presents the methodology of the baseline survey of the TAFS-WCA initiative that will be conducted in Burundi.

1.2.Objectives of baseline survey

The baseline study aims to collect reliable, accurate and sufficient reference values on the impact indicators that can be drawn upon to undertake impact studies with the view to evaluating the changes induced by the One CGIAR regional integrated. Specifically, the baseline study aims:

1. To collect robust socio-economic and geographic data on producers and post-harvest actors in Burundi;
2. To estimate the baseline values of outcomes and impact indicators;
3. To contribute to the monitoring and evaluation of the outcome;
4. And to contribute to ex-post impact assessment of the TAFS-WCA initiative.

2. Methodology

2.1. Study area and sample size

The study was conducted in Burundi. In this country, the TAFS-WCA initiative's baseline survey has been conducted during the month of February to March 2023. The baseline data were collected in six areas in Burundi, namely Bubanza, Cibitoke, Gitega, Kirundo, Makamba and Rutana in Burundi (Figure 1).

Prior to the data collection, the questionnaire was designed and automated on tablets. A total of 18 enumerators (03 women and 15 men) were trained and used for the study data collection.

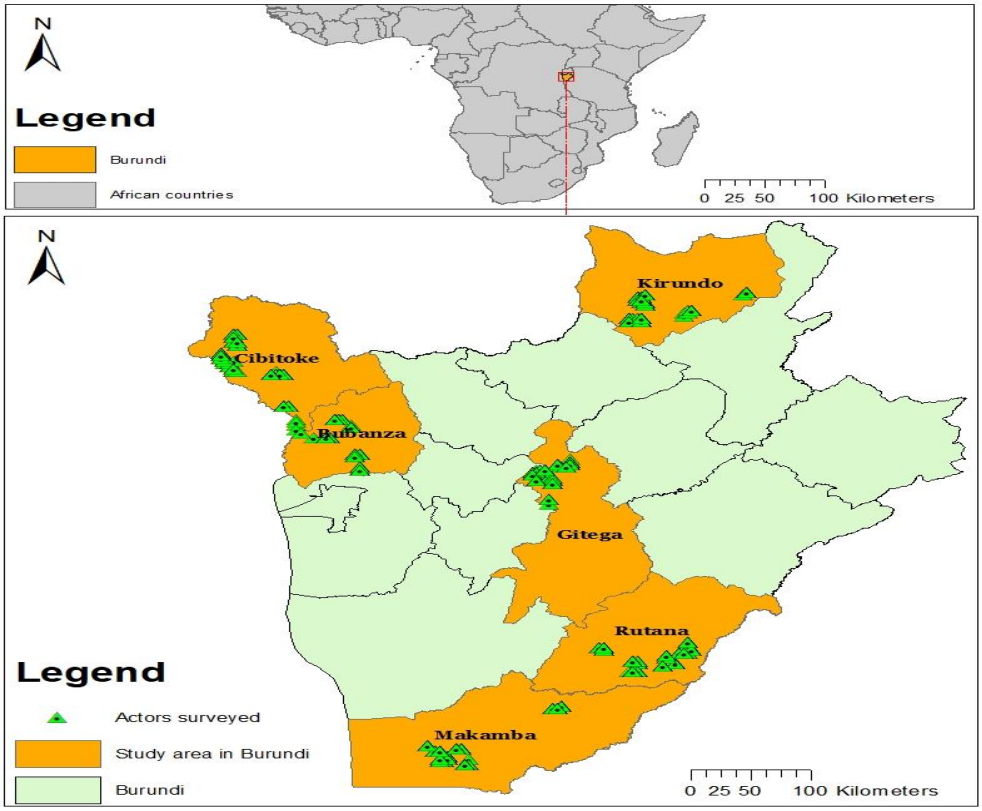

Figure 1: Map of survey

In order to conduct the baseline survey, an e-registration of farmers was first conducted, and the registered farmers then were used as the sampling frame for the baseline study. The e-registration in Burundi mainly focuses on five crops: rice, cassava, sweet potato, banana, and bean.

Initially, 1,751 actors were registered during the e-registration in Burundi. Then, 572 actors were randomly selected to be interviewed including 20 farmers and 4 other actors per village.

2.2.Data collection and quality assurance procedure

Data were collected from sampled households by means of the CSPro application using android tablets. The data collected for this study include: (i) socio-economic and household characteristics; (ii) plots information; (iii) varieties information; (iv) information on agricultural equipment and methods; (v) household food security and welfare information, and (vi) climate change information.

To ensure the quality of data, a supervision team, closely monitored field data collection and provided support to enumerators in the field. Supervisors could therefore quickly address any challenge faced by enumerators. Any mistakes were reported to enumerators for immediate action and correction while still on the field. The field arrangement, in addition to different "filter and skip" rules implemented in the questionnaire, helped ensure a high degree of quality for the primary data collected. The data used were collected from actors' households during 2023.

2.3.Data analysis

The tools used to analyze the data collected were descriptive statistics. Descriptive statistics (i.e., average, minimum, maximum and standard deviation) were calculated for socioeconomic characteristics of producer in the hubs.

The knowledge rates of agricultural technologies and methods were estimated as the percentage of the sample that reported being aware of the technologies, while the use or adoption rates are the percentage of those that accessed the technologies among the total sample.

The food-security analysis was performed by using food consumption score (FCS) developed by the World Food Programme (WFP, 2009). It is an indicator reflecting on food availability, food accessibility and food consumption at the household level. The FCS is therefore a good indicator to evaluate the food security situation of a household. According to the World Food Programme (WFP, 2009), a household has an acceptable, a middle and a poor level of consumption if FCS>35, 21<FCS<35 and FCS<21 respectively.

Additionally, we used the Household Food Insecurity Access Scale (HFIAS) developed by Coates et al. (2007). HFIAS score is a continuous measure of the degree of food insecurity by evaluating responses to a set of standard questions representative of three universal domains of food access in terms of a household's anxiety and uncertainty about (i) inadequate food supply;

(ii) insufficient quality; and (iii) insufficient food intake within a 30-day recall period during the lean period (Coates et al., 2007). The HFIAS score was calculated for each household by adding the coded frequency for each of the 9 occurrence questions relating to household-level food access. Each of the 9 questions has a maximum score of 3 and when summed have and a maximum of 27 and a minimum score of 0. The higher the score of the household, the more food insecurity is experienced, and the lower the score, the household is more food secure.

3. Results

The TAFS-WCA baseline data collection were collected from 572 actors in Bubanza, Cibitoke, Gitega, Kirundo, Makamba and Rutana regions in Burundi. Actors involved in the baseline data collection are producers of rice, cassava, sweet potato, banana, and bean, inputs dealer, traders, processors and service providers.

Among the actors interwieded, 41.61% (238) are rice producers, 10.49% (60) are bean producers, 10.49% (60) are cassava producers, 11.01% (63) are sweet potato producers, 11.66% (99) are banana producers, 12.76% (73) are traders, 2.27% (13) are processors and 0.70% (4) are service providers (Table 1).

Table 1: Distribution of actors

Actors	Actors	Frequency
Producers	Rice	238 (41.61)
	Bean	60 (10.49)
	Cassava	60 (10.49)
	Sweet potato	63 (11.01)
	Banana	61 (10.66)
Other actors	Trader	73 12.76)
	Processors	13 (2.27)
	Service provider	4 (0.70)
Total		**572**

() percentage

3.1.Socio-economic characteristics of actors

3.1.1. Gender, marital status, educational level, household size and age of actors

Majority of the study respondents are men (with 188 women and 384 men). The average age of farmers is 43 years. This shows that the household's heads were relatively young. In addition, the difference between the average age of male and female was not statistically significant (Table 2). The average household size is 6 persons and the number of years of

experience in the activity is 12 years in the whole population, with a statistical difference of about 1 year more for women.

The distribution of the educational status of the respondents showed that the majority of actors (76.75%) have formal education, up to around 1.22% have university education, around 8.74% have senior secondary school, 11.89% have junior secondary school and 54.90% have primary education level (Table 2). The vast majority of actors are married (87.59%), but only 77.13% of female actors are married. The majority of male actors (83.74%) have agriculture as their main activity, while 86.70% for the women.

Table 2: Household characteristics of farmers by actors and gender

Variables		Producers (482)			Other actors (90)			Overall (572)		
		Female (n=162)	Male (n=320)	Overall (n= 482)	Female (n=26)	Male (n=64)	Overall (n= 90)	Female (n=188)	Male (n=384)	Overall (n= 572)
Age	Mean	42.84	44.75	44.11	34.50	34.92	34.80	41.69	43.11	42.64
	Median	41.00	43.00	42.00	33.00	33.50	33.00	40.00	42.00	41.00
	Std. Dev	12.92	12.69	12.78	8.79	11.12	10.45	12.74	12.96	12.89
Number of years of experience (year)	Mean	20.28	19.53	19.78	10.50	9.17	9.56	18.93	17.80	18.17
	Median	19.50	18.00	18.00	9.00	5.00	5.00	16.00	15.00	15.00
	Std. Dev	13.47	13.87	13.72	7.51	9.95	9.29	13.23	13.83	13.64
Household size	Mean	6.17	6.62	6.47	6.50	5.42	5.73	6.22	6.42	6.35
	Median	6.00	7.00	6.00	6.00	5.00	5.50	6.00	6.00	6.00
	Std. Dev	2.58	2.58	2.59	2.45	2.59	2.58	2.56	2.62	2.60
Formal education (%)	None	33.33	21.25	25.31	11.54	12.50	12.22	30.32	19.79	23.25
	Primary	56.17	54.37	54.98	50.00	56.25	54.44	55.32	54.69	54.90
	Junior high school	6.79	11.88	10.17	26.92	18.75	21.11	9.57	13.02	11.89
	Senior high school	3.70	10.31	8.09	11.54	12.50	12.22	4.79	10.68	8.74
	University	0.00	2.19	1.45	-	-	-	0.00	1.82	1.22
Marital status (%)	Married	76.54	94.69	88.59	80.77	82.81	82.22	77.13	92.71	87.59
	Single	3.09	5.00	4.36	3.85	15.63	12.22	3.19	6.77	5.59
	Widow	17.28	0.00	5.81	11.54	0.00	3.33	16.49	0.00	5.42
	Divorced	3.09	0.31	1.24	3.85	1.56	2.22	3.19	0.52	1.40
Agriculture as main activity (%)		100.00	98.13	98.76	3.85	3.13	3.33	86.70	82.29	83.74
Growing season (%)	Rainy season	74.69	75.94	75.52	74.69	75.94	75.52	74.69	75.94	75.52
	Dry season	12.35	7.19	8.92	12.35	7.19	8.92	12.35	7.19	8.92
	Both season	12.96	16.88	15.56	12.96	16.88	15.56	12.96	16.88	15.56

3.1.2. Institutional characteristics of actors

- **Access to credit, extension service and market information**

Table 3 indicates that a majority of the actors have access to the selling price of crop on the market (72.87% for female and 73.44% of Male). The results also show that a low proportion (10.11% of female and 15.36% of male) of actors have access to production credit. However, women have less access to credit than men. In addition, only 20% of farmers have access to extension services. This can be explained by the fact that the villages surveyed in Burundi are not closer to extension services (on average 9.47 km) (Table 4). It should also be noted that less than half of farmers have the news information's about the technologies developed (22%). However, many of them (57.26%) participate in training on these new technologies developed to increase the production. On the other hand, 27.97% of the actors have information on new rice varieties.

Table 3: Institutional characterizes of farmers by country and gender

		Producers (482)			Other actors (90)			Overall (572)		
		Female (n=162)	Male (n=320)	Overall (n= 482)	Female (n=26)	Male (n=64)	Overall (n= 90)	Female (n=188)	Male (n=384)	Overall (n= 572)
Access to credit for production (%)		10.49	17.50	15.15	7.69	4.69	5.56	10.11	15.36	13.64
Information on new crop varieties (%)		21.60	34.06	29.88	23.08	15.63	17.78	21.81	30.99	27.97
Information on new technologies developed (%)		18.52	26.56	23.86	15.38	7.81	10.00	18.09	23.44	21.68
Participation in training on new technologies developed (%)		60.00	58.82	59.13	0.00	60.00	33.33	52.94	58.89	57.26
Access to the selling price of crops on the market (%)		72.84	72.50	72.61	73.08	78.13	76.67	72.87	73.44	73.25
Contact with structure or organization (%)		34.57	35.94	35.48	19.23	21.88	21.11	32.45	33.59	33.22
Contact with extension service (%)		22.84	24.06	23.65	-	-	-	19.68	20.05	19.93
Distance between the village and the extension service (Km)	Mean	9.64	4.75	6.39	5.38	33.99	25.73	9.05	9.62	9.43
	Median	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
	Std. Dev	78.31	7.49	45.77	9.14	174.71	147.65	72.75	72.02	72.20
Distance between the village and the nearest input dealer (Km)	Mean	9.85	5.28	6.81	2.92	35.04	25.76	8.89	10.24	9.80
	Median	2.00	3.00	3.00	2.00	2.00	2.00	2.00	3.00	3.00
	Std. Dev	78.29	7.00	45.71	2.41	174.57	147.61	72.69	71.95	72.13
Distance between the village and the nearest mechanical service provider (Km)	Mean	151.72	175.87	167.75	40.62	174.06	135.51	136.35	175.57	162.68
	Median	3.00	4.00	4.00	2.00	3.00	2.00	3.00	4.00	3.00
	Std. Dev	354.48	375.64	368.47	195.48	378.80	340.59	338.78	375.67	364.13
Distance between the village and the nearest periodical market (Km)	Mean	15.93	3.56	7.72	2.06	2.81	2.60	14.01	3.43	6.91
	Median	2.00	2.00	2.00	1.00	2.00	1.00	2.00	2.00	2.00
	Std. Dev	110.31	4.05	64.17	1.82	2.98	2.71	102.47	3.90	58.94

3.1.3. Gender and decision-making in the household

In terms of decision-making in the household, Figure 2 shows that decisions in the household rest with the husband. Indeed, 50% of decisions in the household are taken jointly but the husband dominates the decision-making. This shows that women did not have a great deal of responsibility in decision-making within the household.

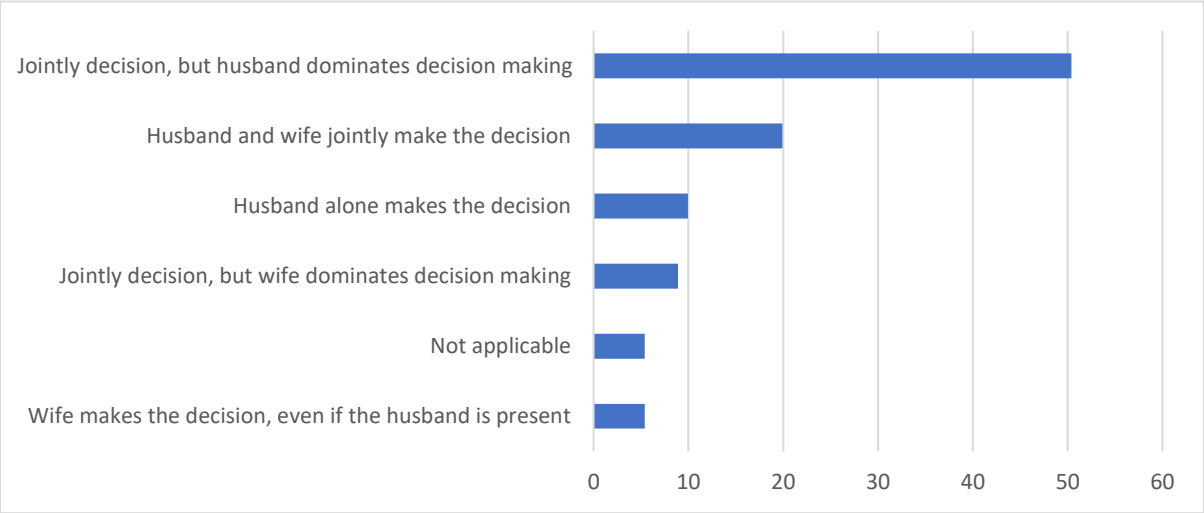

Figure 2: Decision-making in the household

3.2.Knowledge, use of agricultural equipment and methods

3.2.1. Knowledge and use of agricultural equipment

This subsection presents information on agricultural equipment and methods. The information covers knowledge and use of equipment and methods in production systems. In Burundi the main equipment known is the tractor (35.68%) but still with a low rate of use (1.16%) (Table 4). In addition to the tractor, the improved storage bag (double) seeds are one of the best known and used technologies in Burundi, with about 19.02% awareness and 18.48% use.

Table 4: Knowledge and use of agricultural equipment for production activities by gender

Equipment	Knowledge (%)			Use at least once (%)		
	Female	Male	Overall	Female	Male	Overall
Tractor	29.63	38.75	35.68	0.00	1.61	1.16
Motorcycle	1.23	5.31	3.94	0.00	5.88	5.26
Mechanical transplant	1.85	0.63	1.04	0.00	0.00	0.00
Mechanical weeders	0.00	0.00	0.00	0.00	0.00	0.00
Mechanical seeders	0.00	0.63	0.41	0.00	0.00	0.00
Mechanical Salmer (Circular Binette)	0.00	0.31	0.21	0.00	0.00	0.00
Filet (bird struggle)	2.47	2.19	2.28	0.00	14.29	9.09
Mini combine harvester	0.00	0.00	0.00	0.00	0.00	0.00
ASI thresher	0.00	0.31	0.21	0.00	0.00	0.00
RiceAdvice	0.00	0.00	0.00	0.00	0.00	0.00
GEM equipment	0.00	0.00	0.00	0.00	0.00	0.00
Video on the control of the striga	0.00	0.31	0.21	0.00	0.00	0.00
Rice-other crop integration system	0.53	0.52	0.52	0.00	100.00	66.67
Improved storage bag (double) seeds	23.46	16.88	19.09	21.05	16.67	18.48

3.2.2. Knowledge and use of agricultural methods

In terms of knowledge and use of agricultural methods, the main method known and used in Burundi is use of fertilizers, with 55.60% and 92.91% respectively for knowledge and use (Table 5). The other methods observed are transplantation method (54.15%) and crop rotation method (93.344%) in Burundi.

Table 5: Knowledge and use of agricultural methods for production activities by gender

Equipment	Knowledge (%)			Use at least once (%)		
	Female	Male	Overall	Female	Male	Overall
Cropping calendar construction	20.37	17.81	18.67	96.97	87.72	91.11
Alternate wetting and drying	3.70	6.56	5.60	100.00	80.95	85.19
Mulching in the field	7.41	11.56	10.17	83.33	86.49	85.71
Smart Valley / Sawah (Small and Great Dams)	11.11	6.88	8.30	16.67	31.82	25.00
Alternation of dry and wet irrigation phases	4.94	10.63	8.71	75.00	76.47	76.19
Drip irrigation	1.85	1.56	1.66	100.00	60.00	75.00
Mechanical levelling	1.23	5.31	3.94	100.00	88.24	89.47
Row sowing	37.65	28.44	31.54	85.25	89.01	87.50
Transplant	45.06	58.75	54.15	98.63	89.89	92.34
Use of fertilizers	45.68	60.62	55.60	90.54	93.81	92.91
System of Rice Intensification	4.32	15.31	11.62	85.71	93.88	92.86
Livestock diversity	5.56	8.44	7.47	66.67	66.67	66.67
Agroforestry	12.96	11.25	11.83	85.71	86.11	85.96
Cover crop	3.09	3.75	3.53	100.00	75.00	82.35
Crop rotation	29.63	39.06	35.89	87.50	87.20	87.28
Other improved method	0.00	0.94	0.62	-	66.67	66.67

3.3.Perception of climate change

This section presents producers' perceptions of climate change. Figure 3 shows that less than 10% of Burundian producers have less access to climate information. With respect to access to climate information services, Figure 3 also shows that about 9% of producers have access to forecasts of pest or disease outbreak and 8% to information on seasonal forecasts (weather for the following 2-3 months). The results also indicate that the producers perceive the indicators of climate change (Figure 4). The main known indicators are: decrease in soil fertility (39%), late rains (33%), and decrease in yield (30%).

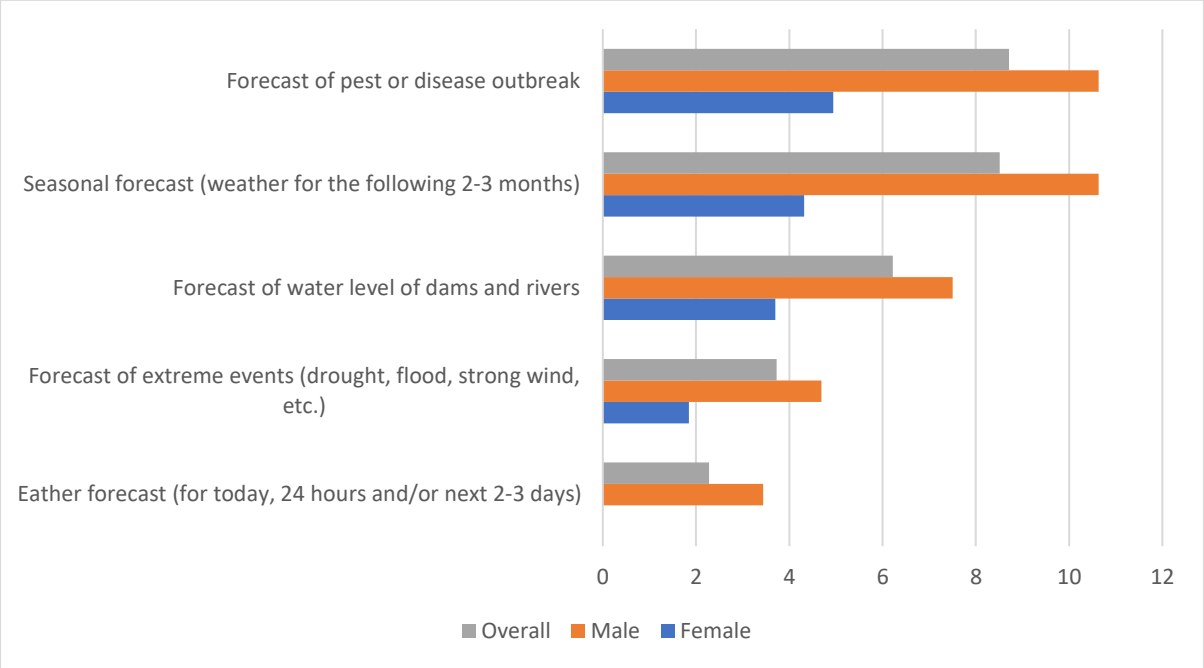

Figure 3: Access of producers to climate information services

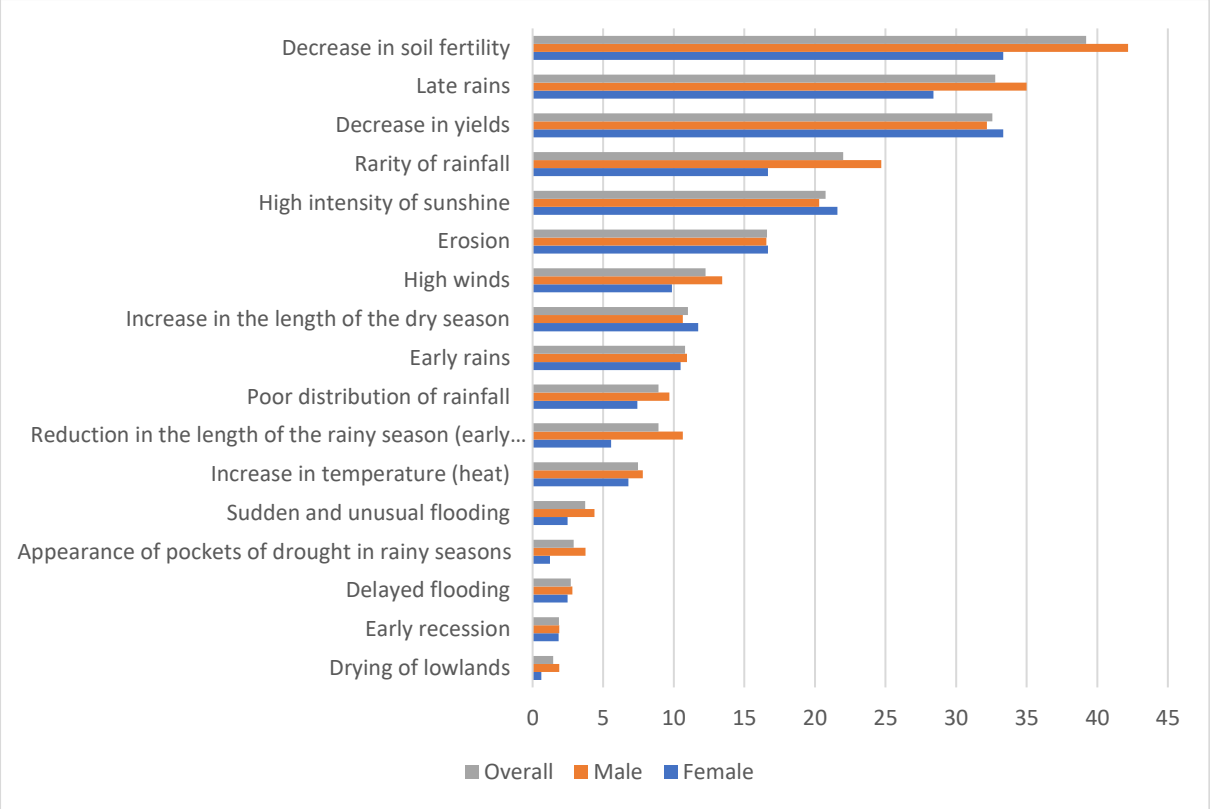

Figure 4: Knowledge of producers on climate change indicators

3.4.Yield gap

The average yield of crops ranges from 1.06 t ha^{-1} and 4.27 t ha^{-1} for bean and rice, respectively (Table 6). In addition, the highest and lowest yield gap are observed for bean (82%) and for sweet potato (64%), respectively. This shows that producers are not yet reaching their better level of yield.

Table 6: Sample mean, attainable (top decile) mean and gaps in yield

		Rice	Bean	Cassava	Sweet potato	Banana
Yield (t/ha)	Mean	4.27	1.06	2.54	2.98	3.77
	Median	3.50	0.56	2.00	2.40	3.16
	Std. Dev	4.74	1.64	2.16	2.32	3.51
Attainable yield (Top decile)		12.88	5.76	7.67	8.27	12.14
Yield gap		8.61	4.70	5.13	5.29	8.37
Gap (%)		66.85	81.59	66.88	63.94	68.93

3.5.Income, expenses, poverty ratio and food security

3.5.1. Income, expense and poverty rate

This section presents income and expenditure estimates for the actors surveyed.

In terms of income, the analysis shows that men's total annual income per capita is higher than women's in the two groups actors (Table 7). In fact, women earn about US$318 and US$168 less than men among producers and other actors, respectively, and these differences are statistically significant.

In terms of total expenditure per capita, we find that between actor’s men spend more than women (Table 7), the difference is around US$297 for men.

In terms of poverty rates, the poverty index for the population remains relatively high (56%) (Table 7). In the producer group, 47% of women are poor and 51% of men are poor. However, the poverty rate at the level of post-harvest actors is not statically different between men and women. In addition, other actors have the lowest poverty rates (34%).

Table 7: Income, expenses and poverty rate by actor and gender

Variables		Producers (482)			Other actors (90)			Overall (572)		
		Female (n=162)	Male (n=320)	Overall (n= 482)	Female (n=26)	Male (n=64)	Overall (n= 90)	Female (n=188)	Male (n=384)	Overall (n= 572)
Annual agricultural income per capita ($US)	Mean	363.16	631.48	541.30	53.34	154.56	125.32	320.31	551.99	475.84
	Median	132.59	280.48	226.20	0.00	9.74	0.00	110.13	235.33	180.29
	Std. Dev	902.16	1207.59	1120.56	116.29	291.70	257.22	845.01	1122.62	1044.53
Annual non-agricultural income per capita ($US)	Mean	28.68	78.82	61.97	110.73	177.70	158.35	40.03	95.30	77.13
	Median	0.00	0.00	0.00	39.38	0.00	0.00	0.00	0.00	0.00
	Std. Dev	146.22	690.32	569.00	168.86	388.74	340.46	151.74	650.48	540.40
Total annual income per capita ($US)	Mean	391.84	710.30	603.26	164.06	332.25	283.67	360.34	647.29	552.98
	Median	141.58	292.86	243.22	70.96	130.36	105.50	132.94	271.21	222.45
	Std. Dev	943.99	1530.99	1369.47	217.00	563.29	493.66	883.02	1422.80	1277.26
Per capita food expenditure ($US)	Mean	149.21	177.12	167.74	269.19	210.31	227.32	165.81	182.65	177.12
	Median	88.40	102.66	98.27	115.25	148.03	138.91	91.63	106.84	101.60
	Std. Dev	172.55	235.88	216.88	293.76	212.50	238.59	197.22	232.21	221.29
Per capita non-food Expenditure ($US)	Mean	82.95	193.73	156.50	204.84	1311.75	991.98	99.81	380.07	287.96
	Median	36.73	54.78	48.08	141.80	136.46	136.46	41.71	66.90	54.69
	Std. Dev	334.65	1384.24	1144.99	188.12	7835.22	6612.17	320.83	3445.03	2830.50
Per capita total expenditure ($US)	Mean	232.17	370.85	324.24	474.03	1522.06	1219.30	265.62	562.72	465.07
	Median	137.72	171.29	168.59	440.28	342.06	366.40	168.59	192.73	180.86
	Std. Dev	450.65	1465.01	1222.98	381.06	7826.46	6605.17	448.63	3471.00	2857.72
Poverty headcount ratio (%)		62.96	58.44	59.96	34.62	34.38	34.44	59.04	54.43	55.94

3.5.2. *Food security analysis*

In terms of food security, Table 8 shows that the food consumption score is relatively high in the sample. The average score is 48 and 52 respectively for females and males, which could mean that households are in acceptable food situations (>35 acceptable levels). This means that the vast majority of farmers' households in both countries have an acceptable level of dietary diversity, meal frequency, and nutritional importance of the food groups consumed.

Interpreting sample statistics of the HFIAS is founded on observing the proportion of households that responded ‘never’ to all sub-domains (Coates et al., 2007). Table 9 shows that in our case the proportion of ‘never’ responses in the first sub-domain is about 45% and 69% for producers and others actors, respectively, implying that 55% of the producers and 31% of the other actors are worried about fulfilling their food needs. Similarly, 63% of producers and 42% of other actors have insufficient food quality (unweighted mean of three sub-domains in domain II). In addition, for the sub-domains III, Table 9 shows that 39% and 26% have insufficient food quantity intake due to physical unavailability (domain III) for producers and others actors, respectively. However, the average HFIAS score for the sample is 6.73 which indicates that more than half of the households are food secure because the higher the score, the more food insecure a household becomes.

Table 8: Food consumption score by actor and gender

Variables		Producers (482)			Other actors (90)			Producers (572)		
		Female (n=162)	Male (n=320)	Overall (n= 482)	Female (n=26)	Male (n=64)	Overall (n= 90)	Female (n=188)	Male (n=384)	Overall (n= 572)
Food consomption score	Mean	46.82	50.65	49.36	55.27	56.63	56.24	47.99	51.65	50.44
	Median	46.00	49.50	47.75	51.00	52.25	52.00	46.50	50.00	48.50
	Std. Dev	15.55	15.07	15.33	15.19	16.01	15.70	15.74	15.37	15.57

Table 9: Household Food Insecurity Access Scale (HFIAS) by actor and gender

		Producers (482)			Other actors (90)			Producers (572)		
		Female (n=162)	Male (n=320)	Overall (n= 482)	Female (n=26)	Male (n=64)	Overall (n= 90)	Female (n=188)	Male (n=384)	Overall (n= 572)
I. Anxiety and uncertainty about household food supply										
Did you worry that your household would not have enough food?		35.19	50.31	45.23	65.38	70.31	68.89	39.36	53.65	48.95
II. Insufficient quality (includes food variety and preferences)										
Were you or any household member not able to eat the kind of foods you preferred because of lack of resources?		29.01	43.75	38.8	50	62.5	58.89	31.91	46.88	41.96
Did you or any household member eat just a few kinds of food day after day due to lack of resources?		27.78	42.5	37.55	57.69	57.81	57.78	31.91	45.05	40.73
Did you or any household member eat food that you preferred not to eat because of a lack of resources to obtain other types of food?		27.16	40.63	36.1	57.69	57.81	57.78	31.38	43.49	39.51
III. Insufficient food intake and physical consequences										
Did you or any household member eat a smaller meal than you felt you needed because there was not enough food?		27.78	45	39.21	50	57.81	55.56	30.85	47.14	41.78
Did you or any household member eat fewer meals in a day because there was not enough food?		32.72	50.31	44.4	53.85	64.06	61.11	35.64	52.6	47.03
Did you or any household member go to sleep at night hungry because there was not enough food?		62.35	73.75	69.92	69.23	82.81	78.89	63.3	75.26	71.33
Did you or any household member go a whole day without eating anything because there was not enough food?		67.28	79.06	75.1	76.92	89.06	85.56	68.62	80.73	76.75
Did you or anyone in your household go a whole day and night without eating because there was not enough food?		71.6	81.25	78.01	88.46	90.63	90	73.94	82.81	79.9
Household Food Insecurity Access Score (HFIAS)	Mean	7.96	6.66	7.1	5.31	4.5	4.73	7.59	6.3	6.73
	Median	8	6	6	2.5	1	1	8	5	6
	Std. Dev	6.12	6.54	6.42	6.37	6.13	6.17	6.2	6.52	6.44

4. Conclusion

The purpose of the Transforming Agrifood Systems in West and Central Africa (TAFS-WCA) initiative's baseline survey was to collect reliable, accurate and sufficient reference values on the impact indicators that can be drawn upon to undertake impact studies with the view of evaluating the changes induced by the One CGIAR regional integrated initiative in target countries.

Preliminary analysis of the study shows that the majority of respondents were men. The data show that the majority of respondents have received formal education and that the survey population is relatively young. However, access to credit for production was very low in both groups.

In terms of food security, the result shows that the vast majority of farmers households in Burundi have an acceptable level of dietary diversity, meal frequency and nutritional importance of the food groups consumed. The scientific report will analyze the data with more details.

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