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Perception of producers and processors on sorghum diversity in the context of climate change in center and Northern Benin

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ABSTRACT

To promote local varieties of sorghum produced in Benin, the perception of producers and processors on sorghum diversity in the context of climate change was assessed. Three hundred eighty-six sorghum producers were interviewed. The main data collected are socio-cultural (ethnicity, place of activity) and technical (years of experience, varieties cultivated, causes of sorghum diversity and endogenous indicators of climate change). Significant differences were realised at the 5% threshold according to the Student Newman-Keuls test. The results revealed an ethnic diversity dominated by the Bariba (40,12%) in N'Dali, Yom-Lokpa (48,84%) in Djougou and (50,29%) in Ouake, Ditammari (39,31%) in Natitingou, Idaatcha (35,23%) in Dassa and Yoruba (32,09%) in Savalou. The majority of producers in the North (70%) have made sorghum, theirs main activity. The proportions of producers of local varieties compared to resilient varieties show a significant difference. The color of the grains in Dassa (50%), the compactness of the panicle in N'Dali (55%) and the grain size in Djougou (30%) which characterize the diversity of sorghum. The causes of this diversity include the environment (50%), followed by the peasant practices (40%) except in Dassa and N'Dali which record the requirements of the processors. These include grain color (>60%) and the moisture content (>50%). The effects of climate change are the cause of the productivity decrease (>50%), followed by abnormal length of seasons and excessive heat in the Center and decline in land productivity in the North. The diversity of sorghum is linked to the effets of climate change in Benin.

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INTRODUCTION

Climate change is a long-term global problem that is already affecting all regions of the Earth (GIEC, 2021). They are considered changes in climate that are attributed directly or indirectly to human activity altering the composition of global atmosphere and that are in addition to the natural variation in climate observed over comparable periods (ONU, 1992). They are caused by radiation of gas such as methane, nitrous and nitrogen oxides, chlorofluorocarbons (CFC) and especially carbon dioxide which cause global warming (GIEC, 2021). Already noticeable with a global temperature increase of 0.6°C in the years 1800, the temperature rose to 1.1°C in the years 1850 to 1900 (pre-industrial period) and could reach 1.5 °C between 2030 and 2050 (GIEC, 2021 et 2019). In this case (moving to 1.5°C), heat waves will be more numerous, hot seasons longer and cold seasons shorter. Globally, they are the result of nearly a century and a half of industrialization with the burning of ever increasing quantites of oil, gasoline, coal, the destruction of forests and certain agricultural practices (CCNUCC, 2021; UNFCCC, 2004). All of these effects are likely to lead to a loss of biodiversity around 15 to 37% by the year 2050 (IFAD, 2008). In Sub-Saharan Africa, agricultural practices and forest destruction remain additional factors (Bénoit, 2007). In Benin, the effects have been noticeable since 1960 with temperature increase of 0.4°C associated with a decrease precipitation, all marked from 1981 to 2010 as over the years 1951 to 1980 (Amoussou *et al.*, 2016; Amoussou, 2010; Totin, 2010). Thus, in addition to the causes common to West Africa, Benin faces aggravating factors such as agricultural practices (bush fires, uncontrolled use of wood resources) and the relaxation of morals in terms of standards of social conduct towards nature (Houédjissin *et al.*, 2012; Vissoh *et al.*, 2012). Several climatic risks have been recorded such as: late and heavy rains, floods, pockets of drought, excessive heat, heavy rainfall, strong winds, rising sea levels (PNUD, 2019; Agbokou *et al.*, 2014; Houédjissin *et al.*, 2012). Agricultural production, food security and biodiversity remain affected (PNUD,2019; Kayodé, 2018; Ayyogari *et al.*, 2014; Agbokou *et al.*, 2014; Houédjissin *et al.*, 2012). For more than a decade, biodiversity loss as a consequence of climate change has been observed in Burkina-Faso (Bénoît, 2007), Cameroun (Piebeng et *al.*, 2023) and Benin (Houédjissin *et al.*, 2012; IFAD, 2008). Cereal biodiversity has been particularly affected with a forecast drop in EVDT maize variety yields of 16.7% and 8.9% respectively by 2030 and 2050 years (PNUD, 2019). The productivity of local sorghum varieties, espacially in the north. For example, Kayodé (2018) reported that most of the sorghum producers and processors have abandoned certain local varieties, even though they were considered suitable for the production of traditional foods, in favor of resilient varieties. Indeed, local cereals such as sorghum are used in several culinary preparations in Benin and play a vital role in food security (Cruz *et al.*, 2005). Local sorghum varieties are attached to the culture and highly preferred in the formulation of infant foods as an important source of energy (50% to 55% of total energy intake) (Alohoutade *et al.*, 2024; Hounhouigan, 2010). Sorghum diversity (biochemical composition, color, shape, size, 1000 grain weight, panicle compactness, variety typology) is highly dependent on agricultural practices and the environment (Ndiayé *et al.*, 2018; Brocke *et al.*, 2004). The reasons for the abandonment of local sorghum varieties in the context of climate change remain very little documented even if, within the framework of adaptation strategies to the effects of climate change, Kayodé (2018) reported that this practice would be linked to the effects of climate change. This hypothesis, however, is not in agreement with the point of view of 60% of sorghum producers and processors. Similarly, the abandonment of local sorghum varieties has led to significant changes in dietary practices as reported by sorghum processors and remain little known scientifically. Thus, the present study carried out through a survey and data from the literature aims to evaluate the perception of producers and processors on the diversity of sorghum in the context of climate change in Center and Northern Benin.

MATERIAL AND METHODS

The methodological approach used in this study includes a documentary research phase, an exploratory study phase and a survey phase.

Study zone

The documentary research consisted of reading and summarizing posters, articles, dissertations, theses, communications and official scientific information available on sorghum in relation to the effects of climate change through websites, scientific journals, online databases, university libraries, research centers and Territorial Agencies for Agricultural Development (TAAD) of Benin. Thus, two municipalities were selected in Benin Center, namely: Dassa-Zoume and Savalou and four municipalities in Northern Benin, namely: N'Dali, Djougou, Ouake and Natitingou. The municipality of Natitingou is part of TAAD pole 3 while the other municipalities are part of TAAD pole 4.

The municipalities of Dassa-Zoume and Natitingou were areas for the introduction of resilient sorghum varieties as adaptation measures to the effects of climate change within the farmework of PROMISO-2 (Strengthening West African farmers' and researchers' capacity to jointly adapt new pearl millet and sorghum varieties and crop production innovations) funded by the European Union through IFAD (International Funds for Agricultural Development) (Kayodé, 2011).

The municipalities of Savalou and Ouake were areas for the introduction and popularization of resilient varieties within the farmework of PANA-1 (Integrated adaptation program to combat the adverse effects of climate change on agricultural production and food security) funded by UNDP (United Nations Development Program) (Kayodé, 2014). On the other hand, the municipalities of N'Dali and Djougou were chosen as areas which have not been subjected to the introduction of resilient varieties. Local varieties of sorghum could be preserved there.

Sampling and collection of data

As a prelude to the survey phase, an exploratory study was carried out in the different municipalities chosen in order to set the sample size of producers to be interviewed. This exploratory study was carried out on 30 people chosen randomly in each municipality and made it possible, following a Bernoulli test (Are-you sorghum producer? Yes or no), to set the p value (probability of success).

$$p\text{-value}=\frac{\text{Number of Yes}}{30}$$

With p-value in each municipality (Table 1), average p-value is 0.144 and the sample size was set by municipality following the formula below:

$N= [U^2_{1-\alpha/2} \times p(1-p)]/d^2$

α= 5%, U=1.96 et 1%<d<15% therefore d = 8% (average value).

Table 1. *p*-value (probability of success) by municipality (exploratory survey)

Municipalities	Number of yes	*p*-value
N'Dali	5	0.167
Djougou	3	0.100
Ouaké	7	0.233
Natitingou	5	0.167
Savalou	3	0.100
Dassa-Zoume	3	0.100

Thus, the average sample is 74 sorghum producers per municipality. During this survey, the year of experience and the respondent's availability to provide requested information were the inclusive criteria. The survey was carried out in the form of an individual interview guided by a well-structured investigation. The main information collected during the survey is socio-cultural (sex, ethnicity, age, place of production activity, level of education, marital status) and technical (number of experience years, the most cultivated varieties and their origin, the endogenous causes of sorghum diversity, endogenous knowledge on the sorghum diversity, endogenous indicators of climate change).

Data processing and analysis

The data collected was processed using Microsoft Excel version 2010 in the form of figures and tables. The frequency analyzes were carried out with the Sphinx software version 2010 in the form of figures. SPSS v 16.0 software was used for the analysis of variance. Table 2 below presents the number of producers actually interviewed during the survey

phase. A total of 386 producers were interviewed out of the 444 planned, representing an 86.93% participation rate in the survey (Table 2).

Table 2. Survey participation rate

Municipality	Sample size	Number of respondents interviewed	Gap	Participation rate (%)
N'Dali	74	70	-4	94.59
Djougou	74	69	-5	93.24
Ouake	74	63	-11	85.14
Natitingou	74	71	-3	95.95
Savalou	74	55	-19	74.32
Dassa-Zoume	74	58	-16	78.38
Average participation rate				86.94

RESULTS

The Table 3 below presents the socio-cultural characteristics of sorghum production activity. Sorghum producers from the Center (age <35 years) appear younger than those from the North (age>35 years). The average age of sorghum producers is higher in N'Dali (38.45 years) and lower in Dassa-Zoume (29.14 years). In the study area, the majority of sorghum producers in the North have made it their main activity (at least 70% of producers) while producers in the Center (nearly 50%) combine sorghum production with another Income-Generating Activity (IGA). The marital status of the majority of producers (over 80%), across all municipalities, revealed that they have a marital commitment. Production activity doesn't require an intellectual level, as evidence by the high proportion of illiterate producers (over 80%) recorded during the survey.

Table 3. Socio-cultural characteristics of sorghum production

Variables	Modality	N'Dali	Djougou	Ouake	Natitingou	Dassa-Zoume	Savalou
Age (years)	Age	38.45	37.45	37.10	35.45	29.14	31.81
Other income-generating activity (%)	Yes	20.17	25.08	15.5	21.48	45.50	50.22
	No	79.83	74.92	84.5	78.52	54.5	49.78
Marital status (%)	Common-law or married	89.15	90.18	92.45	94.40	80.10	80.84
	Unmarried	10.85	9.82	7.55	5.6	19.9	19.16
Education (%)	Letter	8.45	6.47	6.98	8.84	15.86	17.24
	Illiterate	91.55	93.53	93.02	91.16	84.14	82.76
Ethnic groups (%)	Baatonu/Bariba	40.12	5.92	2.24	2.03	0	0
	Yom-Lokpa	2.45	48.84	50.29	0	0	0
	Ditammari	5.82	0	0	39.31	0	0
	Natimba	0	0	0	30.25	0	0
	Fulani	17.13	13.20	25.32	0	4.96	12.55
	Dendi	24.40	31.15	20.45	3.25	0	0
	Yoruba	10.08	0.89	1.70	0	28.53	32.09
	Waama/Waaba	0	0	0	25.16	0	0
	Ife	0	0	0	0	1.15	28.04
	Mahi	0	0	0	0	30.14	26.12
	Idaatcha	0	0	0	0	35.23	1.20

Table 4. Proportion of producers growing local and/or resilient sorghum varieties

Municipality of residence	N'Dali	Djougou	Ouake	Natitingou	Dassa-Zoume	Savalou
Proportion of producers of local varieties (%)	78, 34[a]	80,14[a]	30,16[b]	30,96[b]	31,23[b]	28,31[b]
Proportion of producers of resilient varieties (%)	25,25[c]	31,28[c]	85,17[d]	87,32[d]	89,18[d]	76,47[d]

In each line, the means followed by the same alphabetical letters do not present significant differences at the 5% threshold according to the Student Newman-Keuls test.

Sorghum production is characterized by ethnic diversity in the different municipalities studied. In the municipality of N'Dali, the most represented ethnic groups are Bariba (40.12%), Dendi (24.4%) and Fulani (17.13%). The Yom-Lokpa (48.84 %), Dendi (31.15%), and Fulani (13.20%) are the most represented in the municipality of Djougou. Sorghum production in the municipality of Ouake

is mainly carried out by Yom-Lokpa (50.29%), Fulani (30.32%) and Yoruba (15.45%). Sorghum producers in the municipality of Natitingou are dominated by Ditammari (39.31%), Natimba (30.25%) and Waama (25.16%). Sorghum production in the municipalities of the Center is ensured by the Idaatcha (35.23%), Mahi (30.14%) and Yoruba (28.53%) in Dassa-Zoume and by the Yoruba (32.09%), Ife (28.04%), Mahi (26.12%) and Fulani (12.55%) in Savalou.

Fig. 1 shows the average years of experience of sorghum producers in the different study localities. This figure indicates that sorghum producers in the North have accumulated more years of experience (more than 10 years) than the producers in the Center (less than 10 years).

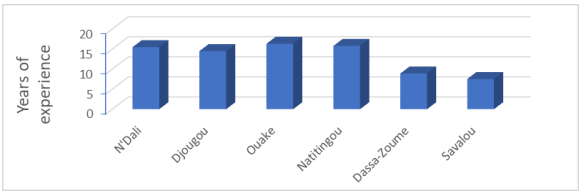

Fig. 1. Years of experience of the sorghum producers interviewed

Overall, producers in Ouake have accumulated more years in the sorghum production activity (about 16 years) while producers in Savalou have accumulated fewer years of experience (about 7 years).

Table 4 below shows the proportions of producers who cultivate local and/or resilient varieties of sorghum in the different localities. Regardless of the commercial and peasant names of local varieties compared to those who cultivate resilient varieties, there is a significant difference. Producers in the municipalities of N'Dali (78.34%) and Djougou (80.14%) mainly produce local varieties, unlike other localities.

Fig. 2 below presents the producers perceptions of sorghum diversity. According to this figure, the characteristics of sorghum diversity are very similar in the different localities. Apart from the variation in the intensity of perception, the majority of sorghum producers, all localities combined, consider the color of the grains (mentioned at more the 40%), the compactness of the panicle (mentioned at more than 35%) and the shape of the grains (mentioned at more than 15%) as characteristics of sorghum diversity. Grain color is more noticeable in Dassa-Zoume (50%) and less noticeable in Savalou and Djougou (40%). Panicle compactness is more noticeable in N'Dali (55%) but less noticeable in Dassa-Zoume (about 35%). Grain shape is most mentioned in Djougou (30%) and least mentioned in N'Dali (about 15%). Moreover, in the municipalities of N'Dali and Ouake, sorghum producers (about 10%) consider to a lesser extent the length of the sorghum production cycle as part of the characteristics of its diversity.

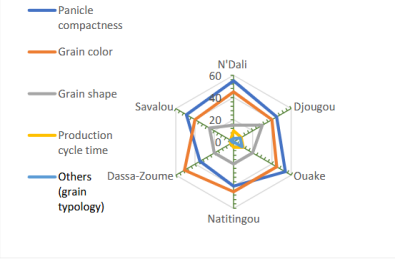

Fig. 2. Characteristics of sorghum diversity

Concerning the causes of sorghum diversity in the different localities, Fig. 3 below indicate the environment (reduction in the duration of rains and poor soils) mentioned at more than 50% in the fundamental reason in the majority of municipalities (Dassa-Zoume, Savalou, Natitingou and Ouake). This cause is followed by peasant practices (selection, exchanges and introduction of new varieties) mentioned at more than 40% except in the municipalities of Dassa-Zoume and N'Dali wich record the requirements of processors at least 40%. Furthermore, pest pressure mentioned at 40% is the fundamental cause in N'Dali.

Compared to the requirements of sorghum processors presented in Fig. 4, the survey revealed that they vary from one municipality to another. Grain color, grain hardness and moisture content are the main requirements of sorghum processors in most of

municipalities surveyed. The humidity level mentioned at more than 80% is a main requirement in the municipality of N'Dali followed by the color and hardness of the grains (mentioned at more than 70% and 60% respectively). The color of the grains mentioned at more than 60% is a main requirement in Djougou, Ouake, Natitingou and Savalou. The hardness and color of the grains (mentioned at more than 65% and 60% respectively) are the main requirements of processors in Center Benin (Dassa-Zoume and Savalou). The homogeneity of the grains is more look for in the municipalities of Northern Benin (mentioned at around 50% in N'Dali, Djougou and Ouake).

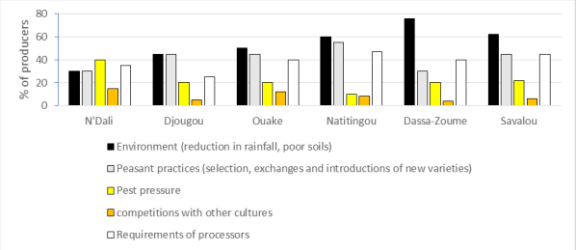

Fig. 3. Causes of sorghum diversity

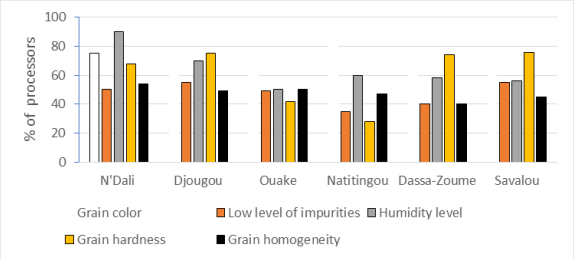

Fig. 4. Requirements of sorghum processors

The processors of Savalou, Djougou, N'Dali and Ouake also consider the importance to the low level of impurities in sorghum grains (mentioned at least 50%).

Fig. 5 below presents the producer's perception of the effects of climate change. According to this figure, the effects of climate change are noticeable from one municipality to another. The decrease in agricultural productivity is the potential effect (over 50%) in all municipalities. In Center of Benin (Dassa-Zoume and Savalou), this effect is followed by abnormal seasonal length and excessive heat at over 50%. In Northern Benin, outside the municipality of N'Dali, the decrease in land productivity represents over 40%, the second noticeable effect of climate change. High pest pressure is perceived in both Center and Northern Benin, but less so in Djougou and N'Dali.

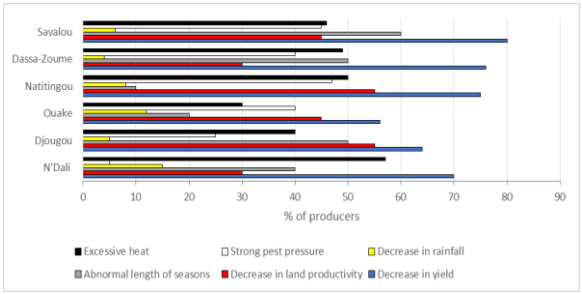

Fig. 5. Effects of climate change

DISCUSSION

Socio-cultural data reveal that sorghum producers in the center are younger (age <35 years) than those in the North. This is the evidence of producers above 35 years in the North and below 35 in the Center. Sorghum production is a main activity for most farmers in the North than in Benin Center. Most producers have a lower intellectual level compared to the higher proportion of illiterate producers (more than 80%) recorded during the survey. Generally, the mode of acquisition of knowledge in traditional food systems and the level of education can justify the age of sorghum producers from one environment to another. Alohoutadé (2015) observed in the production of "ablo", a moist steamed bread in southern Benin, that with a low level of education and a mode of acquiring knowledge based on personal experience or follow-up-imitation, the processors are more adults (age > 35 years). Indeed, with the follow-imitation or personal experience mode of acquisition and the low level of education, the performer takes more time to appropriate production or processing practices to obtain better productivity and better-quality products. Thus, it is after several years of testing that he ended up acquiring the knowledge on the job to be autonomous in the production or processing activity. In addition, these producers combine sorghum production activity with household management as indicated by the high proportion (more than 80%) of producers having a marital commitment. Which shows that sorghum production

activity plays an important role in food security. Usually, when the producer has a marital commitment, he benefits from the proximity of his partner as labor for agricultural work and draws directly from agricultural production, food products to ensure the basic needs within the household. This same observation was made through the Global Analysis of Vulnerability and Food Security (AGVSA, 2017) which indicates a positive correlation between food security and food production within households. Sorghum production is characterized by ethnic diversity dominated by the Bariba (40.12%) in N'Dali, Yom-Lokpa (48.84%) in Djougou and (50.29%) in Ouake, Ditammari (39.31%) in Natitingou, Idaatcha (35.23%) in Dassa and Yoruba (32.09%) in Savalou. This ethnic diversity is often observed in most traditional food systems where the evolution of the method of acquisition becomes a factor which favor the appropriation of the know-how to a family secret by several ethnic groups within the community.

This same observation was made by Alohoutadé (2015) in the production of "ablo" in South Benin where the acquisition of knowledge (production technology) by several ethnic groups is linked to the evolution of the mode of acquisition (from paid or unpaid learning towards monitoring-imitation and personal experience). Regarding the average years of experience of sorghum producers in the different study localitiess, those in the North have accumulated more years of experience (more than 10 years) than those in the Center (less than 10 years). This may be linked to the place of sorghum production activity in the study area. According to the survey, the northern areas where producers have accumulated more years of experience, most of these producers have made sorghum production a main activity unlike that of Benin Center.

Compared to the varieties of sorghum grown in the different localities, the results revealed a significant difference between the proportions of producers of local varieties compared to those of resilient varieties. This can be explained by the introduction by projects/programs of resilient varieties in certain areas compared to others. Indeed, as part of the adaptation measures to the effects of climate change defined in the United Nations Framework Convention on Climate Change (UNFCCC), adopted by the international community on May 9, 1992 and ratified by the Republic of Benin on June 30, 1994, the Least Developed Countries (LDC) initiated National Action Programs for Adaptation to Climate Change (PANA). The introduction of resilient varieties is one of the adaptation measures. And the municipalities of Savalou and Ouake were areas for the introduction and popularization of resilient varieties within the framework of PANA-1 (Integrated adaptation program to combat the harmful effects of climate change on agricultural production and food security) financed by UNDP (Kayodé, 2014). PANA-1 has also trained seed sowers for the popularization of certain resilient varieties which are adopted by producers for their high poroductivity compared to local varieties (Kayodé, 2018) which justifies the low proportions of producers of resilient varieties observed in N'Dali and Djougou who were not eligible for the testing of resilient varieties. These results confirm those of Kayodé (2018) which indicate that with the help of seed sowers resilient varieties are more cultivated in the municipalities of Ouake and Natitingou.

Producer's perceptions of sorghum diversity indicate that the characteristics of sorghum diversity show great similarity in different localities. The color of the grains (mentioned by more than 40%), the compactness of the panicle (mentioned by more than 35%) and the shape of the grains (mentioned by more than 15%) are the main characteristics of the diversity of sorghum. These results demonstrate that the sorghum producers interviewed have a better knowledge of sorghum diversity according to studies by Brocke *et al.* (2004). The latter had indicated characteristics of the diversity of sorghum such as color, shape, hardness, size, weight of 1000 grains, compactness of panicle and typology of varieties.

Concerning the causes of sorghum diversity in the different localities, the survey results revealed the environment (reduction in the duration of rains and poor soil) in the majority of municipalities (Dassa, Savalou, Natitingou and Ouake) followed by peasant practices (selection, exchanges and introductions of new varieties) except in the municipalities of Dassa and N'Dali which record the requirements of processors. The causes linked to the environment and peasant practices were mentioned by Brocke *et al.* (2004) in Mali and Burkina-Faso on the one hand and on the other hand by Ndiayé *et al.* (2018) in Senegal. In addition, the requirements of processors as a cause of sorghum diversity are different from the results of Piebeng *et al.* (2023), Ndiayé *et al.* (2018) and Brocke *et al.* (2004). The surveys also revealed that grain color, grain hardness and moisture content are the main requirements of sorghum processors in most municipalities. Color was identified by Kayodé (2006) as one of the agro-morphological characteristics of sorghum which influences its suitability for the production of traditional foods and therefore is one of the requirements of processors. Dansou *et al.* (2015) had also identified color as one of the attributes very preferred by consumers of "ablo", a moist steamed bread in southern Benin. Hardness and humidity as requirements of processors are important parameters which influence the suitability of grains for processing. This same analysis was made by Assogba *et al.* (2016) in the processing of cereals (corn and rice) in the form of "ablo", in South Benin.

The evaluation of producer's perceptions of the effects of climate change shows that these effects are perceptible from one municipality to another. The decrease in agricultural productivity is the potential effect in all municipalities followed by the abnormal length of seasons and excessive heat in Center of Benin (Dassa and Savalou). In North Benin, the decrease in land productivity is the second noticeable effect of climate change. Strong pest pressure is seen in the Center and in the North of Benin but less in Djougou and N'Dali. This variation in the perception of the effects of climate change may be linked to the fact that certain areas are more vulnerable than others.

This analysis agreed with that of Aho (2006). Indeed, the author had identified eight agro-ecological zones in Benin, four of which are more vulnerable to the effects of climate change. Apart from N'Dali, all the other municipalities (Natitingou, Ouake, Djougou, Dassa and Savalou) covered by this study are among the most vulnerable areas. In addition, the effects of climate change identified revealed that the producers interviewed have better knowledge of these effects. These same effects were reported by Agbokou *et al.* (2014) through the communication strategy for strengthening the adaptation capacities of actors to climate change for agricultural production and food security in Benin. The GIEC (2021) also reported the same effects as impacts of climate change and variability. Ayyogari *et al.* (2014) had reported the decrease in productivity as a consequence of climate change on vegetable cultivation. The studies of Mohammed and Misganaw (2022) also confirmed that the decrease in sorghum productivity is an effect of climate change and variability in Ethiopia. This result is consistent with the perception of populations in peripheral villages of Bouba-Ndjidda National Park in Cameroon in relation to the impact of climate change on biodiversity assessed by Piebeng *et al.* (2023).

CONCLUSION

The investigation of the perception of producers and processors on the diversity of sorghum in the context of climate change reveals ethnic diversity in sorghum production activity in Benin. Producers from the Center have accumulated fewer years of experience than producers from the North who have mainly made sorghum production theirs main activity. Producers in N'Dali and Djougou cultivate more local varieties of sorghum unlike producers in Natitingou, Ouake, Dassa and Savalou who cultivate more resilient varieties. These producers have a better perception of the diversity of sorghum (color and shape of the grains, compactness of the panicle and the duration of the production cycle).

The environment (reduction in the duration of rains, poor soils) and peasant practices (selection, exchanges and introduction of new varieties) represent the reasons for the diversity of sorghum in most localities. The requirements of processors (color and hardness of grains and humidity level) also represent the causes of the diversity of sorghum in the municipalities of Dassa and N'Dali. The survey also revealed that the decrease in agricultural productivity constitutes the most perceptible effect of climate change in all localities, followed by the abnormal length of seasons and excessive heat in Center of Benin and the decrease in land productivity in the northern part. Furthermore, the strong pressure from pests is seen as an effect of climate change in the Center as well as in the North of Benin but less in Djougou and N'Dali where local varieties of sorghum are more cultivated. It appears necessary to evaluate the technological suitability and quality of local varieties compared to resilient sorghum varieties in the different localities of Benin.

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