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Mentoring in Impact Assessment for East and West African Governments Program of the Partnership for Economic Policy (PEP)

Field experiments to promote inclusive adaptation to and recovery from the COVID-19 crisis in Benin

(PIERI 20580)

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ABSTRACT

Through an experiment to assess the impact of the intervention of the National Union of Soybean Producers (UNPS) on the knowledge and productivity of soybean production in a particular health context, we are also testing the levels of knowledge, attitudes and practices of soybean producers facing Covid 19 and analyzing the strategies developed by the producers in the face of the epidemic as well as support they believe should be prioritized. The data were collected as part of the Endline phase of the experimental study which involved 705 households in 38 villages representative of the population of farmers serviced by the UNPS intervention. Descriptive statistics show that at least 50% of men and women in soybean production are aware of the Covid-19 health crisis and consider it a reality. In response to the Covid 19 situation, the practices of wearing a mask, physical distancing as well as hand washing with soap were the most adopted by producers during the lock-down. Only 4 to 6% of respondents benefitted from external actions, initiatives or interventions to support households during the Covid-19 crisis. These actions consisted mainly of receiving a hand washing device, hydroalcoholic gel and sensitization on barrier measures from NGOs and Projects. The producers themselves only engaged in a few strategies to deal with Covid19. They reduced the area sown and the workforce employed in production. Producers reported they would particularly benefit from better market access, technical advice on farms, cash inflow at low or no interest rate. These prioritized actions reflect the perceived needs of soybean producers. They constitute a call to policy-makers to engage in actions for soybean-producing households that this population perceives as a mean to improve resilience to the Covid 19 pandemic in the Republic of Benin.

1. INTRODUCTION

Agriculture is emerging as a predominant sector for several developing countries such as Benin. In fact, agriculture in Benin remains the bedrock of economic and social development given its scope and its capacity to meet the needs of rural populations. It is the best provider of employment with more than half of the population it employs, contributes 33% to the country's Gross Domestic Product and represents more than 70% of export earnings (INSAE, 2015). This is the best means that the countries of the South could use to guarantee the life of their population (Morin Ouellet, 2011). The agricultural sector encompasses several sectors, the most popular of which are cotton, cashew, pineapple, soybeans and shea (MAEP, 2017). Unfortunately, several challenges hamper the harmonious development of these sectors. Soy is one of the sectors that is not spared from these challenges. Authors such as Morin Ouellet (2011) and Yabi (2019) have underlined various constraints, both for production and for the valuation of products on the market. For the latter, the problems relate to ecological, biological and climatic hazards and fluctuations in the price of products on the market. In addition, Thevenet (2009) supports the thesis according to which a sudden health crisis could slow down an economic activity in its functioning. The case in point is the corona virus pandemic which appeared in the areas of Asia in November 2019 and has become, by its speed of propagation, a global crisis since 2020. The effects of the COVID 19 pandemic on the agricultural sector are of various kinds. Indeed, producers need quality seeds, fertilizers, inputs and tools for cultivation and protection as well as labor. Knowing that the elderly are more exposed to the severity of COVID 19, there is therefore the risk that the agricultural sector will be faced with the problem of the availability of labor since in Benin it is the elderly (40 years and over) who do more. Several countries have imposed restrictions on the entry and exit of goods and people in their countries, which impinges on food supply chains (INS, 2020). In this context, it is likely that the levels of inequality and poverty of rural populations will deteriorate, if the crisis does not benefit from a response plan as the crisis persists (UNDP / DPS, 2020). In response to the management of COVID 19, several countries in West Africa such as Togo and Côte d'Ivoire through international institutions have developed management measures that go into limiting the spread of the pandemic. In Benin, the management of the crisis was manifested by the establishment of the cordon sanitaire, raising awareness of barrier gestures and especially the temporary closure of places of education, worship, etc. (Gonroudobou, 2020). Thus, according to the report of the United Nations Development Program (UNDP / DPS, 2020) in Benin, we note the decline in household income, the loss of jobs and the increase in household spending. It is therefore urgent that measures be taken to improve the resilience of producers in the face of the COVID 19 crisis. Faced with this, the government, with the help of technical and financial partners, has set up guarantee funds

intended to non-agricultural enterprises, the refinancing of decentralized financial structures and the access of family farmers and agricultural entrepreneurs to loans adapted to the specific needs and constraints of the agricultural sector from banks and decentralized financial systems through the National Agricultural Development Fund (FNDA). It is clear that these measures have remained inaccessible and unsuitable for the benefit of producers and typically for the benefit of soybean producers. However, actions from projects and programs have been initiated in response to the management of the crisis. Among the actions of the latter, the National Union of Soybean Producers (UNPS), which is a leader of the soybean sector in Benin, has not failed to provide support to these member producers. For this union, therefore, it is an intervention mechanism based on a technological package offered to soybean producers. Soybean producers therefore receive, through this intervention, typical training, inputs (seeds, fertilizers, inoculum, etc.) and financial envelopes to cope with the agricultural services involved in soybean production. Furthermore, there has not yet been a study showing actual actions for the benefit of producers and typically for the benefit of soybean producers. This work is part of a previous work and consists of collecting additional data related to COVID 19. It therefore aims to analyze after the intervention of the UNPS, the knowledge, skills and practices (CAP) small soybean producers following the corona virus pandemic through the various packages received during the intervention. The results at the end of this work, will not only document the existing literature on the crisis but also contribute to scientific knowledge through its participation in the existing literature of actions of COVID 19 on the agricultural sector and on the soybean sector in particular in Benin and in developing countries.

2. RESEARCH METHODOLOGY

2.1 Context of Covid19 in Benin

In Benin, the first case detected dates from 16March2020. Between the16Marchand the23March2020, 4 new cases are detected. As of December 9, 2020, Benin has 74 active cases for a total of 3,090 confirmed cases including 2,972 cured and 44 deaths just before the field phase. Faced with the increase in the number of infected subjects, the Beninese authorities have taken measures to curb the spread of the virus in the country. Overall, the Government has taken strong restrictive measures to limit its spread. In view of the evolution of the situation and taking into account the opinion of the technical committee responsible for monitoring the evolution of the pandemic, the Council agreed to the resumption of sports and cultural activities while respecting the barrier measures. after two months of setting up the sanitary cordon. The Council takes the opportunity to recall once again, to the populations the strict observance of these barrier measures, namely:

systematic wearing of a mask, washing of hands with soap and water or disinfection of hands with gel / hydroalcoholic solution, respect of the health safety distance of at least one meter between people. These various unexpected upheavals inevitably led to a slowdown in activities in all sectors, including agriculture. Various measures, the effects of which are not yet visible at the moment, have been taken by the government towards the population to respond to the pandemic. They imply substantial additional resources of 110 billion FCFA distributed as follows: i) 25 billion FCFA for the guarantee line intended for non-agricultural enterprises, ii) 10 billion FCFA for the refinancing of Decentralized Financial Systems (SFD) and iii) 75 billion FCFA to facilitate the access of family farmers and agricultural entrepreneurs to loans adapted to the specific needs and constraints of the agricultural sector from banks and financial systems decentralized. These measures were also extended to the National Agricultural Development Fund (FNDA) which benefited from the provision of the fund itself, the reduction of the interest rate from 12% to 2% and the reduction of requirements related to the guarantee of agricultural holdings.

2.2 Study area

The study area is made up of four departments in the central part of Benin known as the Agricultural Development Pole 4 (PDA4). Agriculture is the main economic activity in the study area. PDA 4 is one of the main agricultural production area of the country (REFERENCE). In this area, farmers cultivate cash crops (cotton, cashew nuts) and the main agricultural products consumed in Benin. In addition, there are soybean and cassava, considered to be flagship crops (MAEP, 2016). PDA 4, made up of 16 municipalities as shown in figure1 has recently been identified by the government as a priority area for soybean production at the national level as it alone supplies almost half of the national production.

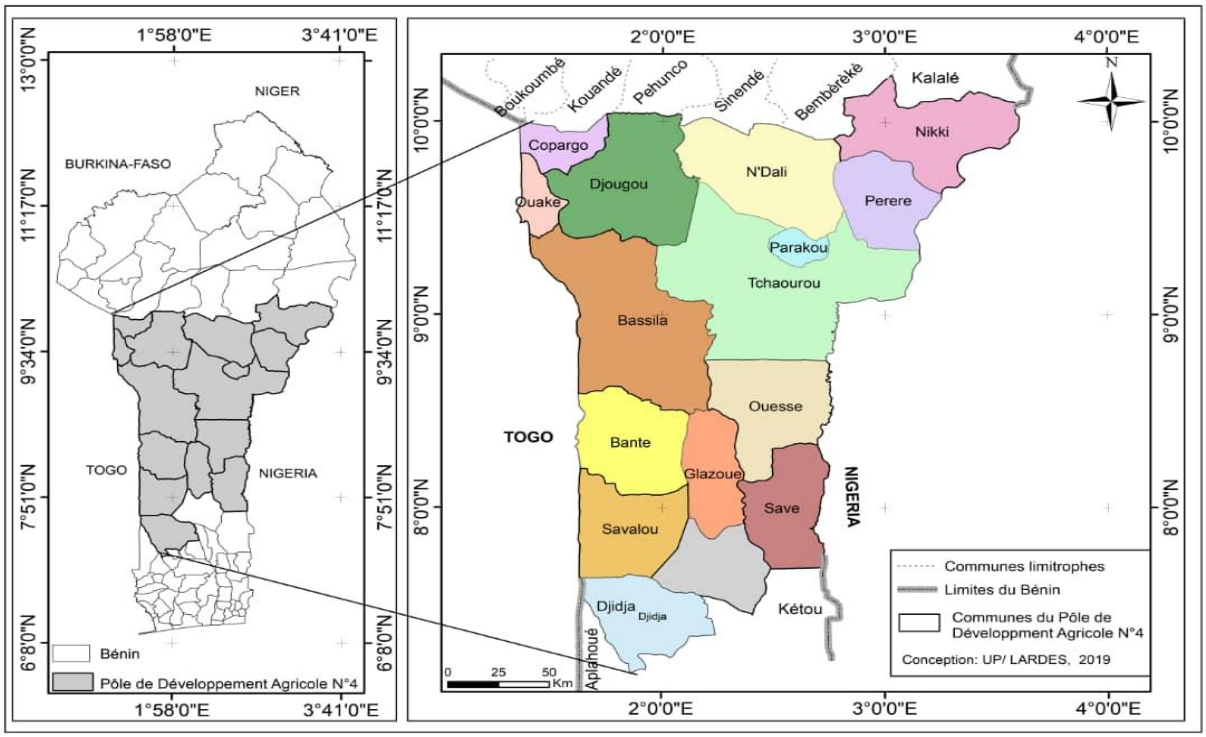

Figure 1 : Map of the study municipalities

2.2 Target population

The data were collected as part of the Endline round of an experimental study on the impact of the UNPS technological package on soybean productivity. Final data collection was conducted in the same study villages as the baseline and on the same sample of farmers. In each village, the main eligibility criterion for inclusion in the Endline data collection is to have participated in the Baseline survey organized during the last agricultural campaign (2019-2020). In total, 19 villages were surveyed (Figure 2). Out of a total of 760 producers planned, 705 were actually surveyed (ie 7.24% attrition). This attrition has also been shown to be random

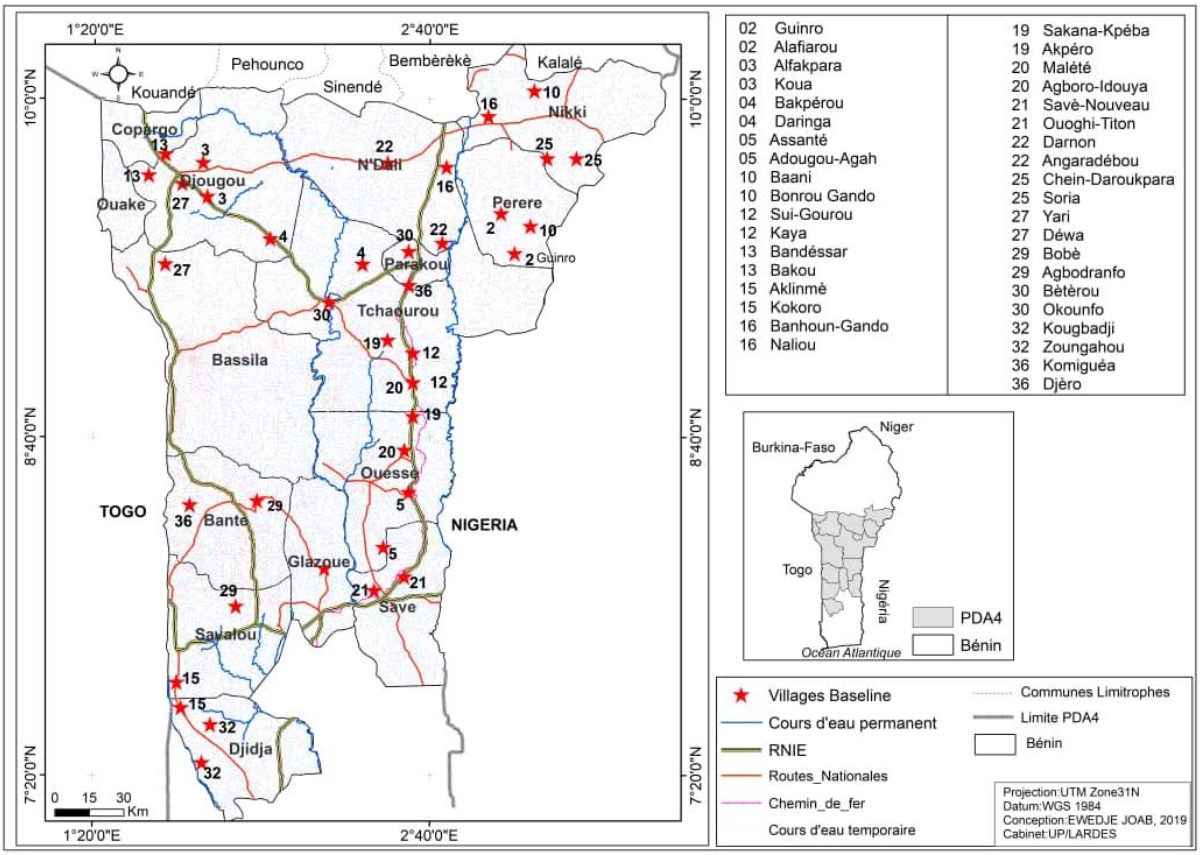

Figure 2 : villages selected in the study municipalities

2.3 Data

The data were collected through a questionnaire composed of three main parts:

- Household questionnaire: This questionnaire, addressed to the head of household, made it possible to collect essential information on the supply of drinking water, sanitation and household hygiene.
- Individual questionnaire for the respondent (male and female farmers): This questionnaire This questionnaire was administered separately to the male and female in the household. It aims to collect information on soybean producers, men and women, identified in the farm household. They report information on such as socio-economic characteristics (age, level of education, experience in agriculture, access to credit, etc.), attitudes and practices related to knowledge in terms of compliance with preventive measures against COVID 19, the perception of the effects of Covid-19, the strategies developed by respondents as a response to Covid-19.

The questionnaire was digitized on the Kobocollect platform to facilitate data collection with tablets and data management.

2.4 Data analysis

The data were analyzed using the STATA 13 statistical analysis software. The analysis consists in providing simple descriptive statistics focusing on the data collected in the special Covid-19 module.

3. FINDING

3.1 Socio-economic characteristics at household level

The following table summarizes the descriptive statistics of the main characteristics of the households surveyed.

Table 1: Socio-economic characteristics of the households surveyed

Variables		Mean	Nd. Dev.
Household size (# / HH)		12.76	7.52
Active household members (# / HH)		7.02	4.80
Total land owned (ha / HH)		11.03	9.57
Household assets	Radio	.70	.45
	Bike	1.56	1.57
	Motorbike	.86	.34
	Livestock	.59	.59
	Big cattle	.16	.16
	Dwelling	.96	.96
Where does the water that your household members drink primarily come from?	Running water: Domestic connections	.01	.07
	Running water: Connections in the lot	.00	.03
	Running water: Connections at the neighbor	.02	.15
	Running water: Public tap / standpipe	.20	.40
	Running water: Borehole or tube well	.34	.47
	Protected well	.15	.36
	Unprotected well	.16	.37
	Water extracted from a protected spring	.01	.09
	Water extracted from an unprotected source	.01	.10
	Surface water (river, stream, sea bass)	.07	.26
I312. Where is this source of water supply located?	In the accommodation	.02	.15
	In the yard / on the plot	.11	.31
	Elsewhere	.54	.49
	Other specify)	.0014184	.03
	Number of minute round trip	12.04	12.96
Water availability	Yes	.43	.49

316. What type of toilet members of your household generally use	Manual or mechanical flushing to	0	0
	Dry pit latrine with slab	.12	.32
	Dry pit latrine without slab / pit	.03	.18
	Composting toilets: Double latrines	.00	.06
	Composting toilets: Double latrines	.01	.11
	Composting toilets: Other toilets	.00	.06
	Hanging toilets / hanging latrines	.00	.06
	No plant / bushes / field	.79	.40
	other (explain, list,)	.02	.14
	Sharing facilities	.79	.40

Source: *Endline survey*

According to Table 1, households are made up of an average of 12 people. More than half of the household members are involved in agricultural activities. The average farmland area owned of by households is 11 (± 9.57) hectares. The other main household's assets are the house, radio, livestock and motorcycle. Only 43% of households have access to water directly in their home. In most cases, the source of water is not even on the farm plot of land and it takes on average about 12 minutes to get to it. The water that household members drink comes mainly from boreholes or tube wells, public taps / born-fondern, unprotected wells and protected wells. Only 1/10 of households have dry pit latrines with slabs. Among these, 79% share these latrines with other households. The rest of the households do not have a toilet facility and generally defecate in the open air.

3.2 Socio-economic characteristics at the individual level

The socio-economic characteristics of the respondents are summarized in the following table.

Table 2 : Socio-economic characteristics of the respondents

Variables		Male (N = 705)		Female (N = 705)	
		Mean	Std. Dev.	Mean	Std. Dev.
Age (year)		41.40	11.35	33.77	9.55
Socio-ethnic group (yes / no)	**Bariba**	.27	.44	.28	.44
	Nago	.12	.33	.12	.32
	IDAASHA	.00	.03	.00	.03
	DENDI	.00	.03	.00	.03
	PEULH	.03	.18	.03	.19
	MAHI-FON	.16	.37	.17	.37
	LOKPA	.06	.25	.07	.26

	GOURMANTCH	.01	.08	.01	.08
	YORUBA	.01	.11	.01	.09
	Other	.29	.45	.29	.45
# Years of living together (year)		16.23	9.39	15.63	9.05
The male has another female (yes / no)		.35	.47	.36	.48
Informal education (yes / no)	Any	.41	.49	.94	.23
	Literacy	.25	.43	.04	.21
	Koranic school	.03	.18	.01	.09
	Other	.00	.03	.00	.03
# Years of study (year)		3.52	4.82	6.19	2.67
Formal education (yes / no)		.41	.49	.23	.42
Professional training (yes / no)		.10	.30	.09	.29
Secondary activities		.32	.47	.47	.49
Primary activity	Agriculture (yes / no)	.96	.19	.89	.31
	Breeding (yes / no)	.00	.06	.00	.03
	Crafts (yes / no)	.00	.07	.02	.15
	Education (yes / no)	.00	.05	-	-
	Transport (yes / no)	.00	.06	-	-
	Trade (yes / no)	.01	.08	.06	.24
	Industries	-	-	.00	.05
	Hotel	-	-	.00	.03
		-	-		
	Others (Yes / No)	.00	.06		
# Years of experience in agriculture (year)		17.98	10.67	10.44	7.67
Membership of an association (yes / no)		.27	.44	.11	.32
Access to credit (yes / no)		.11	.32	.02	.16
Distance between field and property (km)		5.14	4.31	4.64	4.17

Source: Endline survey

According to Table 2, men are older than women in the surveyed households. The majority of respondents are from the Bariba socio-ethnic group (27% of men and 28% of women). Next come the Nago ethnic groups (12.76% of men and 12.05% of women), the Mahi-fon (16.76% of men and 17.16% of women) and other ethnic groups (29.99% of men and 29.36% of women). The household partners have been living together for about 15 years. The polygamous household rate is of 35%. Almost all of the women did not receive any informal education (94%) unlike the men r (41%). The same observation is done at the level of formal education where women are less educated than men. Otherwise, the respondents who had been educated successfully completed 6 years at school compared to an average of 4 years for the women respondents. Women who went to school have more years of education than

men. Only less than 20% of men as women have received vocational training. Most of the respondents have agriculture as their main activity, though female respondents are less experienced. However, the latter outside the scope engage more in secondary activities than the men. The women rarely belong to an association of producers and usually do not have access to agricultural credit. Male and female plots are located in the same distance from home, *i.e.*, about 5 km from their home.

3.3 Knowledge, Attitudes and Practices of Investigations Related to COVID-19

- **Knowledge**

Table 3 shows the level of knowledge of households on the COVID 19 pandemic. Indeed, the levels of knowledge were assessed according to a series of twelve variables. The analysis results showed that knowledge scores are high (8 to 9) and very close for men and women (less than one-point difference in average).

Table 3 : Level of knowledge of respondents on COVID 19

	Male(N = 705)		Female(N = 705)	
	Mean	Std. Dev.	Mean	Std. Dev.
Knowledge score (#)	9.18	4.23	8.55	4.48
Knowledge of (100%) about COVID 19 (yes / no)	.00	.08	.00	.05
75% knowledge of COVID 19 (yes / no)	.40	.49	.27	.44
50% knowledge of COVID 19 (yes / no)	.26	.44	.35	.47
25% knowledge about COVID 19 (yes / no)	.30	.46	.31	.46
Knowledge at (0%) about COVID 19 (yes / no)	.0	.12	.05	.22

Source: *Endline survey*

What type of plowing is recommended for soybean production? What kind of soil is it good to grow soybeans on? What is the recommended plowing depth? What type of seedling is recommended? What is the recommended seed spacing? What is the recommended number of seeds per pocket? What is the recommended number of plants per pocket after thinning? What is the recommended seed variety? What is the recommended sowing date in northern Benin? What is the recommended sowing date in Central Benin? What types of fertilizer do you recommend? If you are using TSP AND NPK what is the recommended rate per hectare? If you are using TSP AND KCL / K2SO4, what is the recommended rate per hectare? Are you aware of the possibility of using the inoculum in soybean production? What is the recommended average number of weedings until harvest? What is the recommended period for the first weeding? What is the recommended period for the second weeding? What is the recommended time for the third weeding if possible? What are the recommended types of herbicide during the pre-emergence period? What are the recommended types of herbicide during the post-emergence period? When using Kalifor G, what is the recommended dose over 1 ha? If using Faaba herbicides, what is the recommended dose? Is it recommended to use insecticides in the event of an attack? If so, what types of insecticide are you using? According to you, when is the best time to harvest? Can you describe the recommended technique for harvesting soybeans? Can you describe the recommended technique for winnowing soybeans? In your opinion, where should soybean seeds be saved before sowing? In your opinion, where should grain soybeans be kept after threshing?

The results revealed that men present an average knowledge score of 9.18 while women have an average knowledge score equal to 8.55. Thus, it has been found that none of the men and women producers has a complete knowledge of the COVID 19 crisis. Only 40% of men and 27% of women have at least 50% average knowledge on COVID 19 health crisis. This knowledge was manifested by the observation of the characteristic symptoms of persons exposed and the barrier measures established for the management of the crisis. Thus, it is the public authorities and NGOs at the local level that have contributed to awareness-raising actions for this pandemic. On the other hand, those who feel they do not know about the existence of the COVID 19 crisis are very minority.

- **Attitudes**

The table 2 below shows the attitudes of producers in the face of the COVID 19 crisis. The attitudes were assessed according to the existence of the crisis, the habits and likely behaviors developed by the producers.

Table 4 : Attitudes of respondents to COVID 19

	Male(N = 705)		Female(N = 705)	
	Mean	Std. Dev.	Mean	Std. Dev.
Covid-19 is a reality (Yes / No)	.57	.49	.55	.49
Fear of being infected or of seeing one of your family members infected with Covid-19 during the lock-down period (Yes / No)	.53	.49	.54	.49
Fear of being infected with the virus / disease or of seeing a member of your family infected with Covid-19 currently (Yes / No)	.47	.49	.49	.50
The pandemic is already over in Benin (Yes / No)	.22	.41	.26	.44
The pandemic may return in the future (Yes / No)	.16	.37	.14	.35

Source: *Endline survey*

Do you think soy is of nutritional importance to you? Do you think soy is economically important to you? Do you think soy is of social importance to you? What is the environmental importance of soybean cultivation?

According to TABLE 4, more than half of men and women consider COVID 19 to be a reality. About half fear being infected or of having one of their close family members infected with the virus. This behavior has been the same before lock-down, during lock-down from March 30 to May 11, 2020 and even currently after lock-down. In addition, some producers believe that the crisis is

over (around 20% of men and women respectively). For a minority (around 15% of men and women), this pandemic is likely to return in the future.

- **Practices**

The table below provides information on the practices developed by producers in dealing with the management of COVID 19. These practices relate to the established measures to counter the propagation of the virus.

Table 5 : Practices of respondents in the face of crisis management

	Male(N = 705)		Female(N = 705)	
	Mean	Std. Dev.	Mean	Std. Dev.
Wearing a mask in a busy place during lock-down (Yes / No)	.43	.49	.36	.48
Physically distancing during confinement (Yes / No)	.38	.48	.30	.46
Use of hand sanitizer during containment (Yes / No)?	.29	.45	.22	.42
Hand washing with soap during containment (Yes / No)	.39	.48	.32	.47
Self-prescribed preventive treatment during lock-down (Yes / No)	.02	.15	.03	.17
Preventive treatment after consultation with a doctor during lock-down (Yes / No)	.00	.05	.00	.03
Wearing a mask after lock-down	.18	.39	.15	.35
Physical distancing after lock-down (Yes / No)	.15	.36	.13	.33
Use of hand sanitizer after containment (Yes / No)	.11	.31	.10	.30
Hand washing with soap after containment (Yes / No)	.17	.37	.14	.35
Self-prescribed preventive treatment after lock-down (Yes / No)	.01	.08	.01	.07
Preventive treatment after consultation with a doctor after lock-down (Yes / No)	.00	.03	0	0

Source: *Endline survey*

Do you ever work on your wife's soybean plots? Do you sometimes discuss production techniques with your spouse, do you sometimes give advice to your husband to produce more on his field, do you sometimes receive advice from him on how to produce, do you ever follow him into his field to see how she is doing? If so, do you ever bring him to your field to show him how? Who decides on the choice of distribution of soybean labor on your field, who decides on the choice of the plot to cultivate soybeans? Who decides how much area to allocate to soybeans in your field? Who decides on the purchase of inputs on your field? Who decides on the purchase of materials and equipment for soybean production?

In response to the COVID 19 crisis, farm households have adopted various practices. These are the wearing of a mask, physical distancing, the use of disinfectants, systematic hand washing with soap, self-prescribed preventive treatment and preventive treatment after consultation with a doctor. These practices during lock-down and after lock-down. In response to COVID 19 during containment, the practices of wearing a mask, physical distancing as well as hand washing with soap have been adopted the most by producers. The practices of self-prescribed treatments or from a doctor are much less adopted. After containment, very few producers continued to observe the recommended measures.

3.7 Perception of producers on the effects of COVID 19

The table below shows the perception of soybean producers on the effects of COVID 19 on their households. This perception was based on the health of household members, children's schooling, food availability, employability, migratory movements, social life and household income.

Table 6 : Producers' perception of the effects of COVID 19

		Male (N = 705)		Female (N = 705)	
		Mean	Std. Dev.	Mean	Std. Dev.
Health of your household members	Yes	.13	.34	.09	.28
	Before lock-down	.12	.33	.08	.28
	Currently	.09	.29	.07	.25
Children aged 0-5 in the household	Yes	.03	.17	.04	.21
	Before lock-down	.03	.17	.04	.21
	Currently	.02	.14	.03	.18
Pregnant women and mothers in the household	Yes	.01	.12	.01	.11
	Before lock-down	.01	.11	.01	.11
	Currently	.01	.11	.00	.08
schooling of household children	Yes	.31	.46	.26	.44
	Before lock-down	.31	.46	.26	.44
	Currently	.15	.36	.14	.36
Food availability in your household	Yes	.07	.26	.06	.24
	Before lock-down	.07	.26	.06	.24
	Currently	.05	.22	.05	.22
rural / agricultural activities of your household	Yes	.14	.35	.11	.31
	Before lock-down	.13	.34	.10	.30
	Currently	.09	.29	.07	.26
Jobs of members of your household	Yes	.05	.23	.05	.22
	Before lock-down	.05	.22	.05	.22
	Currently	.02	.16	.01	.12

Migratory movements of members of your household who Migrated long before covid-19 ?	Yes	.00	.08	.00	.06
	Before lock-down	.00	.08	.00	.06
	Currently	.00	.05	0	0
Migratory movements of members of your household?	Yes	.00	.08	.00	.03
	Before lock-down	.00	.07	.00	.03
	Currently	.00	.06	.00	.03
The social life of your household	Yes	.13	.33	.11	.32
	Before lock-down	.12	.33	.11	.31
	Currently	.08	.27	.07	.26
Your household income	Yes	.25	.43	.23	.42
	Before lock-down	.24	.42	.22	.41
	Currently	.15	.36	.13	.34
Your household soybean income	Yes	.15	.36	.15	.36
	Before lock-down	.13	.34	.13	.34
	Currently	.12	.32	.11	.31

Source: *Endline survey*

From the results obtained, it appears that only 13% of men and 09% of women have perceived the effects of COVID 19 on their households. These effects were more perceived by men before lock-down (12%) and less perceived by women currently after lock-down (09%). The perceived effects are more negative than positive and in relation to health services including consultations and treatments, health expenses and insurance for attending health centers. In addition, it is perceived that COVID 19 has had less effect on children of 0 to 5 years old and pregnant women. The pandemic is reported to have had more effects on the education of children in households either before or after lock-down. With regards to food availability in households, women (24%) perceived the effects of COVID 19 more than men (07%). Rural activities were more blocked on the side of women (31%) than on the side of men (14%). The same goes for the employment of household members. It should therefore be noted that COVID 19 had weak effects on migratory movements within households. The COVID 19 pandemic has also had an effect on the social life of households, on household income and on income from soybean in particular. These effects were perceived more by women and much more before lock-down. on household income and on income from soybean in particular. These effects were perceived more by women and much more before lock-down on household income and on income soybean in particular. These effects were perceived more by women and much more before lock-down.

3.4 Adaptation strategies of producers in response to COVID 19

The following table provides information on the adaptation strategies of producers in the face of COVID 19.

Table 7 : Support for adaptation to COVID 19:

	Male (N = 705)		**Female (N = 705)**	
	Mean	**Std. Dev.**	**Mean**	**Std. Dev.**
Have you benefited from any initiative / intervention or external action related to covid-19?	.06	.25	.04	.21
Have you benefited from the hand washing device	.04	.20	.03	.19
Have you benefited from the hydro alcoholic gel	.03	.17	.03	.17
Have you benefited from the Cash Transfer	0	0	0	0
Have you benefited from the awareness	.06	.24	.04	.21
Did you benefit from the meal / food	0	0	0	0
Have you benefited from donations including remittance	.00	.03	0	0
Have you benefited from agricultural credit	0	0	0	0
Have you benefited from agricultural inputs	0	0	0	0
Have you benefited from the Agricultural advice	.00	.03	0	0
Did you receive other support?	.01	.09	.00	.06

Source: *Endline survey*

According to Table 6, only 6% of male and 4% female respondents benefitted from any actions, initiatives or external interventions related to Covid-19. These actions consisted mainly of receiving a hand washing device, hydroalcoholic gel and sensitization on barrier measures from NGOs and Projects.

3.5 Perception of the support desired by producers in response to COVID 19

The following table provides a list of the supports desired by soybean producers to adapt to COVID 19.

Table 8 : Support desired by producers in the face of COVID 19

	Male (N = 705)	Female (N = 705)

	Mean	Std. Dev.	Mean	Std. Dev.
614. Would you like to receive a loan from the government at little or no interest?	.89	.31	.86	.34
615. Would you like to receive an easing of loan re-payment conditions from the government?	.86	.34	.83	.37
616. Would you like to receive a cash grant from the government?	.90	.28	.88	.31
617. Would you like to receive infrastructure support from the government?	.89	.30	.86	.33
618. Would you like to receive simplified government regulations?	.87	.33	.83	.36
619. Would you like to receive from the government a relaxation of the payment of taxes?	.80	.39	.787	.41
620. Would you like to receive market access facilitation from the government?	.93	.23	.90	.29
621. Would you like to receive technical advice from the government?	.90	.29	.87	.33
622. Are there other types of help you would like to receive from the government?	.04	.21	.01	.13

Source: *Endline survey*

The majority of respondents would like to receive more support from the government. All the listed form of support, except from tax exemption, are favored by more than 80% of farmers. The most desirable are access to the market, technical advice support on farms and a cash grant. Other support was also mentioned. These include, among other things, a loan at a low or zero interest rate, the easing of loan re-payment conditions, support for the creation of infrastructures and simplified regulations.

3.6 Producers' initiative in response to COVID 19

The following table provides information on the endogenous initiatives put in place by the producers themselves to deal with COVID 19. According to Table 8, farmers did not develop individual strategies to adapt to the crisis.

Table 9 : Producers' initiatives in response to COVID 19

	Male (N = 705)		Female (N = 705)	
	Mean	Std. Dev.	Mean	Std. Dev.

reallocation of food budgets to certain food products	.00	.03	0	0
Reduction of the area sown	.02	.14	.01	.10
Reduction of dependence on wage labor?	.01	.12	.00	.07
Changing the amount of fertilizer or herbicide	.00	.06	.00	.03
Change in input supply strategies (fertilizers, herbicides)	.01	.09	0	0
change in marketing of agricultural products	.01	.10	.00	.05
Sale of agricultural assets, including small livestock or larger livestock	.00	.03	0	0
Finance research	.00	.06	.00	.032
Initiation of other income-generating activities outside agriculture	.01	.07	0	0
Another initiative as a response to COVID 19	.00	.06	.00	.06

Source: *Endline survey*

Overall, it appears that the producers, even though they are informed of the existence of the COVID 19 crisis, have not themselves been able to develop clean and effective strategies to deal with covid19. In addition, the few main strategies developed relate to reducing the area sown and the workforce.

3.8 Risk analysis

Table 10 provides information on the risks / uncertainties of the COVID 19 pandemic on household income. The risks were assessed according to whether the probability that soybean income would increase, fall or remain the same over the next few months after the lockdown period.

Table 10 : Risks / uncertainties of producers on incomes in response to COVID 19

		Male (N = 705)		Female (N = 705)	
		Mean	Std. Dev.	Mean	Std. Dev.
Over the next six months, do you think your soybean earnings will increase, decrease or stay the same compared to the	Income will increase	.60	.48	.54	.49
	Income will decrease	.13	.34	.13	.34
	Income will remain the same	.24	.42	.26	.44
	If it increases, by what percentage between 0 and 100?	44.82	24.96	39.66	24.28

same period last year?	If it decreases, by what percentage between 0 and 100?	29.35	21.75	04.29	22.00
	. On a scale of 0 to 100, what is the chance (probability) that you think this will happen?	58.04	25.82	55.68	26.45
Optimistic at best, for the next six months, do you think your farm income will increase, decrease or stay the same compared to the same period last year?	Income will increase	.70	.45	.63	.48
	Income will decrease	.08	.28	.10	.30
	Income will remain the same	.18	.39	.21	.40
	If it increases, by what percentage between 0 and 100?	45.91	25.27	39.75	21.39
	If it decreases, by what percentage between 0 and 100?	33.31	25.94	33.28	20.92
	On a scale of 0 to 100, what is the chance (probability) that you think this will happen?	55.90	26.81	56.68	25.35
Pessimistic In the worst case scenario, for the next six months, do you think your farm income will increase, decrease or stay the same compared to the same period last year?	Income will increase	.44	.49	.49	0
	Income will decrease	.30	.46	.29	.45
	Income will remain the same	.23	.42	.25	.43
	If it increases, by what percentage between 0 and 100?	45.91	25.27	40.00	22.71
	If it decreases, by what percentage between 0 and 100?	33.31	25.94	31.69	24.75
	. On a scale of 0 to 100, what is the chance (probability) that you think this will happen?	55.90	26.81	54.67	26.88

Source: *Endline survey*

From this table, it turned out that the man or the woman thinks that farm incomes could increase in exactly the same period last year. These results will be even more so for the optimistic men and women whose increases in farm incomes could increase by almost half with more than a 50% chance of it happening. Producers have therefore rapidly developed other types of agricultural activities such as processing, valuation of harvest by-products, storage and preservation of products to obtain remunerative prices. In addition, the limitation of mobility leads producers to devote more of their time to agricultural activities given the social conditions imposed by COVID 19.

4- DISCUSSION

The majority of soybean producers surveyed are aware of the existence of COVID 19, although they are in rural areas. Unlike studies by Desclaux et al, (2020) which showed that producers doubt the existence of COVID 19 in Africa, the awareness campaign that have lasted over time have led to a change in the level of knowledge of the relatively low-educated Beninese from rural areas who are part of this study. Kabamba et al, (2020) reported the same trend on the populations of urban areas of Kinshasa in Congo. Uninfected producers developed a fear of COVID 19. This fear remains for some producers after the end of the mobility-restriction measures. This psychosis set in overtime in proportion to the reporting of infected cases, cured and the number of cases died. A minority of soybean producers thinks of a new wave of contamination in the future.

After the lifting of certain restrictions such as the cordon sanitaire and the opening of schools, places of worship and restaurants, the majority of producers have abandoned COVID 19 avoidance practices in the logic that the crisis would be over. Several measures have been announced by the Beninese government to improve the resilience of producers to the effects of COVID 19. Unfortunately, none of the soybean producers surveyed benefited from it for lack of information. In practice, the measures announced by the government arise an issue of relevance. Indeed, access to the market, technical advisory support in farms and the cash subsidy are the measures most farmers report they need. Most of the government support to farmers takes the form of refinancing of the financial institutions supposed to reach producers. The trickle-down has not materialized. This demonstrate the inadequacy of their real needs in the face of the corrective measures offered by the government. Two other facts are worth mentioning. First, farmers did not develop adaptation strategies on their own. Second, they did suffer from the crisis. COVID 19 limited the trade and migration observed in the run-up to the agricultural campaign. As a result, producers, apart from the fact that they do not have the labor force, also hard more difficulty to sell agricultural products. They experienced a drop in household productivity that threatens the food security of these households (Tougan and Théwis, 2020).

CONCLUSION

This work, which is part of the project to improve soybean productivity in the Agricultural Development Pole 4 in Benin, not only made it possible to assess the levels of knowledge, attitudes and practices of soybean producers in the face of COVID 19 but also to analyze the strategies that the producers themselves have developed in the face of the effects of COVID 19. It also made it possible to understand their perception of what they want as support or their own initiatives to counteract the effects of COVID 19, as well as the risks they run in their income-generating activities. In view of the results obtained, it turned out that the producers became aware of the existence of COVID 19 as early as possible and adopted barrier gestures (hand washing, wearing a mask and social distancing) in order to be protected from the effects and risks of contamination. However, they are only 10% of their group to receive some external support. It should be noted that the effects of COVID 19 were more perceived on the children education, the eating habits of cleaning women and their agricultural activities. Moreover, in order to lessen these effects, the soybean farming households have taken the initiative to develop other types of activities that can allow them to ensure the sustainability of income in the household. This work, carried out, shows significant aspects of human life and will not only contribute to scientific knowledge on the issues of the health crisis of COVID 19 but also call on political decision-makers to issue development actions in the direction of " support to soybean-producing households in order to improve their resilience to the effects of the COVID 19 pandemic in the Republic of Benin.

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