



# Impacts of COVID-19 on agricultural activities and food security: the case of the Republic of Benin

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## Impacts de Covid-19 sur les activités agricoles et la sécurité alimentaire : le cas de la République du Bénin

**Résumé :** Une analyse de l'impact de la crise de Covid-19 sur les activités agricoles et la sécurité alimentaire des populations au Bénin a été réalisée. L'objectif de l'étude est de comparer le niveau de production agricole au cours de la période précédant la pandémie de Covid-19 avec celle des années 2020 et 2021. L'approche méthodologique adoptée est basée sur la collecte, la compilation et l'analyse qualitative des données issues de la publication des statistiques de l'Organisation des Nations Unies pour l'Agriculture et l'Alimentation (FAO), de l'Institut National de la Statistique et d'Analyse Economique (INSAE) ainsi que des rapports d'étude du Ministère chargé de l'Agriculture, d'Elevage et de la Pêche (MAEP). L'étude a montré que lors de la campagne 2019-2020, la production agricole totale s'élevait à 11 423 495 tonnes. Cette production a chuté lors de la campagne 2020-2021 à 10 797 383 tonnes, enregistrant ainsi une baisse de 5,48%. Sont principalement concernés, des produits, tels que les racines et tubercules qui ont enregistré une baisse de 7,32%, les légumes-feuilles avec une baisse de 5,69% ainsi que les fruits et légumes avec une baisse de 32,24%. Cette dynamique négative de la production agricole illustre l'impact de la pandémie de la Covid-19 sur les activités agricoles, aggravant ainsi la sécurité alimentaire déjà menacée par les perturbations climatiques.

**Mots clés :** Covid-19, Pandémie, Production agricole, Sécurité alimentaire, République du Bénin.

**Abstract:** An analysis of the impact of the COVID-19 crisis on agricultural activities and the food security of populations in Benin has been carried out. The objective of the study is to compare the level of agricultural production during the period preceding the COVID-19 pandemic with that of the years 2020 and 2021. The methodological approach adopted boils down to the collection, compilation and qualitative analysis of data from the publication of statistics from the Food and Agriculture Organization of the United Nations (FAO), the National Institute of Statistics and Economic Analysis (INSAE) as well as the study reports of the Ministry in charge of Agriculture, Livestock and Fisheries (MAEP). The study shows that during the 2019-2020 campaign, total agricultural production amounted to 11,423,495 tons. This production fell during the 2020-2021 campaign to 10,797,383 tonnes, thus recording a drop of 5.48%. Are mainly concerned, products such as roots and tubers with a drop of 7.32%, leafy vegetables with a drop of 5.69% as well as fruit vegetables with a drop of 32.24%. This negative dynamic of agricultural production illustrates the impact of the COVID-19 pandemic on agricultural activities, thus aggravating food security already weakened by the pangs of climatic disturbances.

**Keywords:** COVID-19, Pandemic, agricultural production, Food Security, Benin Republic.

## 1. Introduction

Currently, the COVID-19 pandemic resulting in significant loss of life across the world, is associated with several multidimensional implications representing an unprecedented challenge to many developing countries. To limit the spread of COVID-19, several countries including Benin Republic have implemented rules restricting movement, economic and social activities which have significant socio-economic repercussions. Agriculture is a vital sector for the Beninese economy as the rest of the world. It contributes with 32.5%, 75% and 15% respectively to the Gross Domestic Product, exportation revenues, and total revenues of the country. It provides approximately 70% of employment (RNDH, 2015; Sossou, 2015; FAO-CEDEAO, 2018). It mainly consists of the crop production, animal and fishery production sub-sectors. The covid-19 associated with the low agricultural productivity often observed in the Republic of Benin has constituted a challenge for the food and nutritional security of the population. This pandemic has affected the food production and distribution chain. This will aggravate the already existing food insecurity situation in the country. In addition, soaring food prices will make it difficult to access them. As restrictive measures continue, many questions are emerging about the impacts of the COVID-19 crisis on public health, the economy, agriculture, employment and food security for populations. In this context of uncertainty, it is necessary to undertake reflection on the effects of this pandemic on Beninese agriculture and food security, in order to contribute to ideas on implementation of response plans preventing food insecurity risks. This article will attempt to provide answers to the following questions: What will be the effects of the COVID-19 pandemic on agricultural performance and the availability of food resources? How will it affect food demand? What measures should we take to address food insecurity and fight hunger during the post COVID-19 period?

## 2. Methodological approach

The methodological approach adopted boils down to the collection, compilation and qualitative analysis of data from the publication of statistics from the Food and Agriculture Organization of the United Nations (FAO), the National Institute of Statistics and Economic

Analysis (INSAE) as well as the study reports of the Ministry in charge of Agriculture, Livestock and Fisheries (MAEP). Non-formal exchanges with users of places of transaction and supply of agricultural products were also part of the methods used in this study.

## 3. Results and discussion

### 3.1. Food Production and Availability of Food

According to data published by the National Institute of Statistics and Economic Analysis (INSAE, 2018a), the area sown for the cultivation of cereals represented 45.1% (Figure 1). Then, there are roots and tubers (17.9%), cotton (17.7%), legumes (16.2%), and vegetable crops (3.0%) (INSAE, 2018).

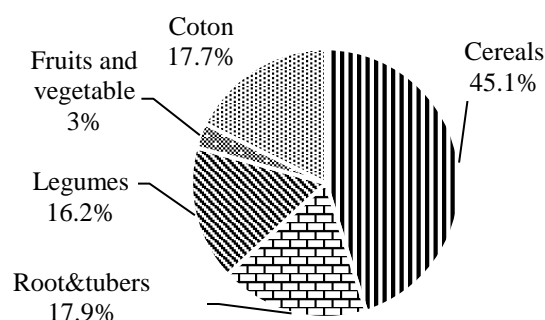


Figure 1. Area sown and harvested

Figure 1. Surface emblavée et récoltée

In terms of volume produced, cereal production, which was approximately 1.9 million tonne (Mt) in 2018, increased by 4.4% compared to the previous agricultural season (2016-2017). Production of roots and tubers increased 4.5% in the same year. This production is dominated by the cultivation of cassava (4.0 Mt) and yam (3.2 Mt), which are the second and third most cultivated crops in Benin, respectively, after maize. Regarding, sweet potato and taro, their yield has been very volatile over the past five years (INSAE, 2018). Vegetables generally grown in Benin are, tomatoes, peppers, okra, onions and leafy vegetables (PNUD, 2015). As seen in the Figure 2, between 2000 and 2018, their production fluctuated with an average growth rate of 4.0%. However, this production suffers significant post-harvest losses, due to conservation difficulties (PMDEPPPBG and PNUD, 2015).

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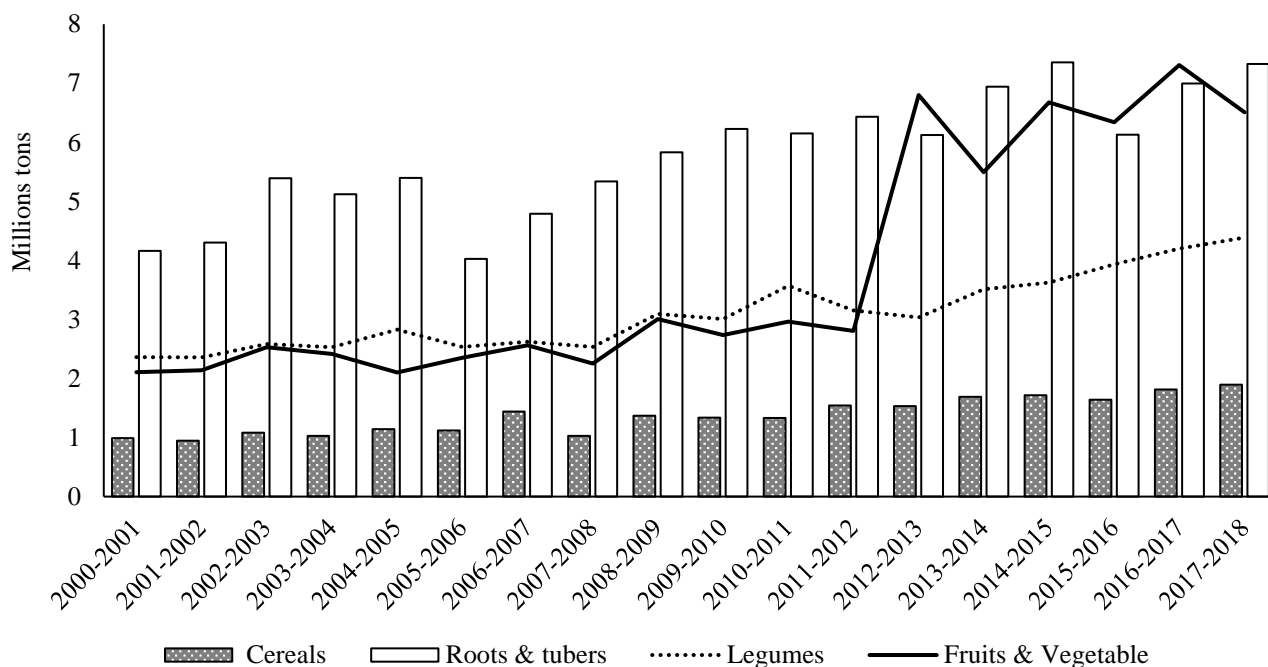


Figure 2. Subsistence crops production from 2000 to 2018

Figure 2. Production de cultures de subsistance de 2000 à 2018

The production level of the main agricultural products during the 2019-2020 and 2020-2021 campaigns are listed in Table 1. This table shows that overall, agricultural production fell by nearly 5.5% between the two campaigns following the COVID-19 pandemic. Some categories of products such as leafy vegetables, fruit vegetables and market garden products have experienced a more or less significant drop in production of up to 32%. Other products such as cereals remained with an increase of 1.16% almost unchanged. It can be admitted that the restriction of mobility imposed by the authorities in order to contain the spread of the pandemic has considerably affected the production capacity of farmers. Indeed, the latter could be denied access to markets to sell their products and obtain supplies of agricultural inputs and other basic goods.

Livestock is the second important component of agricultural production in Benin. It contributes about 6% of the GDP. About 36% of households (mainly in the north of Benin) are engaged in animal production. In the department of Alibori, 87% of households while 41% of households in the department of Borgou depend on livestock farming as their main economic activity. Livestock mainly consists of cattle, goats and sheep, pigs, poultry, rodents and snails rearing. The number of cattle is estimated at 2.46 million, 2.87 million small ruminants, 0.5 million pigs and 21.30 million poultry (FAOSTAT, 2018). The main products from animals farming are milk, meat and eggs. In recent decades (between 2000 and 2018), meat and milk production have

increased with an annual growth rate of 2.1 and 2.4% respectively. In 2018, total meat and milk production reached 81,417 and 149,277 tonnes respectively. This level of production remains insufficient to meet needs. This results in the importation of frozen meat products from the European Union.

With regard to the fishery sub-sectors, fish production during the 2018-2019 agricultural season was estimated at 70,972 tonnes. An increase of about 36% was recorded compared to 2017 (52,251 tonnes) (INSAE, 2018). This marked increase is justified by rehabilitation and cleaning of water streams and support for the development of fish farming. These production levels observed in recent years have ensured good food availability and food situation will remain more or less stable. Sea fishing represents 21% of the national production (INSAE, 2018). In addition to this type of fishing, there is inland fishery as well as fish farming activities geared towards the rearing of Tilapias and Clarias in fishponds, pens and in floating cages. These forms of production account for 79% of the total production. Fish is the most important source of animal protein in the diet of population in general and that of south Benin in particular. However, fishery production does not meet increasing demands, which are estimated at 113,000 tonnes /year (Rurangwa et al., 2014). The deficit is met through importation of fishery products which are constantly increasing.

Table 1: Agricultural production in 2019-2020 and 2020-2021

Tableau 1: Production Agricole en 2019-2020 et 2020-2021

Cultures	CAMPAIGN 2019-2020			CAMPAIGN 2020-2021			Rate of increase (%)
	Realized area (ha)	Realized yield (kg/ha)	Realized production (t)	Realized area (ha)	Realized yield (kg/ha)	Realized production (t)	
Maize	1 470 250	1 075	1 580 750	1 267 159	1 272	1 611 615	1,95
Rice	102 415	3 965	406 083	104 586	3 935	411 578	1,35
Sorghum	151 065	1 059	160 000	134 693	1 101	148 236	-7,35
Millet	29 135	901	26 250	23 807	1 146	27 294	3,98
Fonio	5 881	799	4 700	7 430	590	4 382	-6,76
Total Cereals	1 758 745		2 177 783	1 537 675		2 203 105	1,16
Yam	235 331	14 301	3 365 500	228 998	13 757	3 150 248	-6,40
Cassava	319 299	14 173	4 525 450	346 382	12 015	4 161 660	-8,04
Sweet Potato	9 468	6 274	59 400	10 131	5 619	56 923	-4,17
Taro	588	3 117	1 831	608	3 019	1 837	0,30
Potato	307	11 522	3 534	234	12 714	2 978	-15,74
Total Root and tuber	564 992		7 955 715	586 354		7 373 646	-7,32
Cowbea/Bean	143 291	925	132 500	144 017	937	134 940	1,84
Peanut	174 628	976	170 452	172 783	999	172 641	1,28
Pigeon Pea	3 685	628	2 313	6 630	569	3 772	63,06
Vouandzou	14 542	954	13 877	13 604	923	12 555	-9,52
Goussi	8 809	677	5 966	10 779	501	5 405	-9,41
Sesame	1 336	532	711	2 336	691	1 614	127,06
Dohi	1 380	615	849	3 303	481	1 589	87,18
Soybean	192 412	1 336	257 000	203 572	1 247	253 954	-1,19
Total Legume	540 082		583 668	557 024		586 470	0,48
Lettuce	1 383	9 943	13 755	488	12 932	6 315	-54,09
Amaranth	4 629	10 578	48 971	3 941	7 885	31 073	-36,55
Cabbage	572	17 096	9 787	466	13 956	6 503	-33,56
Crincrin	2 299	8 001	18 396	2 419	7 983	19 312	4,98
Other legume leaf				2 522	8 934	22 532	
Total legume leaf	8 885	10 232	90 910	9 836		85 734	-5,69
Watermelon	1 536	17 095	26 259	784	16 231	12 720	-51,56
Carrot	760	17 515	13 313	615	16 968	10 430	-21,66
Cucumber	387	16 118	6 239	379	17 327	6 565	5,23
Green bean	88	2 697	236	79	3 958	311	31,53
Other legume fruit				130	9 014	1 175	
Total Legume fruit	2 771	16 618	46 047	1 986		31 201	-32,24
Tomato	39 833	9 044	360 250	39 429	6 622	261 103	-27,52
Pepper	27 981	3 103	86 830	30 345	3 590	108 934	25,46
Okra	13 601	3 391	46 122	14 881	3 704	55 125	19,52
Onion	3 959	16 898	66 904	6 041	13 140	79 372	18,64
Citrus/Squashes	456	20 338	9 265	354	35 848	12 697	37,04
Total Market gardening culture	97 486		706 329	102 872		634 167	-10,22
TOTAL	2 961 305		11 423 495	2 783 925		10 797 387	-5,48

Source: MAEP (2021): Agricultural campaign 2020-2021

### 3.2. Situation of Food self-sufficiency and security

The food security concept is closely linked to food availability and food self-sufficiency. In Benin Republic, food production in the past decade has resulted in an average food self-sufficiency (CAS) rate of 91.7% (FAO-CEDEAO, 2018). This indicates that Benin is generally self-sufficient in terms of food. However, this generally satisfactory situation of food self-sufficiency hides perceptible difficulties in covering domestic demand for animal products and some crop foods – notably those of rice and potatoes. Changes in people's eating habits have led to regular rice consumption in both rural and urban areas. Rice in Benin represents 17% of total cereal consumption, behind corn (68%), and before sorghum (9%) and millet (4%). The annual consumption of rice is 45.7 kg/capita. The country officially imported in 2018 approximately 765,766.70 tonnes of broken rice and 789,453.64 tonnes of semi-milled rice representing about 438.74 billion FCFA (MAEP, 2017; INSAE, 2019). The main rice supplying countries are India, Thailand, United Arab Emirates, China, Hong-Kong, Pakistan and Lebanon (MAEP, 2017; INSAE, 2019).

Regarding meat, milk and egg needs of the population, they are covered up to 29.1%, 20.5% and 51.5% respectively by national production (MAEP, 2017). The FAO have established standards value of need for meat, milk and eggs at 21, 50 and 2 kg/capita/year. In 2017, national production only covered an average of 6.11 kg/capita/ year for meat, 10.25 kg/capita/year for milk and 1.03 kg/capita/year for eggs (MAEP, 2017). The deficit of animal protein per capita is satisfied with importations. The meat and dairy products imported over last decade are given on the figure 3. Importations of meat and dairy products have declined in recent years. For example, in 2013, the importation meat estimated at more than 200 thousand tonnes declined to approximately 127 thousand in 2017 (FAO-STAT, 2018). In 2018, the country imported 41,035.86 tonnes of frozen chicken and poultry offal from Europe (United Kingdom, Poland and Netherlands) (INSAE, 2019). As for, imports of milk and dairy products, they are estimated at 10,202 tonnes and come mainly from France and the Netherlands (MAEP, 2017).

Like animal production, the trade balance in fishery products remains in deficit due to demand greater than national production. These products are imported frozen, canned and dried from different countries: France, Spain, China, Mauritania, Ghana, Angola and Morocco (MAEP, 2017). For instance, in 2013, the volume of imports represented 73,580 tonnes in 2013 (Sossou, 2015).

Note that the major part of imported food commodities (rice and poultry meat) are re-exported to neighbouring countries, notably Niger, Nigeria and Togo. According to MAEP (2017), the estimated amount of

500,000 tonnes was rice exported. In addition, DE (2014) reported that only 10% of imported frozen meat is consumed by the local population (DE, 2014; Agossou et al., 2018).

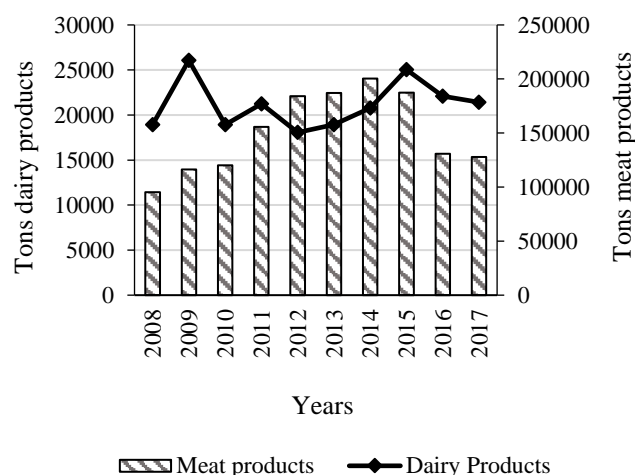


Figure 3. Importations of dairy and meat products from 2008 through 2017 (FAOSTAT, 2018a, 2018b)

Figure 3. Importations de produits laitiers et de viande de 2008 à 2017 (FAOSTAT, 2018a, 2018b)

Despite the efforts of successive governments to meet the food needs of the country's population, food and nutrition insecurity is still one of the major development issues in Benin today. In general, the situation of malnutrition in Benin remains worrying since approximately 1.1 million people were undernourished (FAOSTAT, 2018c). According to a report of FAO (jointly elaborated with the government of Benin), 11% of households were food insecure (<1% severe, 11% moderate). These households had insufficient food consumption or cannot meet their minimum food needs (FAO-CEDEAO, 2018). The daily energy intake of these households does not reach 2400 kilocalories, a standard set by the FAO and the World Health Organization. In rural areas, food insecurity affected approximately 43% of people while 25% of population living in urban areas could not meet food and nutritional needs (MAEP, 2018).

### 3.3. Impact of COVID-19 on food production, availability and price

COVID-19 crisis was confirmed to have reached the Republic of Benin in March 2020. The Republic of Benin is a low-income, food-deficit, and fragile health system with an estimated population of 11.2 million, who are predominantly rural. Undoubtedly, the COVID-19 pandemic might aggravate the already-precarious food security situations in Benin, both along and at the end of the COVID-19 pandemic. From past pandemics that the world has experienced, it has been

shown that quarantines and panic have an impact on human activities and economic growth (Hanashima and Tomobe, 2012; Bermejo, 2004; Arndt and Lewis, 2001); but, the effect also occurs in agricultural activities. Agriculture (the mainstay of the country’s economy) is one of the most important sectors in human development and is related to food security (Abdelhedi and Zouari, 2020; Kogo et al., 2021; Lopez- Ridaura et al., 2019). As given in the figure 4, Benin food chain as in most agricultural systems, is a complex network that includes producers, agricultural inputs, transport, processing plants, deliveries, etc.

According to APESS (2020) all West African countries, like countries in other regions of the world, have turned inward by closing their borders from March. We are witnessing a quarantine of entire regions and large cities in some countries. The health barriers erected by the authorities between the different localities to contain the spread of the pandemic have severely affected the flow of agricultural and livestock products between production sites and marketing sites. Livestock management has been profoundly modified due to reduced mobility (APESS, 2021). Indeed, according to the same source, COVID 19 has had significant effects on the composition of the herd, the practice of transhumance, animal feeding, the practice of fattening and milk production. On the other hand, Benin is an importer country of food products. For instance, fish and meat products which is an important source of protein for

population of Benin are imported to satisfy the local demand. With the border closure, importation will be affected and consequently a shortage of meat food will be faced.

The lockdown measures restricted farmers from reaching markets and, consequently, weaken their production capacity and slow down the sale of their products (WFP, 2020). Furthermore, if the virus spreads to rural areas of Benin, it may severely affect the farm workforce hindering production, harvesting and marketing processes. Hence the spread of the pandemic to rural areas may reduce agricultural output, which in turn, worsens the food scarcity situation in the country. In consequences, prices of food (especially staples such as wheat and rice) are likely to rise due to disruptions to the agriculture supply chain, reduced imports and closures of many informal markets. According to the Food and Agriculture Organization (FAO, 2020a) COVID-2019 is affecting agriculture in two significant aspects: the supply and demand for food. These two aspects are directly related to food security, so food security is also at risk. However, it is difficult to predict the full economic and food security impact of the outbreak. Too much depends on what is not known — how long the outbreak lasts, how many countries it affects, and the type of policies put in place to respond to the crisis (WFP, 2020).

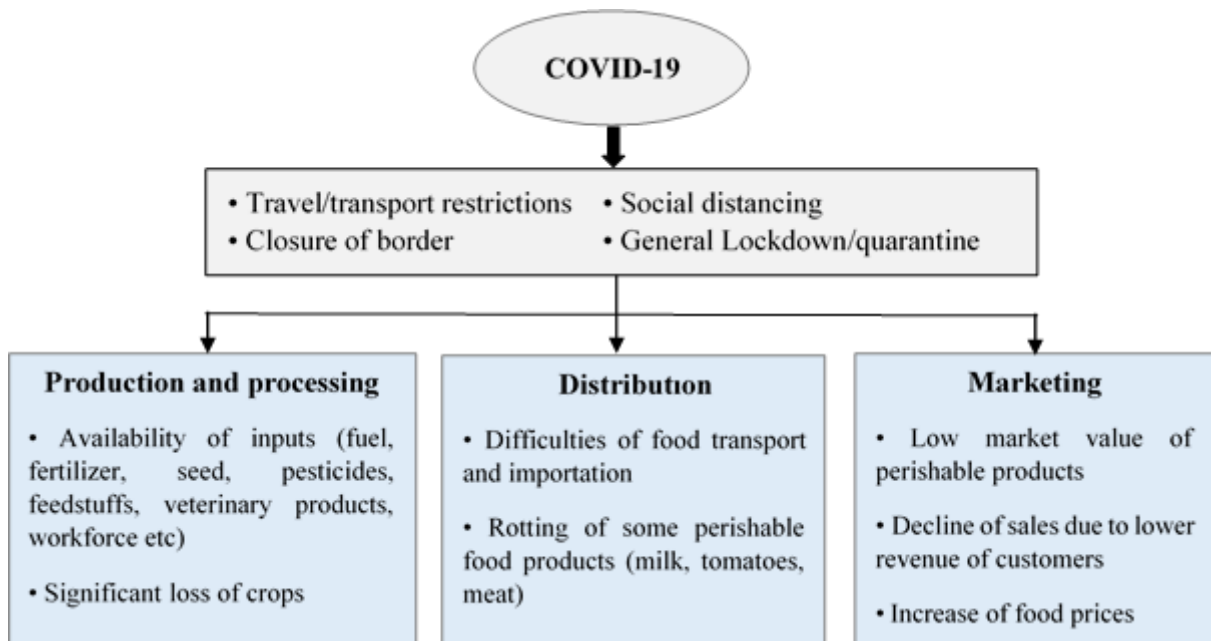


Figure 4. Effects of COVID-19 on food supply chain

Figure 4. Effets de Covid-19 sur la chaîne d’approvisionnement en nourriture

## 4. Conclusion

Benin, like many African countries with limited resources, has been confronted with the COVID-19 pandemic. The crop and animal production sub-sectors have been particularly affected. For all agricultural products, production levels have fallen. The sanitary cordons imposed by the authorities to limit the spread of the pandemic have not improved agricultural productivity, already weakened by the effects of climate change. This double constraint, health and environment, seriously threatens the food security of populations if prompt measures are not taken. Exceptional measures to promote food production, including the distribution of inputs for crops, livestock and fishing.

## AUTHORS CONTRIBUTIONS

Roles	Authors names
Conceptualization	Y. Toukourou
Data collection	J. A. Dehouegnon
Data analysis	J. A. Dehouegnon
Acquisition of fundings	J. A. Dehouegnon
Methodology	Y. Toukourou
Project management	Y. Toukourou
Supervision	Y. Toukourou
Initial manuscript writing	J. A. Dehouegnon
Manuscript review and editing	Y. Toukourou

## CONFLICT OF INTEREST

The authors have declared no conflict of interest.

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