THE IMPACT OF COVID-19 PANDEMIC ON ALGERIA AGRICULTURE SECTOR AND FOOD SECURITY

تأثير أزمة كوفيد19 على القطاع الزراعي والأمن الغذائي في الجزائر

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Abstract:

This study is intended to explain the reality of the Algerian agriculture sector and food security before and during the COVID-19 period, and the focus will be on cereals production, where will describe the state of the sector and assess the potential impact of the shock on it.

We concluded that the Algerian agriculture sector (cereal) are not outside the impact of COVID-19, especially, if the situation continues for a long time, With the knowing the Algerian agriculture far from registering and achieving acceptable levels of self-sufficiency in cereals, and to overcome this shortfall Algeria resorts to import from abroad.

Keywords: COVID-19 pandemic, food security, cereal, agriculture sector.
JEL Classification Codes: E2, Q1, Q17,Q18

ملخص:

تهدف هذه الدراسة إلى توضيح واقع القطاع الفلاحي والأمن الغذائي في الجزائر قبل وأثناء جائحة الكوفيد 19 ، وستركز دراستنا على الحبوب ، حيث سنقوم بوصف حالة القطاع وسنقيم الأثر المحتمل للصدمة عليه.

وقد توصلت دراستنا إلى أن القطاع الزراعي الجزائري (وبالخصوص زراعة الحبوب) ليس بمنأ عن تأثير جائحة كوفيد 19 ، خاصة و إذا استمر الوضع لفترة طويلة ، مع العلم أن واقع الزراعة الجزائرية بعيد عن تسجيل وتحقيق مستويات مقبولة من الاكتفاء الذاتي وخاصة في الحبوب ، حيث تلجأ الجزائر لسد هذا العجز بالاستيراد من الخارج.

كلمات مفتاحية: جائحة كوفيد 19، الأمن الغذائي، الحبوب، القطاع الزراعي.

تصنيفات JEL : E2, Q1, Q17,Q18

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1. INTRODUCTION

Issues of food and nutrition security have received increasing worldwide attention, especially, in light of a COVID-19 crisis. which has influenced on food supply and demand exactly cereal, due to the preventive measures has taken by the governments, such as the imposition of social distancing, self-isolation at home, closure of institutions, public facilities and restrictions on mobility. In other words, effective containment of the disease requires the economy of a country to stop its normal functioning. This has triggered fears of a deep and prolonged global recession, from here, it stands out a problem of our research, which is:

What is the impact of COVID-19 pandemic on the Algerian food security?

a. **Sub-questions**

- What is the impact of COVID-19 crisis on the Algerian agriculture sector?

- Does the decrease of international trade due to COVID-19 pandemic will affect food security in Algeria?

b. **hypotheses of the Study**

- COVID-19 pandemic has influenced on agri-food supply chains and demand

- The decrease of international trade will affect negatively on the Algerian food security.

c. objectives:

- To analyze the impact of Covid19 on agriculture sector;
- To analyze the impact of Covid19 on food security;
- To identify the impact of Covid 19 on food demand;
- To suggest some recommendations that might help in boosting food security in Algeria.

d. Previous studies

- Chaib Baghdad , **The Question of Food Security in Algeria: Between the Collapse of Petrol Price and the Growing Needs of the Population,** This research paper dealt with The Question of Food Security in he collapse of the Algerian economy due to the oil crisis and How to Deal, in This Matter, with the Question of Food Security?.

The study found that the decline of the price barrel has induced some negative effects and consequences on the Algerian economy , resulting to the need and the urgency to review some projects and fields, including the question of food security, knowing the dependency of this to heavy imports, which means more use of foreign money and the probable deterioration of the trade balance. So, it looks that there is no other way only to rely on the domestic sector of agro production, in order to respond to national consumption and to stimulate the local producers.

- Kamel MOULOUDJ , Ahmed Chemseddine BOUARAR ,Hamid FECHIT , **THE IMPACT OF COVID-19 PANDEMIC ON FOOD SECURITY,** the study tryed to analyze and discuss the impact of Covid-19 on food security. The scale of the analysis was of an international level, with special focus on countries suffering from food insecurity such as Algeria. The study found that Covid 19 has had a huge impact on perishable food and caused remarkable food shortages in poor countries, conflict zones and war-affected regions. Additionally, Covid 19 threatened food security even in some developed, whereas developing countries are the most affected due to their high dependency in securing their food supplies.

e. Plan of the study

To answer at the problem, we will address the following elements:

- Definition of food security
- COVID-19 and its Global Impact on the agriculture sector and Food security.
- The impact of COVID -19 pandemic on Algerian food security.

2. Definition of Food Security

Two common definitions of food security come from the United States Department of Agriculture (USDA), and the UN's Food and Agriculture Organization (FAO): **(disabled-world, 2015)**

- Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. (FAO)

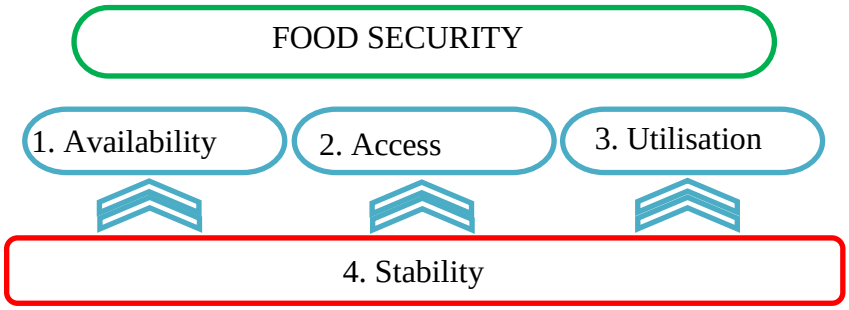
- Food security for a household means access by all members at all times to enough food for an active, healthy life. Food security includes at a minimum, (USDA):

(1) The ready availability of nutritionally adequate and safe foods

(2) An assured ability to acquire acceptable foods in socially acceptable ways (that is, without resorting to emergency food supplies, scavenging, stealing, or other coping strategies).

From the above it can be said that the concept of food security is generally understood to incorporate four main components: *availability, access, utilization, and stability;* although some see stability as a separate cross cutting factor. For a state of food security to exist, all of these components must be sufficiently present.

Fig 1: The components of food security



Source: FCRN FOOD (2018)**, What is food security?** University of Oxford, P5.

In recent years, most of the research initiatives for food security have focused on four key components of the FAO's definition: **(FCRN FOOD, 2018, pp. 5-6)**

➢ **Food availability**. Enough nutritious food of sufficient quality needs to be available to people for their consumption. Availability can be affected by :

- Production: how much and what types of food are available through food that is produced and stored locally.
- Distribution: how is food made available (physically moved), in what form, when, and to whom.
- Exchange: how much of food that is available can be obtained through exchange mechanisms such as barter, trade, purchase, or loans.

- **Food access**. Individuals and households must be able to acquire sufficient food to be able to eat a healthy, nutritious diet, or have access to sufficient resources needed to grow their own food (e.g. land). Access can be affected by:
  - Affordability: the ability of individuals, households or communities to afford the price of food or land for producing food, relative to their incomes.
  - Allocation: the economic, social and political mechanisms governing when, where, and how food can be accessed by consumers and on what terms. For example, food may be unequally allocated according to age and gender within households.
  - Preference: social, religious, and cultural norms and values that influence consumer demand for certain types of food (e.g. religious prohibitions or the desire to follow a specific dietary pattern such as vegetarianism).
- **Food utilization**. People must have access to a sufficient quantity and diversity of foods to meet their nutritional needs but must also be able to eat and properly metabolize such food. utilization can be affected by:
  - Nutritional value: the nutritional value provided by the foods that are consumed, as measured in calories, vitamins, protein, and various micronutrients (e.g. iron, iodine, vitamin A).
  - Health status: the effect of disease (e.g. HIV/AIDS or diarrhea) on the ability to consume the food and absorb and metabolize its nutrients.
  - Food safety: access to food free from food spoilage or from toxic contamination introduction during the producing, processing, packaging, distribution or marketing of food; and from food-borne diseases such as salmonella.
  - Preparation and consumption: the resources (e.g. cooking tools and fuel), knowledge and ability to prepare and consume food in a healthy and hygienic way.
- **Stability**. Food may be available and accessible to people who are able to utilize it effectively, but to avoid increases in malnutrition and in order for people not to feel insecure, this state of affairs needs to be enduring rather than temporary or subject to fluctuations.

Food security "hot spots" include: **(MOULOUDJ, BOUARAR , & FECHIT, 2020, p. 165)**

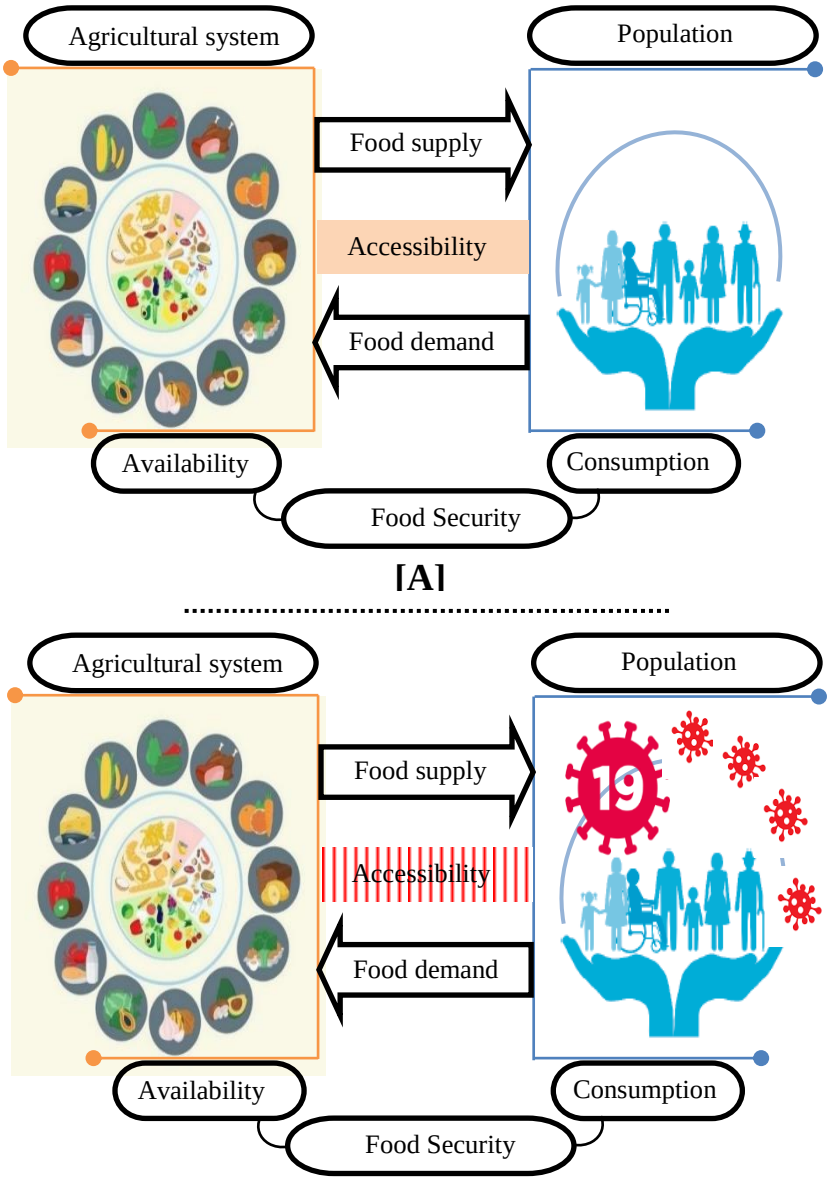
- Vulnerable and war-affected, where logistics and distribution face difficulties even in normal conditions and circumstances.
- Countries affected by various crises resulting from extreme weather condition and pests such as the current locusts plague – the worst in decades— affecting food manufacture in 23 countries.
- The poor and vulnerable, including the more than 821 million people who already suffer from food insecurity before the Covid-19 crisis impacted movement and incomes.
- Countries with major currency depreciation, (driving up the cost of food imports) and countries seeing other commodity prices collapse (reducing their capacity to import food).

3. COVID-19 AND ITS GLOBAL IMPACT ON THE AGRICULTURE SECTOR AND FOOD SECURITY

The Food and Agriculture Organization states that COVID-19 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. With Figure (02) you can understand the relationships between these elements, as well as the impact of COVID-19. **(Siche, 2020)**

COVID-19's impacts on food supply and demand will directly and indirectly affect all four pillars of food security and nutrition (FSN): availability, access, utilization and stability. It is also expected that there will be immediate effects resulting from the containment measures adopted in several countries, and these measures will also have longer-term impacts affecting the full global economy. **(HLPE, 2020, p. 4)**

Fig 2 : Food security system.



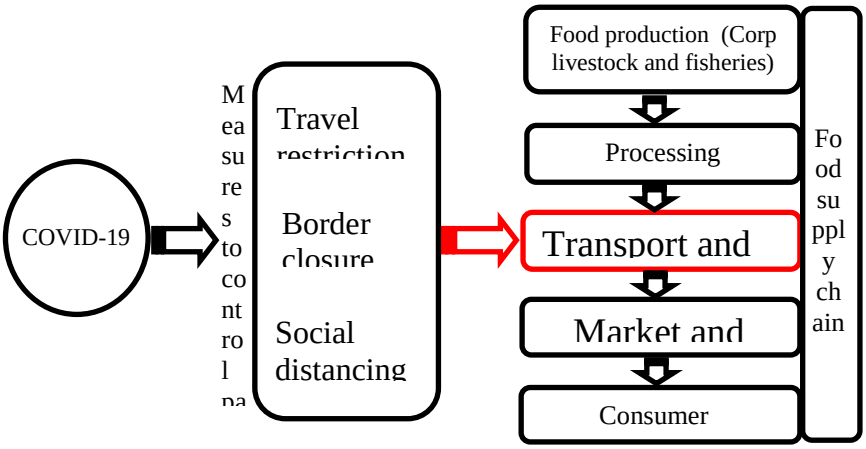
(a)without COVID-19 and (b) with COVID-19

source: Raúl Siche (mar 2020), What is the impact of COVID-19 disease on agriculture?, Scientia Agropecuaria ,vol 11 no.1 Trujillo ene http://www.scielo.org.pe/scielo.php?pid=S207799172020000100003&script=sci_arttext&tlng=en#f2

3.1. Impact on food supply

As caseloads of COVID-19 increase in countries around the world, there are likely to be disruptions to agri-food supply chains. Although there may have been plenty of food within the supply chains at the start of the crisis, disruptions to food supplies have tracked outbreaks due to a rise in panic buying by people concerned about food supplies during potential lockdowns. If outbreaks around the world are severe or continue over long periods of time, there are likely to be more serious disruptions that may reduce food availability in the markets over the medium and longer terms. These disruptions may occur as a result of producers themselves becoming ill or because of disruptions to markets due to policies to contain the virus, and the resulting weakened capacity to produce, transform and transport food. One specific issue is the access to inputs in time for the agricultural planting season, as delays due to transport and market disruptions may affect yields and income. Restriction to workers' movements will cause workforce shortages especially relevant for labor-intensive crops, such as fruits and vegetables. Disruptions in food chains and social distancing policies may also affect social assistance, including children relying on school meals when schools close down. According to the World Food Programme (WFP), already about 320 million children have had their primary schools closed due to COVID-19, with most of them losing access to school meals. Declining demand due to a decline in purchasing power will in turn affect the ability and willingness of farmers and producers to invest and adopt adequate technology and will further shrink food production and availability. **(HLPE, 2020, p. 4)**

Fig 3:COVID-19's impacts on food supply



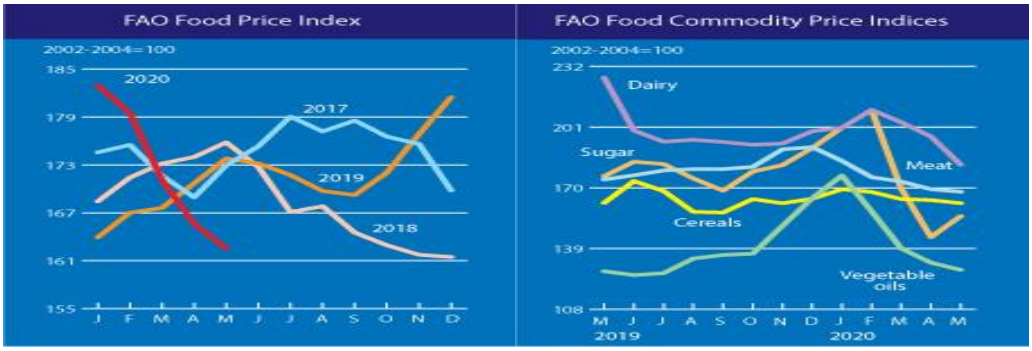
SOURCE: Padam Bahadur Poudel and others (May 2020),**COVID-19 and its Global Impact on Food and Agriculture,** Journal of Biology and Today's World , 9(5): 221,p3.

by speaking about the prices , globally the prices have remained stable, therefore, no spikes in the prices of basic necessities are expected, although it is more likely to occur for high-value products, especially meat and perishables. One of the indices that measure the variation of the price worldwide is the FAO Food Price Index (FFPI), a measure of the monthly variation of the international prices of a basket of food products. **(Siche, 2020)**According to the FAO: **(FAO, The FAO Food Price Index drops to a seventeen-month low, Release, 2020)**

- The **FAO Food Price Index*** (FFPI) averaged 162.5 points in May 2020, down 3.1 points (1.9 percent) from April and reaching the lowest monthly average since December 2018. With the continued negative economic effects of COVID-19, the FFPI has been on a downward trend for four consecutive months. The latest drop in May reflects falling values of all the sub-indices with the exception of sugar, which rose for the first time in three months.
- The **FAO Cereal Price Index** averaged 162.2 points in May, down 1.6 points (1.0 percent) from April and very close to its level in the corresponding month last year. Among major cereals, only rice prices rose in May. International rice prices edged up 1 percent, mainly on rising Japonica and Basmati quotations, although currency movements and demand from Malaysia and the Philippines also kept Indica quotations firm. In wheat markets, after a rise in April, export prices fell under downward

pressure, shedding almost 2 percent, as expectations point to ample global supplies also in the new season while trade activities have slowed down with the harvesting seasons underway, or approaching, in the northern hemisphere. In coarse grain markets, the US maize prices, continuing the downward trend of the last four months, fell further in May, to almost 16 percent below the corresponding period last year. Weak demand from feed and biofuel sectors, amidst abundant export supplies, continued to pressure international maize prices.

Fig 4: FAO food price index



Source: FAO(04/06/2020),**The FAO Food Price Index drops to a seventeen-month low,** http://www.fao.org/worldfo.odsituation/foodpricesindex/en/

In general, we can say that the Global production levels for the most widely consumed staples (rice, wheat and maize) are at or near all-time highs(figure no 5) However, the prices of certain cash crops -- an important source of rural income have been depressed by the slowing of global demand. **(the world bank, 2020)**

Fig 5: cereal production

Source: FAO (04/06/2020),**FAO Cereal Supply and Demand Brief,** http://www.fao.org/worldfoodsituation/csdb/en/

In spite of uncertainties posed by the pandemic, FAO's first forecasts for the 2020/21 season point to a comfortable cereal supply and demand situation. Early prospects point to global cereal production in 2020 surpassing the previous year's record by 2.6 percent. Based on conditions of crops already in the ground, planting expectations for those still to be sown, and assuming normal weather for the remainder of the season, world cereal output is forecast at 2 780 million tonnes (including rice in milled equivalent), nearly 70 million tonnes higher than in 2019, setting a new record high. Maize would account for the bulk of the predicted increase, with an expected expansion of 64.5 million tonnes to a record level of 1 207 million tonnes, boosted by record harvests in the United States of America (USA), Canada and Ukraine, and near-record harvests in Brazil and Argentina. Similarly, rice production is seen reaching an all-time high of 508.7 million tonnes in 2020, exceeding the 2019 reduced level by 1.6 percent. More normal weather and attractive prices are anticipated to underpin rice output recoveries primarily in China, the Lao People's Democratic Republic, Pakistan, Thailand and the USA, as well as continued production growth in India. By contrast, global production of wheat in 2020 is forecast to decline from the previous year's good level, largely on likely downturns in the European Union (EU), Ukraine and the USA more than offsetting expected production increases in the Russian Federation and Australia. **(FAO, FAO Cereal Supply and Demand Brief, 2020)**

After stagnating in 2019/20, world cereal utilization in 2020/21 is tentatively forecast to expand by 1.6 percent (43 million tonnes) year-on-year to reach an all-time high of 2 732 million tonnes. The projected growth would mainly mirror a more robust expansion foreseen in feed use relative to 2019/20, although both food and industrial uses are also forecast to increase. Maize is predicted to account for the largest year-on-year anticipated growth in total cereal utilization, rising by almost 3 percent (33 million tonnes) to 1 169 million tonnes, on expectations of a partial recovery in industrial demand, especially for production of ethanol in the USA, and a faster growth in feed use, particularly in China. Underpinned by plentiful supplies, world rice utilization is forecast to expand by 1.6 percent in 2020/21 to a fresh peak of 510.0 million tonnes, with food use to account

for much of this growth, increasing by 1.6 percent from 2019/20 to 420.0 million tonnes. On a per capita basis, this would result in a global food intake of 53.9 kg, up 0.6 percent year-on-year. By contrast, world utilization of wheat in 2020/21 is expected to fall slightly (0.4 percent) from the 2019/20 estimated level to around 754 million tonnes, mostly reflecting weaker demand prospects for the feed sector due to ample availabilities of coarse grains and a likely cut in industrial use, especially for biofuel production in the EU. **(FAO, FAO Cereal Supply and Demand Brief, 2020)**

3.2. Impact on food demand

Social distancing policies and illnesses cause a **drop in the overall demand** and in the **demand for food-related services** (e.g. restaurants, hotels) with repercussions on loss of jobs, incomes and livelihoods. Starting with the containment and social distancing policies, the pandemic creates first a spike in demand, due to panic buying and hoarding of food by consumers, which will increase food demand in the short-term, primarily among those who have the means to over-buy food for storage in their homes. However, it is expected that this short-term spike in purchases will be followed by a declining trend in demand, both in terms of physical ability to purchase food due to movement restrictions and closure of restaurants or other catering facilities, and in terms of loss of income and purchasing power linked to the loss of jobs and the freezing of economic sectors. Changes in short-term preferences towards packaged food due to perceptions of food safety or convenience can become long-term changes, with repercussions on food systems, livelihoods of food producers and dietary diversity. **(HLPE, 2020, p. 5)**

3.3. Impact on food access

Restrictions on movement may prevent farmers from accessing markets and result in food waste. In many countries, farmers are now unable to sell their produce in local markets or to local schools, restaurants, hotels and other leisure establishments, which have been temporarily closed. **(International Labour Organization, 17 april 2020, p. 2)**

As a summary of the above, it can be said that both supply and demand have been affected, although a greater effect on demand, due to the

possibility restrictions that affect accessibility. Availability and consumption remain almost stable. The agricultural system includes producers, raw materials, agricultural machinery and inputs, processing plants, and farm and industrialized food. Consumption includes people and different marketing systems.

3.4. Impact on employment

The pandemic may also have a serious impact on labour-intensive crop production and processing due to labour shortages and the temporary cessation of production. For example, Europe's agricultural sector is facing dramatic labour shortages due to border closures that prevent hundreds of thousands of seasonal workers from reaching farms that rely on their labour during the harvest period. The impact on the sector is expected to be long term. A number of major European agricultural producers, including France, Germany, Italy, Spain and Poland, are particularly vulnerable. According to Coldiretti, the Italian organization representing farmers, over a quarter of the food produced in the country relies on approximately 370,000 regular seasonal migrant workers. Around 100,000 farmworkers may not be able to come to Italy this year, and the figure may be double that in France. In Germany, where some 286,000 seasonal migrant workers are engaged every year in fruit, vegetable and wine production, the Government is exploring different ways of mobilizing sufficient workers for the harvest, including running direct flights for farmworkers and issuing temporary work permits for asylum seekers. On 2 April 2020, the European Commission has issued practical guidance for member States to facilitate cross-border travel for seasonal workers in critical occupations, which include food sector workers, while putting in place all necessary measures to avoid further spread of the pandemic. **(International Labour Organization, 17 april 2020, p. 2)**

And so on Supply disruptions as well as the **loss of jobs, incomes and employment outlined above will fall especially hard on low wage and casual workers** with more limited savings and access to public healthcare in some contexts. In the absence of responsive social safety nets and robust income assistance, the working poor will see their ability to access nutritious food decline in many situations. Many households will downshift

to so-called "inferior goods" as a cost-saving measure, as well as more shelf-stable goods, which could be more processed and less nutritious foods in industrialized countries, or less processed and arguably more nutritious foods in less industrialized countries. However, these too have a cost in terms of enhanced demands on women's time and labour to process these foods, as became evident during the Structural Adjustment Programmes of the 1980s. **(HLPE, 2020, p. 5)**

3.5. The Global Impact of COVID-19 on Food security

Global food markets remain amply supplied following recent bumper harvests, especially in maize and wheat. For major staple food commodities, stock-to-use ratios are very high by historical standards. Nevertheless, recent announcements of trade restrictions by some key exporters (e.g., Russia for wheat and Vietnam for rice), as well as "excess" buying by some importers (e.g., Philippines for rice, Egypt and Saudi Arabia for wheat), have raised concerns about food security. If such concerns become widespread, hoarding may result. Low-income countries (LICs) are more vulnerable food insecurity, as food accounts for a larger proportion of their consumption than in EMDEs, particularly among the poorest households. Most LICs are located in Sub-Saharan Africa where about one-fifth of the population suffers from malnutrition.

Disruption of supply chains has already affected the export sector of EMDEs, especially for perishable products such as flowers, fruits, and vegetables. For example, following travel disruptions from East Africa to Europe, Kenya's exports of fresh flowers dropped nearly 80 percent. Shipments to Western European markets, including the United Kingdom, the Netherlands, and Germany, fell from 60 to 15 tons per day.

Production is also being affected by disruption to key inputs. For example, low availability of pesticides are already affecting crop protection efforts and will likely reduce yields later in the year. A lack of pesticides is also hampering efforts to contain pest outbreaks, including the current locust outbreak in East Africa. Labor availability for agricultural supply chains is increasingly becoming a problem, especially for highly labor-intensive sectors, such as fruits, vegetables, meat, and dairy production. **(the world**

bank, COMMODITY MARKETS OUTLOOK, APRIL 2020, pp. 10-11)

The World Food Programme estimated that by November 2020 an additional 200,000 people had become food insecure as a direct result of the Covid-19 outbreak and that figure would rise to between 750,000 and 2.3 million by March 2021 if the outbreak continuous. Actually, Food safety and security are the global concern at present scenario. The supply chain has been hit hardest by COVID-19, which causes food security of most vulnerable segment of population at risk. Therefore, the government should enforce the measures to control the pandemic without disturbing the food supply chain and considering the food security of their citizen.

The main effects of COVID-19 on food security, we can be summarized in the following:

- The pandemic may have a significant negative impact on the livelihoods of millions of small farmer and plantation workers engaged in export-oriented, labor-intensive agricultural production, Due to decline in international trade, disturbance in food supply chain and food production, Which will effect on food insecurity. FAO had mentioned that, small farmer and fisher may face difficulty in selling their product which in turn cause decrease in their income and purchasing capacity.
- Agriculture is one of the important sectors for economy.it is indispensable to food security and human development. FAO has estimated that more than 60% of the world population relies on agriculture for survival .COVID-19 has affected all the processes which connect farm production to final consumer. Moreover, it seems to strike the food production system and food value chain. The negative impact of pandemic on supply and demand for food might lead food security at risk, especially in long term.
- COVID-19 pandemic more severely impacts the lives, livelihoods, and food security situations of impoverished people, pity street vendors, daily wage earners, homeless street persons, temporary migrant workers, and beggars. Most of this group of people ‘cannot work from home’ or cannot ‘stay home.’ They have only two worst choices: (1) to go out for their daily subsistence amid the virus or (2) die of hunger at home.

- Most of the farmer producers are facing the manpower shortage. Travel ban have made the shortage of seasonal and informal farm workers. There is rapid increase in employment losses around the world. International Labour Organization (ILO) estimated that COVID-19 has affected the 81% (2.7 billion workers) global work force due to full or partial closure of the work place. To overcome these entire scenarios, many governmental and non-governmental organizations are playing their role to maintain continuous food supply chain. Currently Food and Agriculture Organization (FAO) is working with a main aim to maintain food value chain and keep food supply going.
- The restrictions on the movements of people have had an impact on the circulation, and thus availability, of food and agricultural products, and have also interrupted several value chains, with a potential impact on prices. Counterintuitively, however, what has been observed so far is that, despite the limited circulation of food, the food supply has overall remained stable, and – with limited exceptions – food prices in the countries have overall remained stable as well. This can probably be attributed to the large availability of food stocks at the time of the outbreak, when movement restriction measures began to be implemented. However, the longer the situation persists and the longer the restrictive measures continue, the more stress will be exerted on the whole system. If the circulation of people is not re-established soon, food stocks are destined to decline, and prices to increase. **(MARCHISIO, 2020)**
- Beyond the short-term impact of these measures on the food supply, if the situation persists and restrictions on movements continue, there is a risk that agricultural production would be impacted, with consequent longer-lasting and deeper impacts on food availability, prices and – ultimately – overall food security. **(MARCHISIO, 2020)**

4. Impact of pandemic on agriculture sector and food security in Algeria

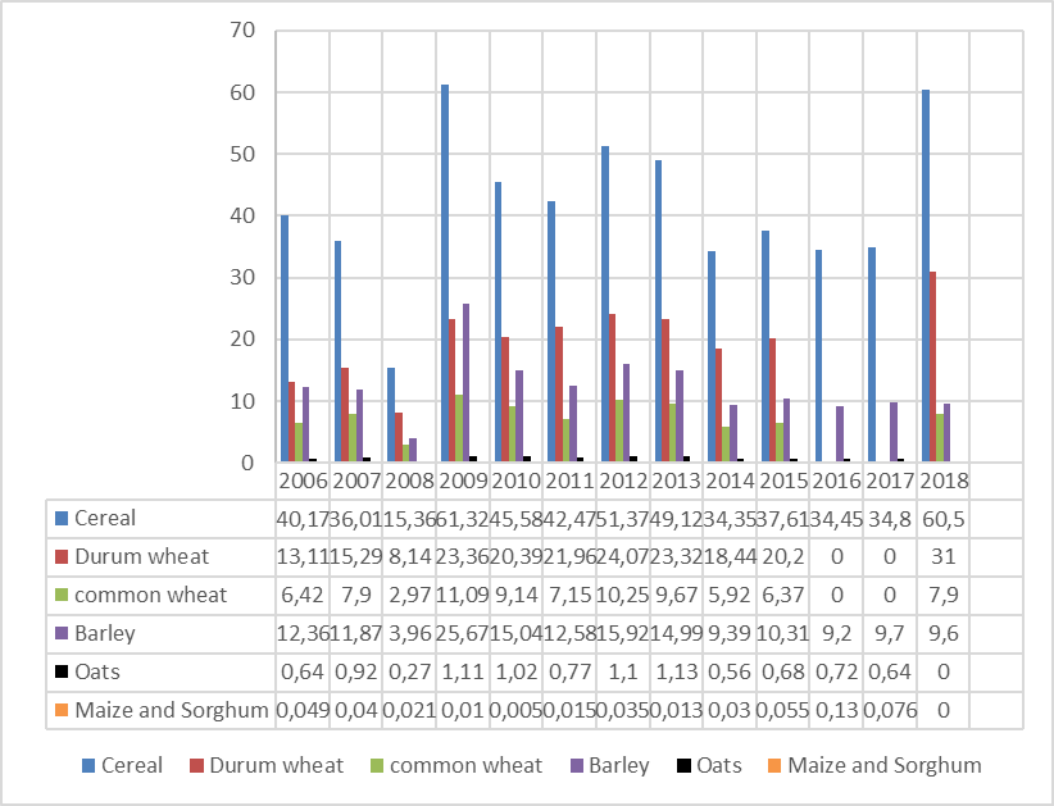
• An overview of food security in Algeria Before the Corona Virus Crisis

the grain sector in Algeria accounts for 30% of national agrifood production, based on the fact that the latter remains predominant in the

choice of consumption of Algerian households. It must be understood that the Algerian government is trying to reduce the bill, which has become too expensive for the public treasury to import foodstuffs, and at the same time to relaunch exports of these goods which are barely of $ 2 billion, while the target was $ 5 billion, with a major concern to reduce this food dependence, a real threat to the budget and trade balance for the country, and to allow a reorientation of the financial resources garnered by the bias of oil revenues in more promising investments and incentives for the government. **(Baghdad, 2019, p. 26)**

Fig 6: Production of selected cereal crops during the period(2005 - 2018)

(Unit: million kantars)



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Cereal	40,17	36,01	15,36	61,32	45,58	42,47	51,37	49,12	34,35	37,61	34,45	34,8	60,5
Durum wheat	13,11	15,29	8,14	23,36	20,39	21,96	24,07	23,32	18,44	20,2	0	0	31
common wheat	6,42	7,9	2,97	11,09	9,14	7,15	10,25	9,67	5,92	6,37	0	0	7,9
Barley	12,36	11,87	3,96	25,67	15,04	12,58	15,92	14,99	9,39	10,31	9,2	9,7	9,6
Oats	0,64	0,92	0,27	1,11	1,02	0,77	1,1	1,13	0,56	0,68	0,72	0,64	0
Maize and Sorghum	0,049	0,04	0,021	0,01	0,005	0,015	0,035	0,013	0,03	0,055	0,13	0,076	0

Source: Statistics of the Ministry of Agriculture, Rural Development and Fisheries.

By sbeaking about the reality of food security in Algeria on cereals,Through the study we have concluded that Algerian agriculture in the field of food is characterized by a state of deterioration. Where

production of cereal record big shortage, it considers as the major staple food of Algerian citizen.

Algeria relies on imports to meet domestic need particularly for cereals. Cereals always account for an important part of Algerian food imports. They represent 31 to 38 percent of the total food import bill each year.

With the effects of climate change, fluctuating hydrocarbon revenues and a devaluing currency, being dependent on food imports seriously undermines Algeria's food security. The country is currently one of the world's largest cereal grains purchasers, with 13.44 million tonnes of cereals bought in 2016 at a cost of $2.8 bn. The following table shows that:

Table 1**:Self-sufficiency ratio for cereals during the period 2005/2016**

Unit: Thousand tonnes

Years	Exports	Imports	Balance Trade of céréals	AVAILABLE FOR CONSUMPTION	Self-sufficiency ratio%
2005	13.98	8290.88	8276.90	11804.33	29.88
2006	8.35	7271.06	7262.71	11280.46	35.62
2007	7.18	7051.52	7044.34	10646.25	33.83
2008	12.13	8933.58	8921.45	10623.50	16.02
2009	6.03	7925.19	7919.16	13172.31	39.88
2010	8.34	7946.15	7937.81	12496.38	36.48
2011	8.3	7946	7938	11666	32.0
2012	8.3	9912.5	9904.2	15041.3	34.2
2013	0.75	7501.93	7501.18	12413.41	39.57
2014	1	12497,7	12496,6	15931,8	21,6
2015	4.4	13915,7	13911,3	17672,2	21,3
2016	3.4	13440,3	13436,9	16379,2	18,0

Source **:** arab Organization for Agricultural Development**, Arab Agricultural Statistics Yearbook,** vol from 27 to 33, Khartoum,2007-2017.

Self-sufficiency rates in cereals has recorded low rates during the period 2005/2016. It were ranged between 16% to 40 % , and witnessed a great decline in 2008, but then raised during the period (2009/2013), Self-sufficiency rates witness another decline during the period (2014-2016) to record 18% in 2016 Which led to an increase in Algeria's cereal imports from 8.2 million tonnes in 2005 to 13.44 million tonnes in 2016.

The cereal imports bill in 2018 increased by 11.55% compared by 2017, the bill reached $ 3.1 billion in 2018, which represented 36% of food imports. (نصيرة سيد علي, 2019)

Effect of climate change on cereals production, the high food import bill (high price of wheat in International markets) and a growing population are behind Algeria's drive to increase its cereals imports.

It is generally known that the resolution of the food question takes into account two fundamental parameters: (Baghdad, 2019, p. 29)

- The demographic rate
- The performance of the agro-food sector (itself dependent on agricultural performance).

In the Algerian case, it must be admitted that the two elements cited are indeed a problematic subject for economic decision-makers, because the local population is close to 40 million and the agro-food sector is deadlocked and confronts a few shortcomings and gaps that seem reassuring for the preservation and resolution of the food security issue.

what is considered as a risk regarding food security in Algeria and making it more vulnerable is the fact to maintain an exclusive dependency on oil revenues in order to pay the essential products for the population on the international markets. **(Baghdad, 2019, p. 26)**

4.1. Impacts on Supply

- **Limited impact on production**

The COVID-19 crisis did not induce significant changes on the grain harvest outlook in Algeria, as it did not coincide with the harvest (to start in June-July in most of the countries). For spring and summer crops, whose planting occurred mainly during the March-May period, no impact has been reported. Workforce at farm level to perform appropriate operations in the field remained on place. Beside sanitary measures, Algeria set up specific traffic authorizations for the agricultural sector issued to farmers / workers, seasonal workers, agricultural operators and suppliers to ensure the normal running of campaigns. In remote areas of Algeria, customary organizations have been mobilized to contribute to the harvest. However, with regard to

cereals, the production of which is highly mechanized, there have been no significant difficulties. **(CIHEAM, 2020, p. 1)**

- **Consequences on imports and stock strategies**

Algeria imported via its Office (OAIC) 2.55 Mt of grain over the December-March 5 months period, which is well above the projections adopted by the public authorities for the 2019/2020 marketing year. The crisis reinforces the urgency for the country to quickly reduce its dependence on imports. In particular, between March 15 and April 15, 2.5 million quintals of semolina were sold in shops, the usual consumption of 3 months in the ordinary period . The quantities supposed to cover one month disappeared in a few days. **(CIHEAM, 2020, p. 2)**

- **Logistic disruptions and agri-food industries**

In Algeria, millers had to face an urgent demand and to accelerate grain processing to supply retailers. The Government made advances on the quantities allocated to processors to meet strong demand (the first days of the crisis).

4.2. Impacts on demand

The demand for wheat flour and semolina surged at the beginning of the outbreak. Following administrative approvals of additional quotas, State and private mills was operated at full capacity to supply the local market. In March 2020, it was reported that the country had enough food stocks to meet its domestic food demand until the beginning of 2021. The Government banned exports of any strategic product (such as food, medicine, personal care products and detergents) until the end of the pandemic. It also expedited custom processing of imported staple food and medicine, and introduced an in‑ kind distribution campaign of food and hygiene items to the most vulnerable families. The Ministry of Agriculture has opened points of sale to sell agricultural produce at reasonable prices to control prices on the markets.

The Ministry of Agriculture instructed the relevant offices to continue with the regular agricultural activities as well as to provide transportation and health protection for agricultural workers to maintain continuity in the agricultural supply chain. Governors of provinces were asked to facilitate the re‑ opening of agricultural input stores for the sale of seeds, veterinary

drugs and agricultural equipment. **(FAO, Global Information and Early Warning System, 2020).**

For some products, the COVID-19 crisis generated significant price increases, as well as widespread speculation causing strain on the availability of certain products. In response, the Algerian Government instructed all the local authorities to watch, in coordination with the Ministries of Commerce and Agriculture, speculators and to take the necessary measures to prevent price increases. Measures have been put in place for violators to face fines, imprisonment and closure of their stores or warehouses. The Ministry of Agriculture has also opened points of sale to sell agricultural produce at reasonable prices to control the prices on the market. Ministry of Commerce inspectors are regularly monitoring markets. Finally, the National Office for Animal Feed, (ONAB) intervened to save the Algerian Poultry Breeders, unable to sell their products due to the forced closure of restaurants. ONAB purchased the excess poultry and will store the surplus until market conditions return to normal. **(Hales & Ferrah, 2020, p. 3)**

4.3. Socio-economic measures to alleviate poverty

- 2.2 million families (unemployed, informal sector) received a bonus of 10,000 DZ
- The government has already released a budget of 22 billion dinars, to which have been added aid in foodstuffs supplied for the benefit of nearly 400,000 families (food baskets containing essential food made available to the most deprived citizens). In May, the national support schemes will be implemented, suspended previously by Covid-19.
- Single window available to farmers.
- Advances are provided on phytosanitary products and other inputs.
- Simplified bank loans as well as insurance at subsidized rates. **(CIHEAM, 2020, p. 10)**

4.4. other Impact of pandemic on agriculture sector and food security

- The pandemic may have a significant negative impact on the livelihoods of millions of Algerian small farmers. Who may face difficulty in selling their products; which in turn cause decrease in their income and purchasing capacity.
- The Preventive Measures to fight the pandemic (such as social/physical distancing, reduced travel, avoiding crowds, closures, and other protective practices), may severely impact on Algerian agriculture production in the long term ,and most other economic sectors in Algeria.
- Due to global trade disturbance, Algeria farmers are facing the shortage of agricultural inputs like seed, fertilizer and pesticides, China is one of the major fertilizer producing producer and exporter in the world, the lockdown in China has severely affected the international fertilizer trade.
- Obviously, the most impacted would be the poorest and the most vulnerable segments of the Algerian population, who have less capacity to deal with the prolonged negative effects of the restrictive preventive measures, especially those affecting labour/wages and production and – ultimately – household income and her food security.
- The Algeria's demand of food has affected due to COVID-19 crisis: At the beginning of the pandemic, consumers were panicked so they have been stockpiling foods, the foods, which in turn has affected the food availability and prices, but after that, the demand of food decreased to two main reasons: The first of them, the closure of schools, universities, restaurants, banquet halls, hotels and entertainment resorts..... etc . The second reason is the stopping of many workers in several sectors (transportation, construction and public works, etc.) on working, which affected negatively in income and purchasing capacity of Algerian citizen. .
-Algeria relies mostly on imports To cover domestic demand(especially of cereals),in light decrease the international trade, and the possibility of stopped countries that export wheat and other foodstuffs like Russia and other countries , Algeria will be in great trouble, especially That the strategic food stock will be sufficient only for early 2021, according to a statement of one of the government ministers, for this case, Algeria must

strive to reduce dependency to the other countries, and this will only be through Attention on agriculture sector.

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5. CONCLUSION

The agricultural sector is one of the most important strategic and sensitive sectors, due to the role it plays in achieving the food security. The agricultural sector is one of the most important strategic and sensitive sectors, due to the role it plays in achieving the food security. Therefore, Algeria has sought to take an interest in this sector. Despite the efforts made to develop this sector (Especially cereal sector). However, the results were not at the desired level as Algeria is considered the world's largest cereals importer.

Algeria was listed by Food and Agriculture Organization among nations that are at the moment (COVID-19 crisis) technically unable to meet their food needs from agricultural production, especially cereals. This is evident through the level of agricultural production is very low compared to the resources available to its. the most important results of the study:

- Algeria relies heavily on cereal imports (Especially common wheat) from the international market to cover its growing domestic consumption needs, which the local production cannot cover it.
- At the present time, agricultural production was not affected by COVID- 19 pandemic, but if the situation persists and restrictions on movements continue for a long time, there is a risk that agricultural production would be impacted, with consequent longer-lasting and deeper impacts on food availability, prices and – ultimately – overall food security.

- The Algeria's demand of food has affected due to the covid-19 crisis, where the purchasing capacity of the Algerian citizen has declined, Because of stopped many workers in several sectors on working. In addition to closure of schools, universities, restaurants, banquet halls, hotels and entertainment resorts..... etc .

Reaching the self-sufficiency, especially, in cereal production will require concerted effort at all levels from family and community to the associations, private sectors, and the Government of the country, we recommend to:

- Promoting good governance and fighting bribery and corruption, through its adopts the principle of transparency in distributing State resources (financial resources, farmland, and exploitation of groundwater...etc) .
- Endeavor to re-educate society about the need to follow a balanced diet that depends on nutritional value, not quantity to minimize waste and excessive consumption, which contributes to improving the rate of Algerian self-sufficiency.
- The adoption of quinoa plant crops as complementary to wheat, knowing that it contains all wheat nutritional values. It does not need much water and tolerates high levels of salinity. Thus, the possibility of its cultivation in arid regions,
- Encourage investment in the Saharan regions;
- Rationalization of the use of phytosanitary products;
- In situations where the COVID-19 pandemic, or concerns over its spread, are having a negative impact on the agricultural sector, appropriate emergency measures should be adopted to support agri-food enterprises with a view to stimulating agricultural production and ensuring that workers continue to receive decent wages and other benefits, in accordance with existing collective agreements and/or relevant laws. In this context, particular attention needs to be paid to the hundreds of millions of agricultural wage workers, who playing a crucial role in ensuring the continuity of the food supply, are often among the most vulnerable, poor and food insecure.

Providing access to unemployment benefits and social assistance for workers who lose their jobs or whose hours are cut is also critical to cushion the impact of the crisis (COVID-19) on household income and her food security.

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