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Developments in community nutrition during The Covid-19 pandemic

Développements dans la nutrition communautaire pendant la pandémie de Covid-19

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Abstract: The new coronavirus is an infectious virus that was first seen in Wuhan, China in December 2019, and SARS-CoV-2 (serious acute respiratory syndrome coronavirus-2), best known as Covid-19, has taken the whole world under its influence in a short time.

Covid-19 pandemic; It has caused significant changes in individuals' eating habits, physical activities, consumer behaviors, sleep patterns, mood and daily life activities. In order to support the immune system in the Covid-19 pandemic; It is emphasized that choosing a healthy lifestyle, consuming foods rich in fruits and vegetables, spending free time by exercising, trying to maintain a healthy body weight and sleeping for a sufficient amount of time. Since the turn of the twenty-first century, the discourse on a global food system transformation that prioritizes healthy eating and nutrition has resonated among agencies and scientists. The Covid-19 pandemic has exposed vulnerabilities within the food system and highlighted the need for a holistic systems approach to accelerate concerted efforts towards our global goals and objectives.

It is thought that determining the nutritional habits of the society during the pandemic period will be effective in the fight against the Covid-19 pandemic. In the light of this information, in this study, it is aimed to evaluate the developments of the nutritional habits of the society in the Covid-19 pandemic.

Keywords: Covid-19 Pandemic, Nutrition, Community nutrition, Food system, Food safety

Résumé : Le nouveau coronavirus est un virus infectieux qui a été observé pour la première fois à Wuhan, en Chine, en décembre 2019, et le SARS-CoV-2 (syndrome respiratoire aigu grave coronavirus-2), mieux connu sous le nom de Covid-19, a pris le monde entier sous son influence dans un court laps de temps.

Pandémie de Covid 19 : Elle a provoqué des changements importants dans les habitudes alimentaires, les activités physiques, les comportements de consommation, les habitudes de sommeil, l'humeur et les activités de la vie quotidienne des individus. Afin de soutenir le système immunitaire dans la pandémie de Covid-19, il est souligné que choisir un mode de vie sain, consommer des aliments riches en fruits et légumes, passer du temps libre en faisant de l'exercice, essayer de maintenir un poids corporel sain et dormir suffisamment longtemps. Depuis le tournant du XXIe siècle, le discours sur une transformation du système alimentaire mondial qui donne la priorité à une alimentation et une nutrition saines a trouvé un écho parmi les agences et les scientifiques. La pandémie de Covid-19 a révélé des vulnérabilités au sein du système alimentaire et a souligné la nécessité d'une approche systémique holistique pour accélérer les efforts concertés vers nos buts et objectifs mondiaux.

On pense que déterminer les habitudes nutritionnelles de la société pendant la période pandémique sera efficace dans la lutte contre la pandémie de Covid-19. À la lumière de ces informations, dans cette étude, il s'agit d'évaluer l'évolution des habitudes alimentaires de la société dans la pandémie de Covid-19.

Mots-clés : Pandémie de Covid-19, Nutrition, Nutrition communautaire, Système alimentaire, Sécurité alimentaire

Classification JEL : I10, Q10, Q17, Q18

1. Introduction

The new coronavirus is an infectious virus that was first seen in Wuhan, China in December 2019, and SARS-CoV-2 (serious acute respiratory syndrome coronavirus-2), best known as Covid-19, has taken the whole world under its influence in a short time. (Del Rio and Malani, 2020).

Covid-19 pandemic; It has caused significant changes in individuals' eating habits, physical activities, consumer behaviours, sleep patterns, mood and daily life activities. In order to support the immune system in the Covid-19 pandemic; It is emphasized that choosing a healthy lifestyle, consuming foods rich in fruits and vegetables, spending free time by exercising, trying to maintain a healthy body weight and sleeping for a sufficient amount of time (Naja and Hamadeh, 2020). In addition to these requirements, it is recommended to reduce the use of cigarettes and alcohol, or even not to use them at all, in order to reduce stress. There is no supplement that is particularly recommended for changing dietary habits in the Covid-19 pandemic. However, it is of great importance for individuals to support the immune system during the pandemic (Carr, 2020).

The Covid-19 pandemic, which has spread rapidly and extensively around the world since late 2019, has had profound effects on food security and nutrition. The resulting crisis has affected food systems and threatened people's access to food through many dynamics. Following the lockdowns triggered by the global health crisis, we have not only witnessed a major disruption to food supply chains, but also a major global economic slowdown. These crises have resulted in lower incomes and higher prices for some foods, made food inaccessible for many and undermined the right to food, and hampered efforts to achieve Sustainable Development Goal (SDG) 2: 'Zero hunger'. The situation is fluid and dynamic, characterized by a high degree of uncertainty. According to the World Health Organization, the worst effects are yet to come (Khorsandi, 2020).

It is thought that determining the nutritional habits of the society during the pandemic period will be effective in the fight against the Covid-19 pandemic. In the light of this information, in this study, it is aimed to evaluate the nutritional habits of the society in the Covid-19 pandemic.

2. Psychological and Social Effects of the Covid-19 Pandemic

In this pandemic process, which affected the whole world and almost all countries had to take various measures, individuals were also affected by the process economically and psychologically, apart from the disease. The most obvious sources of stress are job loss, loss of family members, friends or colleagues due to Covid-19, financial insecurity, isolation from others, especially for those who live alone (Shader, 2020). From the very beginning of the process, healthcare professionals have been fighting at the forefront despite shortages of missing equipment, high viral load and risk of death. And they are undoubtedly the group most affected psychologically by the process. In a study conducted on healthcare professionals in China, 50.4% of the participants had depression, 44.6% had anxiety, 34.0% had sleep disorders, and 71.5% had stress (Lai et al., 2020). In another study conducted in the general population in China, the prevalence of anxiety and depression was found to be 25% and 28%, respectively (Ren et al., 2020). In many studies on the

psychological effects of the SARS epidemic in previous years, anxiety in healthcare workers and posttraumatic stress disorder as a long-term effect were found. A similar situation was observed in studies for the MERS virus (Lee et al., 2018). Again, in a study conducted in Toronto on the SARS epidemic, the incidence of PTSD (Post Traumatic Stress Disorder) and depression was found to be 28.9% and 31.2%, respectively, for 129 quarantined individuals. Based on these previous studies, it can be predicted that the social effects of this process will be much greater and long-lasting due to the fact that it is a pandemic. As a matter of fact, in a study by Torales et al., depression, anxiety, fear, stress and sleep problems started to be seen more frequently during the Covid-19 pandemic (Torales et al., 2020). In a study of 253 people in one of the regions most affected by the epidemic in China, post-traumatic stress disorder was reported with a frequency of 7% one month after the epidemic (Adhikari et al., 2020). The factors affecting the formation of these psychiatric symptoms have also been examined in many studies. In a study, income stability and living with family had a protective effect on anxiety. Gender, age, occupation, education level etc. Factors such as anxiety can also affect anxiety. Due to the closure of schools, economic insecurity, fear of death and the psychological and physical effects of social distance, the sleep quality of people has also been affected, and the number of people who have difficulty falling asleep and staying asleep has increased. Increased anxiety levels, caffeine use, alcohol consumption and blue light exposure due to increased screen time play a role in this (Javaheri and Javaheri, 2020). Conditions such as curfews, closure of public areas and working from home also affected the exercise status of people in this process.

The rapid and sudden spread of Covid-19 has created panic and fear in all people. In order to minimize the risk of transmission and progress in the fight against the disease, countries have informed their citizens that they should stay at home and not go out unless it is necessary. Social isolation and the fear brought by the epidemic caused people to flock to the markets and stock up. During this period, factors such as stocking, insecurity against food due to virus contamination, income changes due to job concerns or earnings, and the time spent at home caused changes in people's food shopping. Studies conducted during this period reveal that the participants ate more food than usual. It has been stated that the main reason for this is the decrease in eating out and the increase in eating at home (Chenarides et al., 2021). In terms of food composition, shopping during the Covid-19 period reveals a lower amount of beverages (especially beer and coffee), a slight increase in egg and red meat intake, and a slight increase in plant-based foods (especially processed vegetables, fruits, nuts, pasta/rice) as in 2019. It is seen that there is a significant increase compared to period food shopping (Batlle-Bayer et al., 2020). There are not many studies in the literature on the financial dimension of food expenditure during the pandemic period. In an online survey study conducted with 284 participants in Tunisia, the budget allocated for food shopping during the pandemic period is examined. Considering that Tunisia's monthly minimum salary is 145 United States dollars ($), it is seen that 36% of respondents spend $100-175, and 32% spend more than $175 on food per month (Jribi et al., 2020). However, there is no study that reveals the monetary difference in the financial burden allocated to food shopping before and after the pandemic. In general, it is thought that more food expenditure is made due to higher food intake in the pandemic.

3. Covid-19 and Community Nutrition

Providing adequate and balanced nutrition is one of the main determinants of health. Since an effective treatment for Covid-19 is not yet available, increasing the immune response of individuals in the asymptomatic stage of the disease is very important for the protection of health. Maintaining an unhealthy diet and lifestyle causes non-communicable diseases such as diabetes, cardiovascular disease and respiratory diseases, which have adverse effects on the prognosis of Covid-19 (Alam et al., 2021). Nutritional habits in our country; It is moving from the Mediterranean type of diet, in which dietary fiber, antioxidants and polyunsaturated fatty acids are dominant, to the

Western type of diet, in which saturated fat, carbohydrates and refined sugars are dominant. The western type of nutrition model causes the development of lipotoxicity and oxidative stress with its proinflammatory properties, and inhibits the acquired immune response through macrophages and neutrophils. An ideal diet is a prerequisite for the control of oxidative stress and the inflammatory process, which has an effect on the immune system (Gomez et al., 2020).

3.1. Changing Nutritional Habits in Society with the Covid-19 Pandemic

More stay at home and quarantine practices during the epidemic process; It causes less use of the sun and thus a decrease in vitamin D synthesis due to the result of much less 7-dehydrocholesterol level in the skin. In vitamin D deficiency, the risk of viral epidemics increases and the development of chronic diseases increases. Vitamin D defends the respiratory tract, while reducing the production of pro-inflammatory cytokines; accordingly, it contributes to the reduction of the risk of pneumonia (Muscogiuri et al., 2020).

The formation of the SARS-CoV-2 coronavirus strain, as well as its development, depends on the interaction between the virus and the individual's immune system. Viral factors include virus type, mutation, viral load, viral titer, and viability of the virus in vitro. Factors that make up an individual's immune system include genetics, age, gender, nutritional status, neuroendocrine immune system regulation, and physical condition. All these factors contribute to determining whether an individual is infected with the virus, the duration and severity of the disease, and whether they are reinfected (Li et al., 2020).

The Covid-19 pandemic increases the stress level in individuals and causes sleep and mental problems. At the same time, the increase in the time spent at home, social isolation can increase the free time of people and indirectly cause a feeling of boredom. Studies show that emotions such as stress, anxiety and depression are associated with eating. At the same time, there are studies in the literature that the feeling of boredom triggers eating. Studies show that the feeling of boredom results in an increase in fat and calorie consumption in people, and people turn to snacks in particular. However, it is known that nutrition is specific to the individual and that some negative emotions are also appetite suppressant in some people (Braden et al., 2018).

The positive or negative psychological or physiological consequences of the pandemic on people have also caused changes in people's eating habits. According to the online survey study conducted with 3,533 participants aged between 12 and 86 in Italy, weight gain was observed in almost half of the population, while people between the ages of 18-30 showed a tendency to the Mediterranean Diet (Di Renzo et al., 2020). Other studies show that the tendency to the Mediterranean Diet increases during this period (Sánchez-Sánchez et al., 2020).

When people suffer from starvation or chronic malnutrition, it means they are unable to meet their food requirements for an extended period of time. They consume enough calories to lead a normal, active life. This has long-term implications for their future and continues to offer a setback to global efforts to achieve End Hunger. When people experience acute food insecurity at the crisis level, it means that they have limited access to food in the short term due to the occasional sudden crisis that can put their lives and livelihoods at risk. However, if people facing acute food insecurity at the crisis level get the help they need, the hungry will not join their ranks and their situation will not become chronic.

Equally urgent is the growing threat of the pandemic to current crises such as conflict, natural disasters, climate change, pests and animal diseases that are already stressing our food systems and triggering food insecurity around the world.

Developing countries are particularly at risk as Covid-19 may lead to a reduction in the workforce and affect their incomes and livelihoods, as well as labor-intensive modes of production (agriculture, fisheries/aquaculture). Of particular concern is sub-Saharan Africa, where most of the countries experiencing a food crisis are located, and the pandemic has spread at critical times for

both farmers and herders – when people need access to seeds and other inputs and to their farms for planting.

The food supply chain includes producers, consumers, agricultural and fisheries inputs, processing and storage, transportation and marketing, etc. It is a complex network containing At the start of the crisis, food supply chains were strained as many countries imposed restrictions on the movement of goods and people across and across borders. As a result, the challenge was not the availability of food, but easy access to it. Then, some countries, worried about all the uncertainties associated with the food supply, made the situation even more difficult by restricting food exports.

Globally, the food supply was adequate and markets have been stable so far. For example, global grain stocks are at comfortable levels and the outlook for wheat and other key crops for 2020 is positive. However, disruptions in food supply chains persist, situations are changing, and there are still many unknowns.

3.2. Change in food production

While declines in the production of high-value commodities are already likely, they are not yet noticed due to lock-ins and disruption in the value chain. In countries already affected by other crises, FAO's field surveys show that small-scale producers face increasing difficulties in accessing inputs such as seeds and fertilizers due to the rising prices of these inputs; severely reduced household incomes; and/or the unavailability of these inputs on the market.

While we do not yet know the extent of these impacts on national production, in some countries, such as Afghanistan, an FAO study with the Government predicts a reduction of more than 50 percent in foods such as grains, fruits, vegetables and dairy products.

Reduced food production can have serious effects on food availability. If planting declines, so does the harvest, meaning that the farming families themselves and their communities, often among the most severely food insecure, will not have access to adequate nutritious food along the line.

3.3. Change in fisheries and aquaculture

In the fisheries and aquaculture industry, results can vary and can be quite complex. For wild game fisheries, the inability of fishing vessels to operate (due to limited or collapse of the market, as well as difficult-to-follow sanitary measures on a vessel) can create a domino effect along value chains in terms of supply. products in general and the availability of certain types. In addition, for wild hunting and aquaculture, logistical problems associated with restrictions on transportation, closure of borders and reduced demand in restaurants and hotels can create significant market changes that affect prices.

3.4. Change in livestock

The pandemic is affecting the livestock industry similar to what is happening in China, with reduced access to animal feed and reduced capacity of slaughterhouses (due to logistics constraints and labour shortages). In countries already affected by other crises, the evidence emerging from FAO's assessments highlights that the livestock sector is particularly vulnerable to the effects of the pandemic.

3.5. Change in food logistics

Congestions on transport routes are hurdles, especially for fresh food supply chains, and have resulted in increased levels of food loss and wastage. Fresh fish and fishery products are particularly at risk, as they perish quite rapidly and therefore must be sold, processed or stored within a relatively limited period of time. Transport restrictions and quarantine measures have prevented farmers and fishermen from accessing markets, their production capacity and selling their

produce. Labor shortages can disrupt food production and processing, especially for labour-intensive industries.

3.6. Change in food markets

The closure of restaurants and street food outlets is eliminating a key market for many producers and processors, which can produce a temporary abundance or trigger production cuts, as can be seen in the fish and meat industries. In some developing countries, urban supply and demand for fresh produce are declining due to constraints and avoidance behaviours by traders and consumers.

At the start of the Covid-19 pandemic, there was a significant increase in demand. Production and demand vary according to the main food products. For example, despite the uncertainties created by the pandemic, FAO's initial forecasts for the 2020/21 season point to a relaxed situation in grain supply and demand. World total meat production is expected to decline by 1.7 percent in 2020 due to animal diseases, market disruptions related to Covid-19 and the persistent effects of droughts. The Covid-19 pandemic will continue to heavily impact seafood markets this year, particularly fresh produce and popular restaurant types. On the supply side, fishing fleets are idle and aquaculture producers have drastically reduced their stocking targets.

Overall, food markets will face months of more uncertainty due to Covid-19, but the agri-food sector is more likely to resist the pandemic crisis than any other sector. Find out more about the latest forecasts for 2020-2021 production and market trends for the world's most traded food products here.

FAO is calling for urgent action in seven key priority areas to transform global food systems to make them more resilient, sustainable and equitable while minimizing the harmful effects of Covid-19 on food security and nutrition:

- Strengthen Global Humanitarian Response Plan for Covid-19
- Improve Data for Decision Making
- Ensure Economic Inclusion and Social Protection to Reduce Poverty
- Bolster Trade and Food Safety Standards
- Increase Small Owners Resilience to Rescue
- Prevent the Next Zoonotic Outbreak with an Empowered One Health Approach
- Trigger Food Systems Transformation

The Covid-19 pandemic is impacting food and nutrition security through economic and social system shocks, food system disruptions, and gaps in the coverage of essential health and nutrition services. Food systems in low- and middle-income countries must adapt and strengthen food and nutrition security in the wake of Covid-19.

Food insecurity, deterioration in nutritional quality, micronutrient deficiencies and other forms of malnutrition result from fundamental, complex and dynamic changes in our food system. Despite varying burdens and different mitigation responses to SARS-CoV-2 around the world, the impacts on national, regional and local food systems have consistently resulted in job losses, income shortages and food shortages. Increases in food waste have also been observed in some LMICs due to low demand for perishables, limited transport and storage capacities, and volatility in retail food prices. These cuts exacerbate existing inequalities in access to food and expose the vulnerability of food systems due to conflict, extreme weather and epidemics. Most LMICs are ill-equipped to weather the Covid-19 pandemic and its consequences, given their susceptibility to external shocks, limited financial resources and poor public services.

3.7. Economic and social system shocks

As a result of Covid-19, the International Labor Organization estimates that 345 million full-time jobs were lost in the third quarter of 2020, with global GDP expected to be 5.0-6.5% lower than forecast for 2020, while remittances will fall in 2021. It is expected to fall by 14% globally and

trigger a recession. This can affect the tax revenues that fund basic public health and social security services. We expect the national and household declines in income caused by Covid-19 to worsen any vicious cycle of poverty, disease and malnutrition.

Food systems support the livelihoods of 1 billion people worldwide. Quarantines and restrictions at the start of the pandemic led to temporary or indefinite closures of official and informal food outlets and catering, resulting in widespread job losses. The sudden reverse migration of newly unemployed has been triggered in some areas and exacerbated existing pressures on local food and health systems, as seen in India. Women continue to disproportionately absorb the shocks from the pandemic; The largest declines in income and labour force participation are observed among women, due to lower job security in the informal sector and greater demands for childcare at home. Low consumer demand for goods and services, especially nutritious foods, due to fears of virus contamination, has resulted in more job losses in the food industry. With these dramatic job and income losses, the pandemic is expected to add to the estimated 3 billion people who before the crisis could not afford a high-quality diet, exacerbating malnutrition; especially among women and young children who are most nutritionally vulnerable.

3.8. Food system disruptions

The epidemic has created many bottlenecks from field to table. Local supply chains of micro, small, and medium-sized businesses (SMEs), which are largely responsible for the supply of food consumed at LMICs, have seen pandemic-related effects, including longer lead times between distributors (due to social distancing protocols), reduced workforce capacity, increased inspections and quarantine measures, and increased operating costs. Much of the global south is dependent on farming and small-scale fisheries, which are often low-paid, unstable and unprotected, employing many migrants and seasonal workers (many of them women). Labor shortages due to Covid-19 become problematic during peak seasons. Processing backlogs have brought with them unprecedented food loss and shifts in commodity supply. While current estimates suggest that staple crop production will be relatively unaffected by the pandemic (rice, wheat, maize, lentils and soybeans), the same cannot be said for high-value, labour-intensive and perishable crops such as fresh fruit and vegetables. and foods of animal origin. This will increase restrictions on poor households' ability to eat a healthy diet.

Closures and restrictions on formal (SMEs) and informal food service (i.e. open-air markets, mobile vendors and cross-border merchants) in markets, especially in the early stages of the pandemic, created a supply shock, while reduced purchasing power due to job and income losses and the decrease in demand from SMEs created a demand shock. Situation analyzes in Africa and Asia point to transportation challenges that have translated into a dramatic increase in food access, food availability and, in some cases, food loss, especially for nutritious, perishable foods. Consumers' real or perceived concerns about the food supply further influence market-seeking behaviours such as food hoarding and panic buying, and can have devastating long-term effects on diet quality and malnutrition. This includes increasing consumption of inexpensive calorie sources (i.e. starchy foods, processed grains, and unhealthy ultra-processed foods), reducing or eliminating more expensive and nutrient-rich foods, or reducing the number of meals; all this is due to very poor quality diets, micronutrient deficiencies and increases in maternal and child malnutrition or overweight/obesity (especially when combined with increased consumption of highly processed foods, reduced physical activity that can result from incarceration and/or unemployment). Although data gaps exist, some evidence suggests that the reduction in consumption of nutrient-rich foods is greatest for fruits and vegetables, dairy products, and meat in both high-income and LMIC contexts.

3.9. Making a difference with transformation

Since the turn of the twenty-first century, the discourse on a global food system transformation that prioritizes healthy eating and nutrition has resonated among agencies and

scientists. The Covid-19 pandemic has exposed vulnerabilities within the food system and highlighted the need for a holistic systems approach to accelerate concerted efforts towards our global goals and objectives. The 2021 Food Systems Summit provides an opportunity to rethink food systems and design long-term planetary health reforms to build resilient communities, protect rural agricultural populations, and promote sustainable supply chains and food security.

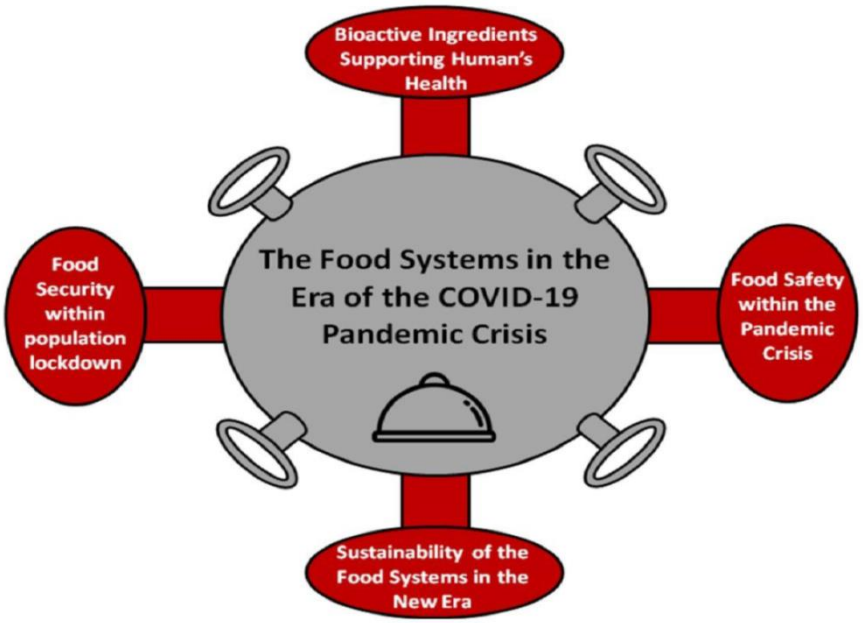
We propose two specific and urgent recommendations to ensure that high-quality diet and nutrition are prioritized in mitigating the long-term effects of the pandemic and similar future crises through sustainable reforms. Existing inequalities in food systems, particularly those related to gender and marginalized populations, must be addressed through policy responses and social protection programs to improve the affordability of healthy nutrition and prevent both current and intergenerational malnutrition. Leveraging and engaging with national and local government actors, agribusinesses, donors and development partners and the international community to translate these recommendations is key to their implementation.

Priority recommendations and actions to adapt and strengthen food systems for food and nutrition security

- Support small and medium-sized businesses (including those led by women, Indigenous peoples, pastoralists, fishermen and family farmers) with more effective government investment (eg agriculture, infrastructure and transport), policies and established purchasing practices. Support nutrient-rich foods sourced locally (including farm and schoolyards) and regionally.
- Protect and support all food system workers (formal and informal) and their rights from future pandemics or economic shocks through social and technological innovation (eg, workforce sourcing and scheduling flexibility, logistics diversity, and employee nutrition and wellness programmes). personal protective equipment. This will ensure a healthy and resilient food system and help improve nutrition security and employment in future crises, especially for women.
- Promote shorter and more diversified food value chains, particularly for nutritious, perishable foods, including wild foods, foods of animal origin, and fruits and vegetables. This could cause food prices to be slightly higher, and so governments should consider it valuable insurance against future shocks that could have irreversible effects on the youngest and most vulnerable. Also, avoid general export restrictions and provide safe trade corridors for nutritious foods.
- Given the dubious origins of Covid-19, there is a need to strengthen international food market transparency and monitor food movement in real time for food safety compliance, data-driven decision-making on food supply and food prices.
- Invest in national and community agriculture to promote the production and commercialization of nutrient-dense staple and non-essential nutritious foods.
- Invest in national or sub-national micronutrient premix facilities to encourage local production of fortified staples (ensure rigorous quality controls are in place), even where trade is impeded. Given the reliance on staple foods that don't spoil during Covid-19, proper fortification of these foods is imperative and food processors don't have to rely solely on imported premix.
- Invest in effective behaviour change and nutritional information approaches and policies to increase demand for nutritious foods (eg through marketing, advertising, labelling and education).
- Strengthen the design and methods of social protection programs to improve their ability to stimulate demand for nutritious food. For example, link cash transfers to behaviour change to encourage consumption of nutritious foods, or use coupons for nutritious foods or cash to be used in nutritious food markets.

- Individual, household and community level and direct support to women (eg skills transfer and job training and development, microcredit etc.) This will empower women, grow businesses and provide additional support to food and nutrition security.

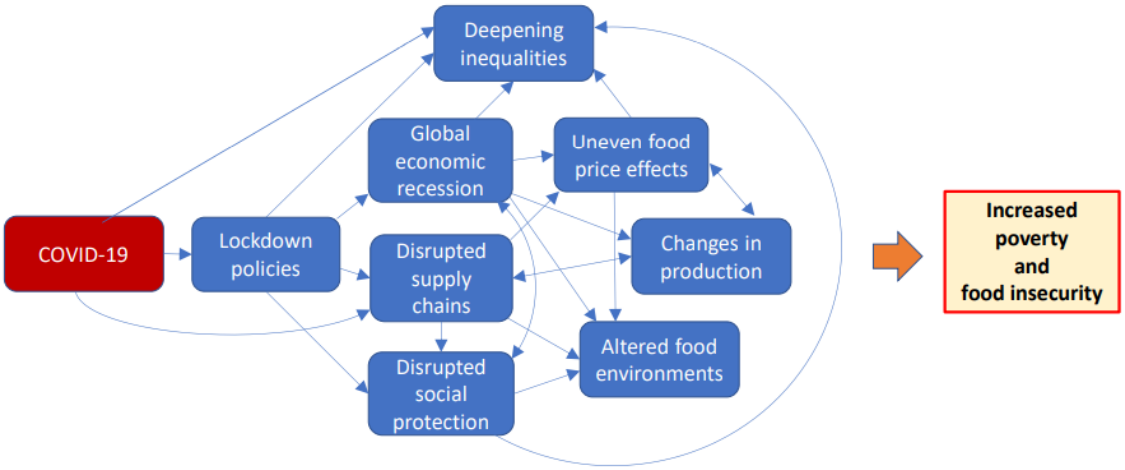
Figure 1. Food systems in an era of coronavirus disease (Covid-19) pandemic crisis.



Galanakis, 2020

A number of overlapping and reinforcing dynamics have emerged that affect food systems and food security and nutrition, including: disruptions in food supply chains; loss of income and livelihood; the widening of inequality; cuts in social protection programs; modified food environments; and unequal food prices in local contexts (see, for example, Klassen and Murphy, 2020; Clapp and Moseley, 2020; Laborde et al., 2020). Also, given the high degree of uncertainty around the virus and its evolution, there may be threats to food security and nutrition in the future, including the potential for lower food productivity and production, depending on the severity and duration of the pandemic and measures to contain it.

Figure 2. The dynamics of Covid-19 threatening food security and nutrition



3.10. Supply chain interruptions

Following the lockdown measures, there have been major disruptions in food supply chains affecting the availability, pricing and quality of food (Barrett, 2020). The closure of restaurants and other food service facilities has led to a sharp decline in demand for certain perishable foods, including dairy products, potatoes and fresh fruit, as well as specialty items such as chocolate and some high-value cuts of meat (Lewis, 2020; Terazono and Munshi, 2020). While quarantines related to the pandemic came into effect in many countries in March-May 2020, there were widespread media reports that foodstuffs were either driven back to the fields or thrown away due to the contraction in demand or difficulties in getting these foods to markets (Yaffe- Bellany and Corkery, 2020). Without adequate storage facilities, including cold storage, farmers found themselves with food they could not sell.

These disruptions in supply chains have affected food availability in some cases, particularly when food is not reaching the markets, which has put upward pressure on the prices of some scarce goods, as noted below. The quality of food environments has also been affected, leading to some shortages of fresh fruit and vegetables as discussed below.

3.11. Global economic recession and related income losses

The global economic slowdown triggered by the pandemic and the spread of the disease itself have exacerbated existing social inequalities in many countries (Ashford et al., 2020). These inequalities affect rights as well as access to basic needs such as food, water and health care, as well as access to jobs and livelihoods, which have implications for food security and nutrition. Food insecurity already disproportionately affects people living in poverty and socially discriminated against, and it is precisely these people who are at higher risk of contracting Covid-19 and have less access to healthcare (Klassen and Murphy, 2020). Covid-19 has also exacerbated inequalities in access to safe water supplies and basic sanitation. According to WHO, one in three people do not have access to safe drinking water and basic handwashing facilities (WHO, 2020b). People who do not have access to these services, which are vital to health and safe food preparation, are more likely to contract the disease, increasing existing inequalities (Ekumah et al., 2020).

3.12. Changing food environments

Food environments have been profoundly changed by the pandemic. The quarantine measures and supply chain disruptions outlined above have changed the context and thus the way people interact and interact with the food system to buy, prepare and consume food. The closing of restaurants and food stalls meant that people who relied on food prepared outside the home suddenly found themselves preparing meals at home. But due to rigidities in supply chains, foods that were previously produced and packaged specifically for food service could not be easily repackaged for retail and home use.

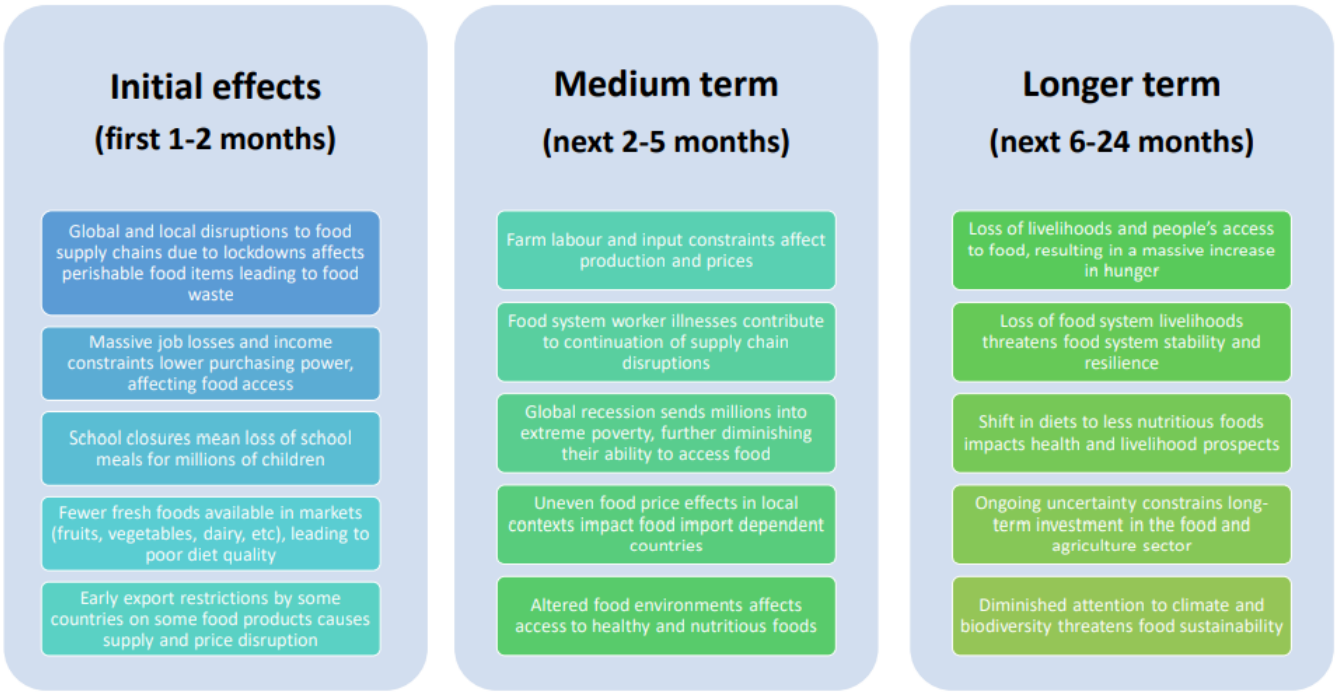
3.13. Potential for change in production

As noted above, global grain stocks were near record levels at the start of 2020, and the food supply was generally not deficient. However, the dynamics outlined above may change due to the high degree of uncertainty surrounding the virus, its evolution and societal impact. The pandemic could potentially impact production levels, depending on how long quarantine measures have lasted, whether they are repeated, and uncertainty regarding the timing and extent of those measures.

In some countries, labour-intensive crops that are often grown with a migrant workforce, especially horticultural products such as fresh fruit and vegetables, are more likely to be affected by the aforementioned disruptions. Horticultural production, processing and exports have expanded dramatically in many developing countries over the past few decades (Van den Broeck and

Maertens, 2016) and these countries may experience production shocks that can affect incomes and therefore food, due to labour shortages and transportation problems. Entrance. Especially in industrialized countries where the use of high-capital equipment is common, grain production is less likely to be affected (Schmidhuber and Qiao, 2020). Supply chains for agricultural inputs such as seeds and fertilizers have also been affected by quarantine measures, making them both scarce and more expensive as previously reported in both China and West Africa (Arouna et al., 2020; Pu and Zhong , 2020).

Figure 3. Impact of Covid-19 on food systems over time



Source: Adapted from Clapp, 2020.

3.14. Implications for the six dimensions of food security

The dynamics outlined above affect food security and nutrition in complex ways. The HLPE Global Narrative report highlights six dimensions of food security and proposes adding agency and sustainability as key dimensions alongside the four traditional "pillars" of food availability, access, stability and use (HLPE, 2020b). The Covid-19 pandemic is affecting or has been impacted by each of these dimensions and illustrates the importance of each of these dimensions in interpreting the food security and nutrition implications of the crisis, including the addition of proposed agency and sustainability.

Availability: While world grain stocks were relatively high and remained strong at the start of the pandemic, this global situation masks local variability and may change over time. Grain production in high-income countries tends to be highly mechanized and requires little labour, making it less vulnerable to disease outbreaks among agricultural workers. By contrast, grain production on smaller farms in low-income countries tends to be more labour-intensive and female-dominated. Unlike grains, supply chains for horticulture, dairy, and meat packaging are more vulnerable to the effects of Covid-19 in high-income countries due to their labour-intensive nature, susceptibility to food worker diseases, and institutional concentrations leading to larger farms and processing. Facilities where disease outbreaks can spread rapidly. Disruptions in supply chains for agricultural inputs can also affect food production going forward.

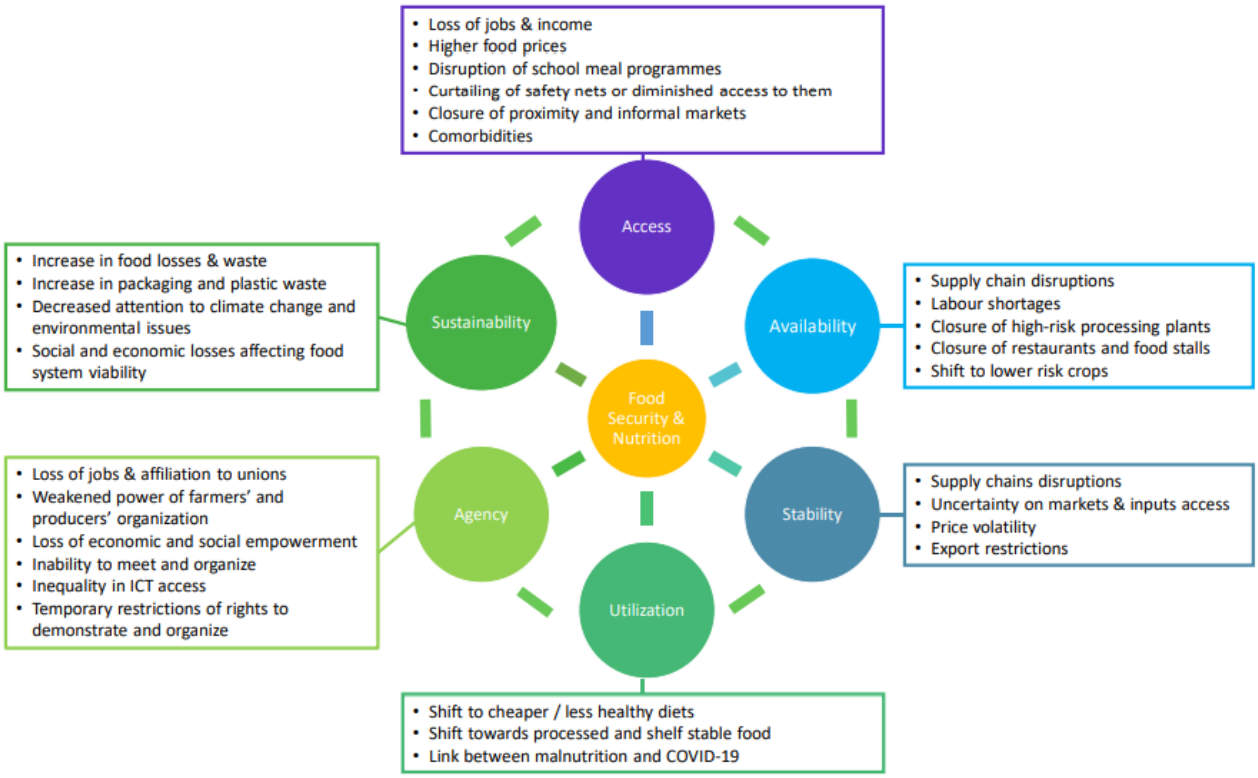
Access: More than any other dimension of food security, access to food has probably been the most impacted by the Covid-19 crisis. The global economic recession triggered by quarantines has had a very negative impact on people's ability to access food. As the crisis drags on, short-term coping strategies (e.g., savings, sale of animals and assets) are reaching their limits or are exhausted, and the capacity to provide comprehensive social safety nets in developing countries is limited (Gerard et al., 2020). Poor households work on tight budgets with little or no discretionary spending. This means that, in the absence of social safety nets, food expenditures plummet as incomes decline during the Covid-19 pandemic. These losses have affected low-paid workers, some farmers and informal traders and peddlers. Increases in food prices directly affected the ability of households to purchase adequate food. Comorbidities have also profoundly affected some populations, particularly marginalized groups, making them more vulnerable to Covid-19 and leading to higher death and morbidity rates for low-income groups, with implications for labour, income, and access to food (Moseley and Battersby, 2020).

Usage: Usage and nutrition have been significantly affected by the pandemic. Good nutrition is essential to support the human immune system and reduce the risk of infection. However, as people's ability to access food was reduced during the crisis, this had a negative impact on their ability to oppose a healthy diet (FAO et al., 2020). This effect is particularly felt in low- and middle-income countries, where people spend a higher proportion of their income on food than people in high-income countries, with the poorest households generally spending about 50-80 percent of their income on food (FAO, 2011). As noted above, the shift in consumption to more processed foods and fewer fruits and vegetables during the crisis also contributes to malnutrition. Such dietary changes can have reinforcing effects, as people who experience any form of malnutrition are more vulnerable to developing disease and complications (Micha et al., 2020). Access to clean water and safe sanitation are essential for good hygiene and safe food preparation, both vital to ensuring good nutrition, but the pandemic has widened inequalities in access to these vital services, thereby affecting nutrition while also increasing disease.

Stability: Serious disruptions in the aforementioned food supply chains are affecting the stability of global food supply and access (Bene, 2020). Export restrictions on key commodities such as wheat and rice have resulted in higher world prices for these commodities, compared to generally falling other food prices (FAO, 2020c). Although most of the Covid-19 food export restrictions are temporary, countries remain at risk of introducing new export restrictions (Espitia et al., 2020). In some local contexts, the upward pressure on food prices also impacts the ongoing economic uncertainty that affects food system stability and currency values, contributing to these trends and posing a continuing risk to stability in global food markets. Uncertainty over the evolution of the pandemic and restrictive measures also affects the ability and willingness of people and companies to invest in a agrifood sector (UNCTAD, 2020).

Sustainability: The pandemic is intricately intertwined with the sustainability dimension of food security. The expansion of industrial agriculture is associated with the increasing prevalence of zoonoses (diseases transmitted from animals to humans), with a prime example being Covid-19 (Everard et al., 2020). The degradation of fragile ecosystems, particularly wildlife habitats, is widely viewed as a key driver of human-wildlife interaction creating an increased opportunity for disease transmission between them. As the disease began to spread widely, the early stages of the aforementioned quarantine measures resulted in a dramatic increase in food wastage due to restaurant closures and reduced demand for certain types of food (Sharma et al., 2020). The pandemic has also led to an increase in the use of disposable plastic food packaging and carrier bags, which cannot be easily recycled (Vanapalli et al., 2020). The pandemic also increases the risk of diverting attention and funding from climate change and environmental concerns, such as biodiversity loss (Barbier and Burgess 2020), which could affect long-term sustainability in the food system. The longer-term viability of food systems is also affected by the social and economic losses from the pandemic, the change in production methods, and the loss of jobs and livelihoods.

Figure 4. Impact of Covid-19 food system dynamics on six dimensions of food security



Widespread disruptions to food supply chains resulting from the pandemic indicate the need for more flexible food delivery systems. While various supply chains have been disrupted by the pandemic, long and complex ones for perishable and specialty agricultural products have been particularly affected. Producers and consumers in low-income countries are most affected by these disruptions, although producers in all parts of the world have felt these effects. As these dynamics unfold, there is a growing interest in strengthening local and regional markets to bring greater resilience to food systems by shortening supply chains. These more localized markets, sometimes referred to as "regional markets", are the dominant market types for local foods in developing countries and have become increasingly important in developed countries in recent years as farmers' markets. It has been redeveloped with increasing demand for local food. Such markets typically provide outlets for foods from various production systems that are often better responsive to disruptions and changes in demand, the kind we have seen post-Covid-19. Markets established in local and regional contexts are also important in strengthening livelihood opportunities for local food producers, processors and vendors. They also have the potential to reduce national and community reliance on remote transnational companies that dominate transactions in concentrated global supply chains. However, there is often a lack of infrastructure support for the development of regional markets, including for example storage facilities. Innovations such as digital e-commerce platforms designed specifically for small and medium businesses and not subject to the control of large companies can also support locally established markets that are better able to respond to supply chain disruptions brought about by Covid-19. National and local governments can play a major role in strengthening the infrastructure for regional markets.

Strengthening food system resilience is critical to an effective response to the Covid-19 pandemic. As international supply chains are challenged by Covid-19, relocalizing food production or seeking a better balance between imported and locally produced food is the right strategy to build robustness and resilience. While some advocate industrial food production techniques as the best way to increase food production at home, this approach is limited because it is not accessible to the

poorest of the poor because of cost; often requires purchased external agricultural inputs that are similarly subject to supply chain disruptions; may be unsustainable in terms of waste and environmental impacts. For example, Agroecology is the science of utilizing ecological interactions in farm areas to increase crop yields and minimize input costs and waste. Agroecology provides a powerful response to the Covid-19 food security and nutrition crisis as it is a sustainable strategy to increase food production at home, accessible to all types of farmers, both rich and poor. Research shows that agroecology is as effective as traditional methods for long-term improvements, especially when the system is examined in terms of energy input and output. Smart plant combinations and mixed cropping strategies can also reduce or spread labour demands. There is a strong need for more research and education to support the transition to more agroecological production systems that can increase the resilience of the food system. In the current context, due to the risks Covid-19 poses to face-to-face education, such efforts may require masks and physical distancing, and in some cases may be supplemented by digital communication technologies, provided these technologies are focused on people's needs. poor farmers and data are openly accessible. Home gardens and urban agriculture can also be more resilient to shocks and disruption and provide access to more diverse and nutritious food for the urban poor. Sustainable fisheries and aquaculture provide important sources of nutrition and are key to livelihoods and employment.

Conclusion

The eating habits that have changed with the pandemic have taken place under the following conditions. We can list these conditions as follows.

While governments face budgetary constraints, now is not the time to cut back on social safety net programs, especially those that improve household access to healthy and nutritious food. Income assistance, coupons for home food purchases, tenant eviction protections, housing assistance, and school lunch programs have all been shown to be effective support tools in some social contexts. Coupons for food purchases must work in formal and informal markets and allow adequate fruit and vegetable purchases. In situations where schools are closed for extended periods due to Covid-19, governments need to think creatively about how to offer alternatives to school lunches. In other cases, public works employment programs have allowed governments to build or maintain vital infrastructure and provide employment during an economic recession. However, agencies must recognize that food-for-work schedules in rural areas are problematic if they interfere with agricultural work schedules. Emergency food aid is vital in these regions, which face significant cuts in food supply. Unfortunately, the international community was unable to provide the necessary assistance for this year.

Priority actions include:

- Provide adequate emergency food assistance with local and regional purchases of food for food assistance wherever possible.
- Provide debt relief to governments struggling to maintain necessary social safety nets.
- Maintain robust social safety nets by recognizing that household food expenditures increase and decrease in relation to other expenditures (eg housing, health, education, etc.).
- Design food assistance programs that provide not only adequate calories but also adequate access to healthy food.
- Whenever possible, provide alternatives to school lunches.
- Allow adequate access to health care, including access to mental health services, in the design and implementation of social safety nets.

The Covid-19 pandemic has made it clear that food system workers are critical to emergency response. However, although food system workers are essential workers, they often lack workers'

rights as legislation in this area is weak in most countries. Given the extent to which food systems depend on various types of labour, from small-scale family farm work to food processing workers and migrant farm work, it is essential to ensure that all food system workers, including migrant workers, are entitled. clear and protected rights under national legislation, in accordance with internationally accepted standards. This includes access to safe working conditions and paid sick leave, access to social protection and adequate living conditions that ensure their safety and well-being, including for migrant workers. Expanding access to social protection, including health insurance, transfers to reduce income losses, and measures to support smallholder production (eg seed distribution) are key to reducing their vulnerability. Such protections will strengthen the resilience of food systems in the face of crises such as those brought on by Covid-19.

Specific recommendations include:

- Ensuring that the rights of food system workers are recognized and integrated into national legislation; promoting and enforcing compliance with established norms.
- Ensure that food systems workers have access to full protection against hazards and risks (in terms of personal protective equipment, distancing measures, clear health and safety guidelines, paid sick leave, adequate sleep, eating and sanitary facilities, quarantine shelters).
- Pay special attention to migrant workers in the food system to ensure they are protected from health risks, have access to health care and have social protection.
- Implement mechanisms to protect farmers and smallholders from uncertainties and income losses, such as certain insurances, transfers and input distribution.

Countries dependent on food imports are particularly vulnerable to international supply chain disruptions caused by Covid-19. Some of these countries may have the opportunity to better balance their food supply portfolios, while others may face real ecological constraints to produce more food at home. Given that conditions in each country differ in their capacity to produce and/or import food, it is important to provide sufficient policy space for governments to pursue policies that minimize the risks associated with dependence on imported food in order to build a larger food system. Durability. At the same time, for countries that have the capacity to do so within their own ecological boundaries, improving domestic food production capacity, including products they want to reduce their dependence on imports, may be a way to reduce price risks. use local market flexibility in the medium and long term. Improving domestic storage capacity also increases countries' ability to ensure food availability through crises.

Specific recommendations include:

- Deter food export restrictions to protect countries dependent on food imports.
- To provide policy space and support to countries that want to develop their domestic food production capacities within their ecological boundaries in the medium and long term.
- Encourage countries to build better long-term grain storage capacity.

Specific actions to support this recommendation include:

- Recognize the role of CFS as a leading body in coordinating an international governance response to the impact of Covid-19 on FSN.
- Establish a CFS-led task force to monitor the effects of Covid-19 on food security.
- Establish a reporting system for CFS member states to share knowledge and experience regarding the impact of Covid-19 on the FSN in local and national contexts.
- Develop a global campaign to educate and inform the public about nutrition-sensitive practices to prevent and manage Covid-19 infections at home and at the individual level.
- Involve food system workers and agricultural producer organizations in national and international Covid-19 decision-making processes.
- Specific recommendations include:

- Invest in more agroecological research-action projects.
- Support the development of an agroecology curriculum in agricultural schools in various countries.
- Work to support more projects that promote agroecology and other forms of sustainable agriculture, given that the majority of agricultural development assistance projects support traditional or industrial agriculture approaches.
- Include support for individual and community interventions such as home and community gardens.
- Ensure that sustainable fisheries and aquaculture, as well as animal production and forestry, are integrated into policy responses to Covid-19 to achieve their full potential in terms of nutrition and livelihoods.

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