IS THE FUTURE OF OUR FOOD SECURE?

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Abstract: *We as humanity live now in a great era of expanding technologies and methods to improve our life, well being, health, education, and many other aspects belonging to the top of the hierarchy of needs. But recent events around the world were an omen to the fact that we, in the developed parts of the world, took for granted the security of our primary physiological needs. Amongst these primary needs being the need to eat, therefore the need to access safe food, in sufficient amount, with the necessary nutritional value, at any given time, regardless the geographical, social or economic circumstances.*

Key words*: food security, food insecurity, undernutrition, obesity, SDG*

INTRODUCTION

Poverty and hunger are two of the realities of this world that might not be highly apparent in the northern hemisphere of the globe, but nevertheless, they affect a great number of people in the world [1,4,5,9]. In 2020, 746 million people live in extreme poverty, of which 50% are under the age of adulthood, and the latest updates prior to COVID-19 related to undernourishment show that 690 million people do not have access to sufficient food to maintain a good level of health [9,10,15].

To these numbers we can add the 1.25 billion people who experience a moderate level of food insecurity. In this category are included those who do not have access to sufficient nutritious food on a regular basis, even though they are not suffering from hunger [5,9].

Although most of the people affected by the insecurity of food are dominant in the southern and eastern hemisphere of the globe, as shown in the Figure 1 (675 million- Africa, 205 million- Latin American and the Caribbean, 1.03 billion- Asia) North America and Europe are not immune to problems related to food [1,2,4,7,9]. 88 million people from these more advanced areas are dealing with moderate or extreme poverty and food insecurity [2,3,4].

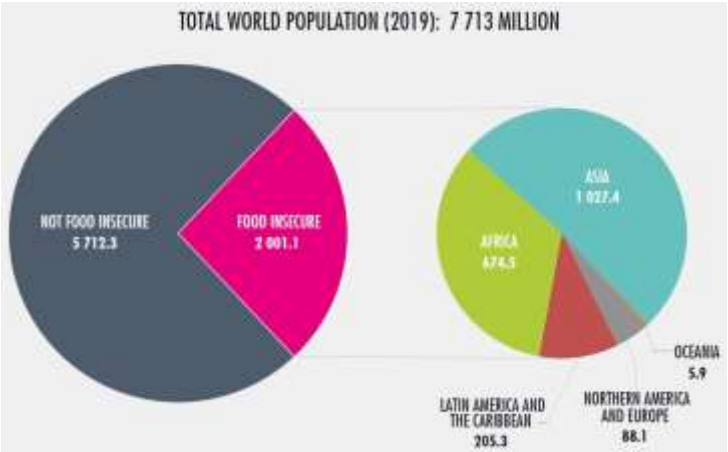


Figure 1. Number of food insecure people in millions in 2019

Source: FAO, IFAD, UNICEF, WFP and WHO. 2020. The State of Food Security and Nutrition in the World 2020. Transforming food systems for affordable healthy diets. Rome, FAO. https://doi.org/10.4060/ca9692en

The total level of food insecurity increased systematically starting with the year 2014, mainly due to the increase of the levels of moderate food insecurity. The number of undernourished people on the globe increased with almost 60 million in the last five years, with an increment of 10 million just in the last year [1,4,5,15]. The most common reasons for this increase can be attributed to a greater amount of conflicts, aggravated by climate-related shocks leading to forced displacement of people. In non conflictual areas, the escalating number of people affected by the deterioration of food security can be attributed to slowdowns in economic activities, compromising access to food sources for the poorer section of the population [10,11,15].

Table 1.

Number of undernourished people in the world, with projection for 2030, before the COVID-19 outbreak

NUMBER OF UNDERNOURISHED (million)						
	2015	**2016**	**2017**	**2018**	**2019**	***2030**
WORLD	653.3	657.6	653.2	678.1	687.8	841.4
AFRICA	216.9	224.9	231.7	236.8	250.3	433.2
ASIA	388.8	381.7	369.7	385.3	381.1	329.2
LATIN AMERICA & CARIBBEAN	38.8	42.4	43.5	46.6	47.7	66.9
OCEANIA	2.2	2.4	2.4	2.4	2.4	3.4
NORTH AMERICA & EUROPE	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.

Note: There are no reported (n.r.) data for North America and Europe, as the prevalence of undernourishment in these areas is <2,5

Source: Author's interpretation of data available at https://doi.org/10.4060/ca9692en

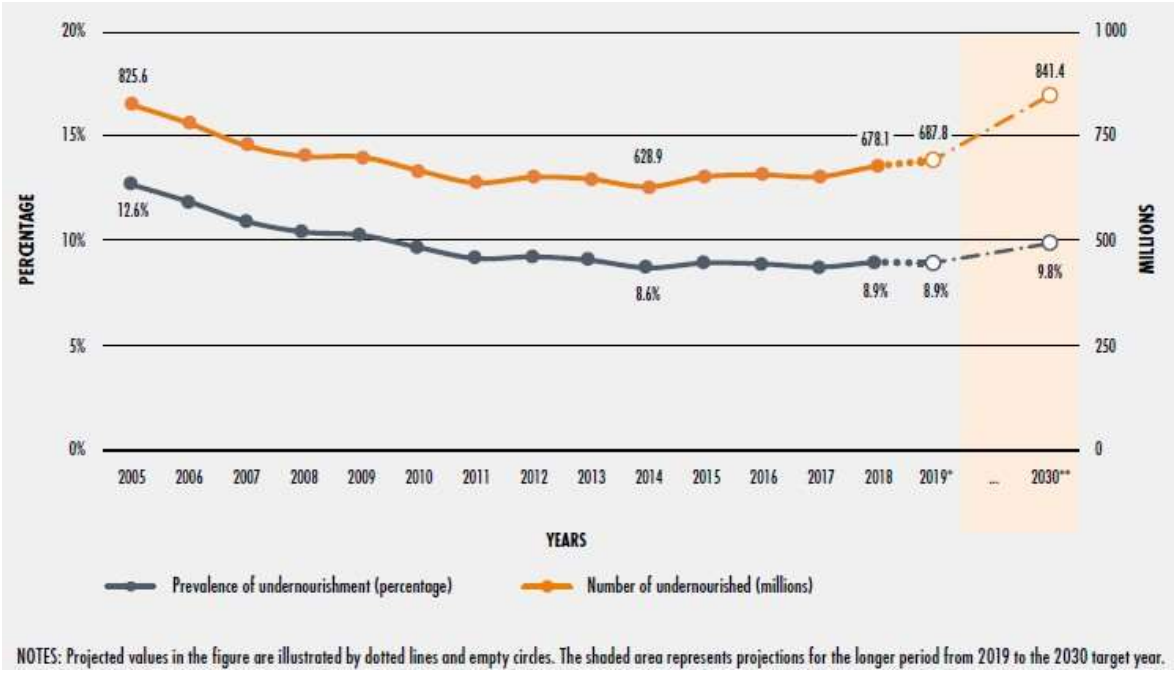
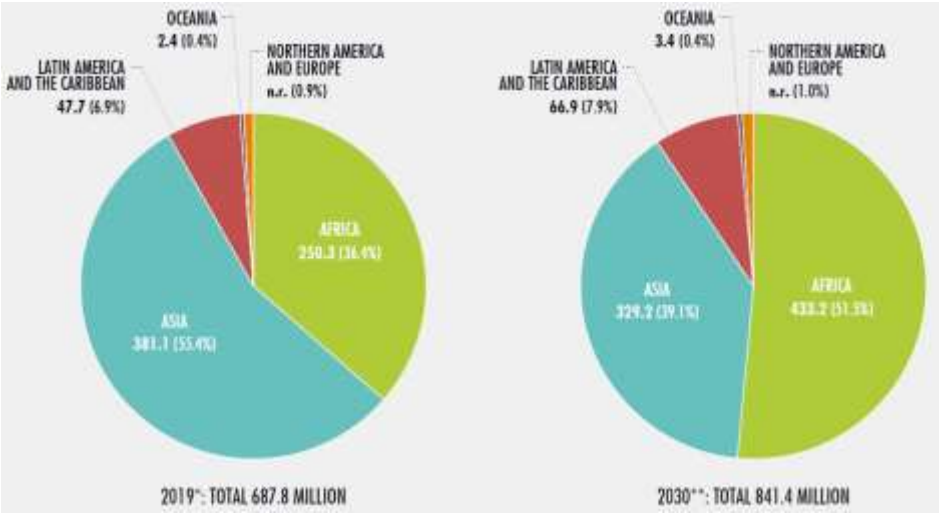


Figure 2. Projected values for the number and prevalence of undernourishment in the world

Source: FAO, IFAD, UNICEF, WFP and WHO. 2020. The State of Food Security and Nutrition in the World 2020. Transforming food systems for affordable healthy diets. Rome, FAO. https://doi.org/10.4060/ca9692en

The data from Table 1 and Figure 2 shows that presently, Asia is the continent with the highest number of undernourished people, accounting for 55.4% of the total. At the

same time, Asia is the only area that registered improvement since 2017, while Africa has seen a rapid growth in the number of undernourished. If the trend persists, data from FAO suggests that in the next 10 years we may assist to a shift in the distribution of undernourishment on the globe, as seen in the graphics presented in Figure 3 [8, 9, 10].



***the numbers projected for 2030 do not consider the potential impact of COVID-19*

Figure 3. Projected values for the number of undernourished people

Source: FAO, IFAD, UNICEF, WFP and WHO. 2020. The State of Food Security and Nutrition in the World 2020. Transforming food systems for affordable healthy diets. Rome, FAO. https://doi.org/10.4060/ca9692en

Given the current situation generated by COVID-19, FAO, UN, WHO and other organizations, assessed that this pandemic could add between 83 million and 132 million people to the numbers shown above. These estimations are based on the global economic available outlook [9,10,14,15].

Although a recovery of the situation is expected in 2021, as seen from data in Table 2, therefore a lowering in the number of undernourished people, it is predicted that this number will still be higher than projected in a scenario without the virus [9,14,15].

FAO calculated the impact of three possible scenarios, based on available data of the impact COVID-19 might have on net food supplies, not considering possible modification in the size and composition of the population, nor the inequality of food consumption. [9] The graphic resulted from those calculations is presented in Figure 4.

Also, it is worth mentioning that the analysis was made with the assumption that a recovery from the situation will happened in the next two years [9].

Table 2.

The impact of COVID-19 on the number of undernourished people in the world, considering three possible scenarios of recovery

VALUES OF THE THREE SCENARIOS			
SCENARIO	**ECONOMIC GROWTH IN GDP**		**INCREASE IN NUMBER OF UNDERNOURISHED IN 2020**
	2020	**2021**	
I	-4.9%	+5.4 %	+83 million people
II	-7%	+3.3%	+103 million people
III	-10%	+0.3%	+132 million people

Source: Author's interpretation of data available at https://doi.org/10.4060/ca9692en

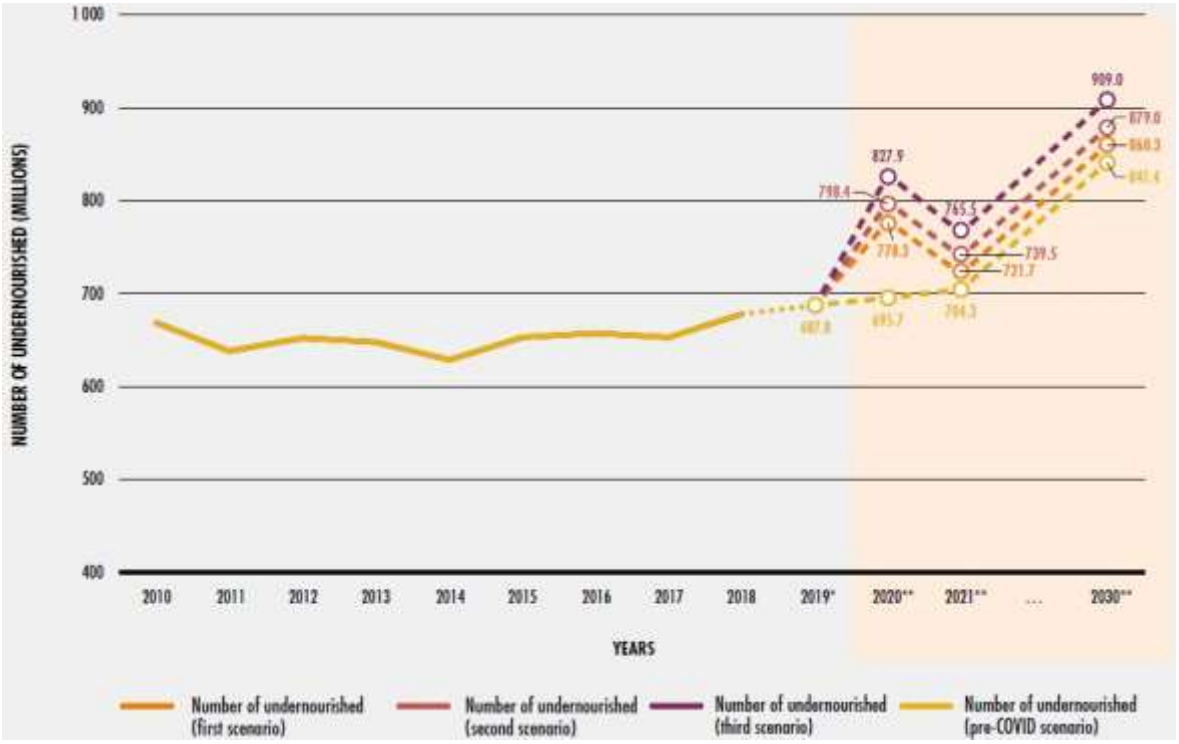


Figure 4. Three scenarios of how COVID-19 might affect the number of undernourished in the world, with projection for 2030

Source: FAO, IFAD, UNICEF, WFP and WHO. 2020. The State of Food Security and Nutrition in the World 2020. Transforming food systems for affordable healthy diets. Rome, FAO. https://doi.org/10.4060/ca9692en

MATERIALS AND METHODS

The present study is based on available data regarding the state of food security across the globe in 2019 and 2020, with the most recent updates accessible on the evolution of the situation after the impact of COVID-19 [1,4,5,9,14,15].

The methods used to carry out this study are the analysis and synthesis of data from external sources and the deduction of logical conclusions.

RESEARCH RESULTS

Five years ago, in 2015, the United Nations concentrated their efforts to implement and follow the 2030 Agenda for Sustainable Development. Addressing not only the problem of hunger around the world, the UN's goal is to determine the underlying causes for malnutrition and lack of access to sufficient amounts of safe and nutritious food for all people at all times. As determined by WHO, food insecurity affects directly the quality of nutrition, and can result in various forms of malnutrition, among them being undernutrition, obesity, stunted growth in children and anemia in women. Therefore, the simple problem of producing enough food everyone becomes more complex, needing to account for the nutritional value of the products and the contributions they have in ensuring an adequate level of macro- and micro-nutrients [1,8,9,12,13,14,15].

As stated by FAO in "The State of Food Security and Nutrition in the World 2020" and other previous editions of the publication, the problem of malnutrition is wrongly addressed by focusing on growing more food. The rate of population growth in the last twenty years was situated around the value of 1.05% per year, whereas the rate of global food production expanded faster. The global production of food is already 1 ½ times bigger than consumption, and could feed the world's projected population peak for 2050, which is 10 billion people. The problem of hunger and malnutrition is therefore not connected to the unavailability of food, but rather the unequal distribution of production and poverty. Out of

the total global population, 1.5 billion people are unable to afford a diet supplying the minimum required amount of essential nutrients and an additional 3 billion people do not have enough financial resources to access even the least expensive healthy diet. This problem is not apparent only in known problematic areas, but is present all over the world, being therefore a global problem that impacts everybody [1,2,5,7,8,9,12,13].

With ten years remaining, recent assessments of the situations show that we are not on the right track to achieve the SDG1: No poverty, nor the SDG2: Zero hunger goals by 2030. Despite all measures and actions taken, the number of people affected by food insecurity is increasing constantly since 2014. New insights in the science of nutrition revealed the fact that current dietary patters are highly unsustainable for the environment and subsequently for the state of food security across the globe. Future actions oriented in the field of food security must also consider facilitating access to nutritious food, in order to combat malnutrition through healthy diets [9,10,12,13,14].

Although there is no universally tailored dietary model, it is generally accepted that in order to consider a diet to be healthy, it must not only cover the necessary calorie intake, but to ensure the required micro- and macro-nutrients to sustain growth in children and health in adults [9,12].

A healthy diet is rather a set of basic principles, that can be practically adapted in many ways, considering the four key aspects of diet quality:

1. **variety**- within food groups and across them
2. **adequacy**- sufficient nutrients from all food groups to ensure the requirements
3. **moderation**- food and nutrients should be consumed in adequate amounts
4. **overall balance**- in the composition of nutrient intake [9,12].

World Health Organization affirms that a healthy and quality diet can protect not only against all forms of malnutrition, but also against all forms of non-communicable diseases (NCDs), like cancer, diabetes, stroke, heart attack [9,14].

Although the science of nutrition provides the quantity of nutrients required for different population groups, the sources of these nutrients can be found in a large variety of foods across the food groups, resulting endless ways of combining available foods, to ensure one's intake of required nutrients. This is the main reason why a universal diet is not feasible, as not all type of foods are found everywhere. Hence, it is in the responsibility of each country to translate the key aspects of a healthy diet in a way that can be followed by the population, given the available foods and food groups of the area [9,12,13,14].

In the late decade more and more countries created food-based dietary guidelines (FBDG), with appropriate dietary suggestions for their context [9,13]. Three such models are presented in Figure 5.

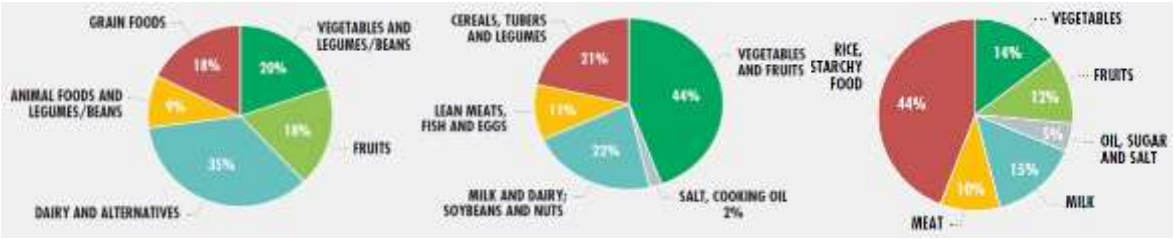


Figure 5. Three models of FBDGs, as percentage of food groups. Starting from left: Australia, China, Thailand

Source: FAO, IFAD, UNICEF, WFP and WHO. 2020. The State of Food Security and Nutrition in the World 2020. Transforming food systems for affordable healthy diets. Rome, FAO. https://doi.org/10.4060/ca9692en

As the fight against all forms of malnutrition unfurls and more knowledge is discovered in relation to healthy diets, there is another subtle matter that needs addressing: the impact of diets over the environment. More and more scientific evidence points the fact

that the way we produce the food and our consumption habits are highly unsustainable [8, 9, 14].

Food production is responsible for more than a quarter of the greenhouse gas emission, 26%, while food waste and loss add 6% more to this number. If current trend in population growth and diets persists, there will be increased environmental and health impacts. Moreover, most of the projected growth of population by 2050- 2 billion people- is expected to occur in low- and middle-income areas, aggravating the environmental pressure associated with diets. FAO and other organizations across the globe raise the importance of promoting healthy diets in ways that are sustainable, in order to tackle the hunger problem [2,6,8,9,10,13].

To further aggravate the issue of food insecurity and diet quality, the current health crisis and the measures taken by authorities in order to confine it, took a great toll on the food system, causing disruptions and fragmentation in the system. The most affected categories of population are those that were vulnerable even before: informal day laborers, migrants, women and children and people with disabilities. Figure 6 shows that even before the actual health crisis, there was unequal distribution in the sources of nutrients, across different income groups. Related to food resources, the most affected are meat, milk and milk products, fruits and vegetables, as they are labor intensive, high-value and perishable [9,10,11,12,15].

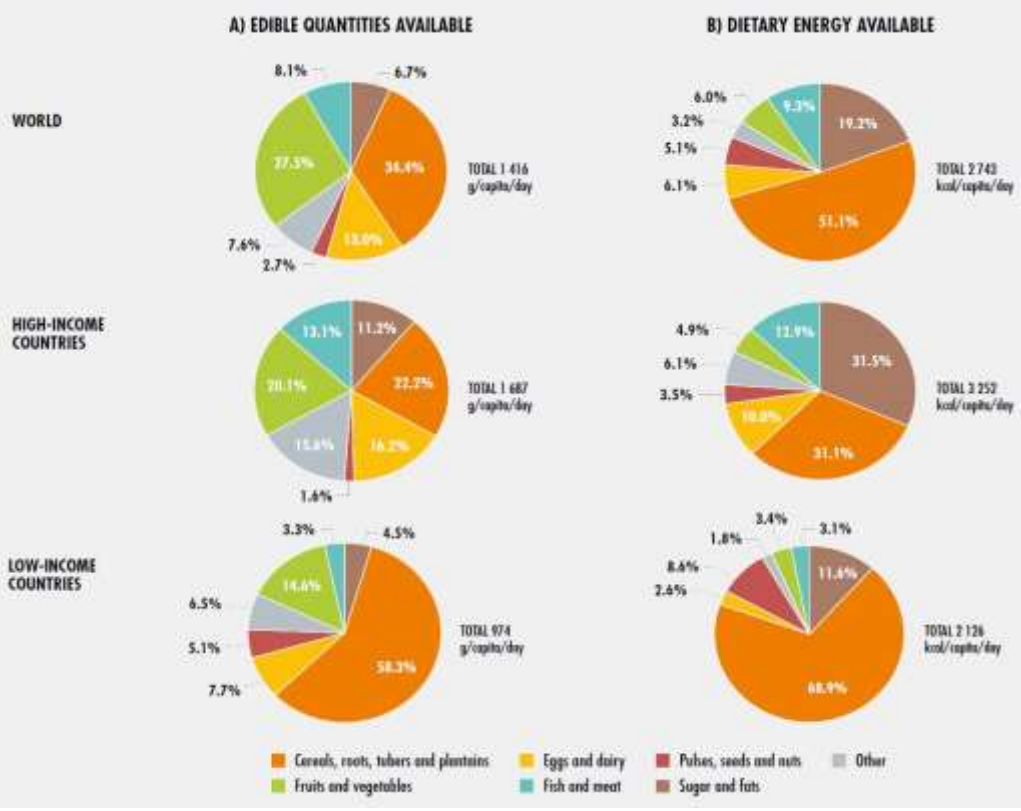


Figure 6. Proportion of different food groups available for consumption across country income groups, before COVID-19

Source: FAO, IFAD, UNICEF, WFP and WHO. 2020. The State of Food Security and Nutrition in the World 2020. Transforming food systems for affordable healthy diets. Rome, FAO. https://doi.org/10.4060/ca9692en

Availability of food greatly decreased, as many food outlets were closed in order to contain the spreading of the virus. Panic buying further aggravated the situation, as those with means for purchasing food depleted the resources, detrimental to disadvantaged people [14,15].

Diet quality also decreased, in favor of quantity, people shifting their attention to staple foods, that are less expensive and more shelf-stable, and highly processed food, that usually contains great amounts of sugars, salt and fats, detrimental to fresh, nutrient-rich food [9,12].

As presented in Figure 6, staple foods accounted for 51.1% of dietary energy available in the world, with different distributions across income groups, even before the pandemic, whereas fruits and vegetables had a small contribution in the total energy intake, even in high income countries [9].

There is direct correlation between income, food security and diet quality, therefore, FAO strongly suggest that in order to successfully fight all form of malnutrition across the globe we need to turn the spotlight on making nutrient-rich, fresh food available for all income groups, rather than focusing in producing more. In Figure 6 can also be observed the difference between the level of energy intake in high income countries and low-income countries, 31.5% of the energy intake being attributed to fats and sugars in high income countries. Overweight and obesity are also forms of malnutrition, with damaging effects for human health and well-being. This is to say that high income, if not directed correctly, can have the same unfortunate result as low income [9,10,11,12,13,14,15].

FAO suggests in "The State of Food Security and Nutrition in the World 2020. Transforming food systems for affordable healthy diets." that the problem must be addressed at global level, with specific measures for each country and geographical area, in order to educate the consumers and transform the food system in such a way that healthy, sustainable diets will be available for every income group [9].

The main problem with healthy diets it's not the unavailability, it's the unaffordability, due to unequal distribution of wealth on the globe. According to FAO, a healthy diet is generally 60 percent more expensive than nutrient-sufficient diets and 5 times more expensive than diets that meet the required energy intake delivered through staple foods [9,10,11].

Table 3.

Difference in medium cost of three type of diet across the major regions of the world

MEDIUM COST* OF THREE TYPES OF DIETS IN THE WORLD			
Region	**Energy sufficient diet**	**Nutrient adequate diet**	**Healthy diet**
World	0.79	2.33	3.75
Africa	0.73	2.15	3.87
Asia	0.88	2.18	3.97
Latin America & Caribbean	1.06	2.83	3.98
Oceania	0.55	2.07	3.06
North America & Europe	0.54	2.29	3.21

**the price in USD/ person/ day*

Source: Author's interpretation of data available at https://doi.org/10.4060/ca9692en

In light of the latest events, their impact on the food system and direct correlation with diet quality and malnutrition, FAO and other organization across the globe raised the issue of changing the way we produce and consume foods. It is essential to consider a transition to a healthier way of eating, while caring for the environment, if we are to end hunger and malnutrition in all its forms. As FAO clearly pointed, the current approach is not sufficient to achieve SDG2 and all the other related SDGs by 2030 [9,12,13,14,15].

CONCLUSIONS

Five years in the fight against poverty and hunger, we as a world are nowhere close to our targets. Furthermore, data available until now shows that we must concentrate our efforts in a different direction than the one initially approached. In order to end hunger in the world, it is not sufficient to address the problem of food availability, we must also address the issues of quality, sustainability and affordability [9,11,12].

The last report on the state of food security in the world, released on June 2020, presents a series of recommendations for the policy makers, in order to ensure the resilience of the food system, as to be able to continuously support a growing population and to ensure the safety of food for everybody [9].

- First and foremost the food system needs urgent rebalancing of agricultural incentives and policies, to encourage investments in nutrient-rich products, as fruits and vegetables and protein-rich plant-based foods, such as legumes [9].
- There is also needed a reconstruction of the food supply chain, in order to enhance the efficiency of food production, storage, processing, marketing, with the goal to minimize food waste and loss [9].
- Adjacent to measures in the food system, policy makers must consider policies that strengthen employment and activities that generate income, in order to increase the affordability of healthy diets [9].
- The educational sector also has a big role to play, as there is need for nutrition education, in order to raise the level of awareness towards healthy diets and reduce overconsumption, food loss and waste [9].
- Additional policies can consider taxation of energy-dense foods, high in fat and processed sugars, in order to promote consumption of nutrient-rich foods, to increase the level of health in population and reduce the incidence of non-communicable diseases, many of them being associated with unhealthy eating habits [9].

In order to strengthen the food system in face of external challenges, like the situation created by the outburst of the coronavirus, FAO issues a set of recommendations for governments, that can help ensure the security of food for everybody, even in dire situations [9].

- To ensure access to nutritious food for the vulnerable categories of population, there is a need for creating, expanding and improving the capacity of programs dedicated to food assisting and social protection [9].
- Intensify the direct support offered to small scale enterprises, in order to facilitate access to markets, physically and trough e-commerce channels, reduce pre- and post-harvest loses and increase their productivity [9].
- Initiate and maintain food fortification programs, in order to counteract the worsening the diet quality during crisis situations [9].
- Establish measures for economic stimulation directed at strengthening access to food resources and recovery of the food system during and after a crisis [9].

The challenges that need to be overcome to change the current food system and achieve SDG2, are the unavailability of healthy diets and increased availability of energy-dense foods, high in fats and sugars; changes in the behavior of the consumer determined by aggressive marketing campaign promoting the consumption of energy- dense foods; policies that encourage the production and consumption of staple foods over nutrient-rich foods; value chains that are oriented to profit rather than environment and the health of population [1,8,9,14,15].

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