

Ecological Sustainability Thinking Behind the Global Food and Nutrition System

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Abstract

As the contradiction between the growing needs of human development and the limits of the ecological environment becomes increasingly prominent, the global food and nutrition system faces the dual task of addressing world hunger and maintaining the sustainability of natural resources. On the one hand, the number of the world's growing population and the need for further expansion of food production may be responses to the upcoming food crisis. On the other hand, it is necessary to avoid excessive consumption of soil resources, prevent damage to ecosystems, and achieve dual sustainable development of global food systems and ecosystems. This paper will explore the impact of the current food system on the ecological environment and analyze the causes of its emergence. In addition, this paper will think about how the future global food system can develop sustainably without sacrificing natural environmental resources, as this is especially important for human survival and the earth's sustained development.

Keywords

Global food systems, Environmental sustainability

1. Introduction

The 2017 report "The Future of Food and Agriculture: Trends and Challenges" identifies 15 trends and 10 challenges affecting the world food system. The report points out that although the past 30 years have made progress in reducing the number of hungry people in the world, "expanding food production and economic growth often comes at a cost to the destruction of the natural environment". The growing population trend will further boost the global demand for food, and the pressure on natural resources will once again intensify. At the same time, trends indicate a continued increase in global economic development and changes in the human diet. Therefore, a reduction in the intake of staple foods such as rice and wheat, and an increase in the consumption of healthy foods such as vegetables and fruits or ultra-processed food (Monteiro, 2013). The result will be to further exacerbate pressures on ecological systems, including deforestation, soil erosion, fertilizer pollution, and greenhouse gas emissions. It can be seen that the global food and nutrition system is closely related to the sustainable development of the future ecological environment.

Many scholars have put forward their own views on the status quo and problems of the global food system and analyzed the causes and future development trends. However, they all agree that if humans do not properly pay attention to and solve the existing food system problems, it will seriously undermine the sustainable development of the ecological environment and ultimately have a negative impact on human survival.

This article will investigate the current status and issues of the development of the global food system, and explore its impact on ecological sustainability and environmental sustainability. In addition, it will dialectically analyze existing views and comments in the academic community and try to find the right path for the future development of the global food system.

2. Development status and main issues of the global food and nutrition system

2.1 Development status

2.1.1 Continuous food loss and waste

Currently, 1.6 billion tons of food are wasted each year, accounting for one-third of the world's total food production, with losses of \$1.2 trillion [1]. Reducing food waste is an important goal, not only because it accounts for 8% of global greenhouse gas emissions, but also because 870 million people worldwide are malnourished [2].

2.1.2 Sustained poverty, inequality, and food insecurity

The global hungry population is still on the rise. The Hunger Project [3] data show that the number of hungry people reached 925 million in 2010, and about one in every six seconds around the world, children leave the world due to hunger.

2.1.3 The current global food system is extremely unstable

First, natural disasters occur frequently and have seriously threatened international food production. The severe droughts, floods, and snow disasters caused by climate warming have led to a reduction in world food production [4].

Second, the food market was affected by the financial crisis and the factors of instability increased. People's incomes have decreased and their purchasing power has declined. This has led to an increase in the number of people living in food shortages.

Third, the rapid development of the world bioenergy industry has accelerated the contradiction between food supply and demand [5]. In a world of imbalanced food supply and demand, biofuels that use crops as raw materials are produced in many countries, and biofuels "eat" a large amount of grain.

2.2 Main Issue

The main problems created by the current development of the global food and nutrition system are reflected in the two dimensions of human and planetary welfare. From a social perspective, it leads to the extremes of overnutrition and malnutrition. The problem reflected by overnutrition is the surge in obesity rates and the increase in social costs associated with related diseases. Malnutrition mainly refers to the problem of the hungry population and the impact of intensive production methods on food nutrition. From the perspective of the Earth, the development of the food system has greatly affected the sustainability of the ecological environment. Food waste and food contamination problems caused by food system operations have increased the burden on the planet.

3. Literature background and argument review

In the existing research, most scholars believe that there are contradictions in the development of the global food system. However, a small number of scholars have confirmed that the global food system has contributed to the people in poverty-stricken areas and solved the problem of hunger for most people.

Writers like Hodges, Pretty, and Peterson [6] claim that the current development model of the world food system and the policies of countries promoting cheap food may mislead social development and have a negative impact on human health, ecological environment, and food safety. From the perspective of ecological sustainability, it is mainly reflected in two points. One is the excess and waste of food under intensive production, and the other is soil erosion and environmental pollution caused by unsustainable development methods.

The current overproduction of food in the food system and the pursuit of high-yield agricultural production targets have led to the birth of cheap food [7]. O'Kane [8] also pointed out that food waste caused by food waste brings a lot of pollutants to the environment, increasing the burden on the earth. Kearney [9] analyzes the reasons for this phenomenon and believes that the increasing demand for food in the world food system is not only due to the increase in population size but also to an increase in per capita consumption. People are pursuing the quality of food, which indirectly promotes the surplus of cheap food. From the perspective of intensive production methods, Antoninibel believes that food production methods are closely related to economic and environmental sustainability. Godfray [10] supplements the arguments for agricultural pollution. In addition to the easy carrying of pathogens, the discharge and treatment of agricultural production waste may cause pollution and damage to the local living environment and wildlife habitat [11]. Contradictions occur between cheap food policies and the practice of sustainable food systems [8].

Currently, 10% of people worldwide suffer from undernutrition. Scholars such as Appleby [12] and Rosin [13] have affirmed that the global food system has eased the hunger problem in poor areas during the development process. But Hodges [6] has a very interesting analysis of the concepts of "poverty" and "hunger": the poor are not exactly equal to the hungry. Poor people do not necessarily refer to those who have no money to eat, and question whether the global food system's policy of expanding production and lowering food prices can really solve the problem of "poverty". At the same time, Alders, Nunn, Bagnol [14] and others also claim that today's "broken" food system not only creates a double burden

of undernutrition and overnutrition but also leads to additional environmental costs.

4. Critical Analysis and Reflection

In analyzing the impact of the global food system on ecological sustainability, Alders [11] links people to the physical environment, proposing that food and nutrition are human rights, and the space in which people live should also be pursued. Determining to contribute to humanity and the sustainable and ethical food system of the Earth's health is extremely important. It is also worth considering whether the food system should give priority to solving the problem of hunger in the world or should give priority to ecological problems.

However, in many views, Hodges [6]'s distinction between hunger and poverty renewed awareness of the question of whether poor people lack food. Tracing back to the underlying causes of poverty, one wonders whether people in poor areas really need cheap food and whether cheap food can really help people out of poverty. If the global food system is only working to address hunger, how long can the existing centralized food supply model last? How many people can be hungry in this way? How long is the recovery cycle after the destruction of the natural environment? At the current rate of development, in order for both ecosystems and food systems to develop sustainably, a single food system must be replaced by a sustainable food system. Alders [11] provides a precise overview of the connotation of sustainable food systems: integrating food production, processing, distribution, consumption, and waste management to bring environmental, economic, and social health together.

In exploring the relationship between global food and nutrition systems and ecological sustainability, Qureshi [15] unilaterally explores the impact of external factors such as climate change, water energy, and land competition on food systems. However, this vicious circle has not been analyzed from the perspective of food production and the reaction to the ecological environment. Conversely, Polly J [16]'s analysis of the many interactions between food systems and global environmental change is thorough.

The global food and nutrition system has created multiple problems in the ecological environment during the development process. It is unwise to hide environmental costs to address the global food crisis.

The high yield of cereals means the use of chemical fertilizers and pesticides. Fertilizers pose potential hazards to the ecological environment, which not only lead to soil nutrient loss, deterioration, water quality deterioration, and potential harmful gases polluting the air but also potential damage to soil remediation capacity. Second, intensive animal feeding may occupy wildlife habitats and reduce biodiversity. Highly concentrated meat processing systems are also extremely prone to large-scale pollution incidents. Finally, food also invests a lot of energy in transportation and processing. Carbon emissions and particulate matter after energy consumption directly affect air quality and local climate, and the growth of food is also affected by climate and environment. Therefore, it may cause a vicious circle, and the final consequences are human beings.

5. Future development goals and trends

The core issue for future development is whether the world's agriculture and food systems can sustainably meet the needs of a rapidly growing global population. However, sustainable meeting of food demand under population growth requires a sustainable ecological environment and sustainable development of food systems, both of which are indispensable. How to meet the needs of human food without destroying the ecosystem is the real problem that the global food and nutrition system is about to face.

Efforts to completely eliminate the problem of hunger in the world should also improve resource utilization and produce nutritious foods in an efficient state. Avoid high-input, resource-intensive farming practices. The release of the potential of the world food system must repair and transform the food system to alleviate the food security crisis and the nutritional deficiencies crisis that have emerged.

6. Conclusion

The food production system and the ecological environment system are closely related, and the two influence each other. A stable natural ecological environment is a necessary condition for the continuous production of food, the way food is produced also has an impact on the natural environment. Therefore, it is especially important to establish a virtuous circle between the two. Most researchers recognize that while focusing on global food shortages, malnutrition, and food safety, they should also monitor and estimate the cost of the ecological environment to minimize damage to ecosystems. However, there are relatively few studies on how to monitor and assess the cost of the ecological environment.

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