EDITORIAL ARTICLE

Future food systems

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Keywords: Occupational safety and health, hazard, '$PM_{2.5}$ and $PM_{10,}$ miners

1.0 Introduction

The global population is projected to rise to over 9.7 billion in 2050 implying that agricultural production has to respond to the anticipated rise in demand for food and as constantly emphasized by the UN Food and Agriculture Organization. Understanding the human population growth trends, regional income disparities, global dietary patterns, rise in per capita consumption and urbanization are very critical in design of sustainable future food systems. This should occur in light of the increased climatic risk characterized by climate change and the subsequent increases in climatic variability. Food systems account for elements such as the environment, people, inputs, processes, infrastructures, institutions and activities related to the production, processing, distribution, preparation and consumption of food. The outcomes of the activities are also integral part of the food systems (FAO 2014). A report by World Bank (2015) underlines the need to transit the current food systems to more sustainable ones to address the current and projected food and nutrition demands. It is expected that global per capita food consumption will rise by 210 calories per day from 2,860 in 2015 to 3,070 in 2050 (Alexandratos and Bruinsma 2012). This implies that critical technological and innovative thought has to be directed towards development of sustainable food systems. The future food systems have to inevitably digress from current systems that are usually land based mainly in rural areas.

2.0 Drivers of future food systems

One of the key determinant of the future demand for food is the population. Both the number and trend are critical in the analysis of the food demand. Projecting the future human population and trends can be handled statistically Lutz and Samir (2010) who observed that adoption of the United Nations Population Division projections with the 'medium fertility' was a reliable approach to studying future food demands. Other drivers of future food systems include the rise in per capita consumption which also leads to increased demand for food (Kearney 2010). The resultant nutritional transition has major impact on high-energy/high-protein diets which mostly require more resources to produce, process and distribute. Application of technology and innovation is income dependent and disparities in regions will definitely affect the future foods systems. A shared approach to food production would be more sustainable where the rich and poor share production, processing and distribution

URL: https://ojs.jkuat.ac.ke/index.php/JAGST
ISSN 1561-7645 (online)
https://dx.doi.org/10.4314/jagst.v21i2.1

resources to reduce the potential damages to the environment by the poor regions attempting to meet the increased demand inefficiently. Urbanization has also been flagged as a determinant of future food systems. The production, processing and distribution systems in urban areas may require a lot of resources (FAO, 2017) thus tweaking the traditional food production approaches. Such production systems are highly intensive with potential to lead to increased greenhouse gas emissions and climate change risks which would negatively impact food production and security. The complex web of socio-economic trends and drivers also influence the patterns of global dietary needs and subsequently the current, emerging and future food systems.

3.0 Challenges of food systems

The Food and Agriculture Organization (2017) identifies three challenges capable of disrupting current and future food systems. They are the i) systemic challenges, ii) challenges related to food access and utilization, and iii) challenges related to food stability and availability. These constraints are characterized by growing competition for available land for food production from other land use demands such as biofuels production and development of mega cities and associated amenities. The rising household and national incomes will additionally increase demand for animal based foods which is associated with much higher negative impacts on the environment and global food supply (Keating et al. 2014). Human and animal diseases epidemics (e.g., COVID-19 pandemic) which has considerable negative impact on the health system can result to significant strain on food systems. Local, regional and international conflicts have potential to disrupt the desired functioning of the food systems implying that they need to be considered in design of future food systems. The food systems occur within physical, biological, social and economic environments all of which can negatively or positively support their future. Climate environment has more significant role as it has direct impact on the food systems. This implies that the future systems must account for climate opportunities and risks. Advances in technology, financial services, partnerships model, research and innovation remain essential in developing sustainable future food systems.

4.0 Conclusion

The future food systems have to cater for the food needs of a rapidly growing population. The systems sustainability is embedded in the knowledge of the human population growth trends, regional income disparities, global dietary patterns, rise in per capita consumption and urbanization. The systems have to be cognizant of the climate change and the need for adoption of relevant technological and innovative approaches to respond to risks and opportunities along systems chains.

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https://dx.doi.org/10.4314/jagst.v21i2.1