

Sustainability of the Food System - Contemporary Challenges and Problems for Bulgaria

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Abstract

There is an objective need to address the challenges of the right to food, malnutrition, poverty, rural development, climate change. The challenges facing modern food systems are complex, unpredictable and specific. This requires that the transition to sustainable food systems be implemented in a coherent manner in accordance with national contexts and capacities. This paper analyses the food system challenges in the world, the European Union and Bulgaria. Achieving an effective transition towards food system sustainability will require significant collaboration between different actors and at different levels of governance, encompassing, among others, policy makers, the many industries in the food chain, land managers, academics, educators and civil society. Based on critical factors for the development of the food system, the need to implement modern practices to ensure sustainability in the food supply is highlighted in the context of the EU's Farm to Fork Strategy and Green Deal.

Keywords: food; food system; sustainable food system; from farm to fork; agri-food sector

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Introduction

The modern food system is dynamic and faces a number of challenges - on the one hand it does not provide enough good nutrition for all people and at the same time it puts serious pressure on the environment. The world's sustainable development policies have identified a crucial role for agriculture and the food system in achieving the UN Sustainable Development Goals. Taking a holistic approach to sustainability allows synergies and trade-offs to be sought to ensure that the overall impact of food production, processing, distribution and supply is positive for the whole system.

Food systems related to food production and supply change over time and face a number of challenges in the context of human development. The importance of food production and processing is increasing with urbanisation, the development of the market economy and rural upgrading. Today, food production generates significant added value and is the largest economy in the world, employing over 2 billion people. When referring to the food system, the entire set of economic, technological, social environmental, institutional and other elements should be considered in their interrelationship regarding the production, supply and distribution of food (FAO, 2018). The food system is not a static system, but has pronounced dynamics that lead to an evolving mix of different patterns of production, processing, distribution, consumption, waste, management, etc. (Dury, et al., 2019) The intensive development of food production from agriculture in industrialized countries is based on specialization, mechanization and massive use of non-renewable energy sources and fertilizers. In the process of processing, a large-scale transformation of agricultural products into food for consumption has begun, and the globalization of markets and trade is creating the conditions for large-scale distribution of these foods around the world. This industrial type of farming and food processing has created the conditions for increased availability and access to food, but at the cost of high environmental damage (pollution, resource depletion, soil degradation, loss of diversity, spread of persistent diseases, climate change, etc.) and social problems (reduction in farmers' incomes, agricultural fragmentation, rural depopulation, etc.). Awareness of these effects has predetermined the need to move towards a more sustainable global food system.

Modern food and agricultural production systems create significant quantities of food available on global markets, but generate serious negative outcomes in many aspects: land degradation, water pollution, ecosystem disruption, high greenhouse gas emissions, biodiversity loss, increasing hunger, nutrient deficiencies, obesity and increasing nutrition-related diseases, stress on farmers' livelihoods due to reduced incomes, unbalanced rural development and Increasing use of chemical fertilizers and pesticides, preventive use of antibiotics in livestock have led to increased vulnerability of agricultural production to environmental changes. The way in which economic systems are structured has changed, reducing the number of actors (mainly small farmers) at the expense of consolidation of production units, which has also affected the food supply system. Circumstances have necessitated a change in the model of agriculture and food production to a fundamentally different model based on farm diversification, limiting the use of resources, reducing the use of chemical inputs, maintaining biodiversity and healthy agro-ecosystems, stimulating interactions between species, as part of a holistic strategy to achieve sustainability. There has taken increasing evidence of the need for a paradigm shift in the implementation of agroecological systems (IPES-Food, 2016). There is growing evidence that these systems can increasingly compete with 'industrial' agriculture and be a sustainable alternative in food production and supply, to improve human health, resource use and environmental impact, and to improve the social development of rural communities. This implies and justifies a shift in policy initiatives towards the implementation and development of an agroecological approach to food production.

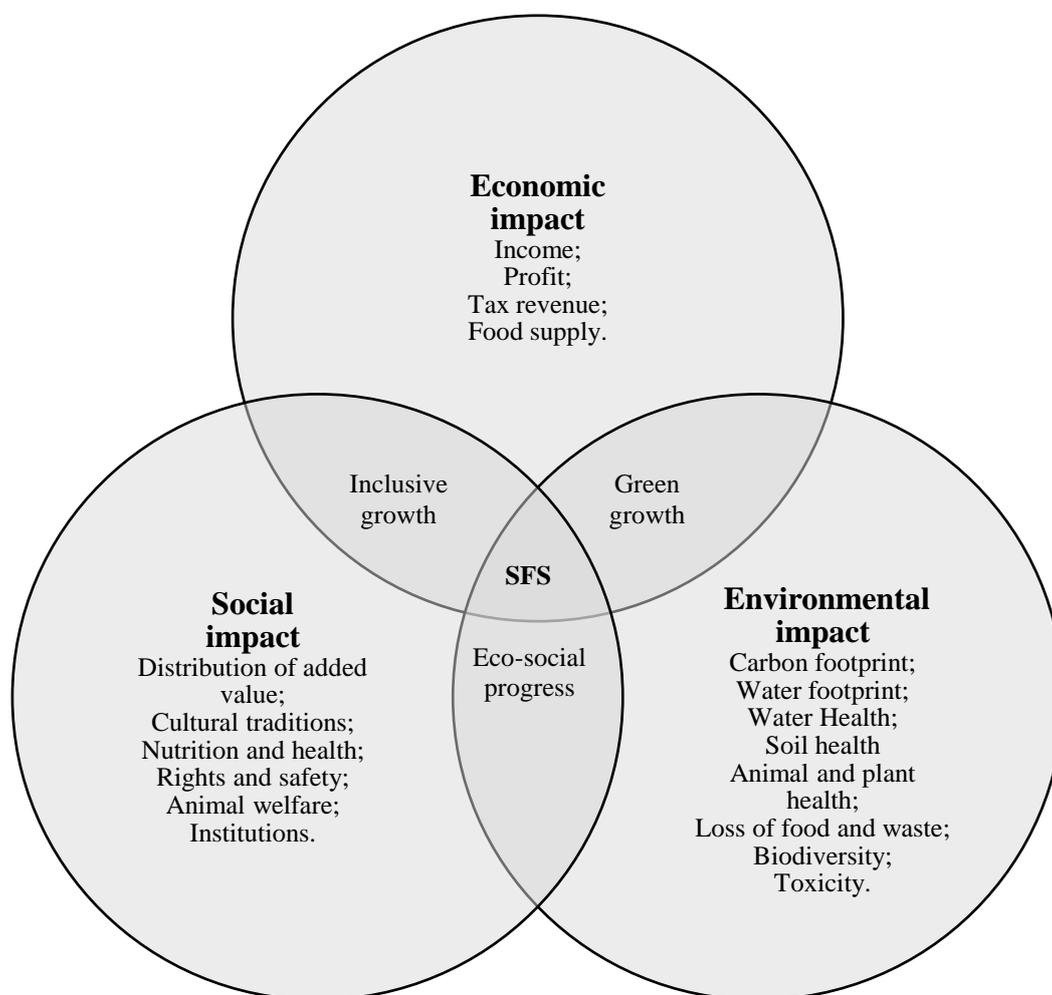
Challenges for the global food system

There is widespread recognition that the modern global food system does not provide enough good nutrition for all people and at the same time exerts serious pressure for environmental degradation. There is an objective need to address the challenges of the right to food, malnutrition, poverty, rural development, climate change. According to the UN Committee on World Food Security (CFS) (CFS, 2021), the global food system is at a crossroads, necessitating profound transformation due to demographic changes, pressures on resource use, increasing climate change, loss of diversity, water scarcity, land scarcity, etc.

The UN 2030 Agenda for Sustainable Development called for "bold and transformative steps that are urgently needed to shift the world towards a more sustainable and balanced development path" (UNGA, 2015). It took the approach that agriculture and the food system are deeply intertwined with economies, cultures, societies, health, food security, climate, environment, etc., and are positioned to contribute to a range of sustainable development goals. International organizations have found that nearly 12 percent of the world's population was severely food insecure in 2020, representing 928 million people, and between 720 and 811 million people worldwide were hungry in 2020 (FAO; IFAD; UNICEF; WFP and WHO., 2021). Meanwhile, levels of overweight, micronutrient deficiencies and diet-related diseases show serious trends (HLPE, 2017). At the same time, rising food costs and limited access to food continue to worsen people's healthy diets. The COVID-19 pandemic has further hampered, challenged and exposed a number of weaknesses and problems of the global food system, through the implementation of stringent blocking and physical distancing policies in many countries - slowing economic activity, disrupted food supply chains, etc. (HLPE, 2021) that have unleashed cascading effects on food security with new dynamics.

In line with the Sustainable Development Goals (SDGs) set by the international community (UNGA, 2015), the food system can contribute to achieving some of them beyond overcoming malnutrition and hunger in the world, by implementing policies in terms of achieving greater food security, improving nutrition and creating a sustainable environment, in the context of combating climate change. Sustainable development of the agri-food chain has become a core strategy of the United Nations in efforts to accelerate the achievement of the Sustainable Development Goals (Walker, et al., 2021). In recent years, various UN agencies have continued to join efforts to continuously improve and integrate sustainable development into food production and supply,

implement sustainable approaches, and expand food cooperation. FAO's High-Level Panel on Food Security and Nutrition (HLPE), in a series of reports (HLPE, 2017), (HLPE, 2018), (HLPE, 2019), (HLPE, 2020) has shown that a profound transformation in agriculture is needed to achieve food security in its four dimensions (availability, access, utilization, stability) at all scales. A defining issue is improving the sustainability of the food system that simultaneously provides sufficient food, protects human health and the environment, and meets socio-economic standards.



Source: Adapted from FAO (FAO, 2014)

Figure 1. Sustainability of food system

The literature lacks a single definition of 'sustainable food system', but it does incorporate an understanding of food and nutrition as part of a dynamic and complex system involving human and environmental processes influencing food with high levels of uncertainty (SAPEA, Science Advice for Policy by European Academies, 2020). The current food system can be assumed to be unsustainable and requires attention to its social, economic and environmental components. From an economic point of view, a food system is considered sustainable if the activities carried out by any actor or service provider is commercially or fiscally viable. Activities must generate benefits or economic added value for all categories of stakeholders in the food supply for consumers. From a social perspective, a food system is considered sustainable when there is equity in the distribution of economic value added, considering vulnerable groups categorized by gender, age, race, etc. Food and nutrition must contribute to the advancement of important socio-cultural outcomes. In terms of the

environmental dimension, sustainability is defined by ensuring that the impacts of food system activities on the surrounding natural environment are neutral or positive (Figure 1). Proposed approaches and practices to achieve food system sustainability will need to be evaluated from all sustainability perspectives to ensure that there will be no adverse impacts on any of these influences. This holistic approach would allow synergies and trade-offs to be sought to ensure that the overall impact of food production, processing, distribution and delivery is positive for the whole system. In line with the realisation of food system resilience, agricultural food production should evolve to ensure the following outcomes:

First, to ensure sufficient food production to meet people's needs and satisfy their right to food. Considering FAO estimates of population growth, changes in nutrition levels, production levels, agricultural production needs to increase by 70% from current levels by 2050 (Alexandratos & Bruinsma, 2012). This projection of course needs to be updated in the context of changes in the structure of crop and livestock consumption as well as changes in food loss.

Second, agricultural production must be developed in ways that increase the incomes of smaller farmers and local producers. Sustainability would be higher when growth is achieved as a result of smallholder production, while stimulating demand for goods and services from local producers and service providers. Subsistence farming is more likely to divert resources to the supply of imported inputs and means of production, thus further increasing rural poverty.

Third, agriculture must not compromise its ability to meet the needs of future generations. Biodiversity loss, unsustainable water uses in agriculture, soil degradation are all problems that compromise the ability of natural resources to sustain agricultural production. Climate change (associated with increasing frequency of extreme natural events such as droughts, reduced rainfall or flooding, flooding, sea level rise, salinization of coastal lands, etc.) is increasingly impacting the ability of certain regions and communities to provide food, altering ecosystems and reducing the ability of agricultural ecosystems to sustain themselves (IPCC, 2019). Climate change is also destabilizing markets (OECD/FAO, 2021), which faces severe income fluctuations for farmers, especially smallholder farmers.

The challenges facing modern food systems are complex, unpredictable and specific. This requires the transition to sustainable food systems to take place in a coherent way in line with national context and capacity (CFS, 2021). There is no single approach to achieving food security and improving the food system. This challenge attracts the interest of international researchers and organizations to seek a variety of holistic and innovative approaches to improving the food system and the transition to sustainability. The need for the introduction of innovative approaches related to the transformation of the food system, including changes in practices, norms, markets, institutional arrangements, etc., which can promote new networks for the production, processing, distribution and consumption of food in a way that is fully objective, different from the existing one (CFS, 2020). Approaches to food sustainability must contribute to the benefits of the three pillars of sustainability (economic, social, environmental), strengthen the four dimensions of food security (availability, access, use, stability), provide flexibility and adaptability, ensure accessibility and justice, to meet the needs of farmers (especially small ones), to encourage young people to take up employment in food production, etc. The use of innovative approaches for this purpose cannot happen without the necessary changes in agricultural and food policy at the international, regional, national and local levels.

There are many innovative approaches in theory and practice that increase the efficiency of inputs used in agricultural and food production, and improve markets and governance. The FAO Expert Group on Food Security and Nutrition identifies two groups of innovative approaches aimed at promoting the transition to a sustainable food system and improving food security (HLPE, 2019): (1) Sustainable intensification and related (incl. sustainable intensification, climate-smart agriculture, precision agriculture, sustainable food chains, nutrition-sensitive agriculture, etc.) and (2) agroecological and related approaches (incl. agroecology, agroforestry, bioregional agriculture,

permaculture, food sovereignty, etc.). The diversity in approaches and practices have different focus on production and interact differently with the food system. Each may be more or less relevant to a specific context and as a response to the challenges it addresses and faces. Different pathways to transition to sustainable food systems can be introduced in different types of agricultural production and food systems, and need to be adapted to the context of local needs and expectations. While there is no one-size-fits-all solution to achieving food security, governments should make efforts to improve the environmental, social and economic sustainability of their food systems, in line with national and international commitments, key among which is the 'right to food' (UN, 2010), which can serve to guide efforts to achieve food security and nutritious diets for all.

Addressing the transition to sustainable food systems and sustainable production systems in agriculture and food production involves long-term approaches and practices aimed at achieving an environmentally sound and safe food system (Pashova, S., 2021), (Stoyanova, A., 2020a), (Stoyanova, A., 2020b), (Marinova, V., 2021).

Challenges for the food system in the European Union

There are currently a number of circumstances that lead to economic, social and environmental unsustainability of the EU food system. These are explored in detail in a number of documents and reports and recognised in the European Commission's initial impact assessment (IPBES, 2019; IPCC, 2019; SAPEA, 2020; European Commission, 2021; IFPRI, 2021). The need for change has also been reinforced in the context of the Covid-19 pandemic. In the context of the COVID-19 pandemic, the importance of having a reliable and resilient food system that functions in all circumstances and is able to ensure that citizens have access to sufficient food supplies that they can afford became clearly evident. The pandemic has more clearly established the interlinkages between health, ecosystems, supply chains, consumption patterns and the planet's limited capacities. Therefore, the more important key issues of European food policy are focused on the environment, climate, animal welfare, and health, as well as social, structural and economic issues, such as those related to trade, sustainability labelling and standards, accessibility and affordability of sustainably produced food, and the concentration of power in the sector. Seeking to jointly address consumption and supply issues in a more holistic way is more demanding than the more entrenched focus on supply within the EU and will require a greater willingness to innovate, but is central to a coherent systems approach. Hence, achieving an effective transition in practice will require significant collaboration between different actors and at different levels of governance, encompassing, among others, policy makers, the many industries in the food chain, land managers, academics, educators and civil society (Baldock, D. & K. Hart (2021). For most, this will require some fundamental changes in thinking and behaviour, as well as a rethinking of business models.

A number of key EU strategies, proposals and bills currently on the table signal major changes in direction. These include the Farm to Fork Strategy, the wider Green Deal, the Fit for 55 Climate Package and more. The publication of the initial impact assessment for a new framework initiative on a sustainable food system signals that now is the time to start a debate about what form this might take and what is required at a more specific level.

The Farm to Fork strategy is the key policy initiative forming the basis of the transition to a sustainable food system. The strategy aims to reduce the environmental and climate footprint of the European food system, ensure food security and limit biodiversity loss. In the context of the Strategy, the current challenges for the food system focus on:

- Building a food system that has a neutral or positive impact on the environment by conserving and restoring the terrestrial, freshwater and marine resources on which the food system depends; helping to mitigate and adapt to climate change; protecting land, soil, water and air, and the health and well-being of plants and animals; and reversing the loss of biodiversity.

- Ensure food security, nutrition and public health by ensuring that all people have access to sufficient, nutritious, sustainably produced food that meets high standards of safety and quality, plant health, animal health and welfare, while meeting needs and preferences.

- Preserving food accessibility while generating fairer economic returns in the supply chain, so that ultimately the most sustainably produced food is also the most affordable, boosting the competitiveness of the EU supply sector, promoting fair trade, creating new business opportunities while ensuring the integrity of the single market and health and safety at work.

The key action lines for improving food system resilience identified in the Farm to Fork Strategy are:

1) Ensuring sustainable food production - by: implementing new, environmentally friendly business models in agriculture and food production; implementation of development models based on the circular economy; expanding the use of energy from renewable sources in agriculture and food production; limiting the use of pesticides and implementing practices for integrated pest management; introduction and development of agricultural practices preserving nutrients in soils; limiting greenhouse gas emissions from crop and livestock production; limiting the use of antimicrobials; development of animal welfare; protection of plant health and maintenance of species and variety diversity; development of organic farming, etc.

2) Ensuring food security and food safety through a full and diverse supply of safe, nutritious, affordable and sustainably produced food for people at all times, especially in times of crisis.

3) Promoting sustainable practices in food processing, food trade and nutrition - by: developing responsible production and trade practices; improving the corporate governance framework; implementation of circular business models; improving packaging; revision of marketing standards, etc.

4) Promoting sustainable food consumption and facilitating the transition to a healthy and sustainable diet - by: implementing sustainable eating patterns based on healthy foods; improving consumer awareness of food; promoting the consumption of healthy foods; improving access to food through short chains; providing tax incentives for the consumption of healthy foods, etc.

5) Reduction of food loss and waste through the introduction of new methodologies for food labelling and reporting of food waste.

6) Combating food fraud in the food supply chain by implementing zero tolerance policies and dissuasive measures.

The whole ambition of the Farm to Fork Strategy requires coordinated action and a refocusing of efforts towards building and sustaining a more sustainable food system. A major challenge is coordinating policy across countries, securing financial support to realise the goals, setting up adequate monitoring and impact assessment systems. Implementing a holistic approach to food sustainability in the European Union requires the active involvement of all Member States, local authorities and civil society structures.

State of the agri-food sector in Bulgaria - production, trade and economy

The agri-food industry plays an important role in the country's economy in providing food for the population and in securing foreign exchange earnings from the export of produce. The agri-food industry includes the production of 'food', 'beverages' and 'tobacco'. The state of the agri-food industry in Bulgaria is the subject of extensive research in the economic literature (Ivanov, B. et al., 2020), (Ivanov, B. & Sarov, A., 2019). Key elements in the development of the agri-food industry in Bulgaria are presented in Table 1.

Data show that the national agri-food sector is key to the Bulgarian economy, accounting for about 20% of industrial output, 2.5% of the country's economy, employing 15% of those employed in manufacturing and 3% of those employed in the economy. The sector maintains its export orientation, providing a positive trade balance and over 13% of exports. Structurally, the agri-food sub-sectors with the largest production are bread, bakery and confectionery and meat processing,

which account for over 10% of final output, followed by dairy and fruit and vegetable production. The number of enterprises in the sector is growing, and gross investment is increasing at the same time. Output in the sector reached almost EUR 6 billion. Almost 90% of enterprises are small or medium-sized, and 74 medium-sized enterprises account for more than 50% of value added. Large companies account for around 25% of the value added in the sector. Food trade in urban centres is dominated by large retail chains with significant market power, but the number of specialised outlets (for fruit and vegetables, meat, dairy, beverages) is growing, although they still have a relatively low market share.

Table 1. Key indicators for the development of the agro-food industry in Bulgaria for the period 2010 – 2018

Indicator	Year		
	2010	2015	2018
Number of enterprises	5 522	6 199	6 186
Production /Output, million euro	4 665	5 549	5 908
Share of food production in industrial production	22,0%	20,0%	17,5%
Value added, million euro	924	1059	1256
Share of value added of food in industry	22,4%	17,0%	16,1%
Share of value added of food in the national economy	2,7%	3%	2,5%
Employed in food manufacturing	103 905	94 399	92 647
Share of employees in the food sector in total industry	17,8%	16,0%	15,6%
Share of employees in the food sector relative to employees in the economy	3,6%	3,2%	3,1%
Gross profit, million euro	120,8	92,6	174,2
Gross investment in food industry, million euro	282,2	346,7	407,4
Food exports, million euro	2 007	2 891	3 635*
Share in total food exports of the country	12,9%	12,6%	13,1%
Food imports, million euro	1 714	2 410	3 226*
Share in total food imports of the country	11,0%	10,5%	10,5%
Trade balance of the food sector, million euro	293	481	409

*Source: EUROSTAT; * - data are for 2020*

Conclusion

There is an objective need to transform the modern food system in order to ensure healthy diets for people worldwide. But the transition to a sustainable food system cannot happen without policy changes at international, regional, national and local levels. This warrant, in conclusion, the following recommendations and proposals:

1. Laying and developing the policy foundations for transforming food systems to ensure sustainability and food security through the deployment of innovative approaches: greater coherence of public policies is needed; promoting the deployment of innovations that are appropriate, accessible and acceptable in terms of the three pillars of sustainability; strengthening the role of the public sector as a regulator of the approaches deployed; developing national transition strategies; promoting partnerships and agreements between

2. Improving support for the transition to a sustainable food system by: promoting and supporting the implementation of diverse and sustainable schemes; supporting innovations aimed at reducing the use of chemical inputs in food production; promoting the implementation and support of sustainable consumption patterns and supporting circular economy activities; promoting sustainable and healthy diets; supporting low-income consumers; promoting and supporting market centres for the development of short chains of

3. Strengthen monitoring and implement effective impact evaluation systems to ensure appropriate improvements are implemented to address food security and healthy diets.

4. Expand support for research, training and knowledge sharing through: strengthening knowledge co-creation; knowledge sharing; public investment in research aimed at food system diversification and resilience, improving knowledge dissemination systems, etc.

5. Multi-stakeholder participation to address inequalities and achieve a sustainable food system by: promoting the creation and effective functioning of NGOs, associations, etc.; supporting smallholder income generation; supporting youth and women in food production activities, etc.

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