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Strategic scenario of an open source of sustainable development for the food system

Abstract. Introduction. The food system requires some transformational changes which should take into account the problem of population growth, uneven distribution of consumer resources and threatening impact of the intensive agricultural development on the environment. *The purpose* is to study the characteristics of the developed strategic scenarios of the food system and identify the ways and directions in the rational combination of market relations with efficient resource consumption at the national level in the implementation of the scenario of open source of sustainable development for Ukraine and Greece. *Results.* The article deals with the present-day food system of Ukraine, its benchmarks and opportunities to solve social, economic and environmental problems and achieve sustainable development. The authors have studied possibilities and principles of agricultural producers, as well as coordination of efforts by the government and society in choosing an open source of sustainable development scenario of the national food system. Directions to promote international cooperation and implementation innovations in the agricultural sector through a combination of close market ties with the efficient and economical resource consumption have been established. Possible directions to intensify close links between the markets for certain agricultural products and prospects of import substitution have been analysed. Practical ways to shift the demand toward economical use of food resources through measures aimed at promoting healthy lifestyles, culture of healthy food consumption, reducing the availability of animal protein and foods high in salt, sugar and fat have been grounded. Potential ways to reduce urban migration through new opportunities of agricultural sector in contrast to global trends of rapid urbanisation and the experience of other countries as to the growing prestige of the farmer's work through cooperation with international organisations and free access to capital have been analysed. *Conclusions.* It has been found out that certain strategic scenarios of global food systems can be recognised in the early stages and best used at the national level. The considered algorithms of actions must be adapted according to the existing conditions at the tactical level and provide economic, environmental and social efficiency.

Keywords: Food System; Strategic Scenario; Sustainable Development Scenario; Market Relations; Resource-efficient Consumption; Food Consumption; Ukraine; Greece

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Стратегічний сценарій «відкритого джерела стійкого розвитку» продовольчої системи

Анотація. У статті проаналізовано сучасну продовольчу систему, її орієнтири та можливості вирішувати соціальні, економічні й екологічні проблеми та досягати цілей стійкого розвитку. Досліджено можливості та принципи координації зусиль сільськогосподарських виробників, уряду та суспільства при виборі сценарію «відкритого джерела стійкого розвитку» національної продовольчої системи. Виявлено можливі способи зрушення попиту на продукти харчування у бік ресурсоощадливості через систему заходів, спрямованих на пропагування здорового способу життя, культури споживання здорової їжі, зниження доступності тваринних білків та продуктів з високим вмістом солі, цукру та жиру. Проаналізовано можливі шляхи скорочення міської міграції через нові можливості сектору сільського господарства на протигагу світовим тенденціям швидкої урбанізації. Розглянуто міжнародний досвід стимулювання урядом використання джерел відновлюваної енергії за підтримки нових технологій та податкових стимулів, а також напрямки зменшення відсотку відходів та втрат продуктів харчування від загального обсягу національного виробництва.

Ключові слова: продовольча система; стратегічний сценарій; сценарій стійкого розвитку; ринкові зв'язки; ресурсоефективне споживання.

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Стратегический сценарий «открытого источника устойчивого развития» продовольственной системы

Аннотация. В статье проанализировано современное состояние продовольственной системы и ее возможность обеспечивать здоровым питанием население планеты. Установлена необходимость поддержки государства и других заинтересованных сторон для внедрения нового видения развития сельского хозяйства, ориентированного на устойчивое развитие. Рассмотрены алгоритмы действий всех участников рынка при разных сценариях для возможного выбора модели дальнейшего развития.

Ключевые слова: продовольственная система; стратегический сценарий; сценарий устойчивого развития; рыночные связи; ресурсоэффективное потребление.

1. Introduction

The present-day food system requires some transformational changes which should take into account the problem of population growth, uneven distribution of consumer resources and threatening impact of the intensive agricultural development on the environment which causes an increase in greenhouse gas emissions, reduction of forest cover and lack of water resources.

According to the investigations of international organizations, the world's population will have reached 8.5 billion by 2030; as of today nearly 800 million people are undernourished and, at the same time, 1.2 billion people are overweight or obese [1; 2]. Irrational distribution of food indicates the inefficiency and ineffectiveness of the food system regulation. Indeed, more than one-third of all food produced is lost, along with 88 countries where hundreds of millions of people suffer from hunger. Reducing food losses and waste will increase the supply of affordable food and strengthen global food security.

These factors must be provided by an effective complex of relationships between different processes implemented through the food system. As is known, the food system includes processes associated with cultivation, collection, processing, packaging, transportation, marketing, consumption and utilisation of food ingredients. Their rational integration should be aimed at high economic, environmental and social performance. The established communication channels between production, distribution, consumption and limits determining the growth of self-reliance and their subsequent expansion from local to national and global levels play an important role in the food system.

2. Brief Literature Review

The problem of organizational and economic nature and functioning of the food system has been considered in the works of the outstanding domestic scientists L. V. Deineko, M. P. Sychevskyi and E. I. Sheludko, who believe that there is a need in a scientific widespread use of the category «food system», which is widely used by European and American researchers in the study of the entire spectrum of problems associated with the cycle of production and consumption of food. Among prominent foreign researchers studying the issues of further development of the global food system according to a scenario approach are Sarita Nayyar (2017) and Lisa Dreier (2017) [1].

3. The purpose of the article is to study the characteristics of the developed strategic scenarios of food system and identify ways and directions of rational combination of market relations with efficient resource consumption at the national level in the implementation of the scenario of open source of sustainable development for Ukraine and Greece.

4. Results

The national food systems of Ukraine and Greece are under the influence of globalisation processes defined by trends of a global finance crisis which has caused falling demand for food, growth of urban population, climate change and the diet structure.

Evidence of a decline in purchasing power in Ukraine is the decline in consumption costs in value terms. Figure 1 shows a declining linear consumer spending trend for food in Ukraine, which dropped by 3.9% in 2016 compared to 2015, reaching USD 20.3 billion.

The annualized consumption expenditure is USD 51,518 million, while the initial annual rate of decline is USD 6494.7 million, which is 12.6% of the leveled volume.

Similarly, we construct a linear trend of consumer spending in terms of value in Greece. It is also declining, but at a much lower pace because the annual rate of cost reduction reaches 5.75% of the expenditure level which is half that in Ukraine (Figure 2).

However, against the background of general changes in consumption expenditure depending on the level of inflation processes and dynamics of the population of the country, the indicative value is the consumption of food (as per primary product) calculated per person on average per month, reflecting the time shift in food security (Figure 3).

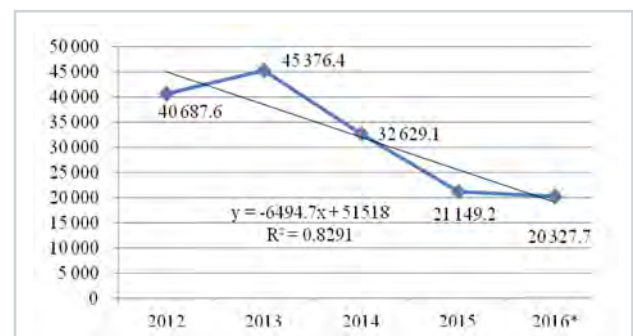


Fig. 1: Consumer expenditure on food in Ukraine from 2012 to 2016 (in million U.S. dollars)
Source: [2]

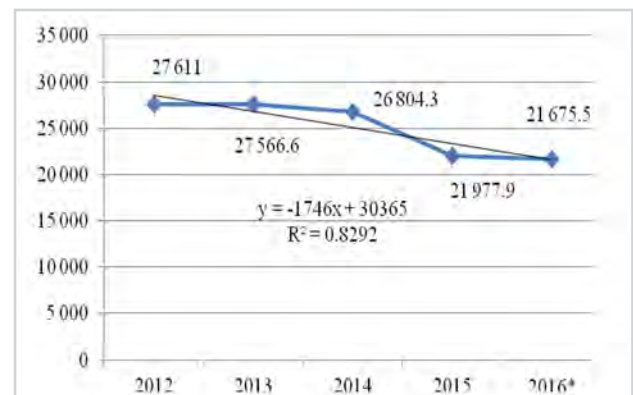


Fig. 2: Consumer expenditure on food in Greece from 2012 to 2016 (in million U.S. dollars)
Source: [2]

The data show that per capita consumption of virtually all types of basic products, except milk, has been reducing over the past 7 years in Ukraine.

The main reasons for this situation are, again, a decline in the purchasing power of the population and an increase in the share of raw materials import for food production, which affects the value of the latter. Food consumption diet per capita in Greece in 2010-2016 has also undergone changes; in particular, there has been a shift towards increasing consumption of meat and reducing consumption of fruits, vegetables and fish.

A characteristic feature of the food system in Greece is significant dependence of farmers on intermediaries, associated with insignificant volumes of farm products (this prevents direct links), discrediting agricultural teams (due to poor governance and debt), and consolidating the central role of intermediaries at the state level. In 2015, Greece was in the seventh year of the most acute and most prolonged economic crisis in its modern history: the output fell by about 25% from its pre-crisis level, and unemployment increased from 7% in 2009 to 25% in 2015 [11].

Of course, under such conditions effective public policies should play an important role in stimulating business activity of small farmers, which, as a result, will increase the purchasing power of citizens and the public's position in relation to labour in agriculture.

In Ukraine, as substantiates A. Popov (2017) in his empirical research, besides the significant influence of mediators on farms, the situation is further complicated by the alienation of land from peasants. They are transformed into rentiers [10], that is, they receive income from the lease of their own land, and the number of private labour owners is gradually decreasing.

A striking example is the experience of Brazil. Its food policy priorities of recent years have been social issues, intensive development of infrastructure in rural areas and improvement of the lives of rural population, not the growth of productivity or profitability. However, tangible positive results in the social sphere respectively affected the economic performance of the food sector [5].

Another example is the experience of India towards the support of the agricultural sector through introduction of the so-called green revolution mechanism, accompanied by increasing productivity, especially of cereals, which resulted in the introduction of new varieties, irrigation, advanced methods of agriculture and mechanisation. The network of lending institutions has expanded; the number of companies that carry out a number of special programs of rural development and supply electricity, fertilizers, various services to farmers has grown. Due to the reforms implemented in India towards the export-oriented development model the country has become a major exporter of rice, and is the world's largest milk producer and exporter of beef (buffalo meat).

An equally important problem that requires changing trends in the food system is a global trend of urbanisation, which has also affected Ukraine.

Under the influence of urbanisation processes, in addition to massive outflow of labour into the cities, the requirements to storage and transportation of food are reviewed and get more complicated. A growing proportion of urban population with higher income prefers animal products in their diet and is willing to pay more for cooked food. This, in turn, leads to a shift in employment in the food system: fewer people work in agriculture and more in transport and wholesale trade.

The results of dangerous competition for natural resources are land degradation, deforestation and lack of fresh water in some regions. A clear example is the intensive development of bioenergy.

New understanding of agriculture (NVA), proposed by the partners of World Economic Forum in 2009, requires simultaneous food security, environmental sustainability and economic opportunities to meet the needs of agriculture. According to this approach improvement is provided in each direction to 20% in a decade to 2050, which requires the transformation of the agricultural sector and coordinated efforts of all stakeholders (government, private sector, farmers, international organisations and scientists). Key success factors in the transformation of the rural sector at the national level include setting the correct direction on the basis of effective models of leadership, strategy and investments.

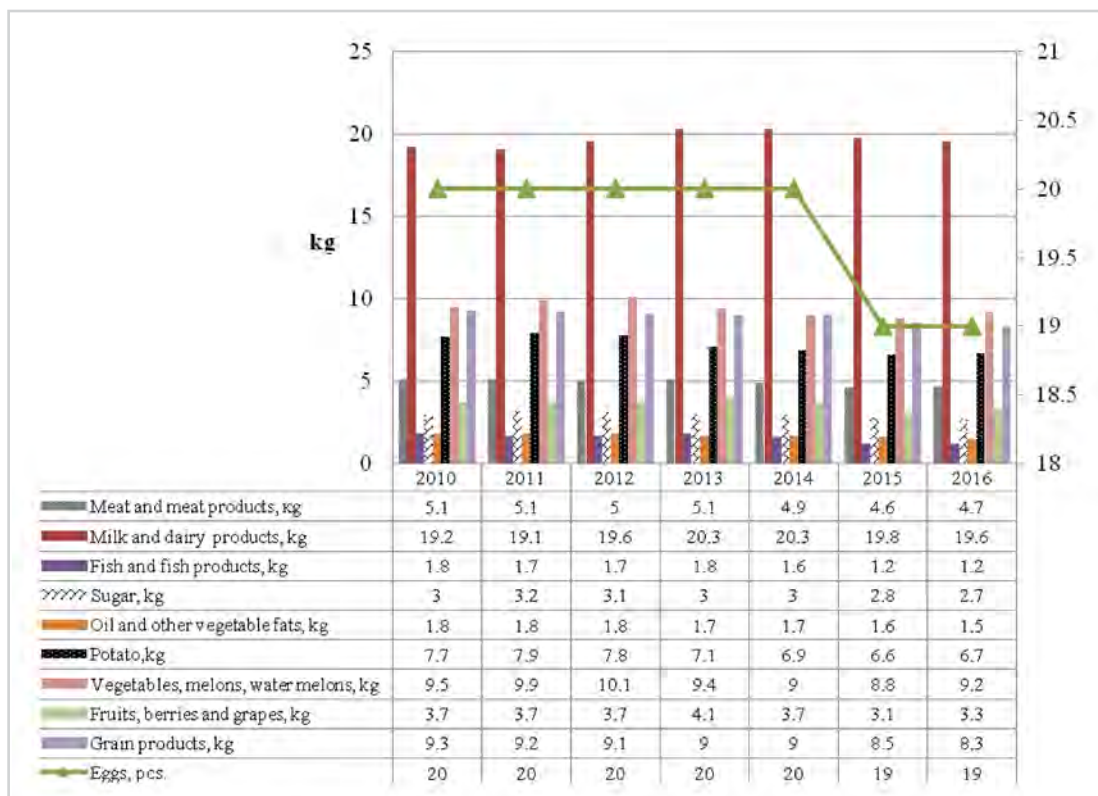


Fig. 3: Consumption of food in households of Ukraine (as per primary product) per person per month Source: [9]

Two basic factors have been selected to design scenarios of future global food system development in conditions of high uncertainty, based at UN reports, namely [3]:

1. Changes in demand. The uncertainty of future demand for food and agricultural products and its possible shift towards either resource-intensive or resource-saving strategy of consumption.
2. Communication and logistics market. This uncertainty relates to the sustainability of trade flows and accessibility of goods that could be both the opportunity and the threat.

A combination of these two critical uncertainties forms a matrix that reflects four development scenarios for the future of the global food system (Figure 4).

Depending on the combination of shifts in demand and market linkages factors, the following scenarios are formed: survival of the richest, uncontrolled consumption, an open source of sustainability and locality as a new global idea that may have the following consequences [3]:

Application of the open source of sustainable development scenario on the example of Ukraine and Greece involves a combination of resource-saving consumption along with a strong market link (producer-consumer). The latter can be actively implemented through the use of the benefits of developing new information technologies: mobile applications that provide an individual approach to the formation of a diet of visual nutrition on the latest advances of nutrition. Moreover, the promotion of a healthy consumption structure, which is mainly reduced to the consumption of animal protein and foods high in sugar, salt and fat, also has an ecological component. After all, the predominant share in the

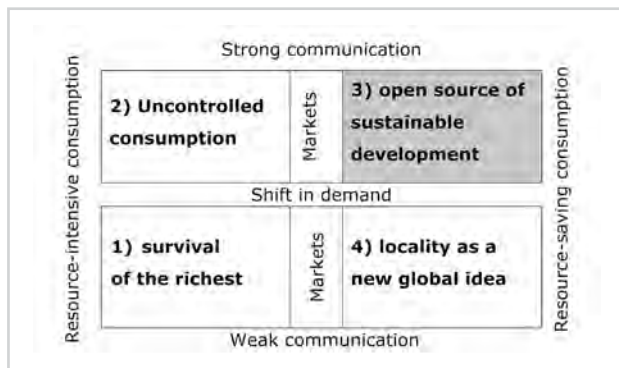


Fig. 4: Potential scenarios for future of the global food system
Source: [3]

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