

## GLOBAL FOOD SECURITY PROBLEMS IN THE MODERN WORLD ECONOMY

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### ABSTRACT

Importance: Food problem at the present stage of development of mankind is that due to improper and overly intensive use of natural resources, increasing demand for livestock products, increasing per capita food consumption and other factors, there has been a steady rise in food prices, represents a threat to food security in the countries with the lowest levels of development, as well as for the poorest segments of the population in developed and developing countries. It should again be emphasized that food will only grow in the future, therefore, from the point of view of attempts to address the global food problem, it can go about creating economic and technological preconditions for curbing price growth. Objectives: The purpose of this article is research of global food security problems in the modern world economy. Methods: In this article by means of methods of the analysis, logical generalization, scientific abstraction global food security problems in the modern world economy are investigated. Results: The main task in the context of a global food problem is control of increase in prices for food which decision lays down on shoulders developed and developing countries.

### KEYWORDS

food resources, food security, global financial-economic crisis, sustainable development, use of natural resources of the territories, the import and export of agricultural products.

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## Introduction

The global food problem is an economic phenomenon and essence, and on form, it can lead to serious political consequences. According to many experts, at the root of the world's revolutions and disasters lies leap rising food prices. From extreme weather events (floods and droughts) also affected wheat yields in many countries and regions, which worsened the situation with rising prices. In the Middle East and Africa the poorest spend about 50% of their income on food,

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which means that the increase in prices of major food products provides incredibly high impact on household spending. At the root of global food problems and recurrent food crises lies, first and foremost, the unequal distribution of the fruits of scientific progress in agriculture, which prevents the reduction of prices on food, even when technical advances allow increase yields in those countries. Against this background, growth in productivity occur farmland, the reduction of the workforce in the countries with the lowest level of development due to the spread of HIV and other diseases, increased competition from other industries for water resources, land degradation, loss of biodiversity and much more, making the task of finding optimum ways of agricultural planning increasingly complex and knowledge-intensive.

Among global problems of development of humanity most of scientists, experts and analysts allocate a food problem. This perspective is actual and topical throughout all last century and the beginning of 21 centuries. The problem of providing the population of the earth with the food is in many respects connected with opportunities of the mankind therefore she can't be compared to irreversible global natural or ecological factors.

### **Methodological Framework**

The population of Earth as of January 1, 2016 has exceeded 7 billion inhabitants, by 2025, by real estimates of experts and analysts, and also forecasts of the United Nations, will exceed value of 8 billion, and by 2050 on the planet more than 9 billion people will already live. Owing to social progress and development food and processing industries in developing countries the number of people with the average and high level of prosperity in high gear increases. Parallel to numerical growth also consumption of a grocery basket grows.

At the same time the problem of proportional providing the population of the planet with necessary food balance has difficult structure and a format, acting as the litmus piece of paper" reflecting the level and qualitative characteristics of economic development of society, processes of a demographic state and migratory processes. Level and possibilities of development of agricultural production, improvement of agrarian technologies, climatic features of these or those territories, criteria of an image of accommodation of different social groups of the population in various parts of the planet (Lifset, 2009) costs a separate perspective in all food chain.

Responsibility for food supply lies on the governments of the sovereign countries. World coordination in the solution of many aspects of a food problem now covers, at best, the questions of extreme poverty (hunger) raised by natural disasters or armed conflicts (UN), informing the world community on development of the situation (Food and Agriculture Organization, FAO) and discussion of problems of agrarian subsidies (Doha Round, WTO).

Situation aggravation at the existing world financial and economic crisis and often changing price correction on raw and food groups (at restriction of dynamics of growth in some regions), different levels and quality of food consumption are capable to be transformed to the global problem, extremely dangerous and irreversible for all population of Earth, capable to lead to emergence of modern animated effects of cumulative influence of problems of food supply, climate change, providing the population with fresh water.



Consequences of such succession of events can be dangerous in the social and economic and political plan.

Increase in production of the food in the world in for half a century fluctuates in a corridor of 2-2,5% a year (planet number at the same time grows with annual dynamics in 1,5%), increases also the general indicators of caloric content of food, the percent of costs of the food in the majority of the countries of the world in parallel decreases. Nevertheless, the alarm of researchers and politicians grows. It is remarkable that the Asian region showing the most dynamically growing demand for the food (the average annual gain for the last 40 years has made 3% a year), least actively increases production of food (an average annual gain of 0,11% in 2001-2011).

The boom of agro-industrial production in the countries of Southeast Asia which has begun with arrival of "green revolution" in the second half of the last century has exhausted soils, having become the reason of their degradation and bogging. Irrational and often barbarous use of soils leads to falling of efficiency of agriculture. You shouldn't forget also and that for Asia traditional branch is the plant growing, collateral value was always allocated for animal husbandry, and the due attention wasn't paid to his development.

Many experts consider: if already now not to begin to make certain efforts for leveling of the calls connected with the expected deficiency of the food, then in the next decades the problem can get out of hand and in a significant amount of the countries there will be "a social collapse" as questions of food security are a cornerstone for all states of the world, and the majority of them is at the moment not insured from deficiency of food. In this case the problem will pass from the category potential or regional into global, having become a factor of world socio-political instability. Experts of FAO claim that for this purpose to increase nutritional value and food security and to lower malnutrition, agricultural production in the future has to grow quicker, than there will be an adaptation of growth of the population and structure of consumption.

In this article the existing world theories of food supply are considered by us; bases for qualification of a problem as potentially explosive and critical; tendencies of overcoming of negative factors and possible options of her permission.

## Results

The food problem isn't, at first sight, so obvious as poverty, other problems included in the Purposes of the millennium of the UN, global climate change or deficiency of fresh water. The people living in the countries with rather high level of economic development don't suffer direct action of threat of the shortage of the food which has hung over the whole world yet. But it is obvious that for poorer citizens of the planet food crisis very and is very notable. Timmer's Jaw says that poor households are more sensitive to fluctuation in prices of food, than the rich as they spend from 60% to 80% of the income for food and have no other opportunity to cope with rise in food prices, except reduction of quantity of the consumed products (Naylor, Falcon, 2012).

Certainly, processes and forms of manifestation of a global food problem in developed and developing countries are essentially various, but, nevertheless, they are connected and make synergetic impact on the economic, political and

social making lives in each country. In the most developed countries it is rather about expansion of demand for high-quality natural food, and in less well-founded - about livelihood of millions living in poverty conditions.

Within the present article we will be limited to opinion that the main manifestation of a global food problem is increase in prices for food which forces to starve the poorest segments of the population in the majority of the countries of the world. It is possible to give the statement as the main characteristic of a global food problem Zh. Shiran, the eleventh executive director of the World food program of the UN: "Despite significant growth in production of the food in the world, we are forced to note that today starving more than when that was. We spread products on shelves of supermarkets, but people just aren't able to afford them to buy" (Herdt, 2004).

## Discussions

Manifestations of a global food problem existed for many decades. If this phenomenon was generation only of the 21st century, in the middle of the 20th century wouldn't be created by FAO, the report of Club of Rome "The Limits to Growth" wouldn't be written in 1972. However at the beginning of the 21st century there was obvious a fact that reduction of prices of the food will never follow, the cost of food will continue to increase as all limits for increase in production of the food are reached, and the second "green revolution" isn't expected.

The food problem isn't something new to world economy, but in the 21st century the situation has changed in two relations: the public perception of such problems as poverty and insufficient food has become aggravated; there were bases to expect the high frequency of splashes which can be called "food crises". Definition of food crisis in this case not necessarily assumes absolute shortage of the food as it happened in the history (especially in the conditions of wars and natural disasters).

In the 20th century the tendency to reduction of prices of the food, an exception of which made only the jumps in prices caused by wars or oil shocks, was observed. In the 21st century former tendencies were succeeded by continuous increase in prices for the food which cornerstone the military conflicts aren't any more. These specifics are also noted by the famous specialist in an agrarian perspective: "The food crisis which is characterized by the sharp growth of the world prices for the food has begun to be shown in 2002, has amplified in 2009 and has reached the blossoming in 2014. Reduction of the real income of households has turned out to be a direct consequence of crisis that, in turn, has slowed down process of overcoming of poverty and hunger in many countries of the world" (Lantier, 2008).

The question most actual at the moment consists not in whether Earth will be able to make the necessary quantity of food products for the increased population, and in, whether it will be possible to satisfy in the closest decades of need of mankind for those food, demand for which will be the highest, and whether it will be possible to carry out it at reasonable prices which could be adequate to the income of rather poor sectors of society of many countries. However the UN predicts impossibility of implementation of such control and



claims that in the closest 20 years of the price of the main articles of food will double.

The drought in the USA and South America taking place in 2012 has lifted a price index on food to the highest mark for the last 62 years in 268 points that has once again proved the thesis that the world constantly balances between a food problem and food crisis. According to the estimates of experts of the UN, by 2050 release of food will increase for 60%, however these figures are very exaggerated and therefore falling of food prices shouldn't be expected as demand for him constantly increases, and the offer as has set an example of droughty summer of 2012, is subject to the considerable fluctuations which aren't giving in to regulation from the person.

System approach to the analysis of sources of increase in prices for food contains in work of Abbott and C. Hurt which give four major factors generating increase in prices for food at the moment (Abbott, Hurt, 2011):

- unprecedented growth of world demand for biofuel and increase in demand of China at soybeans;
- increase in inelasticity of the world market;
- weather anomalies;
- weakening of dollar rate.

Are emphasized with authors that these factors of increase in prices are characteristic of the current period (2011-2013), and increase in prices observed in 2014 differs from food crisis of 2008 radically. Food crisis of five-year prescription has been caused by the long-term trends characteristic of the world market of the food for the last 40 years.

Cumulative influence of these trends has led at the same time to decrease in growth rates of production of the food and to increase in demand for food. So, from 1970 to 1990 production grain grew in the world on average for 2,2% a year while since 1990 the indicator will decrease to 1,3%. According to forecasts of Department of agriculture of the USA, in 2017 increase in production grain in the world will be reduced to 1,2% a year. If the annual growth of productivity of arable lands from 1970 to 1990 equaled 2%, then since 1990 the indicator was reduced to 11%, and the predicted growth in the next decade is on a mark of 1% (Holt-Gimenez, Peabody, 2008).

Food crisis of 2008 has been caused by cumulative effect of action of the long-term factors connected, first of all, with quantitative indices of production of the food. Growth of the prices in 2011-2015 has under itself other background and is caused by high-quality changes of characteristics of the market of the food.

The second manifestation proving existence in the modern world of a global food problem is increase of negative balance of foreign trade in the leading foodstuff (grain and meat) in the majority of regions of the world. The increasing dependence of the countries with the smallest level of development, and also the developing Asian countries, from import of grain and meat is obvious. Even the USA, one of the leading exporters of foodstuff, has overcome trade deficiency on meat production only at the beginning of the 21st century. In Europe there was

a small surplus on meat in 1980, 1990 and 2000, however at present the foreign trade balance became negative again. On grain in Europe surplus since 2000, and differs in the greatest stability Oceania where the foreign trade balance throughout all considered period positive both on grain, and on meat.

If to address data on the prices of the considered goods, then obviously bigger rise in price of meat concerning grain. In 2015 meat price has reached record value. FAO predicts only small fluctuation of meat price, but not decrease, by 2020.

The third phenomenon proving the thesis that the global food problem exists is so-called “agflyation”, that is increase in cost of the food of rather traditional raw materials. Dynamics of price indexes on the food, metals and minerals and oil which demonstrates that from 1960 to 2003 the price index on the food exceeded price indexes on nonfood raw materials is presented (except for a jump in prices of oil in the early seventies). Thus, food can be considered as one of inflation “engines” in the world (Abbott, 2011).

But not only food prices inspire alarm. Many scientists began to state fears concerning the new tendencies connected with potential deficiency of the food in the world recently (Behnassi, Draggan, Yaya, 2011; Devereux, 2007; Vanhaute, 2011). So, FAO regularly publishes reviews of dynamics of balances of production and consumption of the food in the world and gives forecasts of the change in price for food. The balance of supply and demand in the world has rather fragile character on a number of products, in particular, on grain crops. Estimates have been made joint efforts of OECD and FAO that food prices in the world current decade can be 10 times more, than in the previous period. This forecast is based on a combination of several factors (both from demand, and from the offer). The main thing from them is the high rate of economic growth and change of social structure which are observed in many developing countries which generate increase in demand for food.

In the world there is an imbalance between groups of the population their level of development. At the same time, on increase in production of food South America and Europe are in the lead. In the last, apparently from the table, the increase in population isn't observed, as well as a gain of consumption of the food per capita. Indicators of a gain of consumption of production of animal husbandry in the Asian countries which illustrate the increased demand for food of an animal origin, first of all - on meat are of huge interest. Consumption of meat per capita grew in Asia from 1970 to 2000 for 4% a year while the gain of consumption of grain was minimum or further negative. It speaks about process of replacement in the diet of inhabitants of the continent of grain meat caused by growth of the income of the population. This tendency, apparently in Table 1, is characteristic also of the whole world in general though in less expressed look.

**Table 1.** Average annual rates of a gain of the main indicators on continents, %

Indicators	Period	World	Africa	North America	South America	Europe	Asia	Oceania
Average annual rate of a gain	1970-1980	2,16	1,46	2,22	3,08	2,97	1,37	1,49
	1981-1990	2,32	3,03	0,63	2,44	3,98	1,20	1,22



productions of food	1991-2000	2,36	2,71	2,36	3,73	4,32	-1,69	3,61
	2001-2015	2,52	3,16	1,72	4,64	3,35	-0,11	-0,59
Average annual rate of a gain consumption of the food	1970-1980	2,03	2,92	1,28	2,43	0,88	2,60	1,21
	1981-1990	2,29	3,13	2,04	1,82	0,78	3,10	2,17
	1991-2000	2,65	2,88	1,94	2,79	-0,64	4,01	0,98
	2001-2008	2,02	2,99	1,15	2,09	0,80	0,86	1,94
Average annual rate of a gain consumption of production of animal husbandry	1970-1980	2,37	4,02	0,79	3,72	1,61	4,18	1,07
	1981-1990	2,28	2,32	1,61	2,46	0,97	4,82	1,95
	1991-2000	2,32	2,72	1,39	3,77	-1,14	5,43	0,13
	2001-2008	2,40	3,64	U2	2,16	0,95	3,62	2,38
Average annual rate of a gain consumption of production of plant growing	1970-1980	1,91	2,76	1,72	1,96	0,41	2,37	1,35
	1981-1990	2,30	3,26	2,39	1,55	0,65	2,80	2,38
	1991-2000	2,77	2,90	2,38	2,34	-0,30	3,70	1,70
	2001-2008	1,89	2,89	1,17	2,05	0,70	2,02	1,60
Average annual rate of a gain consumption population	1970-1980	1,88	2,75	0,96	2,32	0,55	2,14	1,65
	1981-1990	1,77	2,78	1,01	2,05	0,39	1,95	1,63
	1991-2000	1,42	2,46	1,10	1,61	0,06	1,49	1,43
	2001-2008	1,20	2,35	0,96	1,27	0,15	1,15	1,60
Average annual rate of a gain consumption meat	1970-1980	1,26	0,52	0,25	1,39	3,44	2,16	0,34
	1981-1990	1,05	0,01	0,27	0,34	4,01	1,16	0,39
	1991-2000	1,29	0,29	0,65	3,29	4,31	-0,93	-0,05
	2001-2008	0,96	1,46	0,39	0,97	1,43	1,15	2,13
Average annual rate of a gain consumption of grain	1970-1980	0,37	0,57	0,72	0,96	0,59	-0,62	-0,82
	1981-1990	0,43	0,34	2,29	-0,14	0,58	-0,38	-0,48
	1991-2000	-0,13	0,16	0,84	-0,04	-0,20	-0,71	-0,36

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2001- 2008	-0,06	0,67	-0,14	0,35	-0,22	-0,23	0,75
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One of manifestations of a modern food problem is that production of animal husbandry in the world becomes more and more demanded. Production of proteinaceous food of an animal origin (especially meat) demands much more big expenses (energy, finance, biomass, etc.), than production of vegetable. The animal husbandry also strongly surpasses plant growing as animals need to be provided with warm open-air cages, the electric lighting mechanized by conditioning agents, etc. in power consumption.

The least effective of all branches of animal husbandry is production of beef as for receiving 1 kg of this type of meat it is necessary to spend 7 kg of grain (for comparison, on production of 1 kg of pork 4 kg of grain, and are spent for production of 1 kg of chicken meat - 2 kg of grain).

Opportunities for accumulation of volume of agricultural production approach the maximum at these technologies: both on use of lands, and on increase in productivity limit opportunities are visible. All options of extensive increase in release of agricultural production are already settled: only 11% of sushi are suitable for agriculture, and development under plant growing of other territories isn't possible. From 80th of the 20th century the quantity of arable lands in the world counting on one person was reduced by 33% (from 0,3 hectares / persons to 0,25 hectares / persons). But these sizes are received by means of statistical generalization (the total area of arable lands is divided into the total number of the population). If to take into account unevenness of the countries arable lands, indicators are absolutely others. So, in Canada 1,48 hectares of an arable land, in the USA - 0,63 hectares, in China - 0,08, in Japan - 0,03 hectares are the share of one person. This indicator is equal in Russia to 0,85 hectares (to Horrigan, Lawrens, 2002).

Quality of the lands which are already occupied under plant growing worsens owing to their excessive every year, and often unskilled, operation which leads to salinization, a wind and water erosion, and in some regions - to full degradation of soils. The new technologies allowing to reduce negative influence of agricultural activity on a condition of the soil and also qualitative modern equipment, application of a crop rotation, investment into melioration and selection can become the solution of this problem. It is also worth noting that the considerable part of lands, suitable for agriculture, is used for other purposes, especially near the large cities.

In November, 2011 FAO has for the first time published rather full and exact data on a condition of land and water resources. 25% of soils are recognized completely degrading, 8% - partially degrading, 36% - stable or slightly degraded and only 10% - improving from the point of view of fertility increase. In other words, according to considerable group of researchers, deficiency of the food is caused by the accelerated use of resources and their exhaustibility: so, volumes and quantity of arable lands are reduced every year (Scarcity and degradation of land and water, 2011). At the same time FAO allocates 4 aspects characterizing food security. Treat them:





- existence of food - existence of enough the food of appropriate quality delivered by national or import producers (including humanitarian aid);
- availability of food - access for individuals to the resources necessary and sufficient for receiving food for the balanced diet;
- rationality of use of the food - satisfaction of all physiological requirements of an organism by means of the balanced food;
- stability - absence of risks of loss of access to food in the near future.

We will note that in this concept quite similar to concepts of energy security, there is in an explicit form no price factor (but there is “an economic access”), and also social aspects of a problem, unevenness of consumption on a social vertical. Besides international, there is also a national food security which is interpreted often in different ways. The part of researchers holds even that opinion that this term means uninterrupted supply of the population of the country with especially domestic goods, i.e. the state shouldn't depend on external suppliers of food (Kotenko, 2010).

The analysis of the nomenclature of export and import of a number of the countries allows to allocate the states, the most dependent on external deliveries of the food. From such countries of the WTO especially distinguishes Yemen, Côte d'Ivoire, Senegal, Bangladesh and Bosnia and Herzegovina: the food share in their import exceeds 20%. And since 2000 this dependence has strongly increased: in 2000 average value of a percentage share of the food in the general import for these countries equaled 17,5%, by 2015 it has reached 25,4%.

In most cases the countries import and export considerable volumes of the food of various type. Thus, for the states in which the big share of import is made by food the food security directly depends on economic ability to acquire the food made abroad (Arkhestov, Dikinov, Dikinova, 2016).

If to consider food security in the same context as power (that is to analyze a share of the import food in total amount of the consumed food), then in 2014 most dependent on external deliveries, according to the Ministry of Agriculture of the USA, became Algeria and Tunisia in which the percent of import grain - the largest article of consumption - has made 61%.

Other experts consider that the main factor of food security is availability of food to all social and economic groups of the population. And this availability not necessarily has to be provided only with internal producers of the food. Existence of free import of food is among guarantees of food security of the country. In our opinion, the most adequate in modern conditions the following definition of food security saying that its key property - satisfaction of need of each person for food not at a minimum level not at the level of a survival, and according to rather highly established level of a qualitative and balanced diet looks.

In recent years for the countries with rather high level of economic development there was a new gradation of food security assuming her division into two levels: safety of the state and safety of the population. And if in the first case the traditional treatment connected, first of all, with quantity of food

products means, then in the second case - the criterion of quality of these products and their compliance to preferences of people predominates. And in this context it is inexpedient to talk about need of full food self-sufficiency of the country (Dikinov, Dikinova, Eleeva, Zakaeva, Sadueva, Abdurakhmanova, 2015).

Agriculture belongs to a number of branches, the most dependent on geographical conditions therefore it is obvious that each country has potential for production only of limited number of food. International trade has made available many goods which to make in the territory of the country or it is impossible, or is very expensive. And it is simply irrational to neglect advantages of the international division of labor in the conditions of modern development of world economy.

### Conclusion

The most competent option of food security is the combination between self-sufficiency and import of food. The percentage ratio between these sizes depends on a geographical position of each country and development of her agro-industrial complex. Certainly, it is worth caring for increase in a share of national agriculture in this proportion, however the aspiration to the fullest domination of domestic producers is a utopia and doesn't bear in itself an economic benefit (Adaeva, Sadueva, Dikinov, Abitov, 2015).

All listed measures are possible only in developed and in rather rich developing countries which have the potential for investment into the knowledge-intensive and exact agriculture, and also political will and the administrative capital for implementation of this policy. As for the countries with the smallest level of development, owing to the general inability to self-development, dependence on import of the food remains their destiny still. Therefore the main task in the context of a global food problem is control of increase in prices for food which decision lays down on shoulders developed and developing countries.

### Disclosure statement

No potential conflict of interest was reported by the authors.

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