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ENVIRONMENTAL AND SOCIO-ECONOMIC ASPECTS OF FOOD PRODUCTION SECURITY OF THE CZECH REPUBLIC

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Abstract: Recent decades have witnessed a rapid and globalized socio-economic development that has brought many negative and ecologically inter-dependent problems related to environmental food production security. These impact on both natural as well as anthropogenic factors, including air, water and soil pollution, arable land erosion, disposal of solid wastes, and so on, that together ultimately contribute to a reduction of food quality and a certain agricultural production decline. Food security is, together with energy stability and natural (biodiversity and landscape) protection and preservation, one of the most topical, global environmental and economic themes. This paper discusses some of the issues on natural resource management and economy-related security on the example of the present national food-production strategy of the Czech Republic. The study subject illustrates a closed inter-linkage of particular environmental, social and economic segments that are mutually dependent. Environmental risk assessments of potential natural and anthropogenic accidents (including climate-triggered events, such as drainage floods, landslides, drought seasons with forest fires, as well as industrial pollutionand agricultural soil contamination) thus play the key role in the short- and long-term evaluation of the food security status of the country. Effective plans and programs should aim to monitor, prevent and mitigate these risks, which might potentially develop into full-scale ecological, food- and health-risk situations. Recognition of the main environmental (natural and industrial) hazards for national food production in the context of sustainable development thus belong to the principal action priorities of the main state institutions and the central government.

Keywords: food security, sustainable development, environmental risks, Czech Republic

INTRODUCTION

The environment, together with socio-economic stability, plays a key role in the maintenance of a nation's food production. Intriguing questions may be asked about the prospects for the quality of natural environments and the lives of future generations. These issues attract massive attention and contain vital ecological, social, cultural and economic aspects that can be evaluated to some degree on the basis of previous historical experience. One of the main aims and objectives of food-production security studies is to recognize the related natural and anthropogenic threats that may result in a World food crisis, as in the case of the most recent crisis in 2007–2008. This crisis has in turn invoked

active discussions about the direction of modern technological civilization and on the quantitative and qualitative limitations of the present natural resources. It is important to evaluate these issues, since the resources, including water, land, strategic mineral deposits and technology, ensure the functioning of national economies. The key point is sustainable development, i.e. the use and exploitation of natural resources without their total depletion and the disturbance of the contextual natural environment. This problem is closely related to global foodstuffs (food production) security, closely linked to a sustainable agricultural/stock-breeding strategy, which integrates three main factors: environmental land agency, profitability and a prosperous farmer society. These interdisciplinary science issues also reflect complex international market relations. From this viewpoint, identification of the main ecological hazards and risks to national food production is of the utmost importance.

In the present economically and technologically globalized world, interlinked by high-tech information networks, nature, together with modern civilization, creates one unified, closed and very complex system. The resulting interactive environmental and socio-economic complexity, however, is very fragile and exposed to regional as well as global risks, including various natural catastrophes, political instability, geo-demographic and health problems, such as starvation, epidemics, as well as the far-reaching economic and financial crises that we have experienced during the last few years. In this perspective, vital crisis management strategies at all levels and in the main socio-economic spheres are of crucial relevance for controlling and maintaining a state's functioning, with the focus on national food-production stability. Abilities, experience, science, and social and political skills can not be mechanically transferred to solve the problems, with reference to United Nations global policies. Specific approaches need to be taken and implemented in defining, monitoring and mitigating the key risks and hazards in particular countries, reflecting the national, historical, economic development and the present needs and priorities. This paper outlines some of the main environmental and socio-economic aspects predetermining food security and its sustainability in the Czech economy.

NATURAL CONTEXT OF FOOD SECURITY OF THE CZECH REPUBLIC

The Czech Republic, with its size of 78,866 km² and a ca. 10.5 mln population (2010) is a well-developed country where agriculture and the animal breeding economy play a key historical role in securing food for the nation. The gradual rise in population density, promoted by intensified and sustainable alimentary production, has accelerated particularly during the last century, reaching the present average settlement density of 133 inhabitants/km^2. The geographic

position of the historical Czech lands (Bohemia and Moravia) in Central Europe, characterized by favorable mid-latitude climatic and corresponding natural conditions around the 50ºN parallel, provides the main pre-conditions for a year-round seasonal agricultural economy. A sufficient amount of solar radiation and atmospheric precipitation brought by the NW Atlantic anticyclone regime contributes to the country's food resource self-reliance, artificially deformed by globalized economic trends and the open markets of the European Union. The total extent of agriculturally used lands is about 38% percent, which together with the 33% of the state's forests (most of which are economically managed) and 2% of water surfaces (lakes and artificial ponds) add to the total of ca. 73% of land exploitation.

Its geographical position, with the country's surrounding mountain ranges in the south-western, western, northern and eastern parts, and the main river basins of the Labe-Vltava and the Dyje-Morava drainage systems, contribute to the regionally-specific micro-climate differentiation. The most productive, south-eastern regions of Moravia, geographically linked with the Carpathian Basin and the (north-)central parts of Bohemia, have the highest annual temperatures (9–10ºC), but also the lowest precipitation values (less than 400 mm per year in the Chomutov District, NW Bohemia; 450 mm per year in the Žatec region, central Bohemia; and < 500 mm in the Znojmo-Mikulov area, southern Moravia) by comparing the country's average of 7.3ºC MAT and 700 mm MAP. Most of the territory is covered by coniferous and mixed forests, with the former distributed mainly at higher elevations along the national border zones and on the Czech-Moravian Highlands. Open landscapes characterize the lowland areas, with the original parkland-steppes being preserved in some semi-arid locations of southern Moravia (e.g. the Pouzdřany steppe, the Pálava NP). The top soils correspond to the dominant vegetation cover, with the agriculturally most-productive brown chernozemic soils and grey soils in the parkland-steppe areas of southern Moravia and central Bohemia (MAP 450–600 mm, MAT > 8°C) that developed on a loessic substratum. Brown soils are mainly formed under mixed deciduous-coniferous forests transforming into podzolic soils, gleysoils and ranker soils at the higher and most humid relief zones (MAP > 1000 mm, MAT < 4°C) covered by coniferous (mostly spruce-dominated) forests.

Recognition of the principal environmental (natural and industrial) hazards for food production and sustainable development belong to the principal action priorities of the main state institutions. The strategic framework of the official governmental policy of the Czech Republic includes, among other things, ecology planning, environmental and biodiversity protection, sustainability of agricultural production with application of high-tech innovations, and landscape socio-economic stability. All these issues have close connections to national food security. Environmental liability, defined as the level of threat of a potential environmental accident or disaster that may exist in a certain situation, may have

diverse forms and extents depending on particular situations. Environmental risk assessments, describing the possibility or probability of an environmental accident (including naturally-triggered events, such as floods, landslides, forest-fires, as well as industrial pollution), thus play a key role in the short- and long-term evaluation of the food security status of a country. The aims of systematic industrial monitoring is to define methods and research insights of natural, medical and social sciences in order to trace pollutants from their sources through surrounding ecosystems and eventually into the human food chain. Ultimately, national management policies should be based on the complex environmental context evaluation of agriculture and animal-production food resources and the assessment of impact of potential contaminants on public health.

Accelerated global development and urbanization during the last few decades has also brought many negative aspects to environmental and food security, including air, water and soil pollution, disposal of solid waste, reduction of food quality and agricultural products‘ nutritional values with effects on public health. All these aspects relate more or less to the emerging and actual risk issues together with food security, energy stability and environmental protection discussed at various national, regional and World economic and ecological forums. Accordingly, an effective sustainable development strategy/program should be able to monitor, prevent and mitigate environmental risks and hazards that might develop into full-scale ecological, food- and health risk situations. Food-production security surveys in conjunction with ecology monitoring are the principal instruments in the prognosis, prevention or reduction of potential risks related to food production. From the environmental point of view, these particularly concern localized weather events, (such as storms and floods) as well as ongoing climate change with a strengthening continentality with all its impacts on the environment (i.e. land slides, mechanical removal/erosion of arable land, decreasing fertility of soil cover due to regional aridization or overuse of industrial fertilizers and pesticides and their leeching that results in contamination of ground waters, for example). In the context of the Czech Republic, natural weather-triggered risks, such as the periodic floods in the Morava or Labe river basins (1997, 2002, 2009), represent the most prominent, cyclical and visible threats to the national economy.

SUSTAINABLE DEVELOPMENT IN THE CZECH REPUBLIC (SOCIO-ECONOMIC ASPECTS)

Sustainable development can be defined as development which provides present and future generations with the opportunity to satisfy their basic living needs while at the same time preserving the natural functions of the ecosystem by retaining the diversity and quantity of original natural resources. The

emphasis on the basic necessities of life and also on biodiversity and the natural functioning of ecosystems is crucial. Human material needs can be ensured in sustainable ways only if the environmental system is respected by the socio-economic system. Human activity, especially its material elements, is pre-disposed to the exploitation of natural resources, which are all, due to their physical essence, limited, and whose essential parts are non-renewable. Natural resources are at the same time a "common wealth" of each state, although true individual participation in this wealth is very limited. In many countries around the world, many communities of inhabitants live in poverty, not just because wealth in those countries is distributed socially unequally, but because these lands are poor as a whole. The Czech Republic, unlike underdeveloped countries, does not need strong economic development, but prefers stable and gradually progressing balanced national growth (Jetmarová 2009). An integral task of state policy is, among the other socio-economic aspects of food security, ideally based on renewable and ecologically-based agricultural production (FAO 2011).

Sustainable development of the Czech Republic is defined by the Strategic Economic Development Plan on the basis of government decree no. 37 of 11.01.2010. This document determines and projects the vision and the forms of sustainable development in the country with the basic principles measuring indicators and determinant fundamental priorities and targets of sustainable development segmented into five interlinked priority axes. The final targets proposed in the Strategic Framework should ensure the prosperity of Czech society for the following decades by balancing the three principal pillars of sustainable development in the economic, social, and environmental spheres, respectively. National sustainable development for the immediate future thus represents a complex system of strategies which enable the country, by means of particular economic tools and technologies, to satisfy the social, material and spiritual needs of its people in compliance with the total quantitative environmental limits of the land.

The above definition covers all levels of the economy which are necessary for regulating sustainable development (economic growth) by any possible means, including science and technology, intellectual capacities and capabilities, and overall natural resources. The responsibility towards future as well as current generations is expressed there not only in time but also in the space of the globalized world. The environmental limits implicate a responsibility to preserve a functioning and sound environment for future generations, but also define the quantitative and qualitative limits for satisfying the present needs of the country. In order to project this issue onto the food security and nutritional strategy of the nation, it is crucial to understand the contextual, environmental complexity of a food-production economy. Specific environmental and resource-exploitation regulations and economic markers for sustainability reflect the principal political decisions. In the absence of objective markers of sustainability, neither

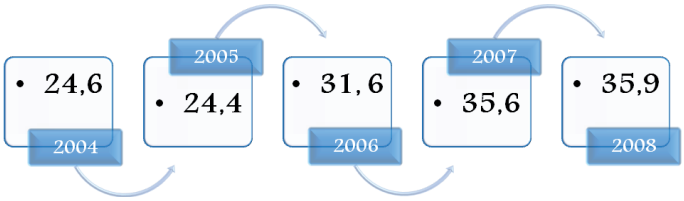

Fig. 1.
Source: authors' own compilation

a continuation in economic production, nor a comparison with other countries or regions can be done. Each of the applied indicators of sustainable development includes quantitative information on the evaluation of the particular system parameters (atmosphere, water, land, nature, industry, agriculture, transport, social sphere, etc.). These indicators are used at all levels of the political decision making of central government.

In general, a quantitative and qualitative assessment of the environmental endurance in respect to human activities is based on the presented model discussed below (Fig. 4), evaluating the general environmental requirements. The natural resources and environmental absorption capacity demands are predetermined by the size of the territory/area, but also the intensity of natural-resource exploitation and the economic production processes of the Czech Republic. Variables of this model include the processed material, energy flows and size of exploited territories. For the summary aggregated indicators, it is necessary to understand the processes of integration of each of the particular indicators of material, energy flows and other proxy-parameters of the exploited territory and the economic resources of the country.

FOOD PRODUCTION SECURITY IN THE CZECH REPUBLIC

Within the Czech Republic, food security can be specified on two separate levels. First, the overall food security of the country, i.e. the level of necessary production sources in relation to home consumption. It presents the degree to which the nation's household consumption is covered in case of unusual situations and events (such as natural catastrophes, international trade collapses, wars, etc.). The country's food security can also be expressed qualitatively by the so-called food security threshold, i.e. the number of slowly or problematically renewable food-production sources or resources under conservation status (Doucha 2002). The food independence is defined as the actual ratio between domestic production and consumption of an agrarian commodity over a specified period of time.

At present there is still not sufficient attention paid to the issue of national food security in the Czech Republic. These issues have become more current and are discussed in the context of the impact of the present global economic crisis (Kovalev 2010). Climatic instability, pronounced seasonality with droughts and intensive rainy periods, the decline of regional water volumes, sudden temperature fluctuations, flash floods, extinction of bee colonies, depletion of former fish stocks, these are some of the indicators of the food system decline that is being observed worldwide. The present trends towards bio-fuel production with related constant energy costs increases additionally contribute to the creation of a perfect scenario for a potentially devastating food crisis in the coming years. Moreover, according to the food production security power index calculation for the Czech Republic, claims about assurances of food security have risen steadily for the last 18 years, which points to a possibility of future problems with food sustainability and the assurance of independent food sources in favor of the EU sources. The reason for the food security index growth is the decreasing amount of arable land and increasing number of inhabitants together with natural climate-related effects, which together influence annual harvests and thus the level of food sustainability in a given year. The rate of food sustainability in the Czech Republic is closely related to food production security. On the other side, EU agricultural production has been characterized by food surpluses in the last decade, as a result of state-subsidized agricultural policies. The abovementioned reasons, which are primarily related to ecological issues, in particular to environmental risks, make determination of the state food security highly complex, and finding a solution to this issue is rather crucial in relation to the assurances of security for the entire society.

Solution of food problem is one of the main global challenges and tasks that we face today in the context of the new economic, ecological, social and political conditions of particular nations and in respect to retaining global security. The Czech Republic's national strategy refers in this context to "The Strategy of Assurance of Food Security in the Czech Republic" after joining the EU, document no. 1277 ratified in 15.12.2004" as well as "The National Strategic Plan for Countryside Development" (Bulletin of the Ministry of Agriculture of the Czech Republic, May 2006). Together with other governmental and non-governmental initiatives, these documents represent jointly an operational basis for long-term national participation in the "Common Agricultural Policy of the EU" (CAP). The Common Agricultural Policy (CAP) implicated in the Czech socio-economic environment, however, means more policy and bureaucracy than farming and industry alone. The way out of this *status quo* can only be by systemic restructuring with the application of rationally regulative elements proposed by the Czech government and included in the CAP. That is why the idea of complex, professional agricultural advice based on risk analysis, the principles of prevention and state sponsorship should be officially endorsed.

From the view of the food security threshold it is not possible to determine if the Czech Republic is a country where food security is sufficiently guaranteed. The formula of the food security power index, as indicated in the listed food security values calculated according to the food security power index for the years 2001–2009 (Fig. 2, Tab.) is a better predictor. From the present data it is evident that from 2004–2008 the food security index grew significantly, especially as a result of the loss of agricultural land and the increasing number of inhabitants in relation to the food production development in particular years (Fig. 3). Despite the fact that the Czech Republic is a country where there should be no problem assuring sufficient, high-quality domestic food production, it is necessary to take into account also the total food sustainability of the country and the development index in the following years, especially in terms of the constant reduction of farmland due to various environmental and economic reasons and its usability potential. Acreages are often exploited for growth of rapeseed and it is possible to observe a move away from foods production which is not included in the statistics for evaluation of the nutritive area for a single inhabitant. The mass of high-quality food is at present accessible without problems thanks especially to global markets. Each state, however, should be self-reliant at least in basic food commodities, which is the means of trouble-free access for all inhabitants to food, as in the case of the Czech Republic (Lukášková et al. 2011).

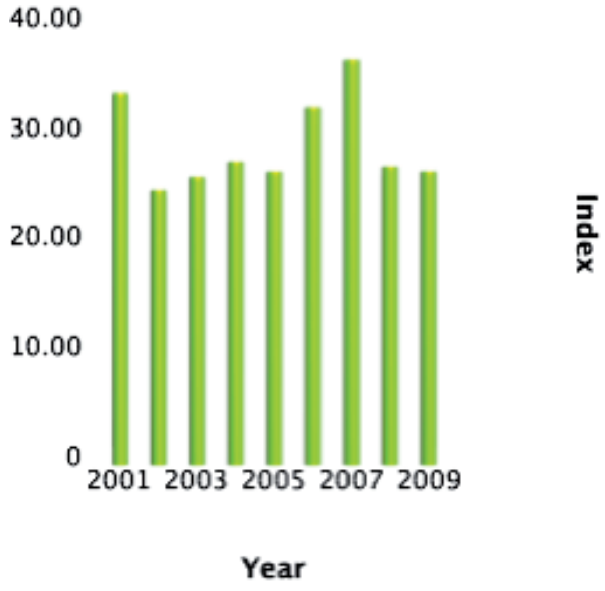

Fig. 2. The Values of the index of food security in the Czech Republic
Source: authors' own compilation

Table. Values of index of food security in the Czech Republic in 2001–2009

Years	L	A	P	1	a	p	Index
	Number of Inhabitants (in millions)	Farmland Area (in millions of hectares)	Soil supply (in millions of hectares)	Natural Growth Increment (in percentages)	Nutritive Area Size in Given Year for One Inhabitant (in hectares)	Foods Production Size Change between Two Years	
2001	10,22	4,280	7,887	–0,17	0,42	1,6	32,70
2002	10,22	4,277	7,887	–0,15	0,42	1,00	24,17
2003	10,20	4,272	7,887	–0,17	0,42	1,1	25,33
2004	10,21	4,265	7,887	0,09	0,42	0,99	24,60
2005	10,23	4,259	7,887	0,06	0,41	0,97	24,40
2006	10,23	4,254	7,887	0,01	0,41	1,4	31,35
2007	10,32	4,249	7,887	0,1	0,41	1,6	35,63
2008	10,43	4,244	7,887	0,14	0,41	0,94	35,90
2009	10,50	4,239	7,886	0,1	0,40	0,92	25,80

Fig. 3. Growth of Food security index in the Czech Republic in 2004–2008
Source: authors' own compilation

GLOBAL FOOD SECURITY AND INTERNATIONAL AGRICULTURAL POLICY

The problem of food security has historical significance. It has always been connected with a number of intentions related to the formation and accumulation of food reserves which would enable a country to survive a period of food shortage. A fundamental re-evaluation concerning food security was accentuated particularly during the 20th century (FAO 1996; Rogers 2002; Jeníček and

Foltýn 2009) During the 1970s, international partnership efforts were initiated under pressure of the global food crisis in order to solve the shortage of food and nutritional problems on a global scale that unified two hitherto separately comprehended needs – individual and collective – to protect against the potential national famine threats (Stachowiak 1999, 2003).

There are three main groups of factors which influence the formation of world food security under present-day conditions.

1. Basic conditions, including the particular geological, geographical, climatic, socio-economic, technological, logistic and other aspects and the related primary energy requirements for food production security.
2. Non-market geo-political factors that significantly influence inquiry and supply for food on a worldwide scale.
3. Speculative factors that play a significant role on the international food market. This also includes the effects of the policies of the United States and the European Union as well as of other countries, in their efforts to stimulate the production of bio-fuels.

It is necessary to remark that the global financial crisis generated a sequence of related crises and has widened the gap between basic research and the implementation in practice of its results.

The main cause of the crisis is seen in the functioning of the global food system, which is under the influence and pressure of globally strengthening economic as well as ecological problems. Food security exists when people at all times have physical, social and economic access to sufficient, safe and nutritious food resources that meet their dietary needs and food preferences for an active and healthy life,

Food security thus has three principal dimensions:

- Availability
- Stability
- Biological utilization.

Access to food on the national level (macro level) is given byconsumer research, which is determined by home production, commercial imports, food aid and reserves of food. On the regional level, access is influenced by the central market economy, regional and local foods production, reserves of food, as well as the distribution system and private food production on the level of households. Access to food also reflects the overall income level of households and useability reflects how wholesome the food is (Konold 1999). The necessary conditions for a country's food security intotal is thus given by the most suitable conditions that can ensure the existence of the nation as a whole, as well as state security. When we consider these dependences with regard to the requirements of modern development of civilization, it is necessary to see the problem of food security from the point of view of the nation's expectations and actual needs (Lukášková 2003; Ševčík and Lukášková 2010).

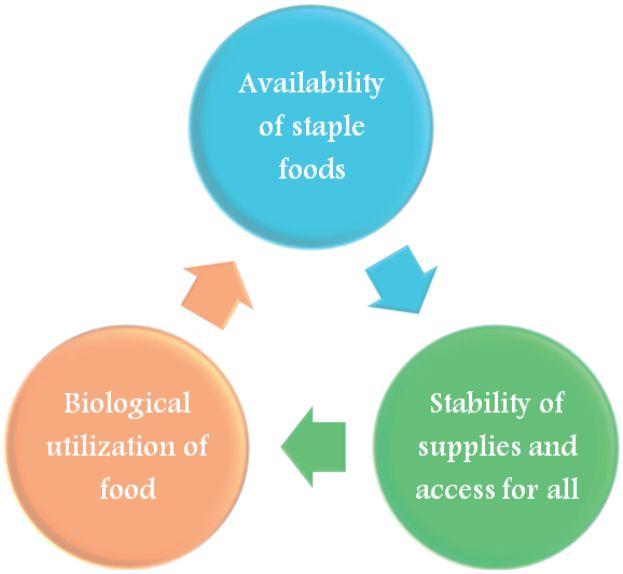

Fig. 4. Basic dimension of food security
Source: authors' own compilation

The identification of food security scales and markers is carried out in the principal steps of their formation (i.e. offer, inquiry and infrastructure). For determining the area of a balanced sphere of these determinants, it is possible to accept a self reliance state in food and economic raw materials supplies. Their determination and analysis enable the conduct, at the same time, of an evaluation of the overall (present and future) food security status. In the following formula, the particular factors (L, A, P) characterize the state of a country's food security where the indexes (1, a, p) determine the changes of each factor over time. By means of the resulting coefficient, it is possible to estimate the desired level of the state's food security (Stachowiak 1999).

Food security power index formula

$$IBZ = \frac{(L \times a \times P) + (A \times p \times L) + (P \times 1 \times A)}{3}$$

L – number of inhabitants (in millions),
A – farmland area (in millions of hectares),
P – soil supply (in millions of hectares),
1 – natural growth rate (in percentages),
a – nutritive area size for one inhabitant per year (in hectares),
p – food production size change in comparison with the previous year (index = 1).

From the international point of view, global food activities are governed by the Food and Agricultural Organization (FAO) aimed, among other issues, to solve the questions of the global food security. The principal concept of its policy is to ensure free access of all people at any time to a sufficient amount of food (FAO 2000). Macro-economic policy (monetary and fiscal policy, exchange rate and balance of payments) then represents the principal market aspects of food security. Food security is understood there from an economic point of view and the production-market agricultural perspective. Although this concept is implemented mainly in food-aid programs to under-developed countries, it also concerns the solution of questions of food security assurance in developed countries, including the Czech Republic, in cases of environmental, economic and geopolitical crisis situations. Similar strategies are in place within the framework of the EU, which has a well-constructed concept of food security and food aid based on the same principles as the FAO (FAO 2002).

In order to achieve food security, it is necessary to provide analysis of approaches and resources, such as the limits of financial, natural and human sources necessary for food production which can be achieved by state-owned, private and individual food-production systems (Baris and Deshormes 1999; Leblanc 1999). Food security in the Czech Republic, as well as in other countries, is closely connected with the environmental, demographic and socio-economic conditions in countryside, which is the primary producer. The national situation has worsened due to the globalization of markets for agricultural commodities and the accompanying downward pressure on prices, even though some sources conversely support market liberalization as one of the aspects which increase food security.

FOOD SECURITY IN THE CONTEXT OF THE PRESENT WORLD ECONOMIC CRISIS

The food security can be temporarily interrupted by natural events such as floods, droughts, but also by a political instability. By means of focused food aid emergency and food reserve activation it is possible to reduce temporary food shortages. During the 1970s food crisis, the FAO recommended providing 17–18 % of world food consumption for the support of food security on a global scale. The current high prices of cereals, oil-rich crops, oils and fats and some other agricultural raw materials and foods reflect cyclical temporal fluctuations, recently accentuated by the situation in the financial markets and commodities speculations. The continuous price growth of basic agricultural commodities may trigger risks of inflation, a declining food supply , social conflict and a dramatic growth in starving and malnourished people among socially weak population groups. The world food crisis, as a part of the global financial and economic

crisis, has hit the agrarian sector unevenly. Whereas in developed economies, the immediate impact of the crisis has been softened by national policies for subsidized agriculture, particularly evident in the USA and western EU states, they have become more pronounced in underdeveloped countries. The food crisis has also revealed basic problems and contradictions in global agrarian systems, which are only slowly adjusting to the changes associated with population growth, global industrialization and urbanization.

On the other side, the most common approach to a recognition of what is going on in the agrarian sector (which can be understood as the main way of decreasing the extent of thefood crisis)is the study of the fracture lines, understood as a close analysis of the factors that cause them. The frequently asked questions of who is interested in seeing an imminent crisis develop (lack of food, higher prices, bio-fuel production, increased speculation, etc.) remains unanswered. Nevertheless, the basic causes of food crises lie way beyond the borders of national food production. They also reflect the technological level and natural resources base, and also the overall civilizational level and global development trends. The present global climate change plays a major role in this process. The world prices of basic food commodities in 2009 decreased by 40% in comparison with 2007–2008), indicating a certain stabilization in the agrarian sector and the food security state. This also stimulates subsequent negative factors and, together with the consequences of the global financial crisis which to restricted access to loans for many farmers, has brought about a decrease of maintained and exploited acreages, poorer harvests and a progressive trend for price increases in agricultural commodities on world food markets.

The crisis attracts the attention of many people unconnected with agriculture and agribusiness to problems of the present agrarian sector and the global agricultural system. Current agro-globalization is also reflected in growing economic and food-market dependence of particular countries, by growth in the complexity of international division of labour, a steep increase of cost-production factors, and so on. The above tendencies inevitably lead to the bankruptcy of millions of small farmers worldwide and to a decrease in the assurance rate of food security, and subsequently to food-production dependency mainly in underdeveloped countries. Similar trends are observed in the solution of global problems related to energy and drinking water security, and the ways and forms of solving the present global economic crisis. Geo-environmental issues must be considered as the principal issues behind this situation. Some treaties warn of a collapse of modern civilization (Adams 2011) on the basis of changes that adversely affect the world's population today, including all the environmental and technological issues and the economic system's limitations for successful global sustainable development. Specifically, these include: tornadoes, hurricanes, earthquakes and tsunamis; biological indices, such as the silence of the bees (CCD – collapse disorder syndrome, a rapid death of bee colonies for hitherto unknown reasons),

the failure of atomic science; increasing trends of food shortages particularly in developing countries; destruction of the world´s major energy companies and the continued contamination of the planet, including pharmaceutical and genetically modified product pollution, among other things.

SUMMARY AND CONCLUSIONS

The concept of food-production security in the context of environmentally-balanced sustainable development in the Czech Republic has still not been fully embedded in central state policy. The last few decades have witnessed rapid economic growth with urbanization, and the globalization of agricultural production which has also brought many negative aspects and placed demands on the environmental background of the economy's resources and food security, including air, water and soil pollution, disposal of solid waste, a drop in food quality and the nutritional values of agricultural products with effects on the public health of the nation. The current philosophy of economic growth is often viewed as an inevitable contradiction between a steady economic rise along with a growth of living standards on one side and imposed environmental protection and biodiversity preservation regulations on the other. Only a balancing between these two spheres can overcome this contradiction and ultimately solve the many persistent problems related to the sustainable and environmentally friendly development of a country. Currently, the situation is slowly progressing in favour of ecological approaches in the economic production sector in respect to the global trends that bring changing perceptions towards nature and the moral values of a modern society and preferences for renewable energy resources, particularly in the most developed countries. The member states of the European Union have implanted the concept of sustainable development as a politically central theme and argue for the application of new ecological principles in all spheres of economic growth, including the agrarian sector. A further mobilization and dissemination of these ideas on the level of central government as well as in the general public, and their implementation in practice will undoubtedly contribute to the short- as well as long-term sustainability of a country's development, where ecological aspects will play the leading strategic role. Recognition, monitoring and mitigation of the main, unpredictable natural hazards and environmental threats related to ongoing climate change are therefore of the utmost importance.

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