FOOD RESOURCES – AN ELEMENT OF CRITICAL INFRASTRUCTURES

Lieutenant General Professor Teodor FRUNZETI, PhD*

The present paper presents that the surrounding environment and its resources preservation for the current and future generation represent vital issues for the long-term humankind sustainable economic development, energetic or food security.

The author considers that food security guaranteed at national, regional or global level cannot be treated independently from AACI, no matter whether we consider cultivable fields, irrigation systems, warehouses, means of transportation, or the protection systems against flooding and other types of protection means. The identification, configuration and securing of AACI, according to principles and criteria that need wise elaboration, became compulsory elements in order to pass to the operational and actional dimension, shaping the attitude towards the evolution of certain components of national and international security environment.

Keywords: *food resources; critical infrastructures; food security; the current situation of food resources; the agro-alimentary field.*

Besides the explicit political-military threats against international security, other threats have emerged for some years, due to the intensive consumption of natural resources in some parts of the world and their lack in others, or to both natural and man-caused risks to those resources. In this context, experts, politicians and the competent public alike have started to cite „catrastrophic" classical visions, drawing attention on the global anarchy caused by the exhaustion of some resources or the overpopulation of the planet, and also anticipating the "limits of growth". Their fears were fed by the tremendous expansion of production, credit and consumption in the Occident and also by the great ascension of emergent economies, from the "Asian tigers" to the BRICS countries[1]. The recent economic-financial crisis has mitigated these excessive trends and forced the international community to realize the importance of food

* Lieutenant General Professor Teodor FRUNZETI, PhD (tfrunzeti@unap.ro), member of the Academy of Romanian Scientists, Commandant (Rector) of „Carol I" The National Defence University.

[1] Brazil, Russia, India, China, South Africa.

resources and to intensify the preoccupation for the protection of the critical infrastructures from the agro-alimentary field. Natural resources generally speaking represent a problematic issue which has lately become a more frequent subject of debate, as people have started looking for solutions not only to provide energetic security but also the security of food and water resources.

Food resources and food security

Nowadays, the position and role of a state in the international hierarchy and in power „equations" are not only the result of its armed forces, but also, and especially, of its natural resources. The conflicts and wars of this beginning of century are more and more directed towards obtaining economic, technological, informational etc. domination. At present, the economic war is a constant issue in the development of relations among states and a very efficient instrument for accomplishing certain strategic goals. Within its framework, the competition for gaining access, control, and distribution of vital water, food and energy resources has not slowed down; on the contrary, it has become much harsher, the specter of their exhaustion emphasizing this battle even more.

Resources are defined as components satisfying different necessities of humankind[2], more precisely, the whole amount of quantitative and qualitative production factors used in order to satisfy economic and social needs. Among them, *natural resources* represent the amount of mineral and raw metals deposits, of cultivated and usable lands, of forests and waters that a certain country[3] owns, which appeared as an effect of natural processes and evolutions, without any human intervention. This category includes: air, water, soil, mineral substances, plants, animals, solar energy, wind energy, tides, etc.

Among these natural resources, the first place is, obviously, occupied by *food resources.* These comprise quantities of food merchandise and any derived products available for human consumption along a reference period[4]. The foodstuff or food product is defined as any product or substance, no matter whether it is integrally, partially prepared, or unprepared, designed or meant for human consumption[5]. For example, global maize resources comprise the quantities of maize, maize flour and any derived products such as cornflakes available for human consumption. On the contrary, milk resources represent the quantities of fresh and canned milk available for a certain period except butter, cheese and other milk products which are quantified separately.

As H. Morgenthau considered, "a state with sufficient or almost sufficient own food

---

[2] Gheorghe Preda (coord. tratat), Mihai Marinescu, Gabriel Năstase (coord. vol. I), *Tratat: Valorificarea resurselor naturale. Volumul I: Bazele resurselor naturale*, Editura International Univestity Press, Bucureşti, 2004, p. 13.

[3] *Dicționarul explicativ al limbii române*, Institutul de Lingvistică „Iorgu Iordan", Academia Română, Editura Univers Enciclopedic, Bucureşti, 1999, p. 920.

[4] Food and Agriculture Organization of the United Nations (FAO), *Food balance sheet: A handbook*, Rome, 2001, p. 14.

[5] Art. 3, alin. 1 din *Legea nr. 150/2004 privind siguranța alimentelor şi a hranei pentru animale*, republicată în Monitorul Oficial nr. 959 din 29 noiembrie 2006.

resources has great advantage over one which, not owning enough resources, imports them thus risking underdevelopment and famish" [6]. In this context, *food security* is a new concept on the agenda of international relations, introduced by the World Declaration for Nutrition[7], its provision depending mainly on the existence and access to food resources. It is ensured if all individuals, at any moment, have physical and economic access to enough, safe, and nutritional quality food, in order to satisfy their food needs and preferences for an active and healthy lifestyle[8]. We can state that food security represents that component of national security involving organizational instruments and policies used in order to prevent risks, threats and vulnerabilities and to counteract possible crises in the field of the population's access to food. Some specialists consider that it is part of human security together with the political, economic, ecological, and personal or community security.

Usually, the food security concept involves zoo-technical security (domestic animals, poultry and fish) and agro-technical (cereals, vegetables, fruits, vineyards, spawns, and seedlings, etc.) and it is applied on three aggregation levels: regional/national, household and individual. Moreover, the concept is divided in three main elements used for estimating the degree of food security/insecurity in a certain region, country, community or household: the existence of food, the access to it and the way it is used[9]. Therefore, in order to be secure as far as the food issue is concerned, food resources have to be:

- *available* – the quantity and quality of food available at regional, national or local level may be temporarily or for a longer period of time affected by numerous factors, including those regarding climate and environment, disasters, wars and conflicts, social movements, number and rate of population growth, agricultural practices, social status, and trade;
- *accessible* – this depends on ensuring certain prices for food products so as to allow the less wealthy and the poor to be able to buy enough, safe and nutritional qualitaty food without any assistance and even to contribute to the decrease of the percentage of food expenses in the family budget;
- *usable* – the needs for enough and varied food at the household level must be ensured so as people may develop normally, satisfy their energetic needs and avoid any kind of diseases.

The free access to food is a fundamental human right, unanimously recognized so, given the current threats represented by the impact of global environmental changes over food production and population health[10]. Thus, performance within the three categories mentioned above is considered an essential condition for providing proper food security.

---

[6] Hans J. Morgenthau, *Politica între naţiuni: lupta pentru putere şi lupta pentru pace*, Editura Polirom, Iaşi, 2007, p. 153.
[7] FAO and World Health Organization, *World Declaration and Plan of Action for Nutrition*, Rome, December 1992, http://whqlibdoc.who.int/hq/1992/a34303.pdf.
[8] FAO, *World Food Summit: Plan of Action*, World Food Summit, Rome, 13-17 November 1996, www.fao.org/wfs/index_en.htm.
[9] *Thematic Evaluation of Food-Aid Policy and Food-Aid Management and Special Operations in Support of Food Security*, Volume 1: Final Evaluative Report, Evaluation for the European Commission, July 2004, p. 2.
[10] Ştefan Blacioti, *Securitatea alimentară – interes naţional al României în condiţiile integrării în Uniunea Europeană*, teza de doctorat, Bucureşti, 2009, p. 103.

However, the existence of sufficient food in the world is a necessary condition for ensuring food security, but not the only one, since many times the access to food is prevented by the low purchase power or defective distribution of food. It is obvious that national/European food security is influenced by 4 groups of factors resulting in risks and threats against it: social-economic and political environment; agricultural sector performances; social protection; health and hygiene[11]. These groups of factors are combined and inter-related, without being determined at all or determined in a unitary manner. They act together, consecutively; therefore, in a failed political environment, economy and social protection are damaged, agriculture suffers negative alterations, also affecting the food sector performance. All these elements influence the health of people, who interacting with a precarious hygiene in all the individual's social life aspects, determined by the lack of current water, energy, self-care products and/or material resources to purchase them, create an environment of insecurity generalized with the exacerbation of these elements.

The current situation of food resources

After World War II, the global food reserve covered the necessities for 133 days, while in 2007 and 2008 this went down to only 57 days and, respectively, 40 days[12], situation that probably got even worse in the following period. Moreover, UN estimates that until 2050 world's population will reach almost 9.3 billions people[13] meaning almost a duplication of food request.

According to American Population Reference Bureau[14], global population grew from 6.067 billions in 2000 to 6.892 billions in 2010, an increase of 825 million persons in only 10 years. Although the natural population growth lowered from 1.4% in 2000 to 1.2% in 2010, 2011 will bring an increase of global population with at least 83 millions inhabitants. This means that every day there are other new 219,000 persons to be fed[15]. Although last year, for the first time in the late 15 years, a reduction of the number of underfed persons was noticed, their number continue to remain unacceptably high at almost 925 millions in 2010, as compared to 1,017 millions in 2009; in other words, 1 in 7 people is starving.

---

[11] Ştefan Blacioti, *Securitatea alimentară – interes național – riscuri, amenințări şi vulnerabilități la nivelul Uniunii Europene şi țării noastre*, în volumul Sesiunii anuale de comunicări ştiințifice cu participare internațională „Stabilitate şi securitate regională" a Universității Naționale de Apărare „Carol I", Secțiunea 1: Securitate şi Apărare, 9-10 aprilie 2009, Editura UNAp, Bucureşti, 2009, p. 894.

[12] European Parliament, Committee on Agriculture and Rural Development, *Draft Report on The Common Agricultural Policy and Global Food Security*, 20 October 2008, p. 4, www.europarl.europa.eu/meetdocs/2004_2009/documents/pr/747/747819/747819en.pdf.

[13] United Nations Press Release, *World Population to reach 10 billion by 2100 if Fertility in all Countries Converges to Replacement Level*, 3 May 2011, http://esa.un.org/unpd/wpp/ Other-Information/Press_Release_WPP2010.pdf.

[14] Population Reference Bureau, *2010 World Population Data Sheet*, www.prb.org/pdf10/10wpds_eng.pdf.

[15] Lester R. Brown, *The New Geopolitics of Food*, în „Foreign Policy", May/June 2011.

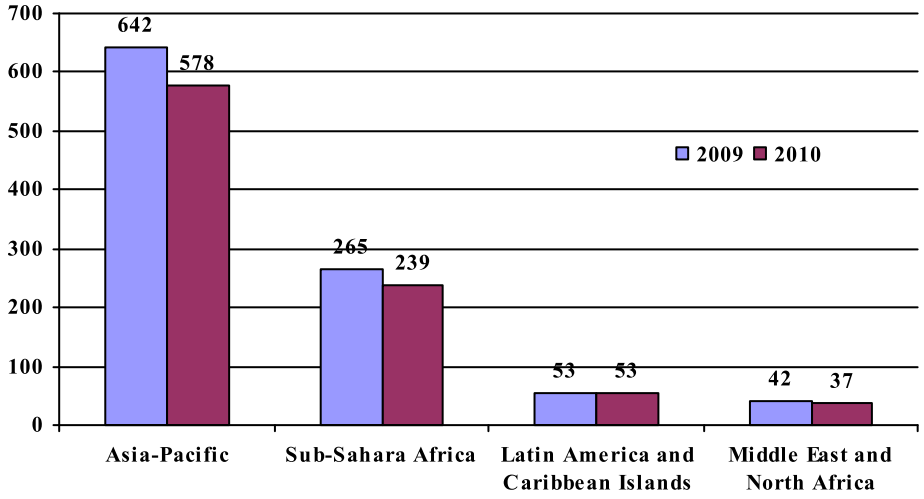

Figure no. 1: The situation of underfed persons 2009-2010 (millions)[16]

The most significant decrease took place in Asia and Sub-Sahara Africa, about 80 millions and, respectively, 12 millions less underfed persons. This reduction is mainly owed to a more favorable economic environment and the renewal of economic growth especially in the developing countries as well as the attenuated growth of international prices for food products. Despite this, the number of persons suffering from lack of food is bigger in 2010 as compared to the economic and food crisis from 2008-2009. As UN Secretary General Ban Ki-moon underlined: "We have enough food to feed all the people but, still, a billion of persons are starving…".

Fortunately, the financial and economic crisis which followed, affected especially the developed countries from the West, unlike the emergent economies which sensed less its negative effects. Yet, the crisis of food prices in 2007-2008 and then the economic recession reduced the buying power for wide categories of population in many developing countries, diminishing their access to food products and, as a result, undermining food security. UN food prices index reached 234 points in June 2011, 1% bigger than in May and 39% more than June 2010. In February 2011, the index reached to the 238 points record value[17], after 8 months of consecutive growths. As one can see, the international food prices continue to stay at a high level but the impact is not sensed equally, depending on the degree in which they are transmited to internal markets.

[16] FAO, *The State of Food and Agriculture 2009*, Rome 2009, p. 104 şi *The State of Food and Agriculture 2010-2011*, Rome, 2011, p. 67.
[17] FAO, *FAO Food Price Index*, 7 July 2011, www.fao.org/worldfoodsituation/wfs-home/foodpricesindex/en.

The global food demand increases permanently while production slackens or, at best, increases very slowly, being affected mainly by certain extreme hydro-meteorological phenomena, soil erosion and water reserves diminishing. The last FAO forecasts show the global production of cereals will get to 2,313 millions tones in 2011, 3.3% bigger then in 2010. Still, the cereals stocks went down from 533.2 millions tones in 2009/2010 to 493 millions tones in 2010/2011[18]. Therefore, it is less probable that this slow rhythm of production growth will cover the increasing food demand. Besides, about a third of the global food production is wasted or thrown to the garbage bin yearly[19].

In our opinion, BRICS countries represent an essential source for the future global food security. Brazil, Russia, India, China and South Africa are countries in full economic and demographic expansion. They mean about 25.9% from the geographic surface of the world and 40% from world's population. If we take into consideration only China, India, and Brazil, we will see that they have a much wider surface of arable land than Europe and North America together. By an increase of agricultural productivity, they have the possibility to cover more than half of world's food needs.

BRICS	Surface[20] (km²)	Population[21] (inhabitants)		GDP[22] (billions dollars)		
		2010	2050	2000	2008	2010
Brazil	8.514.877	194.946.000	222.843.000	642	1.655	2.090
Russia	17.098.242	142.958.000	126.188.000	260	1.660	1.465
India	3.287.263	1.224.614.000	1.692.008.000	480	1.259	1.538
China	9.596.961	1.341.335.000	1.295.604.000	1.198	4.520	5.878
South Africa	1.219.090	50.133.000	56.757.000	133	276	357

Figure no. 2: BRICS countries surface, population and GDP

[18] FAO, *FAO Cereal Supply and Demand Brief*, 7 July 2011, www.fao.org/worldfoodsituation/wfs-home/csdb/en.
[19] Jenny Gustavsson, Christel Cederberg, Ulf Sonesson, Robert van Otterdijk, Alexandre Meybeck, *Global Food Losses and Food Waste*, FAO, Rome, 2011, p. V.
[20] Central Intelligence Agency, *The World Factbook 2011*, www.cia.gov/library/publications/the-world-factbook.
[21] United Nations, Department of Economic and Social Affairs, Population Division, Populations Estimates and Projections Section, *Population*, http://esa.un.org/unpd/wpp/unpp/panel_population.htm.
[22] International Monetary Fund, *World Economic Outlook Database*, April 2011, www.imf.org/external/pubs/ft/weo/2011/01/weodata/index.aspx.

BRICS	Arable land (% of surface)		Food production index (1999-2001= 100)		Agriculture percentage in GDP (%)	
	2000	2008	2000	2008	2000	2008
Brazil	6,8	7,2	98	148	6	6
Russia	7,6	7,4	98	130	6	4
India	54,7	53,2	98	123	23	18
China	13,0	11,6	100	130	15	11
South Africa	12,1	11,9	106	123	3	3

Figure no. 3: Agro-alimentary situation of BRICS countries[23]

China and India own significant natural resources and other production factors which make them able to sustain high rates of economic growth. In 2000, the four BRIC countries contributed only 18% to the global GDP, while the industrialized nations had 65%. In 2010, BRIC generated over a quarter from the global GDP (27%) as compared to developed countries whose percentage diminished to 56%. Actually, the total GDP of BRIC countries increased in 2000-2010 by an impressive percent of 92.7%, totally different from the global GDP – 32% or the industrialized economies – 15.5%. This situation lead, at least for China, to the ascent of many families to the middle class, category that contributes significantly to a growing request and consumption of superior qualitaty food.

However, the food production and productivity level in India and China are threatened by unsustainable irrigation systems. This is also accompanied by the decrease of underground water level and also the accelerated desertification of some regions: yearly over 2,200 km^2 in Northern China decome desert areas[24]. Under these circumstances, China and other countries with significant financial funds acquired or rented wide surfaces of arable land to complete their cereals production, especially in Africa. Moreover, the high inflation rates from all BRICS countries favor in an increasing manner the growth of prices for the consumer, including food products.

Consequently, securing the food resources by the wealthy countries could cover their medium and long term internal consumption, but would not contribute help to the increase of world's food security. Under these circumstances, BRICS leaders adopted at the Summit in Ekaterinburg, in June 2009, a Joint Statement on Global Food Security[25]. In order to offer a solution to the evermore problematic issue of food security, they decided to adopt and implement a wide range of medium and long term measures as follows:

- to provide resources and supplementary assistance for the agricultural sector

[23] The World Bank, *Indicators – Agriculture & Rural Development*, http://data.worldbank.org/indicator.
[24] Lester R. Brown, *op. cit.*, May/June 2011.
[25] *BRIC's Joint Statement on Global Food Security*, Yekaterinburg, 16 June 2009, http://archive.kremlin.ru/eng/text/docs/2009/06/217964.shtml.

through national budgetary channels and international institutions of development, especially for household agriculture which is the main source for food production;

- to develop common technological innovations and international cooperation for the introduction of advanced technologies in the agricultural sector from the developing countries in order to significantly enhance their agricultural productivity;
- to modernize the agricultural infrastructure, including the systems of irrigation, transport, supply, storage, and distribution and to promote technical assistance, access to loans and policies meant to facilitate the process. In this field, the public-private partnerships will play an extremely important part;
- to enhance the exchange of knowledge and know-how and to commercialize sustainable bio-fuels;
- to provide a wider access to food at the national and international levels by adequate policies and functional distribution systems, especially for the poor and the most vulnerable people from the developing countries;
- to exchange good practices on successful operation of some public distribution programs;
- to endow developing countries with financial and technological means in order to apply the measures meant to minimize the negative effects of climate changes over food security.

More and more specialists have expressed the warning that by maintaining the actual trends of humankind economic and demographic development, it will not be long until oil is not enough and water, food and even air resources become insufficient. The late period events emphasized the vulnerability of global food security provision to major shocks, both on agricultural markets and within global economy. Humankind is only “a shock distance away” from a wide crisis of food supply and prices. A single major event related to weather in some of the regions of great cultivators can push global economy into an unprecedented food crisis.

The critical infrastructures from the agro-alimentary field

The ever-closer specter of a very serious food crisis had forced the international community to admit the growing and long-term importance of specific critical infrastructures. Both Americans and Europeans include the agro-alimentary field among the elements of critical infrastructure to be protected. Agro-alimentary critical infrastructure consists mainly of elements, systems and their components on the national or transnational territory whose disturbance or destruction can seriously affect or even incapacitate the respective state/states to guarantee their population food security, not only with respect to basic food supply, but also to their quality and safety for the health of the consumer. They can be found all along the supply chain with food products (production – processing – packaging –

storage – transport – distribution[26]) up to the final consumers.

Along the chain of food products from the producer to the consumer, the following Agro-Alimentary Critical Infrastructure (AACI)[27] can be identified:

- ***Arable lands, pastures and meadow*** necessary for growing cereals and breed animals for consumption. They can be the target of natural disasters, but also of an intentional contamination with chemical, biological or radiological agents. For example, natural or man-produced fires can burn down, in a short time, wide surfaces of cultivated lands, thus being able to damage the national, regional and even global food product request-offer balance.
- ***Water sources and irrigations systems*** became a crucial element of the Agro-Alimentary Critical Infrastructure given the current climate changes. The prolongation and multiplication of drought periods caused agriculture to depend in large measure on irrigation systems without which the cultivation of plants and the breeding of animals would not be possible. Other important factors are the adjacent facilities of irrigation systems, such as the ones meant to prevent flooding, barrages, barriers, etc. This is because the last five years' experience of Central and Eastern European states proved that floodings represent hazards with extremely serious effects on agriculture, sometimes compromising the crops on large surfaces, implicitly disturbing the activities related to animal breeding, generating deficits of agricultural products at national or regional level, seriously damaging population food security.
- ***The warehouses of agricultural vegetal products and the animal farms*** represent facilities in which large quantities of primary agricultural products are stored or where animals are bred. Their contamination with chemical or biological agents and the incapacity of unveiling it in time will have disastrous consequences on the population's health, on food security and even on citizens' trust in the possibility of the state to govern efficiently. Moreover, given the globalization context described above, a possible solution to be considered is that of extending the effects of such an event on regional or even global scale.
- ***Units of food industry*** – facilities in which agricultural products are processed – constitute extremely important elements of agricultural critical infrastructure due to the concentration of a large amount of agricultural and animal products in a single place and also due to the destination of the products of this industry – the processing of these goods could involve certain risks for population food security which could become, under certain circumstances, veritable hot spots of contamination. Among these processing units in food industry, we can mention the units of processing milk products, meat and meat products, sugar and sugar products, vegetables and fruit, oils and vegetable fats.
- ***Road, rail, sea and air transportation ways*** which connect the producers, the

[26] Department of Homeland Security, *Food and Agriculture Sector-Specific Plan: An Annex to the National Infrastructure Protection Plan*, 2010, pp. 10-11.

[27] Cristina Bogzeanu, *Infrastructuri critice din domeniul agriculturii*, în cadrul Proiectului „Sisteme de management integrat pentru protecția economico-financiară a infrastructurii critice şi a personalului împotriva terorismului de orice natură", Bucureşti, 2010, pp. 69-70.

processing industry and the consumers of agricultural products. These represent the basic condition of primary agricultural products transportation from the producers to the processing industry and then to the final consumers. The disturbance or the destruction of transportation ways will deprive the population of primary food products, especially in the urban areas. As urbanization has got extremely high in proportion, the food supply toward the urban environment from the rural one becomes a very important aspect of national security provision. Moreover, the transnational transportation has also gained much importance because their destruction or disturbance can interrupt or seriously affect the trade with agricultural products among states or at a regional level, leading to the deprivation of one or many states' population of certain alimentary goods.

We consider that the analysis of these types of Agro-Alimentary Critical Infrastructure must firstly take into consideration the basic agriculture function – to provide food for population – which depends on the technology level, on the dependence on other critical infrastructures and on the degree of interconnection between this segment of national economy and those of other states' economies. The stronger these bonds are, the more important AACI will become, as a state or several states' population supply with basic food products depends on their proper functioning.

The risks against AACI can be grouped under two categories: natural and man-made. The natural category includes most frequently the hydro-meteorological ones – flooding, drought, storms, and other extreme phenomena – able to damage both crops and the transportation means, warehouses, farms, units of food industry and irrigation systems. The man-made risks determined by human intervention and human activities can be generated by different technological accidents (industrial, transportation or of other nature), from toxic substances spill over in running waters that would lead to the contamination of agricultural areas, also seriously damaging animal breeding, up to terrorist attacks aiming at contaminating agricultural products with chemical, biological or radiological agents. Usually, the goal of a terrorist act is to produce serious damage to the consumers; therefore, it is expected that terrorists will focus on the contamination of final products.

One of the most serious risks the AACI are submitted to is known in the literature in the field as agro-terrorism. This is defined as the intentional misuse or the threat to use vegetal or animal pathogen agents to cause catastrophic diseases in agriculture[28]. Terrorist acts, including the ones using, for example, explosives, are actions meant to interrupt production, processing and distribution of agricultural products and regard the blocking or damaging of the functions or essential elements of AACI. We could consider as the most vulnerable to this type of risk the agricultural products warehouses, the animal farms, and the units of processing food. Equally, agro-terrorism represents a risk to agriculture and to the population's supply with food, precisely because of the interdependence between the three elements: agriculture – food – population. The agricultural products' chain from

[28] Federal Emergency Management Agency, *Tool Kit for Managing the Emergency Consequences of Terrorist Incidents*, July 2002, p. E-1.

harvesting or from the farm to the final consumer is complex and its elements are profoundly interdependent, causing AACI to have many vulnerable points where an attack could be launched. Worse than that, the effects of a terrorist act cannot be immediately observed but after a certain time which can amount to days or weeks from the act up to the manifestation of the first symptoms in human and animals health, time in which the infected products could spread at national, regional or even global level (for example, the provision as humanitarian aid with such infected products undisclosed in time). Thus, agro-terrorism represents a blow for economy, human health and also social structure and population trust in the decision-making factors.

The preoccupation with the protection of AACI amplified after the recent economic-financial crisis, more and more countries becoming aware of their high risk to natural hazards or terrorist attacks and their importance for own citizens' food security. So, they adopted a series of measures and they developed protection systems aiming at reducing vulnerabilities, managing the consequences of a hazard or a terrorist attack, so as the disturbance or destruction of AACI may be less probable and even if they happened, the effects on population to be minimized and rapidly attenuated.

Among these, we consider that the most important ones are investments to strengthen the surveillance, communications and rapid alert means and the ones to elaborate procedures for inter-institutional cooperation at national level. For example, in order to track down a contamination, to install the quarantine, to follow and arrest the person responsible for the terrorist attack, to prevent a subsequent attack, to diminish and avert effects, to disseminate the lessons learned from this experience, all these need a set of cooperation procedures, a methodology of clear action in this field to settle without doubt every institution's role in the re-establishment of normality.

Conclusions

The food security concept has dynamically evolved in time, enlarging its significances and connections, so as nowadays it comprises all the aspects allowing the population to have optimal access to food resources.

The perspectives of accelerated demographic expansion in the next years, especially in the poor areas, emphasize the need for food production growth. The specter of a major food crisis compels the international community to make efforts in order to provide a balance of food resources, optimizing the ratio between needs and available food resources. In order to ensure food security, a comprehensive approach is needed to integrate agriculture with energy, population and hydro policies. Food security strategies must involve significant investments and measures to increase agricultural productivity, production, and food distribution by using as few water resources as possible and preserving fertile soils.

At the same time, it is necessary to raise the population awareness with respect to the critical importance of food security. The surrounding environment and its resources preservation for the current and future generation represent vital issues for the long-term

humankind sustainable economic development, energetic or food security.

Finally, we consider that food security guaranteed at national, regional or global level cannot be treated independently from AACI, no matter whether we consider cultivable fields, irrigation systems, warehouses, means of transportation, or the protection systems against flooding and other types of protection means. The identification, configuration and securing of AACI, according to principles and criteria that need wise elaboration, became compulsory elements in order to pass to the operational and actional dimension, shaping the attitude towards the evolution of certain components of national and international security environment.

BIBLIOGRAPHY

Gheorghe Preda (coord. tratat), Mihai Marinescu, Gabriel Năstase (coord. vol. I), *Tratat: Valorificarea resurselor naturale. Volumul I: Bazele resurselor naturale*, International Univestity Press Publishing House , Bucureşti, 2004.

Hans J. Morgenthau, *Politica între națiuni: lupta pentru putere şi lupta pentru pace*, Polirom Publishing House, Iaşi, 2007.

Ştefan Blacioti, *Securitatea alimentară – interes național al României în condițiile integrării în Uniunea Europeană*, teza de doctorat, Bucureşti, 2009.

Ştefan Blacioti, *Securitatea alimentară – interes național – riscuri, amenințări şi vulnerabilități la nivelul Uniunii Europene şi țării noastre*, în volumul Sesiunii anuale de comunicări ştiințifice cu participare internațională „Stabilitate şi securitate regională" a Universității Naționale de Apărare „Carol I", Secțiunea 1: Securitate şi Apărare, 9-10 aprilie 2009, National Defence University Publishing House, Bucureşti, 2009.

Lester R. Brown, *The New Geopolitics of Food*, în „Foreign Policy", May/June 2011.

Jenny Gustavsson, Christel Cederberg, Ulf Sonesson, Robert van Otterdijk, Alexandre Meybeck, *Global Food Losses and Food Waste*, FAO, Rome, 2011.

Cristina Bogzeanu, *Infrastructuri critice din domeniul agriculturii*, în cadrul Proiectului „Sisteme de management integrat pentru protecția economico-financiară a infrastructurii critice şi a personalului împotriva terorismului de orice natură", Bucureşti, 2010.