

**UNDERLYING CAUSES OF GLOBAL FOOD PRICE CHANGES****NÓRA GOMBKÖTŐ**

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**ABSTRACT**

There is a significant increase in food prices all over the world. Rate of annual increases in prices of all kinds of food is more than 100 percent. However, this can lead to long-term food crisis. The research aims to find out the factors that contribute to a large increase in food prices, as well as to predict the likely consequences of food price increases. Then potential solutions related to specific problems should be highlighted. In this study several factors were determined, which were contributed to central (global food price increase) and general problems. These problems were separated by cause and consequences, they were structured and ordered hierarchically. Through outline the problems it can be improved that in global market of foods both demand and supply are influenced by many factors. The most important factors affected demand are: increase of population and urban population all over the world and increase of income level and internal migration in emerging countries. Supply is influenced by the following factors: a decrease in the yield of agricultural crops, low level of productivity in agricultural sector, as well as reduction in food crops production area because of unfavourable weather and increased production of biofuels. Most of general and specific factors, which affect food price increase, are related to each other causally but there are also separate factors. The most effective solution to the problem is increasing of agricultural productivity at the same time investments into agricultural researches and rural infrastructure.

**Keywords:** food price increase, demand, supply, causes, consequences

**INTRODUCTION**

Foods are essential consumption goods, so demand for foods is permanent and it is increasing in line with population of the world. At the same time agricultural land is limited on the earth, so food production can not be increased indefinitely. Moreover, area of arable land is decreasing continuously. Partly, this is a result of climate change, which has caused desertification in some parts of the world. The other problem is the widespread biofuel production today. For this required oil crops are grown in areas, where food crops were grown previously. All in all, an unfavourable trend emerged recently, whereupon supply and demand changes in the opposite direction in food market (demand increases and supply decreases permanently), after all, consumer prices increased significantly.

According to FAO report global food prices have increased since June 2010 permanently and the global food price indices are higher than 200 percent since 2011 (FAO, 2017). The real food price indices are below the nominal rates somewhat, however, there was observed a significant increase in those changes. This food price increase trend seems to be sustained both in nominal and in real terms. However, the food price index measured by FAO is an average rate, which value is increased by sugar and dairy commodity primarily (sometimes even more than 250 percent), this rate approached 200 percent on market of meat, grain and vegetable oil products several times.

There was a global food crisis in 2008, but researchers did not assume to be repeated in such a short period of time, and that the latter one would be so permanent. Food price increase of the year 2008 occurred after a declined trend of prices, which lasted for about three decades. Analysts and experts debated about factors that primarily contributed to global food price increase in 2008.

Global food price increase in 2008 hit the net food importer developing countries, while net exporters realized benefit. The price increases enhanced poverty, malnutrition, and vulnerability to external shocks in poorest regions of the world. However, some analysts thought that rising prices will offer new revenue-generating opportunities for farmers in developing countries, whereby farming can contribute to economic growth increasingly. However, this was not realized due to current price rising (BRAUN ET AL., 2008; ROSEGRANT, 2008).

The current long-term global price increase is different from the crisis of the year 2008 in several ways. In point of food price increase different views were emerged among experts and analysts in 2008. According to some experts, current price increase was not caused by supply decrease, but it was caused by a strong demand growth beginning in the Far East and by weather conditions (drought in Eastern Europe, extreme weather in Central Europe, etc.) However, according to other experts, prices are forced up by speculation on commodity market. The most disputed topic is the food-shortage caused by production of biofuels and its upward pressure on prices of food raw materials (VILÁGGAZDASÁG, 2011). Current prices are clearly favor for major exporter countries such as Australia, New-Zealand, United States, Canada. Food price soaring hit the poorest countries. The price increase is expected to hit about 70 African and Asian countries (EUROPEAN COMMISSION, 2011).

Basic hypothesis of this research is that the food price increase began in June 2010 was caused by increase in demand of foods and decrease in supply of raw materials. Both processes were induced by simultaneous presence of several factors. Increase of demand is mainly due to the population growth, the income level increase in emerging countries and internal migration. Decrease of supply is caused by factors such as less arable land on agricultural production because of climate change, more and more widely spread in production of biofuels, as well as decline in agricultural crop yield due to unfavourable weather conditions in recent years. Of course, many other processes also contributed to global food price increase, which are related to each other causality.

Basic objective of this research is to reveal the factors that contributed to the global and long-term food price increase, which is permanent since 2010. These factors were categorized, and targets or rather propose solutions were assigned to problems. Execution of this a problem and objective tree analysis was carried out.

## **MATERIAL AND METHOD**

In this research a problem and objective analysis was used. It shows negative aspects of an existing situation. There should be a negative situation, because the "why?" question applies to it. This should be formulated possible the most general. This will be the starting point that is the central problem. This level is above the concrete situation, often a combination of social, economic and environmental problems. To this belong causes and effects. The specific problems are located below the central problem, and central problem is resulted by these. There is a causal relationship between these problems. At the bottom of the hierarchy starting problems are found, many of these are jointly contribute to the appearance of a high-level problem. During the outline outline problems have to be translated into goals, that is to say, each problem is converted to targets. On three levels structured targets (general, specific, operative) make up the marrow of logical framework of the strategy. There are specific objectives on lower levels, overall goals on middle levels, and strategic goal is found on the top of objective tree. The cause and effect

relationship is followed by means and targets relationship. Targets related to similar areas are grouped and listed under common name.

In this study different problems were assumed in that were determined several factors, which were contributed to central (global food price increase) and general problems. These problems were separated under cause and consequences and were structured and ordered hierarchical. Thereby possible direct and indirect causes of the food price increases and some of those consequences were outlined.

## RESULTS

General causing factors of fast increase of food prices are the massive increase for foods in the world, the agricultural products and the reduction of decreases of food supply, the increases of food costs, and the spread of stock market speculation commerce of agricultural products.

Need of foods, and increasing demand is indicated by three main processes. One of causes of increases of demand in recent years is the dynamic growing of whole population. The world's population growth rate declined from the 1970's, but world's population still grows 75 million (1.1 percent) persons per year, mainly in developing countries. The other two processes are interrelated. On the one hand there was an intensive income level rise in developing emerging income level decrease, that lasts in present. On the other hand, primarily in these countries, but also in other developed regions a massive process of urbanization was begun. The urban residents in the world are growing. The traditional agricultural sector, the agricultural production is left by more and more, the people were moved to cities, and they signed on in industrial sector. Direct and indirect causes of migration between downtown and sectors are varied, but the main direct cause of migration is the huge differences between urban and rural incomes. Large geographical distance is offset by the higher income. In addition, migration may also be contributed by targets, such as increasing the level of education, to avoid rural social and cultural "captivity", and following family members. Migration between urban and rural areas in developing countries is growing at an increasing rate even though the urban labor surplus and the unemployment rate are rising. Migration from rural areas is a prerequisite for urbanization as well as economic growth, and it provides resources for development of rural areas in developing countries, but it also has got numerous negative effects. It is possible that a huge flow mass can not be absorbed in the cities, so that the migrants do not reach an adequate level of public goods. As a consequence, there will be an increase in crime and develop the slums. Urbanization causes imbalances inequality between population distribution of, as well as inequality between urban rural areas (LALL ET AL., 2006).

The other hand the level of education of developing countries was improved. More and more got a better qualification and got a work in the sector that needs a higher qualification.

Internal migration between sectors, and thereby the urbanization cause problems, because more and more significant manpower leave agriculture. The number of people is reduced, who are producing primary commodity of food for themselves and the society in industry. Thus, agricultural production is reduced too. Meanwhile the number of people is growing who needs food. The internal migration is also linked to income level rise, because by migration of agricultural sector an extreme industrialization process is started, the industrial production is growing. A higher income level can be reached, than by the agricultural production. Because of the recent increase in income level consumption habits of society have changed in some developing countries. Rice and wheat may come to the

forefront instead of sorghum and millet. Consumption of corn, wheat, meat and dairy products have increased significantly in these countries. More animal products, fruits, vegetables and processed foods are consumed.

Global increasing demand of foods is although influenced by population growth, that doesn't mean problem itself. It comes with the fact, that in the emerging countries the income level is rising. Growth of global demand for foods exceeds growth of population. That means, that the population in developed and emerging countries needs a higher quantity of foods, than earlier. So, foods are bought much higher quantity than necessary for subsistence food. These foods are squandered, when it isn't eaten. On the other hand – due to the increasing scarcity of food goods – in many countries around the world people are starving, because they don't get enough quantity of food.

Other problem is decrease of food supply that strengthens the price raising effect of increasing demand. Decrease of supply is attributable of five main causes, the link between these is less close, than between the elements of demand. Although between these triggering facts there are overlaps. The first triggering fact is the reduced crop yield of agricultural products. One of causes is the more extreme weather in last years (droughts, rainy summers, etc.), because as a result of this crop yield is reduced significantly.

Other cause that can be also linked to extreme weather is that the soil water started to lessen. That comes with the drying up of soil, and eventually with growing of irrigations costs. There's a fact, that leads to reducing of yield crop, and that's also the general problem of global food supply: low level of sources are invested in the agricultural research and development, and in using modern technology. The infrastructure on countryside is underfunded too.

If there won't be an investment in research and developing, there can't be ennobled plant species with high yield crop. In default of new technologies and developed infrastructure effectiveness of production reduces largely. Another problem is the above-mentioned internal migration between sectors in developing countries. Therefore, number of manpower in agriculture reduces largely. The fourth difficulty is the low level of food reserves.

Last but not least it should be mentioned the decreasing area of food production agriculture- perhaps the most disputed theme in the world. In last years – the much discussed – climate change caused environment changes on number parts of world (desertification etc.), that doesn't fit to living conditions of plants there. An another cause of reduced agricultural area of food production is, that in recent times biofuel producing is emerged in developed and emerging countries, so on growing areas plants are grown for bioethanol and biodiesel production (oil-plants, maize, sugar cane, etc.). A triggering cause of biofuel productions popularity is, that in recent times the price of petroleum was risen significantly, so it can be a governmental purpose to replace these with biofuels.

Food prices of the world are rising due to changes contrary of demand and supply, and rising of producing costs (material-, energy-, delivering costs). Observing the material costs, it can be determined, that agricultural area - consistenced with mentioned above - is decreasing. Seed and feed plants are also decreased all over the world, so overall by plant growing and animal breeding factory costs of seed and feed is increasing significantly. In recent times fertilizer and pesticide costs are increasing too. Between costs of energy the costs mechanical works are growing which casuses are the above-mentioned rising costs of petroleum. This contributes to high costs of transport.

Another piece of problem are various speculations of stock on the market of agricultural products. By wrong governmental policies in different countries the prices of foods were more exacerbated. Export prohibitions and import limitations are introduced by some

countries, by those the foods in world trade were fallen back, so their supply was decreased more.

In the above-mentioned problem tree, the structured negatives were converted to solution suggestions. Prepared objective tree can be seen on *Figure 4*.

By compilation of problem tree some causes and also consequences are emerged, those were causing factors of central problem, so they can't be ignored, but can't be turned into goals. By these factors, conversation can be limited, because facts can't be influenced by people (eg.: climate change, extreme weather, decreasing of petroleum supplies), or they are hardly influenced (eg.: speculation of stock),

Increasing of food demand can't be turned back totally, because two of its inducing facts (population growth, rising income level of emerging countries) can't be stopped, thus final goal must be the minimalization of increasing of demand. This could be realized, if in each country migration of sectors could be minimalized. So, the population growth of cities would be slowed down. If wages would be raised in agriculture, and people would be encouraged to stay in countryside, manpower wouldn't migrate from agricultural sector to industrial sector.

So, supply of food is concerned too, because manpower in agriculture can produce more primary commodity of foods, than it would be flown to industry. Higher productivity can be reached by increasing the sources in agricultural researching and developing, more developed technologies and in rural infrastructure. Furthermore, even yield crop can be increased with ennobled plants of higher yields. This could be reached possibly by central (national or even regional) support of costs of irrigation. However, the loss of yield crop by extreme weather can't be replaced.

Various speculation decisions can be influenced hardly too, but with right governmental policy enough quantity of food reserves can be made. Growing area of food plants will be reduced in future, so primary goal is to minimize this reduction.

Not all factors – that affects supply - can be influenced (extreme weather, reducing of soil water, speculation), but all of general problems can be changed less or more. Thus, instead of decreasing supply of food it can be a goal a slight increase of supply. It's optimal, if the rate of increasing supply and demand is the same.

Next goal is to reduce the costs of agricultural production to reach a stagnation or slight increase of global food prices. However as increasing of petroleum prices, energy prices and transfer costs is inevitable, and the cost of various industrial materials (fertilizers, pesticides, etc.) can be influenced limited, so primarily by reducing the costs of seed and feed should be realized.

Instead of a general problem, wrong policy as respond to increased prices it can be a solution, if these policies would fit to principles of efforts of increasing food price problem. Export inhibition and import supports should be withdrawn. There wasn't a massive effect of weaken USD, but the goal is to maintain the stability of Dollar.

If the suggested solutions could be realized, global food prices would increase less, than in last months.

## CONCLUSIONS

Through outline a problem analysis can be improved that both demand and supply are influenced by many factors in global market of foods. The most important factors affected demand are: increase of population and urban population all over the world and increase of income level and internal migration in emerging countries. Supply is influenced by following factors: a decrease in yield of agricultural crops, low level of productivity in

agricultural sector, as well as reduction in food crops production area because of unfavourable weather and increased production of biofuels.

As well as, of course, many other factors contributed to food price increase, which do not affect demand and supply directly. These factors are such as an increase in cost of production of agricultural products, typical futures market speculation in agricultural products, weakening of US dollar against other currencies. Most of general and specific factors, which affect food price increase, are related to each other causality, but there are separate factors too.

After all global food price increase took a considerable change because deliberate and chance occurrences took place together and at the same time in the world, and negative particular effects were strengthened, which had various effects on food price changes.

Solution of the problem of food price increase should be sought in main causing factors such increase in demand and decrease in supply. On the demand side, population grow is an irreversible process, furthermore, industrialization and rising level of education are favourable and desirable processes, so these should not be changed. Migration and its main direct causing factor, the low agricultural wages may be changed. The excessive urbanization and migration from agricultural sector to industrial sector should be prevented. People should be kept in rural areas. Its solution is that, adequate mouth existence and living conditions should be given to agriculture workers. In addition, they should receive a fair income. Agricultural and industrial wages should be equalized. Agricultural supports should be given also in developing countries. On the other side, price increase would stop or turn back when increasing needs of the world's population would be satisfied that is to say when the current relative low level of supply would be increased. This solution lies in production technology. Size of cultivated arable land can not be increased (thus land as a special means of production is limited), therefore, the only solution is to increase agricultural productivity.

Overall, to increase productivity, a huge amount of capital should be involved into agricultural researches and into development of rural infrastructure. This is currently only implemented in some countries in the form of foreign investment. In the future, it should be laid stress on this, in that should assume a role governments, the private sector, as well as the resource-poor but capital rich countries and several international financial institutions.

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### **REFERENCES**

- BRAUN, J. (2008): Food and financial crises. Implications for Agriculture and the Poor. Washington: Food Policy Report, International Food Policy Research Institute. 17 p.
- EUROPEAN COMMISSION (2011): A Bizottság felvázolja a globális élelmiszer-áremelkedés hatásainak mérséklését célzó európai választ. Access: <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/08/763&format=HTML&aged=0&language=HU&guiLanguage=en>. Downloaded on 13.01.2011

FAO (Food and Agriculture Organization of the United Nations) (2017): Food Outlook. Biannual Report on Global Food Markets. Access: <http://www.fao.org/3/a-I8080e.pdf>. Downloaded on 23.02.2018

LALL, V.S., SELOD, H., SHALIZI, Z. (2006): Rural-Urban Migration in Developing Countries: A Survey of Theoretical Predictions and Empirical Findings. Washington: World Bank Policy Research Working Paper, The World Bank. 63 p.

ROSEGRANT, M.W. (2008): Biofuels and Grain Prices: Impacts and Policy Responses. Washington: International Food Policy Research Institute. 4 p.

VILÁGGAZDASÁG (2011): Rekord szinten az élelmiszerárak. Access: <http://www.vg.hu/vallalatok/mezogazdasag/rekordszinten-az-elelmiszerarak-337606>.

Downloaded on 11.01.2011