Determination of Agricultural Export Features in Developing Countries

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1. Introduction

Development of agricultural exports of developing countries has a significant impact on the conjecture parameters of the world agricultural market, the possibility of achieving global goals of sustainable development, which relate to poverty reduction, hunger and food security and free access to energy resources (in particular biofuels), etc. Improving the fundamentals regulation of agricultural production and agricultural exports requires taking into account the differences between developed countries and developing countries. Therefore, the study of the characteristics of agricultural exports in developing countries is relevant and has a scientific and practical value.

2. The object of research and its technological audit

The object of research is the process of development of agricultural exports in the context of globalization. The subject of the study is an identification of the features of agricultural exports in developing countries, in
terms of the possibility of achieving the global goals of sustainable development.

3. The aim and objectives of research

The main aim of the article is studying the specifics of the system for supporting the export activities of agricultural companies in developing countries in terms of achieving the global goals of sustainable development. In accordance with a specific aim, the following objectives are set and solved:

1. To determine the factors of the modern development of the world agricultural market.
2. To carry out a comparative analysis of the development of agricultural exports of countries with different levels of development.
3. To highlight the specific features of agricultural exports in developing countries.
4. To determine the positive and negative effects of agricultural exports on developing countries.

4. Research of existing solutions of the problem

Studies of agricultural exports are widely represented in the scientific works of domestic and foreign scientists. In particular, an analytical report prepared by FAO experts [1] is devoted to the problem of achieving an optimal balance between national priorities and the common good in the context of achieving food security in the world. OECD experts examine the compliance of national institutional and regulatory instruments with the main parameters of joint obligations on agriculture and international trade in agricultural products [2].

The relevance of the research topic is confirmed by numerous studies devoted to the impact of agricultural exports on the population welfare in some developing countries (see, for example, [3–6]).

Let’s note a number of works of domestic scientists concerning allocation of problems of agricultural sector of Ukraine in the conditions of globalization and in the eurointegration process [7–9], including on export potential [10]; the role and system of supporting the export activities of agricultural companies in general [11]; in the context of sustainable development and the introduction of a smart economy [12], etc. World Bank experts examine the prospects of overcoming poverty and hunger by 2030 through improved agro-production and the global agri-food market [13]. However, the significant share in export supplies in the world agricultural market of developing countries, and the vulnerability of the domestic socio-economic situation of the exporting countries themselves makes the study of the specific features of agricultural exports of these countries urgent.

5. Methods of research

General scientific and special research methods are used in the work. They are based on a systematic approach, a comparative analysis of scientific literature and statistical information, a graphical method and a correlation analysis.

The article examines countries with different levels of development in accordance with the World Bank methodology groupings: high-income, middle-income and low-income countries with above-average income, lower-middle income, middle-income and least developed countries (LDCs). The statistical information for the period 1990–2016 of the open databases of the World Bank and FAO is used.

6. Research results

Modern inter-country interaction in the global agricultural market is characterized by considerable activity caused by a number of factors, in particular:

- aggravation of the problem of food security, the solution of which for many countries is possible through foreign trade;
- changes in agro-production conditions due to global climate change;
- improvement of multilateral trade cooperation of the countries of the world (WTO, EU, etc.);
- expansion of technical and technological opportunities for production (cultivation), transportation and storage of agricultural products;
- improvement of the exchange trade and the introduction of new forms of trade and financial systems and the like.

One of the tendencies of the development of the world agricultural market is the acquisition by developing countries, the primacy among agricultural exporters. «The most pure exporter of food is Latin America, where a significant increase in production is ahead of consumption. The second most important net exporter is North America, but this is more likely a consequence of consumption stagnation in the region than production growth. Eastern Europe and Central Asia are in the process of transition from net importers to net exporters» [1]. A similar trend is typical for agricultural products of non-food character and agro-export products.

Development of agriculture is one of the most powerful tools for overcoming extreme poverty and achieving prosperity for the middle class. The growth of the agricultural sector in two to four times (depending on the country) is more effective with increasing incomes among the poorest segments of the population compared to other sectors. Agriculture is a factor of economic growth in developing countries, where 65 % of poor working adults live off of agriculture [13].

As can be seen from Fig. 1, the share of agriculture in the world’s GDP from 1990 to 2016 has steadily declined and since 2007 has fluctuated at the level of 3.8–4 %. But the importance of the agricultural sector is the same in different groups of countries. For example, the specific weight of agriculture in the GDP of the LDCs decreases more slowly (by 24 % during the investigated period). So, in 2016, this indicator in the LDCs was 26 %, while in the group of low and middle income countries – 9.5, and in high-income countries – less than 1.4 %. Let’s note the growth in the share of agriculture in Ukraine since 2008 that is a different trend from the global.

For many developing countries, the export of agricultural products has a system-forming importance plays the role of the main factor of economic growth, the sources of well-being for the majority of the population, the main item of foreign exchange earnings.
The most sensitive area of participation in world agricultural trade for developing countries is food security, so let’s consider the factors associated with the development of agri-food exports. The following relative variables are selected: the share of agri-food exports in the country’s commodity exports, the share of the agri-food sector in GDP, the index of livestock productivity (2004–2006 = 100), the yield index (2004–2006 = 100), the food production index (2004–2006 = 100). The time series consists of eleven data points for 1990, 2000, 2007–2015 (World Bank [14]). To analyze the relationship between the share of agri-food exports in commodity exports of countries and other indicators for groups of countries and the world, the correlation coefficient is calculated in Microsoft Excel (Table 1), Sig. (2-tailed) for all the above-mentioned indicators – 0.000.

Interpretation of indicators of relationship tightness is carried out on the Chaddock scale (Table 2).

The correlation between the share of agri-food exports in commodity exports and other indicators for countries with different levels of development (for 1990, 2000, 2007–2015)

<table>
<thead>
<tr>
<th>Share of the agricultural sector in GDP</th>
<th>High-income</th>
<th>Low and middle income</th>
<th>LDCs</th>
<th>World</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.026</td>
<td>0.94</td>
<td>0.139</td>
<td>0.818</td>
</tr>
<tr>
<td>The livestock productivity index (2004–2006=100)</td>
<td><strong>0.909</strong></td>
<td><strong>-0.814</strong></td>
<td>-0.286</td>
<td>-0.644</td>
</tr>
<tr>
<td>Yield index (2004–2006=100)</td>
<td>-0.177</td>
<td><strong>-0.749</strong></td>
<td>-0.297</td>
<td>-0.556</td>
</tr>
<tr>
<td>Index of food production</td>
<td>-0.013</td>
<td><strong>-0.777</strong></td>
<td>-0.294</td>
<td>-0.59</td>
</tr>
<tr>
<td>Share of agri-food exports in commodity exports of countries</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

*Note:* calculated according to the data of [14].

Characteristics of the relationship tightness indicators between the correlation analysis variables

<table>
<thead>
<tr>
<th>Correlation</th>
<th>Negative</th>
<th>Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>No correlation</td>
<td>-0.09 to 0.0</td>
<td>0.0 to 0.05</td>
</tr>
<tr>
<td>Very low</td>
<td>-0.29 to -0.1</td>
<td>0.1 to 0.29</td>
</tr>
<tr>
<td>Low</td>
<td>-0.49 to -0.3</td>
<td>0.3 to 0.49</td>
</tr>
<tr>
<td>Average</td>
<td>-0.69 to -0.5</td>
<td>0.5 to 0.69</td>
</tr>
<tr>
<td>High</td>
<td>-0.89 to -0.7</td>
<td>0.7 to 0.89</td>
</tr>
<tr>
<td>Very high</td>
<td>-0.99 to -0.9</td>
<td>0.9 to 0.99</td>
</tr>
</tbody>
</table>

*Note:* interpretation of [15].
Correlation analysis makes it possible to identify the difference between the nature of the relationship between the share of agri-food exports in commodity exports of countries with different levels of development (Tables 1, 2). If global indicators show a very high positive correlation between the share of agri-food exports in commodity exports and the share of the agricultural sector in GDP (0.818), there is an average negative correlation with other investigated indicators, in particular the livestock productivity index (−0.644), the yield index (−0.556), food production index (−0.39).

For high-income countries, there is a very high positive relationship between the share of agri-food exports in commodity exports that exists only with a variable index of livestock productivity (0.909). At the same time, a very low correlation with the yield index (−0.177), there is no correlation with the share of the agricultural sector in GDP (0.026) and the food production index (−0.013). This situation is explained by the low share of agriculture in the GDP structure, and several times higher – the commodity exports of developed countries, for example, in the USA in 2015 1.1 and 10.1 % respectively, in the eurozone – 1.5 and 8.7 %, in the EU-28 – 1.6, and 8.75 %, in the UK – 0.65 and 6.7 % (according to the data of [14]).

For low- and middle-income countries, a very high positive relationship exists with the share of the agricultural sector in GDP (0.94) and a high negative correlation with other studied indicators, in particular the livestock productivity index (−0.814), the yield index (−0.749), the food production index (−0.777).

For LDCs there is a very low correlation with all the studied parameters. The LDCs specificity is not only in the low level of per capita income, but also in significant institutional deficiencies that lead to considerable economic vulnerability, which puts hunger, poverty, literacy and poor quality of life at the forefront of economic policy. For the LDCs there is a high share of the agricultural sector in GDP, whereas agricultural exports have diametrically opposite significance for different countries. For example, in Burundi, the agricultural sector accounts for 43 % of GDP, while agri-food exports in commodity exports – 72.5 %, Central African Republic 42.6 and 0.5 %, Ethiopia 39.2 71.7 %, Madagascar 25.3 and 30.1 %, Sierra Leone 61.4 and 87.8 % respectively (according to the data of [14]). According to the differences in the importance of agri-food exports for LDCs, its development is not related to performance indicators.

The consequences of participation in world agricultural trade for developing countries can be not only positive, but also cause imbalances not only in the agricultural sector, but also at the level of the entire economy. Countries with developing countries have a common negative impact on the export activities of agricultural companies, caused by gaps in market institutions and regulatory systems. One of the negative consequences of the export of agricultural products in developing countries is a reduction in the supply of food products on the domestic market in conditions of medium or low levels of production of agri-food products. Violation of market equilibrium on the national agri-food market leads to an aggravation of food security (and in some cases to hunger), the emergence of irreversible destructive processes in the environment, the emergence of structural imbalances in the entire economic system, and the like.

Even countries that are dynamically developing and have the opportunity to invest in the development of agriculture can’t provide adequate nutrition to a wide section of the population. For example, the People’s Republic of China has ensured the growth of agricultural production and labor productivity (the dynamics of the grain yield of China in 1962–2016 testifies to the excess of this indicator in China of global importance) and carries out significant volumes of exports of beans, fruit juices and fruits, but remains net importer and the second largest importer in the world agricultural market (according to the World Bank [14]).

Concerning exporters, let’s note that a decrease in yields, for example due to unfavorable weather conditions, leads to an increase in food prices, and reduces access to them by the public. The deterioration of the food basket of wide sections of the population affects the quality of human capital. Since an unbalanced diet with a low content of proteins and vitamins affects the health and impairment of performance.

However, the practice of restricting or banning food exports in individual developing countries that was introduced for food security purposes did not produce the expected result, as it deprived the population of income, which led to a reduction in food demand and contributed to the exacerbation of poverty problems (this policy was repeatedly carried out by the government of Ukraine).

Another problem that arises from the implementation of the export strategy in the world agricultural market by developing countries is dependence on foreign markets. Only a limited number of developing countries have the opportunity, in terms of the volume of exports, to influence the conjuncture of the world agricultural market. In particular, Brazil, thanks to the provision of 50 % of the world’s sugar exports, Kazakhstan, the Russian Federation and Ukraine each separately try to increase their share in the world cereal market, but even collectively they can’t provide a third of grain exports. And since price fluctuations are inherent in the global agricultural market, fluctuations in prices for agricultural products are affected by changes in export earnings, in accordance with the fluctuations in the incomes of producers and exporters, the purchasing power of the population is changing, the balance of payments is unbalanced, which leads to fluctuations in the domestic foreign exchange market, and opportunities to provide critical imports. That is, there is a probability of a debt burden on the economy.

Export activity requires additional costs and investments not only from the trade and agribusiness enterprises, but also from the state to provide the necessary nationwide or regional infrastructure (for example, the construction of deep-sea ports for the export of high-tonnage vessels with associated loading and unloading services and associated storage facilities). From the exporter’s side, additional expenses concern the development and implementation of the marketing strategy, certification (often at a distance from the location of the farm and even abroad), compliance with the strict quality and safety standards in the process of production, collection, transportation and storage of agricultural products.

Let’s also note that developing countries usually export raw agricultural products or products with low added value. The global trend is the growth of revenues in the trade of more technologically advanced products. » In 2001–2004
and 2009–2012, the share of products that have undergone technological processing in agricultural exports remained unchanged at the world level and amounted to approximately 41%, while in the LDCs it was observed its fall from 31 to 26%. At the same time, the share of primary commodities in the total value of agricultural exports to LDCs increased significantly – from 37.8 to 48.5%, and in developing landlocked countries – from 33.5 to 46.7%. In contrast, in small island developing countries, the share of exports of raw materials decreased from 52.9 to 38.3%, while the share of processing processed products increased from 37.8 to 48.3% [1]. However, the increase in the level of processing of agricultural products involves the introduction of new technologies, since the world market is highly competitive and such technologies have a high price.

However, the possibilities of financing investment projects in developing countries are limited by the weakness of financial and credit institutions and the high riskiness of projects, which increase their cost.

7. SWOT analysis of research results

The strength in the conducted research is the definition of cause-effect relations of development of the world agricultural market; a comparative analysis of the development of agricultural exports in countries with different levels of development; determination of the features of agricultural exports, its positive and negative consequences for the economies of developing countries.

The weakness is that the variables chosen for the correlation analysis do not cover all the factors of the development of agri-food exports in the commodity exports of countries.

Opportunities for further research is the expansion of a set of indicators for economic statistical analysis and the use of econometric models to obtain quantitative assessments of the influence of factors on development of agri-food exports of developing countries.

Threats to the results of the conducted studies are the negative impact of political crises in developing countries, and military conflicts between them on development of agri-food exports.

8. Conclusions

As a result of the research:

1. The main factors of the modern development of the world agricultural market are determined, in particular:
   - the aggravation of the problem of food security, the solution of which for many countries is possible through foreign trade;
   - changes in agro-production conditions due to global climate change;
   - improvement of multilateral trade cooperation of the countries of the world (WTO, EU, etc.);
   - expansion of technical and technological opportunities for production (cultivation), transportation and storage of agricultural products;
   - improvement of the exchange trade and the introduction of new forms of trade and financial systems and the like.

2. Comparative analysis of agricultural exports of countries with different levels of development allows to assert that the key vectors for development of agricultural exports have significant differences in developed countries and developing countries. Agricultural exports in developing countries reflect the relative importance of the agricultural sector in GDP, the state, level and structure of agricultural production, the government’s long-term general economic plans for infrastructure projects, the state of the financial sector, the dependence of the balance of payments on agricultural exports and the ability to level price fluctuations in the world agricultural market, etc.

3. The specific features of agricultural exports in developing countries are the dependence of their economies on agriculture, the high role of agricultural exports as a stimulus to economic growth and sources of income, the vulnerability of agricultural exports from the conjuncture in external agricultural markets and the state of the production, transport and trade infrastructure.

4. Despite the national, geographical and natural resource specificities, the developing countries have common problems that determine the positive and negative effects of agricultural exports inherent in this group of countries.

The positive consequences of agricultural exports for developing countries, which together increase the welfare and quality of life of the population, are:

- growth in the volume of agricultural production;
- growth of incomes of domestic agro-enterprises and agro-traders;
- introduction of quality standards at all stages of production, storage and transportation;
- growth in foreign exchange earnings;
- economic growth of the country.

The main negative effects of agricultural exports on developing countries, which together lead to an aggravation of food security and poverty of the population are:

- reduction of supply of food products in the domestic market in conditions of medium or low yield;
- currency crises, a decrease in the incomes of agricultural producers and structural imbalances in the economic system, as the situation on the world agricultural market worsens.

References

Проведен аналіз досліджень аграрного експорту в наукових трудах. Опреділені причинно-сумісні зв'язки розвитку світового аграрного ринку. Освітлено суперечність розвитку аграрного експорту в країнах з різним рівнем розвитку. Виявлені особливості аграрного експорту, його позитивні та негативні наслідки для економік розвивальних країн.

Ключові слова: аграрний експорт, світовий ринок, продовольча безпека, бідність, розвивальні країни.

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