

Leading role of innovations in rural development and agriculture

Oleksandr Kendiukhov

Zaporizhzhia National University
Zhukovsky str. 66, 69600 Zaporizhzhya
Ukraine

e-mail: alexkend@ukr.net

Tetiana Pishenina

Kiev Institute of Business and Technology
Starry Ave. 1/5, 04078 Kiev
Ukraine

e-mail: pishenina@ukr.net

Alla Rusnak

Kherson Branch of the Admiral Makarov National University of Shipbuilding
Ushakov Ave. 44, 73022 Kherson
Ukraine

e-mail: rusnak_av@meta.ua

Abstract In the 21st century, with the efficiency of work and production gradually increasing, the traditional sectors of economy such as rural development and agriculture are no longer perceived as its main drivers. Nevertheless, even with growing labour efficiency, the leading role of innovations in rural development and agriculture and their impact on world economy is still unquestionable. Rural development and agriculture keep playing a strategic role in the economic development of any country. The increasing the supply of food by the agricultural sector is therefore very important for any country's economic growth.

This paper focuses on the aspects describing the leading role of innovations in rural development and agricultural sector as well as their role for the development of the world economy. We provide several examples and case studies that highlight its importance and relevance. The paper scrutinized the role of agriculture in international trade and the state of agro-industrial sector in developed and developing countries. Moreover, we analyse the drivers of profitability and success of the agro-industrial sector and yield that rural development and agriculture still remain the important aspects of the world economy and global trade.

1 Introduction

Nowadays, with the world economy going global and technology and technical progress evolving with an astonishing speed both in European Union (EU), North America and Asia (Jiroudková et al. 2015), the role of rural development and agriculture, in particular the role of innovations in the agro-industrial sector, is often being underestimated (Herrendorf and Schoellman 2015; Abrham et al. 2015; Le Billon and Sommerville 2017; or Niño-Amézquita et al. 2017). However, one would probably agree with the fact that the increased agricultural productivity is leading to increased rural income which, in turn, leads to increased demand for industrial products and thus to the sustainable growth of the industrial sector as well as for the microlevel (Bielik et al. 2013; Kalyugina et al. 2015; Aloba Loison 2015). Production is one of the key elements of agriculture's contribution to the modern economy. Similarly, improving the productivity of crops can pave the way for the advancement of the swap economy, which can contribute to the growth of non-agricultural activity (Wiggins and Proctor 2001).

Agro-industrial sector is distinguished by a number of specific characteristics that predetermine its nature and its success: i) the impact of climatic factors; ii) price volatility; iii) low degree of monopolization of agricultural production compared with other sectors of the economy; iv) lack of capital inflows into intensive agriculture (Matiah et al. 2016). The growth of agro-industrial enterprises and the emerging agro-industry sector offer the opportunity to take labour out of the ground and, through improved connections to demand for fresh and processed food in cities and urban centres, generate demand for agricultural holdings. Therefore, the innovations are needed in order to provide a support for its growth.

Moreover, agro-industrial state requires the support of the government aimed at stimulation of its growth and development. In addition to the important role of the government, a well-functioning and vibrant private sector will be crucial to help the country improve its production by investing in new products, services and agro-processing to ensure that farmers are encouraged to adapt new practices.

Furthermore, a good practice of strengthening and implementing an integrated agricultural strategy through integration and additional capacity building and technical support should also be implemented.

In collaboration with the governments and international partners, national efforts to implement integrated agricultural changes - in particular, to provide a diverse range of agricultural and food systems that improve access to affordable, nutritious foods and strengthen markets – should be fostered (see e.g. Moskalenko and Yevsieieva, 2015; Smutka et al. 2015).

With the regional demand for livestock products expected to grow by more than 150 percent by 2050, the development of the livestock sector offers a unique way to improve the income and nutrition of people in developing countries (McDermott et al. 2010).

In case of countries isolated from global markets and dominated by agriculture and large rural populations, it is disproportionate to allow farmers to spend disproportionately on unprotected products and services at home. Therefore, when growth is driven by agricultural productivity, farmers who adopt high productivity practices benefit from growth, while farmers and rural households benefit from lower food prices, thereby increasing their demand for agricultural and non-agricultural products (Rahman 2003; Špička and Smutka 2014). It also appears that successful plans identify targets in a limited number of chains of crop and livestock values, cross-section agricultural tools (such as lower transport costs or access to irrigation) and specific geographic areas.

2 Public support for agriculture

Public support for agriculture is crucial for enabling and sustaining its leading position in the world economy. Governments are working on a number of different purposes, including increasing agro-processing, reducing unemployment, reducing poverty, increasing autonomy, food autonomy, economic growth, increasing exports, reducing malnutrition and supporting innovations.

One can see that one strategy could focus on increasing the productivity of small farmers in a particular region of a particular country where poverty and poverty in rural areas are high, while the same strategy focuses on what is needed to accelerate the growth of the industry that might increase the export revenues (e.g. some dominating agricultural product or other products).

For example, in Morocco, major public and private sector stakeholders found, by trial and error, the most effective way to tackle rural poverty is to cultivate high-value crops (e. g. tomatoes and olives in the case of this particular country) on well-established areas (while at the same time accelerating investment in irrigation) to supply regional urban, European and export demands (Boettiger et al. 2017).

Another good example is Canada. Being the fifth largest exporter of agriculture in the world, the local agricultural sector gives jobs to 2.3 million Canadians who work in agriculture (i.e. 1 in 8 people on the Canadian labour market). The global vision of the Canadian government is to stimulate innovation and resourcefulness to build a global economy in agriculture and food for the benefit of all Canadians (Government of Canada 2019).

The price of global food also depends on whether (and if so, how much) productivity in agriculture continues to exceed demand and to what extent diets in emerging economies are moving to the detriment of livestock and horticulture products. Similarly, countries with above-average population density may also see a decrease in their agricultural comparative advantage, as capital accumulation and industrialisation continue. In addition to occasional mining booms, sustainable economic growth is usually due to the increase in the capital produced (including available technology) per worker.

Changes in consumption patterns (slow growth in agricultural product consumption and, in middle-income countries, the transition from cereals and other raw materials to livestock and horticulture products) are also changing every country's net commercial situation (Pingali 2007). Similarly, countries with a relatively high population density may also see a decrease in their agricultural comparative advantage as a result of industrialisation (or when other industries such as mining, production or services enjoy a boom in export-led production or a persistent inflow of foreign aid).

3 Global demand for agricultural production

Current global economic conditions stimulate demand for food and agriculture, creating the favourable conditions and plausible basis for world agricultural trade. For example, in the United State, the U.S. Chief Agricultural Negotiator tends to work closely and collaboratively with the USDA Secretary of the TFAA and the Foreign Agricultural Service (FAS) in their long history of common trade policies and promoting the sale and consumption of American Agricultural products. It appears beneficial for the U.S. agricultural trade to support the language in trade agreements to protect American food, beverages and agricultural products from the use of geographic metrics (GIs) used by foreign competitors to limit trade in United States.

American agricultural policymakers have long relied on the global market to serve a diverse programme management of the domestic agricultural economy, to stimulate geopolitical interests and to strengthen exports.

The U.S. agricultural policy is aggressively aimed at building new market share and promoting international dependence on U. S. food exports. Moreover, it appears that American agricultural policymakers have long relied on the global market to pursue a varied programme - including managing the domestic agricultural economy, promoting geopolitical interests and, above all, stimulating exports.

Among the factors affecting American agriculture one might find global supply and price, changes in exchange rates, and government support for agriculture. United States has become the main supplier of agricultural imports with China's most important agricultural imports are land-based products such as oil seeds, oils, and cotton flooding the U.S. market. Nevertheless, with the recent developments (trade wars between United States and China induced by the current U.S. leadership), it is the U. S. farmers who are at high risk due to the ongoing commercial dispute with China. China is both a leading market for agricultural exports and an important source of agricultural imports for the United States. China is a large U.S. agricultural export market which has grown enormously over the last 25 years.

However, the foreign policy of intervention in the global agricultural trade has a negative impact on U.S. farmers. With regard to that, traders and policymakers have to work at all levels (bilateral as well as multi-way) to address these challenges, to secure market access for American farmers and to guide global efforts to reform agricultural trade standards in order to ensure fair and market oriented.

In addition, one can see that countries around the world are constantly entering agricultural markets to protect influential domestic producers from foreign competition and unwanted price fluctuations. Until recently, agricultural trade has opened up steadily, as tariffs and other trade barriers have fallen and farmers' agreements have been reduced to new markets worldwide. In response to the new U.S. trade sanctions, China, Canada and Mexico have beaten American soya, pork and other agricultural products. By continuously replacing price and volume grants with direct payments, which do not compensate for over-production, countries can maintain a healthy agricultural sector while minimizing economic disruption and maximizing consumer benefits.

As for the European Union (EU), its agriculture is interlinked by trade with agriculture in the rest of the world: countries connected and neighbouring countries, major competitors, developing countries, etc. In addition to commodity trading, markets in the United States are developing for agricultural and food products with a higher value, such as those covered by EU quality labels (e.g. organic products, geographic information, mountain products) and others (non-GM products, etc.). The flexibility of agricultural trade flows is therefore based on comparative advantages, and larger trade flows are expected in countries that are more likely to specialise in similar agricultural products and thus compete head-to-head in foreign markets.

European Union considered most of its farmers to be incapable of competing and maintained a trade policy that maintained their national policies aimed at protecting their farmers.

In most EU countries, it is believed that the agricultural population cannot survive without protection from cheap imports, and that there may be a significant deterioration in the rural area, which has all the negative consequences, both socially and in nature and in the environment. Countries with higher costs of agriculture did not want to open up their agricultural sector to liberal trade without any support. As trade issues continue, farmers and their foreign markets cannot take part in the debate and the agricultural international trade suffers.

4 Agriculture and trade in developed and developing countries

The developed countries will supply an increasing proportion of food needs in developing countries, and in return they will continue to import more agricultural products, including tropical drinks, rubber and fibres. For example, if the reform process started under the Uruguay agricultural settlement agreement, the reform of the sector would be fundamentally revised and if there were significant reductions in subsidies for production and protection in industrial countries, this could have an impact on the expected trade patterns.

Although poor access to markets is generally considered to be a limit to agricultural productivity in rural Africa, quantifying this effect is complicated by the lack of granular data on entry and production prices and the cost of accessing local markets.

And if political reforms were to expand beyond the developed countries and the remaining agricultural prejudices were eliminated in the policies of several developing countries, it could mobilize resources to improve productivity and stimulate rural economic growth. In addition, the growth of manufacturing trade has been fuelled by the rapid expansion of intra-industrial and inter-industrial commerce, which uses a labour division within companies operating in different countries or continents.

The growth in agricultural exports from developing countries has also been hampered by the limited capacity of their export markets. In addition, there has been very little commercial or commercial trade in food and agriculture. The current recommendations on agriculture for development are conducive to the support of the trading model, which is based on increasing productivity by improving markets rather than subsidies.

In China, a similar Canadian-funded project has developed a programme aimed at training small farmers, extension workers and government officials in the field of food safety and marketing standards for global trade organisations. The vertical integration, combined with improved food chain efficiency and safety, has raised

concerns about the expansion of export - oriented industries, which can favour large companies from the exclusion of small farmers, who tend to be the poorest and can lead to the loss of social welfare.

Research on agricultural food systems in developing countries shows that farmers participating in modern food supply chains are also involved in traditional food systems. The health departments should raise awareness of the potential health and economic benefits for both the developing and developed sectors, as well as the management of trade assistance to the markets for fresh products.

Developing countries have two thoughts about agriculture supporting policies and initiatives: although they have given them a special status and protection for agriculture, including consolidating high-level import rates, the application of input grants and the higher de minimis, they have allowed developed countries to protect and subsidize their own industries. In addition, food systems in developing countries are becoming more integrated and up-to-date due to private investments in food preparing and processing, supermarkets, fast-food chains and other related areas. In the same time, policymakers are reducing their direct involvement into many sectors leaving the “invisible hand” of the market to do its job.

Moreover, many trade agreements related to agricultural products completely ignore oligo-political market power in the world (and many domestic) agricultural raw material markets. Although it is apparently only about global markets and trade, the agreement determines the type of investments that countries can make in their agricultural sectors.

In practice, the agricultural support policies have legitimized the use of subsidies in developed countries, which distort global markets and harm the local markets of developing countries - reducing the opportunities available to developing countries that are interested in protecting rural life and food safety at home (not to mention food sovereignty).

In the past, agriculture was relatively isolated from trade negotiations, although commodity agreements were a characteristic of the 1970s and 1980s (and some of them dating back to the 1950s) and agriculture was incorporated into some projects, such as a general System of Preferences, which allowed developing countries to enterprising countries with a tax - free or low-free entry.

Environmental efficiency is achieved by focusing on the production of certain crops in countries with the largest "comparative advantage ", and private companies are able to manage the business of obtaining food from where it is cultivated, or where it is needed, thus reducing significant costs from government budgets in the countries where the state.

Supporters stated that the agreement would provide a way to control industrialised agricultural spending - in particular the United States, the European Union and, to a lesser extent, Japan - and allow developing countries to gain a comparative advantage in the world market as a cheap agricultural supplier.

However, when food prices rose in 1995 and 1996 (partly because Chinese corn harvests caused enormous and unusual demand in global markets), which led to an increase of 40 % in food import bills, this decision was not taken.

Developing and less wealthy countries are demanding reforms of such a commercial practice that will overwhelm small farmers and enrich large companies. Moreover, agricultural subsidies in advanced economies around the world are inherently unequal, and given the broader context of rising food prices, climate change and protectionism, the current system is clearly in dire need of changes.

However, poor leaders in poorer countries have criticized the proposal, saying that the United States must further reduce the negative effects of agricultural subsidies on small farmers in their countries. In addition, non-profit organizations (NGOs) such as Oxfam and ActionAid say that the World Bank's agricultural policy will not increase growth and reduce poverty, unless rich countries limit their subsidies for agriculture and reduce tariffs on agricultural products.

5 Conclusions and discussions

Overall, we might conclude that rural development and agriculture still occupy an important position in the global economic trade and has a profound influence on the economies of many developed and developing countries. As the world's population is rapidly growing, the demand for agriculture and food products is increasing. And it is not just the demand for any kind of products – most people in the developed Western economies strongly prefer genetically unmodified, healthy, and ecological production. Therefore, innovations are needed to support these sectors.

Another important aspect is the changes in rural development when traditional agriculture gives way to the novel and enhanced methods of using rural space through developing sustainable businesses and enterprises that give jobs to the increasing share of rural population. Hence, the changes in agro-industrial sector that need to embrace all these new trends and innovations in order to keep pace with the leading trends and the current demand on the world markets.

We can also conclude that public and state support for the rural development and agro-industrial sector means a lot for its position and its development in the long run. With regard to that, one has to state that agricultural

economic policies should be designed with great care and precision in order not to harm the existing traditional producers and farmers but also to make room for the innovations and the new technologies leading to the technological improvements of the ago-industrial sector.

References

- Abrham J, Strielkowski W, Vošta M, Šlajs J (2015) Factors that influence the competitiveness of Czech rural small and medium enterprises. *Agricultural Economics-Zemedelska Ekonomika* 61(10):450-460. doi: 10.17221/63/2015-AGRICECON
- Alobo Loison, S (2015) Rural livelihood diversification in Sub-Saharan Africa: A literature review. *The Journal of Development Studies* 51(9):1125-1138. doi: 10.1080/00220388.2015.1046445
- Bielik P, Smutka L, Svatoš M, Hupková D (2013) Czech and Slovak agricultural foreign trade-two decades after the dissolution. *Agricultural economics-Zemedelska Ekonomika* 59(10):441-453. doi: 10.17221/26/2013-AGRICECON
- Boettiger S, Denis N, Sanghvi S (2017) Successful agricultural transformations: six core elements of planning and delivery. McKinsey & Company. <https://www.mckinsey.com/industries/chemicals/our-insights/successful-agricultural-transformations-six-core-elements-of-planning-and-delivery> Accessed 21 April 2019
- Herrendorf B, Schoellman T (2015) Why is measured productivity so low in agriculture? *Review of Economic Dynamics* 18(4):1003-1022. doi: 10.1016/j.red.2014.10.006
- Government of Canada (2019) Agriculture and Agri-Food in Canada. <http://www.agr.gc.ca/eng/about-us/publications/we-grow-a-lot-more-than-you-may-think/> Accessed 18 April 2019
- Jiroučková A, Rovná LA, Strielkowski W, Šlosarčík I (2015) EU Accession, Transition and Further Integration for the Countries of Central and Eastern Europe. *Economics and Sociology* 8(2):11-25. doi:10.14254/2071-789X.2015/8-2/1
- Kalyugina S, Strielkowski W, Ushvitsky L, Astachova E (2015) Sustainable and secure development: facet of personal financial issues. *Journal of Security & Sustainability Issues* 5(2):297-304. doi: 10.9770/jssi.2015.5.2(14)
- Le Billon P, Sommerville M (2017) Landing capital and assembling 'investable land' in the extractive and agricultural sectors. *Geoforum* 82:212-224. doi: 10.1016/j.geoforum.2016.08.011
- Maitah M, Kuzmenko E, Smutka L (2016) Real effective exchange rate of rouble and competitiveness of Russian agrarian producers. *Economies* 4(3):12. doi: 10.3390/economies4030012
- McDermott JJ, Staal SJ, Freeman HA, Herrero M, Van de Steeg JA (2010) Sustaining intensification of smallholder livestock systems in the tropics. *Livestock science* 130(1-3):95-109. doi: 10.1016/j.livsci.2010.02.014
- Moskalenko V, Yevsieieva I (2015) Effective leadership conflict management in food technology enterprises. *International Economics Letters* 4(2):91-102. doi: 10.24984/iel.2015.4.2.4
- Niño-Amézquita J, Dubrovsky V, Jankurová A (2017) Innovations and competitiveness in regional development: a comparison of Latin America, Europe, and China. *Czech Journal of Social Sciences, Business and Economics* 6(1):28-36. doi: 10.24984/cjssbe.2017.6.1.4
- Pingali P (2007) Westernization of Asian diets and the transformation of food systems: Implications for research and policy. *Food Policy* 32(3):281-298. doi:10.1016/j.foodpol.2006.08.001
- Rahman S (2003) Profit efficiency among Bangladeshi rice farmers. *Food policy* 28(5-6):487-503. doi: 10.1016/j.foodpol.2003.10.001
- Smutka L, Steininger M, Maitah M, Škubna O (2015) The Czech agrarian foreign trade-ten years after the EU accession. *Agrarian Perspectives XXIV, Global Agribusiness and the Rural Economy, Proceedings of the 24th International Scientific Conference, Czech University of Life Sciences Prague, Faculty of Economics and Management, 16-18 September 2015, Prague, Czech Republic, pp. 385-392*
- Špička J, Smutka, L (2014) The technical efficiency of specialised milk farms: a regional view. *The Scientific World Journal* 2014:985149. doi: 10.1155/2014/985149

UN (2017) UN Food and Agricultural Organization, FAOstat database. <http://www.fao.org/faostat/en/#data/QC>. accessed 24 April 2019

Wiggins S, Proctor S (2001) How special are rural areas? The economic implications of location for rural development. *Development Policy Review* 19(4):427-436. doi:10.1111/1467-7679.00142