

STRATEGIC PRIORITIES AND FINANCIAL SUPPORT OF UKRAINIAN AGRICULTURAL SECTOR DEVELOPMENT

E. A. Kirieieva¹, N. V. Pryshliak², O. I. Shamanska³, I. Yu. Salkova⁴, A. V. Kucher⁵

¹Department of Economics, Vinnytsia National Agrarian University (Ukraine);
e-mail: nora.kirieieva@gmail.com

²Department of administrative management and alternative energy sources, Vinnytsia National Agrarian University (Ukraine); e-mail: pryshliaknatalia@vsau.vin.ua

³Department of Economics, Vinnytsia National Agrarian University (Ukraine);
e-mail: shamanska@vsau.vin.ua

⁴Department of Economics, Vinnytsia National Agrarian University (Ukraine);
e-mail: salkovairyna@i.ua

⁵Sector of economic research NSC «Institute for Soil Science and Agrochemistry Research named after O. N. Sokolovsky»; V.N. Karazin Kharkiv National University, (Ukraine);
e-mail: anatoliy_kucher@ukr.net

ABSTRACT

The agricultural sector is one of the most important in the Ukrainian economy, which can be proved by numerous indicators. The article has analysed such data as the share of agricultural sector in the total export of Ukraine, the share of agricultural sector in total GDP, land use in Ukraine, etc. Despite high potential of the agricultural sector in Ukraine, a lot of challenges hold back an efficient development of agriculture. The aim of this research is to determine the main challenges of the agricultural sector development in Ukraine through PEST-analysis of political, economic, social and technological factors, which influence the agricultural sphere, and also to investigate the main ways of the future development of the agricultural sector. To achieve this goal current agricultural policy is being analyzed and the dynamics of the funds allocated in the State Budget for loan programs in the agricultural sector of Ukraine and the dynamics of the budget financing of the agrarian sector of Ukrainian economy are presented. According to the findings, the agricultural sector has been defined as one of the crucial ones for the economic development of Ukraine. The steps to be taken to achieve the goals of efficient agricultural development have been identified by this scientific research. Theoretical and practical recommendations that can be implemented in the governmental policy have been presented and the strategy of achieving agricultural development has been developed.

Key words: agricultural sector, agricultural development, financial support, Ukraine, agricultural policy, PEST-analysis, strategy, crops production.

Jel code: G28; Q18

1. INTRODUCTION

Globalization and transformation processes are changing all systems in the modern world. These days economic development is characterized by the changes in the structure of the world GDP and focus on new technologies and services. Despite this transformation, the agricultural sector is still one of the vital in the world economy since efficient agricultural development is being the basis for food and national security globally. We absolutely agree with the opinion of Derek Byerlee, Alain de Janvry, and Elisabeth Sadoulet that "...Agriculture is a source of the product, factor, foreign exchange, and market contributions that all helped trigger industrial growth and a decline in the share of agriculture in the economy." (Byerlee, Janvry, and Sadoulet, 2009).

Moreover, the importance of agricultural sector development is presented in the Agricultural Development Strategy Overview, where the main challenges for the agricultural sector are outlined. Thus, "...severe hunger and poverty affect nearly 1 billion people around the world; by 2050, it's estimated that the earth's population will reach 9 billion; global food production will need to jump by 70 percent to 100 percent to feed these people; rising incomes, increasingly scarce resources, and a changing climate are putting additional strains on agricultural productivity; two billion people in the developing world are malnourished; malnutrition continues to be the world's most serious health problem and the single biggest contributor to child mortality..." (Gates Foundation, 2011).

2. THE ANALYSIS OF RESEARCHES AND THE TASKS SETTING

Many national and international scientists address future agriculture development. L. Levkivska and I. Levkovych (Levkivska and Levkovych, 2017) have determined social responsibility and emphasize the fact that "Modern agriculture is facing increasing integration and competition in the world economy, with close links between supply chain areas, various interests of stakeholders, as well as numerous conflicts, scandals and public pressure relating to the environment, food safety and human standards. In addition to these challenges, the Ukrainian agriculture confronts social and structural problems arising from transition process".

The ways of solving such problems through innovations and smart farming are presented in the research conducted by A. Waltera, R. Fingerb, R. Huberb and N. Buchmann (2017).

Moreover, most scientists agreed on the necessity of the governmental support for the agricultural development. The phenomenon of agricultural protection in developed countries has drawn a great deal of research attention of agricultural economists since World War II. Indeed, the persistence of agricultural protection is intriguing given the widely recognized benefits associated with free trade (Moona and Pinob, 2018).

The key ways and strategies of Ukrainian agricultural growth are presented by H. Kaletnik (2015), who argued that agricultural sector of the Ukrainian economy is a solid foundation of the state food security, the basis for expanding its export potential, and a source of meeting domestic demand for agricultural products and foods.

Scientists are investigating various environmental and economic aspects of sustainable development of the agricultural sector, for example: economic growth and environmental degradation (Das and Sen, 2018); economic restructuring in view of destructive effect of enterprises on environment (Karintseva, 2017); assessment of environmental costs of national economy (Shkarupa and Kharchenko, 2017); relationship between outputs and inputs in agriculture (Figurek and Vasković, 2017); forms of management in agricultural production (Shulskyi, 2017); assessment of the reproduction process of agricultural enterprises (Tyapkina and Ilina, 2018), etc.

The development of agricultural production in Ukraine is the key to the economic growth, food security, and global food security since the Ukrainian agricultural sector has great export potential and is able to provide food for a lot of people all over the world. The need for the future agricultural growth and development determine the objective of the research, which is to find the efficient ways of the agricultural development through a highly effective modern governmental policy.

The purpose of the research is to find the most efficient ways to agricultural development through the implementation of the modern governmental policy. This purpose defines the following research targets: to analyze the current state of the agricultural sector development; to identify the political, economic, social and technological factors affecting the agricultural sector development in Ukraine; to analyze the governmental policy and financial support in agricultural sphere; to develop the key solutions and performance indicators of the agricultural policy modernization.

To achieve the objective of the research such methods as historical analysis, synthesis, induction, deduction, formalization, and PEST-analysis have been implemented. Historical method has been used to analyze the genesis of the agricultural development of Ukraine. The methods of analysis and synthesis made it possible to study the structure and estimate the agricultural sector export potential as well as to determine the dynamics of foreign trade of agro-food products. The qualitative elements of the research included the review of the literary sources such as journals, theses, organizational reports, and statistics on agriculture according to the conceptual framework. Historical method has been adopted to investigate the dynamics and changes in Ukrainian agricultural policy. The method of scientific abstraction was applied to identify the agricultural sector features.

3. RESULTS

Agriculture is a major sector of the Ukrainian economy. Furthermore, agriculture is a major sector of the economy all over the world, which ensures food security, energy security (biofuels production) and national security of the countries.

With 41.5 million hectares of agricultural land covering 70 percent of the area, agriculture is Ukraine's largest export industry, which generates 12 percent of GDP. Ukraine is the world's largest exporter of sunflower oil, third largest exporter of barley, fourth largest exporter of corn, sixth largest exporter of wheat, and ninth largest exporter of poultry. In 2016, Ukraine again set a record for grain output, harvesting 66 million tons, which is 6 million tons more than in 2015. By 2020, Ukraine's grain

production will have reached 70-75 tons a year. Ukraine's record increase in output is driving capital investment in agriculture, which grew from \$1 billion in 2015 to \$1.7 billion in 2016, being the highest over the last 19 years (U.S. Commercial service, 2017).

According to the Databases, the total gross agricultural production grew by 66,492 million UAH in 2016 compared with 2010. The increase in the total gross production is largely due to the growth of the gross crops production. We can, also, point out the disproportion between the gross crops production and gross livestock production. The major part of the total gross production in Ukraine is the gross crops production, which accounted for over 72 % of the total agricultural gross production in 2016. Moreover, the agricultural sector provides the biggest part of Ukrainian exports. For example, in 2015 Ukrainian export included more than \$14,8 billion of agricultural and food products. Overall, food and agricultural products amounted to 38.2%, and topped a number of categories, for instance, sunflower oil (7.9%), corn (7.9%), wheat (5.9%), soybean (2, 1%). To conclude, future growth of the country's economy depends a lot on the successful agriculture development.

Furthermore, in 2016, Ukraine established itself as an export leader in several categories:

1st place in world export of sunflower oil, \$4.8 billion (32% of total world export);

4th place in world export of barley, \$653.4 million (8.5%);

4th place in world export of maize, \$2.4 billion (8.4%);

6th place in world export of wheat, \$2.6 billion (7.2%);

7th place in world export of soybean, \$645.3 million (1.3%) (CFC Consulting Company, 2017).

Despite the growth of the gross products, agriculture faces many challenges, making it more and more difficult to achieve its primary objective of feeding the world each year. Population growth and changes in diet associated with rising incomes drive greater demand for food and other agricultural products, while global food systems are increasingly threatened by land degradation, climate change, and other stressors (An Action Agenda for Sustainable Development, 2016)

Agricultural policy is one of the keys to the efficient agricultural development. From the 1950s to the 1970s, the economics of agricultural development called for a major role of government in providing: essentials – incentives, transportation and marketing, new technology and access to inputs; and accelerators – extension, credit, irrigation, farmer cooperatives, and development planning) (Roumasset, 2004).

Agricultural policy is a crucial element in determining the rate and pattern of the economic growth. The policies such as investment in education, health and sanitary facilities, and transportation infrastructure have a great impact on agricultural sector productivity. In general, economists, policymakers, and development institutions have reached a consensus on the importance of these investments. Another set of policies affect particular agricultural commodities or production techniques. These commodity-specific policies include taxes, subsidies, and quantitative control over particular outputs and inputs, as well as the policies affecting macro prices (interest rates, wage rates, and exchange rates). For this set of policies, little consensus has emerged on appropriate levels of

use (Monke and Pearson, 1989).

To build an efficient and beneficial strategy for the agricultural development and growth it is important to apply modern tools. PEST analysis is one of the effective methods that can help to determine the influence of the politics, economic, social and technological factors on the agricultural sector of Ukraine.

PEST has been conventionally used in two different ways: first, to analyse the position of a particular organisation or industry sector within a particular business environment; second, to analyse the viability of general management solutions in a business environment (Peng and Nunes, 2007)

PEST analysis examines four categories of external environmental factors, namely, Political factors (P): these cover various forms of government interventions and political lobbying activities in an economy. Economic factors (E): these mainly cover the macroeconomic conditions of the external environment but can include seasonal/ weather considerations. Social factors (S): these cover social, cultural and demographic factors of the external environment. Technological factors (T): they include technology-related activities, technological infrastructures, technology incentives, and technological changes that affect the external environment (Kim-Keung Ho, 2014)

PEST analysis of the agricultural sector of Ukraine will include the identification of Political and Economic components presented through Agricultural Policy analysis.

Table 1: Ukraine's Basic Macroeconomic and Agricultural Sector Development Indicators, 2012-2016

Indicator	Date, years					Deviation 2016/2012 (+; -)
	2012	2013	2014	2015	2016	
GDP, annual change in %	0,2	0,0	-6,6	-9,8	2,3	2,1
General govt. gross debt, % of GDP	37.5	40.5	70.3	79.3	81.2	43,7
GDP produced in agriculture, %	8,1	9,4	10,7	12,5	12,1	4,0
Inflation, %	-0.2	0.5	24.9	43.3	12.4	12,6
Unemployment rate, %	8,2	7,8	9,7	9,5	9,7	1,5

Source: developed by the authors based on [14].

The agricultural policy of Ukraine is based on the Strategy for Agriculture and Rural Development 2015-2017, finalised in July 2015. Its main objective is to increase agricultural competitiveness and promote rural development in a sustainable manner in line with the EU and international standards. It consists of seven specific objectives, which are to approximate the EU legislation, particularly on food safety; deregulate or abolish unjustified regulations and administrative acts and reform state-owned enterprises (SOEs); address the main challenges related to the factors of production, including land reform, access to finance, modernization and upgrading of production and processing capacities, and infrastructure and logistics; promote agricultural innovation; increase the transparency and efficiency of production and market management measures; improve the efficiency of the state support of agriculture; develop a rural development program, including measures to support small farms, and

improve the quality of life in rural areas; and establish a regulatory framework for environmentally-friendly agriculture and production methods (Review of Agricultural Investment Policies of Ukraine, 2015).

One of the main tools of the agricultural policy implementation and enhancement is the governmental financial assistance provided by the state through various support programs.

According to C.C. Eze, J.I. Lemchi (2010) and others: "Support for agriculture is widely driven by the public sector, which has established institutional support in form of agricultural research, extension, commodity marketing, input supply, and land use legislation, to fast-track development of agriculture. These are aside the Private sector participation is not limited to local or foreign direct and portfolio investment financing, but also to the sponsorship of research and breakthrough on agricultural issues in universities, capacity building for farmers and, most importantly, the provision of financing to farm businesses."

As of February 1, 2018, there are 82 banks operating in Ukraine, but over the period between 2010-2018, 100 banks were found insolvent. The lending conditions for agricultural enterprises offered by the banks make this source of funds inaccessible to most agricultural producers. The loan interest rate for agro-industrial enterprises ranges from 22 to 34% per year. Government lending is an important tool of the budget policy of agricultural production support. Between 2014 and 2018, the State Budget of Ukraine allocated funds to provide loans to farmers; financial support of the activities in the agro-industrial complex, as well as procurement of material and technical resources for the needs of agricultural producers (table 2).

*Table 2: Dynamics of the funds allocated in the State Budget for lending programs in the agricultural sector of Ukraine, mln USD**

Name according to the classification program of expenditures	Date, years					Deviation 2018/2014 (+; -)
	2014	2015	2016	2017	2018	
Providing loans to farmers	2.35	1.17	0.63	2.41	1.61	0.74
Financial support in the agro-industrial complex on terms of financial leasing	0.32	0.17	0.15	0.14	0.14	0.18
Formation by the Agrarian Fund of the State Intervention Fund, as well as procurement of material and technical resources for the needs of agricultural producers	117.85	64.10	55.56	28.63	33.36	84.49
Total	120.52	65.45	56.33	31.18	35.11	85.41

*References: dollar exchange rate 2014 – 11.88; 2015 – 21.84; 2016 – 27.00; 2018 – 26.80.

Source: developed by the authors based on [14], [25].

One of the main tools of the governmental support in Ukraine is financial support. Expenditures of the State Budget of Ukraine are presented in Table 3. The main tools of budget support for agricultural producers used in Ukraine are financing of budget programs, subsidies for the development of agricultural producers and stimulation of agricultural production. The process of budget financing of agrarian production is characterized by its diversity both in terms of volume and financing

mechanisms. Due to the unstable political and economic situation and inflation, there is significant reduction in funding.

*Table 3: Dynamics of budget financing of the agrarian sector of Ukraine's economy, mln USD**

Name according to the classification program of expenditures	Date, years					Deviation 2018/2014 (+; -)
	2014	2015	2016	2017	2018	
Total for the Ministry of Agrarian Policy and Food of Ukraine	534.44	100.22	83.81	349.71	535.74	1.31
Apparatus of the Ministry of Agrarian Policy and Food of Ukraine	289.52	40.09	27.45	215.11	254.57	-34.96
<i>Total for the support of agricultural producers</i>	93.39	33.19	19.89	205.14	242.41	149.02
<i>General management and management in the field of agribusiness</i>	3.80	2.09	3.39	4.53	6.08	2.28
<i>Together in the scientific and social spheres in the agroindustrial complex</i>	192.34	4.80	4.17	5.45	6.07	-186.27

*References: dollar exchange rate 2014 – 11.88; 2015 – 21.84; 2016 – 27.00; 2018 – 26.80.

Source: developed by the authors based on [14].

The share of the expenditures for the Department of the Agrarian Policy and Food and agricultural sector support in the total structure was less than 1% in 2016. Such facts reflect a low level of the governmental support of agricultural sphere.

Direct financial support for agricultural producers by the government is insignificant. In particular, the Ukrainian government's dearth of financial resources results in Ukraine's Producer Support Estimate being very low in comparison to other Black Sea producers and other grain exporting nations. According to the OECD, the Producer Support Estimate (PSE) is "...an indicator of the annual monetary value of gross transfers from consumers and taxpayers to support agricultural producers, measured at farm gate level, arising from policy measures, regardless of their nature, objectives or impacts on farm production or income." This means that agricultural producers must resort to their own sources of financing, including the attraction of foreign direct investments (Unleashing Ukrainian Agricultural Potential to Improve Global Food Security, 2016).

Overall, the state support of agricultural producers is far below the level observed in developed countries but they still managed to raise their total factor productivity in recent years. In monetary terms, state support of Ukrainian agricultural producers is estimated to be below EUR 40 per ha and mostly indirect support, while such support varies from EUR 175 per ha to EUR 1343 per ha in the EU (EUR 345 per ha in the neighboring Poland) and its mostly direct financial support (Unleashing Ukrainian Agricultural Potential to Improve Global Food Security, 2016).

The Social component of the agricultural development can be seen through the condition of the rural areas. Apparently, there is a huge number of weaknesses in the internal environment and threats in

the external one. Nevertheless, there are just as many strengths and opportunities in the rural areas of Ukraine.

Obviously, the most acute recent weakness of the rural areas is the standard of living of rural inhabitants, affected by poor social infrastructure. Many Ukrainian villages experience the lack of modern schools, kindergartens, hospitals, emergency medical assistance, clubs, and other social facilities. The living conditions in the Ukrainian village have been highly unfavorable.

The level of wages in agriculture has been one of the lowest in the national economy (the average 69% nationally) (Kirieieva, Kostuchenko, 2017).

The analysis of the technological component in Ukraine, in general, and in agricultural sphere, in particular, can be illustrated through the Global Innovation Index (GII). Global Innovation Index considers databases of 127 countries and across 81 indicators into 21 sub-pillars, 7 pillars, 2 sub-indices and, finally, the total index. The place of Ukraine in the previous years is shown in figure 1.

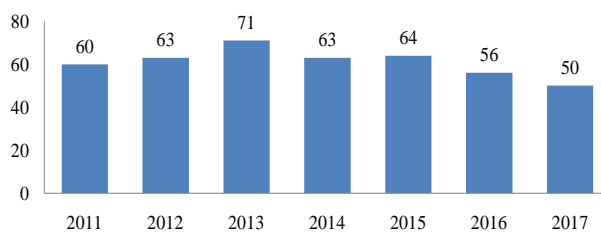


Figure 1. The place of Ukraine in The Global Innovation Index in 2011–2017

Source: the Global Innovation Index 2017.

In 2017, Ukraine ranked the highest over the past 7 years, holding the 50th place and being ahead of Thailand and behind Montenegro and Qatar.

Agriculture and food innovation systems are complex and are constantly evolving. Today, robotics, biotechnological and digital technologies are applied in agriculture and food systems.

To identify the current state of innovations and technological development in Ukraine we can analyse the level of mechanization in the Ukrainian agricultural sector. Unfortunately, the average machinery wear level in domestic agriculture is 70%, with that of 77.57 % for tractors, and 70.56 % for combine harvesters. To renew the machine and tractor fleet of agricultural enterprises in order to meet the level of technological needs, the purchase of more than 15 billion UAH worth technical equipment is required. Of these, 3.0-3.5 billion UAH should be spend on the renewal of the tractors fleet, 3.5-4.0 on grain combine harvesters, 0.35-0.4 on sugar beet harvesters, 0.35-0.4 on feed harvesters, 1.0 on

livestock machinery, 2-3.0 billion on general-purpose machinery. In addition, to maintain the tractor fleet in proper working order, 2.0-2.5 billion UAH are required to purchase spare parts and repair materials (Skotsyk, 2017).

To summarize all political, economic, social and technological factors affecting the agriculture development we can present the matrix of PEST-analysis in the table.

Table 4: PEST-analysis of the Agricultural Sector in Ukraine

Political	P	Economic	E
1. Political instability; 2. The risk of revolutionary upheavals; 3. Military conflict in the East of Ukraine; 4. Bureaucratization, corruption and lobbying of the interests of certain political groups; 5. The recruitment of young and highly skilled personnel to make positive changes; 6. Identification of strategic priorities of development and ways of their achievement; 7. Support of international institutions and partner countries; 8. New laws creating more attractive conditions for agricultural business; 9. European vector of development.		1. Instability of the national currency; 2. Prevalence of imported products over exported (a fair trade balance); 3. Commodity economy; 4. High inflation and unemployment rate in the country; 5. Uncertainty in land relations; 6. Energy dependence of the country, increase in all types of energy resources prices; 7. Gradual economic recovery; slight but stable GDP growth; 8. The availability of a sufficient amount of cheap and highly skilled labor; 9. Investment attractiveness of the national economy.	
Social	S	Technological	T
1. Aging of the nation, increasing number of elderly people; 2. Migration processes, youth outflow abroad; 3. Urbanization, rural development problems; 4. Low income level and low spending power.		1. Lack of connection between science and technology in the real sector of the economy; 2. Insufficient attention and support of science and innovations by the government. 3. Automation and mechanization of all production processes; 4. Rapid pace of development of scientific and technological progress; new technology and techniques; 5. Strengthening protection of intellectual property rights.	

Source: developed by the authors.

PEST-analysis presents stimulating and deterrent factors of the agricultural sector development influenced by political, economic, social and technological spheres. A low level of the financial governmental support of the agricultural sphere, political instability, low level of innovations and other factors contribute to the need to update the current agricultural policy and implement a wide range of agricultural development tools. The key measures of the agricultural strategy and performance indicators are presented in fig. 2.

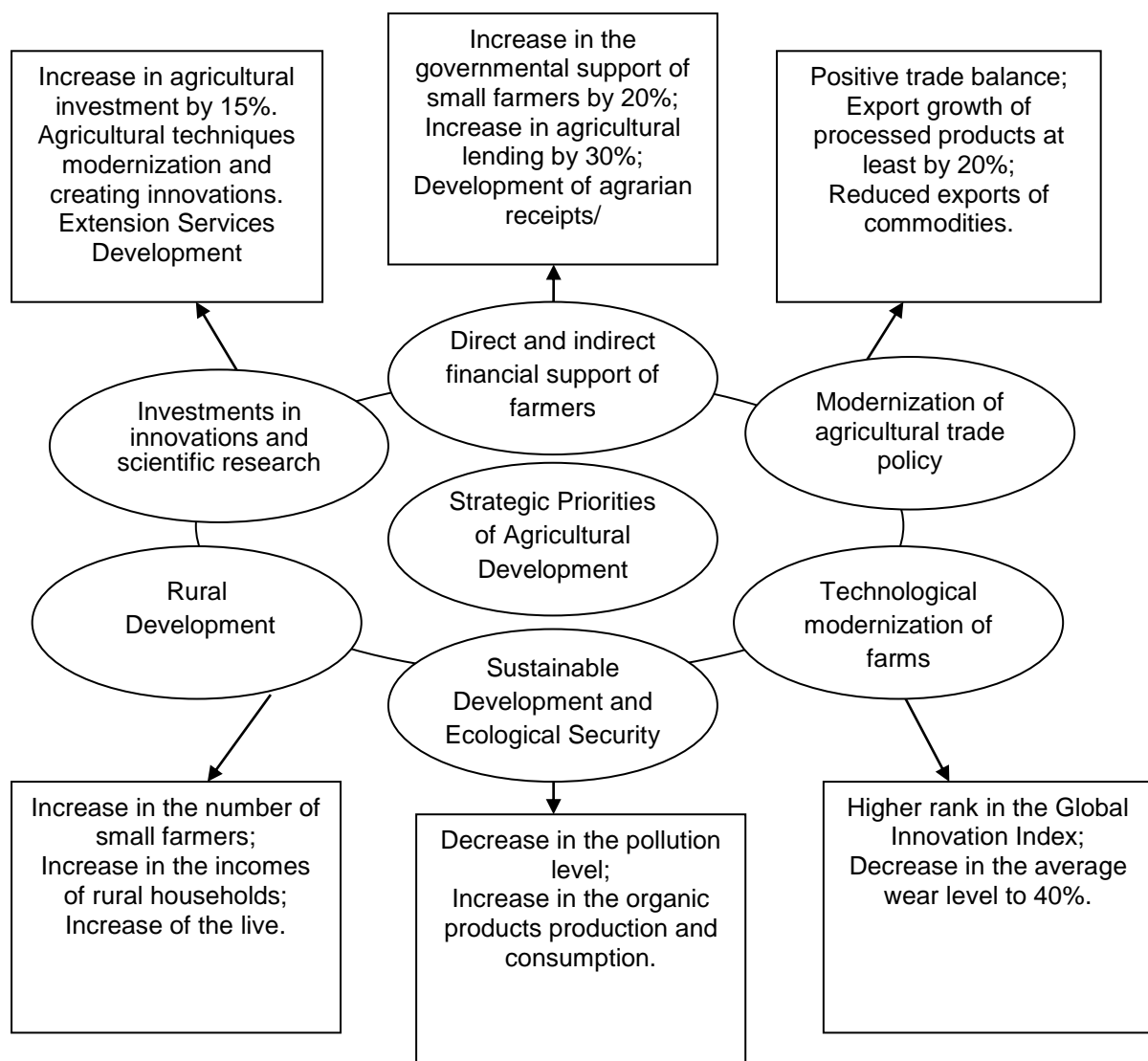


Figure 2. Strategic Priorities and Performance Indicators of Agricultural Sphere Development

Source: developed by the authors.

The implementation of strategic priorities of agricultural policy has to be mutually agreed upon and planned on different levels, such as national and regional. Moreover, it is necessary to provide the strategic analysis of the country, detailed analysis of natural resources and factors affecting them, which justifies the objectives and the action plan. Secondly, the level of the governmental support in agricultural sphere is the lowest, so it should be increased according to the current needs and priorities. Thirdly, it is vitally important to implement the system of the governmental control and regulation of the rational use of natural resources and lands; the use of modern technology; rural development and popularization of farming; governmental support of innovations and scientific researches through the grant system. An obligatory requirement for applicants to receive any state financial support for agricultural producers should be providing at least simple reproduction of soil fertility, because the soil in Ukraine is degraded (Kucher, 2016). This proposal is in line with the

principle of cross-compliance in the EU countries.

4. CONCLUSION

The research identified the agricultural sector as one of the crucial ones for the economic development of Ukraine. The structure and the main agricultural commodities of the Ukrainian export have been presented. Modern governmental policy in agricultural sphere has been analysed; strengths and weaknesses of the current agricultural policy in Ukraine have been investigated. The low level of the governmental support in agricultural sphere have been determined and the comparison of the agricultural sphere support in different countries has been presented. According to the research, it is necessary to update the agricultural policy. The most important ways to improve the agricultural policy are to raise the level of direct and indirect financial support; to support innovations and scientific research through grant system; to stimulate the use of modern technology. One of the mandatory requirements for applicants to receive any state financial support for agricultural producers should be providing at least simple reproduction of soil fertility.

The results indicated, that The Global Innovation Index in Ukraine somewhat improved, but remains low. Therefore, in order to increase the competitiveness of the agricultural sector of Ukraine, it is necessary to introduce innovative, in particular digital technologies, and also should export not only agricultural raw materials, but also products with added value. The steps to be taken to achieve the goals of efficient agricultural development have been identified by this paper. Theoretical and practical recommendations that can be implemented in the governmental policy have been presented and the strategy of achieving agricultural development has been developed. Future studies should focus on analysis of the relationship between the level of innovation, environmental friendliness and food security.

5. REFERENCES

1. Byerlee, D., De Janvry, A., Sadoulet, E. 2009, Agriculture for Development: Toward a New Paradigm. *Annual Review of Resource Economics*. **1**, 15-31.
2. Bill & Melinda Gates Foundation 2011, *Agricultural Development. Strategy Overview*. Available at: <https://docs.gatesfoundation.org>.
3. Levkivska, L., Levkovych, I. 2017, Social responsibility in Ukrainian agriculture: the regional issue. *Eastern Journal of European Studies*. **8(1)**, 97-114.
4. Walter, A., Finger, R., Huber, R., Buchman, N. 2017, Smart farming is key to developing sustainable agriculture. *PNAS*. **114(24)**, 6148-6150. <https://doi.org/10.1073/pnas.1707462114>.
5. Moona, W., Pinob, G. 2018, Do U.S. citizens support government intervention in agriculture?

Implications for the political economy of agricultural protection. *Agricultural Economics*. **49**, 119-129, <https://doi.org/10.1111/agec.12400>.

6. Kaletnik, H. 2015, Strategic and institutional principles of the efficient using of the agrarian sector potential in the modern economy. *Economy, finances, management: topical issues of science and practical activity*. **1**, 3-15.

7. Das, M., Sen, A. 2018, Economic Growth and Environmental Degradation: An Empirical Analysis of BRICS towards Resource Efficiency. *International Journal of Ecological Economics and Statistics*, **39(3)**, 15–27.

8. Karintseva, O. I. 2017, Economic Restructuring in Ukraine in View of Destructive Effect of Enterprises on Environment. *International Journal of Ecological Economics and Statistics*, **38(4)**, 1–11.

9. Shkarupa, O. V., Kharchenko, M. O. 2017, Integrated Assessment of Environmental Costs of National Economy: A Case Study. *International Journal of Ecological Economics and Statistics*, **38(3)**, 43–50.

10. Figurek, A., Vasković, U. 2017, Determination of the relationship between outputs and inputs in agriculture in the EU member states. *Agricultural and Resource Economics: International Scientific E-Journal*, [Online], **3(1)**, 27–36. Available at: www.are-journal.com.

11. Shulskyi, M. 2017, Forms of management in agricultural production: state and development opportunities. *Agricultural and Resource Economics: International Scientific E-Journal*, [Online], **3(2)**, 159–171. Available at: www.are-journal.com.

12. Tyapkina, M. F., Ilina, E. A. 2018, Assessment of the Reproduction Process of Agricultural Enterprises. *International Journal of Ecological Economics and Statistics*, **39(1)**, 171–179.

13. U.S. Commercial service 2017, *Ukraine – Agricultural Sector*. Available at: <https://www.export.gov/article?id=Ukraine-Agricultural-Machinery>.

14. Database from the official website of Ukrainian Statistic Service 2018. Available at: ukrstat.gov.ua.

15. CFC Consulting Company 2017, *Agriculture*. Available at: <http://www.ukraine-arabia.ae/economy/agriculture>.

16. *Unleashing Ukrainian Agricultural Potential to Improve Global Food Security* 2016. Available at: http://www.bleyzerfoundation.org/files/tbf_reports/Unleashing%20Ukrainian%20Agricultural%20Potential-August%202016.pdf.

17. An action Agenda for Sustainable Development. *Report for the UN Secretary-general*. Available at: www.unsdsn.org.

18. Monke, E. A, Pearson, S. R. 1989, *The Policy Analysis Matrix For Agricultural Development*. Available at: https://www.cepal.org/sites/default/files/courses/files/03_3_pambook.pdf.

19. Peng, G. C., Nunes, M. B. 2007, *Using PEST Analysis as a Tool for Refining and Focusing*

Contexts for Information Systems Research. In: ECRM 2007. 6th European Conference on Research Methodology for Business and Management Studies, 9th-10th July 2007, Lisbon, Portugal. Academics Conference International, 229-236. Available at: <http://eprints.whiterose.ac.uk/78787/>.

20. Kim-Keung, Ho J. 2014, Formulation of a Systemic PEST Analysis for Strategic Analysis. *European Academic Research*. **II(5)**. Available at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.433.5631&rep=rep1&type=pdf>.

21. Review of Agricultural Investment Policies of Ukraine 2015. Available at: http://www.oecd.org/globalrelations/Agricultural_Investment_Policies_Ukraine_ENG.pdf.

22. Eze C. C., Lemchi, J. I., Ugochukwu, A. I., Eze, V. C., Awulonu, C. A. O., Okon, A. X. 2010, *Agricultural Financing Policies And Rural Development In Nigeria*. The 84th Annual Conference of the Agricultural Economics Society. Available at: http://ageconsearch.umn.edu/bitstream/91677/2/7eze_lemich_ugochukwuetal.pdf.

23. Kirieieva, E., Kostuchenko, D. 2017, State and Prospects of Rural Development in Ukraine. *Baltic Journal of Economic Studies*. **3(4)**, 120-127. <http://dx.doi.org/10.30525/2256-0742/2017-3-4-120-127>.

24. Roumasset, J. 2004, Rural Institutions, Agricultural Development, and Pro-Poor Economic Growth. *Asian Journal of Agriculture and Development*, **1(1)**, 56-75.

25. Chornopishuk, T. 2018, Imperatives and peculiarities of the state financial and economic regulation of agrarian production development. *Economy, finances, management: topical issues of science and practical activity*. **2**, 51-66.

26. Skotsyk, V. 2017, *Organizational-economic mechanism of formation and functioning of the agricultural machinery Ukraine*. Abstract of Dr.S. dissertation. Vinnytsia National Agrarian University, Vinnytsia, Ukraine.

27. The Global Innovation Index 2017. 2018. Available at: www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2017.pdf.

28. Kucher, A. V., Kucher, L. Yu. 2015. Expert assessment of economic losses caused by soil degradation at agricultural enterprises. *Actual problems of economics*. **8**. 165-169.