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SECTION 2. ECONOMICS

**FINANCING OF SCIENTIFIC,  
TECHNICAL AND INNOVATIVE ACTIVITIES  
IN THE AGRICULTURAL SECTOR\***

*Lyudmyla I. Kurylo\*\* & Olexandr G. Shpykulyak\*\*\**

**ABSTRACT**

The sources of financing of scientific and technical works and possible ways to improve the effectiveness of such financing have been revealed. The most common means of stimulating innovation processes in a number of countries and proposals for research and innovation sector of Ukraine have been considered.

**KEYWORDS**

finance, science and technical activities, innovation, stimulation, agriculture sector

The introduction of innovative products in the reproductive process of the agricultural sector is largely hampered by two factors: financial security and reducing number of scientific and technological

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potential. A number of scholars<sup>49</sup> believe that the core is still financial support for the research institutions and users of intellectual property. These reasons are forming a kind of vicious circle in which the lack of financial resources deprives business and consumer from opportunities to improve their competitiveness and profitability through the introduction of innovative products developed by research institutions and at the same time does not allow the latter to carry out R&D, which makes problematic their further existence.

In Ukraine innovative development is provided with funding from various sources. The structure of funding of R&D activities can be classified in different directions<sup>50</sup>:

*a) By the source of funding:*

- 1) Funds allocated from the state budget (including funding of basic research and priority areas of science and technology);
- 2) Funds allocated from local budgets;
- 3) Funds allocated from the special extra budgetary funds;
- 4) Funds allocated from economic contracts of domestic customers;
- 5) Funds allocated from contracts with customers in other countries;
- 6) Own funds of enterprises and institutions;
- 7) Funds allocated from other sources;

*b) By the channeling of funds:*

- 1) Funding of research activities;
- 2) Funding of other expenses which are necessary for the functioning of scientific institutions (staff management, etc.);
- 3) Accumulation of funds (retained earnings), or other;

*c) By the types of costs:*

- 1) Salaries of researchers;
- 2) Purchases of equipment, machinery, etc.;

*d) By the stages of the cycle "research-production"*

*e) By the sectors of science: academic, industry, university, factory;*

*f) By the regions.*

49 Shchuryk, M.V. Financial Security of the Innovative Process of a Microregion/M.V. Shchuryk//Finances of Ukraine. – 2008. – N 3. – P. 35.

50 Ibid.



The adequacy of financial resources in modern conditions is one of the major components of economic maintenance of innovation activities.

The actual amount of funds allocated from the national budget is much smaller than the one defined by the law (at least 1.7% of GDP), (table 1)

The sources of financing of R&D activities  
(in actual prices, millions, UAH)<sup>51</sup>

Indicator	2000	2005	2006	2007	2008	2009	2010	2011
TOTAL:	2046.3	5160,4	5164,4	6149.2	8024,8	7822,2	8995,9	9591,3
including: state budget	614,5	1711,2	2017,4	2815.4	3909,8	3398.6	3704,3	3859,7
own funds	61,3	338,5	462,7	521,1	592,5	629,4	872	841,8
Funds of customers								
enterprises, Ukrainian organizations	785,8	1680,1	1563,3	1725.7	2072,2	1870,8	1961,2	2285,9
Foreign countries	477,1	1258.0	1000,9	978,7	1254,9	1743,4	2315,9	2478,1
Other sources	107,6	172,6	120,1	108,3	195,4	180	142,5	125,8
Financing of Agricultural Sciences, in% of total	5,3	5,0	5,5	5,7	5,9	6,1	5,8	5,6

According to statistics the actual demand for scientific-technical and innovation activities in Ukraine is satisfied by less than 20%. The trends in funding structure have not changed in recent years. The funds from the state budget in the structure of financing number 40.2%, which is 1 p.p. less than last year. The funds from customers in 2011 accounted 49.7%, 52% of which were foreign. The share of own

<sup>51</sup> Source: Research and Innovations in Ukraine/Stat. collection. – K., 2010.



funds amounted to 8.8% of the total funding. As for the other sources of funding there is 20% of 125,8 million stands for local budgets, and 13.4% are the funds for special purposes.

Therefore, improving the efficiency of the budget financing of scientific work remains the most problematic issue that can be addressed through the targeted funding of scientific research and development.

Monitoring the effectiveness of scientific activities is essential for the organization of public accounting of scientific and technical work. To this end, we consider it appropriate to establish a foundation of complete scientific development, which will consist of innovation, where the project is a form of their completion. It must necessarily include the developments created for the public order and projects of other performers at their own request<sup>52</sup>.

There must be agreements signed between the foundation and the owners of innovative developments, which will regulate the relationship of the parties in case of the project customer. At the same time the creator (the creators) of the development and its owner (owners) are protected by Ukrainian law in the field of intellectual property. This personal responsibility encourages better and faster execution of public contracts on scientific and technical products and receiving of compensation in case of using of development by the producers.

Organization of fund innovation marketing (the study of supply and demand in the market of innovation, advertising of development, etc.) will help to revive demand for innovation. The formulation of the DTC (development-to-consumer) offering program, which will provide the opportunity of credit, installment, etc., would help producers to use economic instruments in their work more efficient.

There are two ways of giving information:

- general information is provided to a consumer on a state level, which is necessary for reasonable decisions regarding to the transfer of development in the manufacturing sector in order to create or preserve its high-tech equipment;

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<sup>52</sup> Innovative Activity in the Agricultural Sector: Institutional Aspect: Study./[P.T. Sabluk, O.G. Shpykulyak, L.I. Kurylo and others], - K.: NSC IAE, 2010. - 706 p.



- the information on particular finished developments is provided on an industrial level in order to give an opportunity to navigate confidently in the world trends of technological development, to be clear about the advantages and disadvantages of development that are intended to be used along with the best foreign counterparts, to compare and select the appropriate options for those developments which are of interest.

This distinction in the provision of information will allow to realize very important management functions:

- Analysis of completed developments flow for the selection of domestic and foreign counterparts to assess the quantitative indicators, searching for analogues in available data banks;
- Assessment of development replication capabilities that is the study of conditions for their effective functioning;
- Marketing analysis of completed developments with the search for potential customers;
- Evaluation of developments on the criteria of technological excellence and safety use;
- Searching for existing developments on different criteria of effectiveness.

This requires a creation of technical possibility of using the world banks of the latest developments. Our country has not yet formed the preconditions for the active work with the data banks in global networks, so it is necessary to focus primarily on the use of internal capabilities and make benefit from the services which are present on the local media market<sup>53</sup>.

Shokun T., A. Goncharenko, Kuranda V. Pysarenko, T., Vavilin N. and Kuranda T.<sup>54</sup>, suggested the new procedure of registration of research and development works, which makes it possible to evaluate the scientific novelty, practical orientation and other parameters of the products created by the results of research; and enables the selection and further implementation of innovative products and increase the

<sup>53</sup> *Innovative Activity in the Agricultural Sector: Institutional Aspect: Study.*/[P.T. Sabluk, O.G. Shpykulyak, L.I. Kurylo and others], – K.: NSC IAE, 2010. – 706 p.

<sup>54</sup> *Monitoring of the Results of Scientific Researches.*/T.V. Shokun, V.M. Kuranda, N.I. Vavilina, T.V. Pysarenko, T.K. Kuranda//*Problems of Science: Interbranch Scientific and Technical Journal.* – 2008. – JSfo 5. – P. 20-26.



control level of budget funds using results in the scientific area. Maintenance of this registry is crucial for informing industrialists, representatives of business structures, researchers on promising results of science and enhancing the process of proliferation and commercialization of their results.

The support of scientific, technical and innovative activity and its stimulation is one of the important directions of public policy in industrialized countries. The encouragement of the implementation of the latest developments in production in the countries with an innovative model of development is carried out within governmental programs, which involve a big variety of economic and legal mechanisms for the development of new technologies and their high commercialization.

The most wide-spread ways of innovative process encouragement in a number of countries are the following: USA – exclusion of R&D expenses related to major industrial and trading activities from the amount of taxed income; tax relief for venture capital firms and companies engaged in R&D; no tax on lease for venture capital firms; preferential depreciation; investment tax credit, etc.. Similar incentives are applied in the UK: income tax reduction for venture capital firms; insurance system of funds that are provided by venture capital firms; write off of R&D expenditures in prime cost of goods (services); grants for research on developments of new products or technologies; reimbursement for innovation under the state programs of subsidizing small innovative firms, etc.<sup>55</sup>.

There are two types of financing in Poland – public financing, for the so-called ‘custom’ projects of national importance (the state takes responsibility for their implementation) and target financing carried by the state budget (50%) and business-customers who use innovations in manufacturing. Their basic researches are funded by the state budget, and applications – due to the direct market demand for R&D effects<sup>56</sup>. In China, investment and innovation activities are focused

55 Research and Development and Innovative activities in Ukraine in the Context of European Integration Processes: Study/I.Yu. Yegorov, I.A. Zhukovych, Yu.O. Ryzhkova, M.V. Pugachova; R&D Complex of statistical Researches. – K.: IPC State Statistics Service of Ukraine, 2006. – 223 p.

56 Smolenyuk, P.S. State Regulation of Investment and Innovation Activities/P.S. Smolenyuk//Innovative Economy. – 2007. – 3. – P. 143.



primarily on self-financing through various forms of integration of science and production and cooperation with foreign investors<sup>57</sup>.

Agricultural policy has certain specifics that affect the opportunities of innovation implementation. They need preliminary assessment of their impact on the land fund, living organisms, etc. in this area. In agriculture there is also a much higher risk when introducing innovative product. And first of all, the solution of these problems requires state funding<sup>58</sup>.

The main purpose of introducing new technology in a market economy is to increase productivity and obtain additional income. The main components in the development of innovation processes in agriculture are research institutes, selective centers with scientific potential. In general, the success of the functioning of crops and livestock areas depends on the efficiency of the creation and introduction of new crop varieties and new breeds of animals that meet the requirements of the market.

In 2010 it was planned to allocate 485 810 000 UAH from the general state budget to the National Academy of Agricultural Sciences for funding scientific research and national target programs, 19 062 000 UAH are targeted for public and industry programs. Actual financing accounted for 93.3% and 99.9% of the target.

Share of the special fund significantly increased (161 786 000 UAH) which is 22,7% more than planned, the main sources of income of which were funds from state contracts (43.2%), contracts with the Agriculture Ministry (1.3%), rental property (12.9%), and high-tech products and other sources (42.6%)<sup>59</sup>.

In 2011 the actual value of funding of applied scientific and technological developments, works for the state targeted programs and public order was 448 580 400 UAH, which is 99,9% of planned. Expen-

57 Bublyk S.G. Analysis of National Scientific Investments of the Top Countries of the World/ S.G. Bublyk//Problems of Science. – 1999. – 2. – P. 46.

58 Shchuryk M.V. Financial Security of the Innovative Process of a Microregion/M.V. Shchuryk//Finances of Ukraine. – 2008. – N 3. – P. 34.

59 Report on the Activities of National Academy of Agricultural Sciences of Ukraine in 2006-2010 and in 2010/compiled by V.V. Adamchuk, O.M. Zhukors'ky, O.S. Sydorenko. – K.: Agricultural Science, 2011. – 422 p.



diture on research activities in the general fund amounted to 431 505 600 UAH, including labor remuneration and benefits – 385 283 200 UAH. Budgetary costs per scientific worker were 36 300 UAH.

The average salary per employee of the research institution in 2011 due to the general fund was 2369 UAH<sup>60</sup>. Under conditions of low state benefits – 385 283 200 UAH. Budgetary costs per scientific worker were 36 300 UAH.

The average salary per employee of the research institution in 2011 due to the general fund was 2369 UAH<sup>61</sup>. Under conditions of low state financing of R & D activities it is logical to define a priority of research, which will result to the rapid introduction of developments in production, creation of a competitive product innovation.

According to the State Target Program of Ukrainian villages for the period till 2015 it was planned to allocate 120 750 500 UAH of budget funds during 2008-2015 to support the agricultural sector, where only 4.5% will be used to develop agricultural science and another 15% to improve the system of professional education<sup>62</sup>. Government support for R&D and innovation activities should include the formation of regional innovation development programs that will include an order for scientific, technical and innovative products, funding of R&D and innovation projects on regional and national level, assistance to the leading scientific institutions in getting credit resources of international organizations; development and implementation of legislative and regulatory framework to facilitate the development of scientific, technological and innovation activities; release of intellectual products on the market.

Under conditions of limited budgetary resources of innovation activities it is necessary to create an extra-budgetary fund of innova-

<sup>60</sup> Report on the Activities of National Academy of Agricultural Sciences of Ukraine in 2011/ compiled by A.S. Zaryshnyak, L.A. Pylypenko, V.V. Kuz'mins'ky. – K.: Agricultural Science, 2012. – P. 269.

<sup>61</sup> Ibid.

<sup>62</sup> The State Target Program of Development of Ukrainian Village for the Period up to 2015/ Resolution Cabinet of Ministers of Ukraine of 19.09.2007 1158. – K.: NSC IAE, 2007. – 53 p. Kolod'ko, T.G. Mechanism of Budget Financing of Innovative Development of AIC in terms of Ukraine's Accession to WTO/T.G. Kolod'ko//Economy of AIC. – 2008. – 2. – P. 87.



tion development; to reduce the interest rate of the loans for the regional budget companies and organizations of research and innovation sector; development of the centers of support to the enterprises providing innovative products; fractional subsidizing of the costs associated with the development of small innovative businesses (at regional and district levels).

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*Appendix A*

There has been a technical error in our magazine Princeton Journal of Scientific Review: Law, Special Issue, Number 2 dated June 2013. In the article ADMINISTRATIVE RESPONSIBILITY AS A LEGAL GUARANTEE OF PROVIDING PUBLIC SERVICES IN THE AGRICULTURAL SECTOR OF UKRAINE the name of the author had to be written instead of Dmytro V. Pavlenko, Denys V. Pavlenko. Mr. Denys V. Pavlenko is the author of the article ADMINISTRATIVE RESPONSIBILITY AS A LEGAL GUARANTEE OF PROVIDING PUBLIC SERVICES IN THE AGRICULTURAL SECTOR OF UKRAINE . Please, accept our apologies for this technical error.