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MANAGEMENT OF THE AGRICULTURAL VOCATIONAL EDUCATION PERFORMANCE AND ITS IMPACT ON THE SUSTAINABLE DEVELOPMENT OF THE RURAL ENVIRONMENT IN THE REPUBLIC OF MOLDOVA

SPECIALITY: 521.03 – ECONOMICS AND MANAGEMENT IN THE FIELD OF ACTIVITY

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The doctoral thesis and the abstract can be consulted at the Republican Agricultural Scientific Library of the State Agrarian University of Moldova and on the ANACEC website.

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CONTENTS

CONCEPTUAL GUIDELINES OF RESEARCH

The actuality and importance of the research theme. The sustainable development of the rural environment in the Republic of Moldova is an objective of major significance. Over time, the approach to the subject has become more intense both globally and nationally. An indispensable condition for achieving sustainable development is the improvement of the vocational education process with an agricultural profile and the extension of the area of its performance indicators and the impact that they have on the economic and social development of the rural environment.

Being a post-experience thing, the effects of education are not immediately visible, but its role is extremely important in achieving the goals of sustainable development. Therefore, it is certain that agricultural vocational education is a „factory" for training young specialists qualified in the required fields of activity in the rural areas of the Republic of Moldova.

Agriculture, as a basic branch of the analyzed environment, has wide ecological, economic and social implications. In this sense, the sustainable development of agriculture is a national priority, on which in the last decade more attention has been drawn, finding its expression in the developed policies and strategies.

At the moment, the sustainable development of the rural environment is a major concern, having as a reference the environmental problems and the crisis of natural resources, the urgent need to approach them, being aware and public declared about five decades ago. At the same time, more and more efforts have been directed towards highlighting the role and place of education at all levels in achieving the goals of sustainable development. The international community's concerns in education for sustainable development are reflected in a number of international events.

The Republic of Moldova has, in turn, assumed the objectives of sustainable development, by nationalizing the respective indicators, as well as reflecting the concern for sustainable development in a series of strategic documents. Implicitly, there are a number of shortcomings both in the content of the related strategies and in the extent to which the performance indicators of vocational education, but also the performance itself, contribute to achieving the objectives of sustainable development.

The main goal of this research: to explain the impact of the performance of agricultural vocational education management on the sustainable development of the rural environment.

Objectives of the thesis are:

1. Evaluation of the performance measurement system in the vocational education from the Republic of Moldova in terms of the extent to which the adopted indicators correspond to the education requirements for sustainable development;
2. Identification and description of the cause-effect links between the performance of agricultural vocational education and the indicators of economic and social development of the rural environment based on the contribution of skills, obtained by specialists in the initial training process, on indicators of sustainable development at the agricultural enterprise level;
3. Evaluation of the quantitative and qualitative outputs of vocational education with agricultural profile, as well as the relations of young people with the labor mar-

ket - intermediate link in the transfer of the performance of vocational education in the performance of the sector;

4. Quantifying the contribution of the performance of vocational education with agrarian profile in the sustainable development of the rural environment by modeling the impact of the educational performance on the indicators of sustainable development of agricultural enterprises;

5. Proposing an updated mechanism to evaluate the quality of educational performance in terms of performance indicators.

The research hypothesis consists in the assumption that the management of the performance of agricultural vocational education is an important factor of sustainable development of the rural environment, the impact being exerted through the enterprise - as the basic economic link of the economy and employment unit.

Degree of study of the problem. The issue of sustainable development of the rural environment is studied profoundly, both at national and global level. In order to achieve improvements in this evaluation, as mentioned by a considerable number of researchers, special emphasis must be placed on the quality of education of the young generation. In this context, we can deduce the role that pertain to the institutions of professional-technical and higher education in the respective process.

Mentioning below the authors and their studies regarding the approached topic, we found out a deficiency of the research of the analyzed subject. The analysis of the content of doctor and doctor habilitat theses, elaborated in the period 2010-2016, showed no researches on this subject.

Among the authors who have conducted research in the field of performance management can be listed: Bocean; Bîrcă; Neacşu; Cimpoieș and Sîrbu; Bădescu, Mirci și Bögre; Avasilicăi; Gherghina, Văduva and Postole; Prisăcaru; Litvin - authors from the Republic of Moldova and Romania, as well as authors from other countries: Armstrong; Pulakos; Verweire și Berghe; Forrester; Shields; Mathis and Jackson; Briscoe and Claus. The theme of sustainable development of the rural environment is also found in the works of authors from the Republic of Moldova and Romania: Berca; Chicinaș and Blaga; Otiman; Băltărețu; Lazăr, Mortan and Vereș; Prisăcaru, and from other countries: Rabbinge și Bindraban; Spiegelaar and Tsuji; Zhao, Luo, Deng and Yan; Cai, Huang, Yang, Sun and Chen; Pašakarnis, Morley and Malienė; Gobattoni, Pelorosso, Leone, Ripa; Suarez etc.

Synthesis of the research methodology and justification of the chosen research methods: The research process, according to the assumed objectives, was carried out by applying classical research methods: empirical observation, comparative analysis (quantitative, qualitative and historical), structured and unstructured thematic interview, questioning method, tabular and graphic illustration of information, synthesis, induction and deduction, correlation and regression method.

In addition to scientific and analytical publications on the subject, there served as a research information base available data of the National Bureau of Statistics of the Republic of Moldova, the normative framework of the Republic of Moldova reflecting the investigated issues, the database of the Statistical Office of the European Union, the data obtained in the process of interviewing and questioning different groups of respondents (business representatives and students) etc.

The research methods were selected according to the established objectives and correspond to the provisions of the scientific research methodology related to the investigated field.

The object of the research is the vocational education system with agricultural profile, represented by vocational-technical (3-4 ISCED levels) and higher education institutions (6-7 ISCED levels).

The theoretical significance. The results obtained by the research are a support of theoretical and methodological concepts in the field of agricultural vocational education performance management and its impact on sustainable development of the rural environment of the Republic of Moldova.

The applicative value of the thesis resides in**:**

1. *At the theoretical-methodological level* - the results can be applied both in the teaching process within the educational institutions with agricultural profile, and by the scientific researchers in the field of activity concerned.
2. *At the macroeconomic* level - research results could be used by line ministries: Ministry of Education, Culture and Research; Ministry of Agriculture, Regional Development and Environment and sectoral committees concerned.
3. *At the microeconomic level* - the results of the research can be used by agricultural economic agents in rural areas to express their requirements in the vocational education system in terms of necessary skills.

Approval of scientific results. The theoretical-methodological and practical results of the research were presented at a series of national and international scientific-practical conferences: Scientific Conference „Development of trade relations from the perspective of economic integration of the Republic of Moldova in the international economic circuit" (Chisinau, TCUM, 2017); International Scientific Symposium „Perspectives on sustainable rural development in the context of new economic challenges" and International Scientific Symposium „Sustainable rural development - achievements and perspectives", dedicated to the 85th anniversary of the founding of the State Agrarian University of Moldova (Chisinau, SAUM, 2018); International Scientific Conference „Perspectives and issues of integration in the European space of research and education" (Cahul, USC, 2019); International Scientific Conference „Modern paradigms in the development of the national and world economy" (Chisinau, MSU, 2019) etc. The research results were capitalized by the Ministry of Agriculture, Regional Development and Environment.

The research results were published in 12 scientific papers.

THESIS CONTENT

In **chapter 1** of the thesis – **„Theoretical aspects of vocational education performance management with respect to the concerns for the sustainable development of the rural environment"** a push into conceptualizing performance and performance management is made; it elucidates the process of emergence and consolidation of performance management in vocational education worldwide, including the system of performance measurement indicators used. Also, the synthesis of the conceptual approaches of the rural environment, of the sustainable rural development is carried out; the indicators of sustainable development at European, national and enterprise level are

clarified; a foray into the concept of education for sustainable development is made; the most relevant international events dedicated to education for sustainable development are presented, as well as the tasks undertaken within them; the analysis of the normative framework of the Republic of Moldova and of the performance indicators in the vocational education system is performed in terms of the extent to which the assumed objectives for education for sustainable development are reflected.

Having Latin origin („performare" - analyze a proposed action), the term "performance" was subsequently imposed by a multi-purpose approach. At the same time, through the synthesis of multiple approaches to performance, we consider that this term has an optimal relevance, namely in expressing the final side of the activities performed. Also we support the acceptance of performance as success, an exceptional result, superior compared to the average data that we find in several authors, in this sense the term is also presented in the explanatory dictionary of the Romanian language. Based on the above, as well as based on the competitive environment in which current activities take place in all fields, including academia, we consider it appropriate and relevant to examine the concept of "performance" as *an exceptional result obtained in an activity, superior comparatively with average data, able to ensure the competitiveness and implicitly, the sustainability of an organization.*

Synthesis of conceptual approaches to performance management [5; 7; 8; 23; 25; 26; 28] showed that, in general, it focuses on the following landmarks:

- examining performance management as a process;
- systemic approach to performance management;
- strategic approach to performance management.

In the context of the above said, we consider that the definition of performance management offered by Armstrong [4] has an optimal significance, according to which it is designated "...as a continuous process of improving performance by setting individual and group objectives, linked to strategic goals of the organization, performance planning in order to achieve the established objectives, analysis and estimation of progress, development of people's knowledge, skills and abilities".

Coming from the private sector, performance management was later taken over by the public sector, including vocational education institutions, simultaneously with the penetration of economic thinking in the management of vocational education.

In the last decades (starting with the 80s of the last century), in the vocational education on the world there have occured transformations that have been imposed by two major interventions:

- as a parameter of the institutional performance, the efficiency indicators of the carried out activities were introduced, which, in their essence, express effects superior to the efforts, therefore benefits that justify the financial resources allocated by the state;
- the educational offer was transformed into a marketed one, its quality representing a factor of the sustainability of the vocational education institution.

Based on the above mentioned, it is obvious that the performance of vocational education, in the created situation, must express the quality of financial resources management, on the one hand (rendered by efficiency indicators), and the quality of the product proposed to the educational services market, on other. We consider that

the management of the vocational education performance, in turn, must be defined as *a management system aimed at carrying out vocational education activities with maximum effectiveness and efficiency, so as to ensure the competitiveness and sustainability of the institution and allow optimal impact on the development of the society.*

The emergence and consolidation of performance management in the public sector, including vocational education, has occurred simultaneously with the establishment of a performance measurement system. Having the aim of measuring the efficiency of public money invested in vocational education, a concern that has led to the penetration of economic thinking in vocational education management, performance measuring and analysis are often expressed by the term "efficiency analysis" meaning tool for estimating the efficiency of professional training process. To this end, the results of the institutions' activity with regard to inputs are examined, both components being expressed by a series of indicators that vary, more or less, from one country to another. In the US, for example, it has been found out that the following indicators of institution performance are most commonly used: unit costs (per student); the workload rates of the faculty teachers; student-teacher rate; cohort analysis: progression and wear; license exam pass rates; analysis of the social, ethnic and gender context of students; the number of degrees conferred [17, p. 5].

The United Kingdom has established in Europe as a pioneer in the development of vocational education performance indicators: after much debate, it was not until the late 1990s that indicators were developed to express the inputs, processes and outputs for each institution. The indicators initially designed in 1998 have evolved permanently, subsequently, the largest revisions being made in 2006-2007, following consultation with beneficiaries in the sector. In the current version, the indicators adopted by the United Kingdom for the evaluation of university performance are systematized on two levels: institutional and sectoral, and in four areas: access / extension of the participation of underrepresented groups; non-continuity and completion rates of the module; employment; research results [18, p. 3].

In the context of the above said, we should also mention the contribution of the European Quality Assurance Reference Framework for Vocational Education and Training (EQAVET) established by the Recommendation of the European Parliament and of the Council, adopted on June 18, 2009. Being conceived as a European tool to support the development of national quality assurance systems in vocational education, EQAVET offers a common set of principles to guide quality assurance systems within countries, as well as to support the transparency of quality assurance systems at European level at all levels of vocational education, and it contains the following components:

- the quality improvement cycle, consisting of the following steps: planning, implementation, evaluation and review;
- quality monitoring, as a combination of internal and external evaluation procedures, established by Member States to receive continuous, factual and credible feedback on progress towards the pre-established objectives;
- quality measurement tools - 10 indicators at system level, to assess, evaluate and confirm the quality, effectiveness and efficiency of the vocational education system [12].

By generalizing the above, however, we must recognize that neither the adoption of the EQAVET indicator framework model, nor the numerous practices of ap-

proach to performance indicators by vocational education institutions within its performance management systems exclude certain difficulties related to the quantification of vocational education outcomes, namely: the inability to measure all outputs in monetary and physical terms; the exact mismatch of the time in which the inputs occur with that of the outputs (in fact the outputs occur in a much wider time horizon); difficulty in establishing the technical relationship between inputs and outputs. Based on the above mentioned, we can deduce that, even if countless attempts are made to improve performance measurement systems, due to the complexity of the field, multiple effects, etc., measuring the performance of vocational education remains an area with deep potential for investigation and intervention.

Although, the term sustainable development has appeared in response to environmental problems and the crisis of natural resources, it has a wide coverage area, targeting economic, social and environmental (ecological) issues. Thus, with reference to sustainable rural development, we consider it fair to define it as *a complex strategic process, aimed at achieving economic, social, cultural and environmental objectives, so as to ensure continuous economic and social growth in rural areas, provided conservation and protection of natural resources for future generations.*

Currently, the estimation of sustainable development at international level can be done through 241 indicators (or 230, if we take into account the fact that 9 indicators are repeated two or three times), developed in accordance with 17 objectives of sustainable development set out in the Agenda 2030. In the context of adapting the 2030 Agenda, the Republic of Moldova mapped the global indicators and identified the most relevant ones. As a result of this process, the objectives of sustainable development were nationalized, they being found in 225 indicators.

In the context of the concern for sustainable rural development, we will highlight, in particular, the role played in this regard by agricultural economic units: *sustainable rural development cannot be achieved without each economic unit in the rural area directing its own efforts towards sustainable development.* Efforts in this regard can be expressed by indicators that reflect the quality of sustainable development of the production environment (ecological aspect), the social environment and sustainable economic development [19, p. 55].

The focus on education, in view of the concern for sustainable development, led to the introduction of the term "Education for Sustainable Development" (ESD). According to UNESCO, ESD "... empowers learners to make informed decisions and take responsible actions for environmental integrity, economic viability and a just society, for present and future generations, while respecting cultural diversity" [27].

The concern for ESD has led to the organization of several international events, including the World Education Forum in Incheon, where the adoption of the famous Incheon Declaration - "Education 2030" took place. The Incheon World Education Forum has established itself through a multilateral approach to the Sustainable Development Goal 4 - " Ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all", highlighting a number of tasks to be achieved, four of which (4.3, 4.4, 4.5, 4.7) also aim at vocational education.

The Republic of Moldova, by signing, together with other states, the Declaration of the Summit on Sustainable Development, has assumed the provisions of the

2030 Agenda for Sustainable Development, subsequently adjusting the indicators to the national context. By the correlative examination of the global and national indicators, however, there was identified a certain disregard for vocational education in the process of adapting the global indicators to the national framework. Thus, the exact content of the global indicator 4.7.1 is: "The extent to which global citizenship education and education for sustainable development, including gender equality and human rights, are integrated at all levels into national education policies, curriculum, staff training teaching and student assessment ". At national level, as set out above, this indicator contains only references to the school curriculum. In this context, we consider that it would be necessary to give a broader content to the respective indicator, being focused not only on the school curriculum, but on the education curriculum achieved at all levels, including the professional one.

By investigating the normative acts of the Republic of Moldova regarding the tasks relevant for vocational education, we find out that they, more or less, are found in several strategic documents, referring directly to education or revealing important aspects of development, where the education system is approached in context. At the same time, a number of problems were detected:

- Dispersion of objectives and actions in a large number of documents, thus, for educational institutions being difficult to perceive them in full, and also their transfer in concrete missions and objectives;
- Absence of correlations of objectives and actions, proposed in various documents;
- Insufficient approach to environmental education in the Education Development Strategy for 2014-2020
- Superficial approach to ESD in the National Strategy for Agricultural and Rural Development for 2014-2020.

Based on the above said, concerning the normative framework of the Republic of Moldova with regard to ESD, we consider it necessary to improve it by developing and adopting a strategy of ESD 2030, integrating and adapting the tasks of Education 2030 to country-specific conditions, levels and fields of education, including agricultural vocational education.

The consolidation of performance management in vocational education in the Republic of Moldova occurred in the context of quality management systems, which, along with other positive implications, it also was imposed by establishing performance indicators within ten accreditation standards, which are landmarks of immense value for each institution in directing its efforts towards a successful activity. At the same time, as a result of the correlative examination of the performance indicators related to the accreditation standards for vocational-technical and higher education in relation to the certain tasks established by the Incheon Declaration "Education 2030" identified as appropriate for vocational education, the following was found out:

- As a result of the synthesis of 51 performance indicators for higher education and 38 for vocational-technical education, 28 indicators for higher education and 26 - for vocational-technical education were identified, through which they contribute to the achievement of ESD tasks established by Incheon Declaration "Education 2030";
- While some performance indicators may simultaneously contribute to two or

three tasks of ESD, it was discovered, however, that task 4.7 (which provides for "obtaining knowledge and skills to promote sustainable development, respect for human rights, gender equality, a culture of peace and nonviolence, cultural diversity and the contribution of culture to sustainable development "[20]) is not found in certain outcome indicators.

Based on the above said, we can mention *the need for interventions in the content of performance indicators by introducing additional indicators to highlight the orientation of study programs towards the acquisition of concrete skills (professional and transversal) for sustainable development*, as shown in table 1.

Table 1. Recommendation of additional performance indicators for the vocational education system

Group of performance indicators	Proposed additional indicators	Specification regarding the implementation of indicators
Indicators of the development quality of vocational education processes	Distinctive reflection of the objectives of sustainable development in vocational education programs of all levels.	Providing, within each vocational education program, the skills of sustainable development and their concretization through specific competencies/study purposes for the disciplines related to the program.
	Orientation of research activities of pupils and students towards the formation of sustainable development skills.	Diversifying the topic of scientific conferences of pupils/students by including several topics related to sustainable development; Permanent updating of the topic of undergraduate theses by including topics related to sustainable development; The inclusion of a point, as a mandatory component of each bachelor's thesis/diploma thesis, through which the results of the investigation will be evaluated in terms of contribution to achieving the objectives of sustainable development; Organizing several scientific forums for young studios, focused on sustainable development issues.
Indicators of vocational education system outputs	The contribution of graduates skills to achieving sustainable development goals.	Elaboration of mechanisms for evaluating the opinion of graduates and employers regarding the extent to which skills acquired in the vocational education process contribute to achieving sustainable development goals, their optimal capitalization as tools for optimizing the contribution of study programs in achieving the objectives of sustainable development.

Source: elaborated by the author

In **chapter 2 - „Implications of the vocational education system with agricultural profile in the sustainable development of the rural environment in the Republic of Moldova"**, there is characterized and schematically presented the cause-effect relationship between the performance of the vocational education system with agricultural profile and the sustainable development of the rural environment; there is made an analytical incursion in the labor market trends in the rural environment of the Republic of Moldova; the educational offer with agrarian profile is analyzed in dynamics; there are analyzed the performances of the professional education with agrarian profile, in terms of quantitative and qualitative outputs, through the implications in the sustainable development of the rural environment; there is evaluated the

communication with employers, as a factor of connecting the educational offer to the requirements of sustainable rural development.

There exists a cause-and-effect relationship between the performance of the agricultural vocational education system and sustainable rural development, mediated by the labor market and employer enterprises, as shown in Fig. 1.

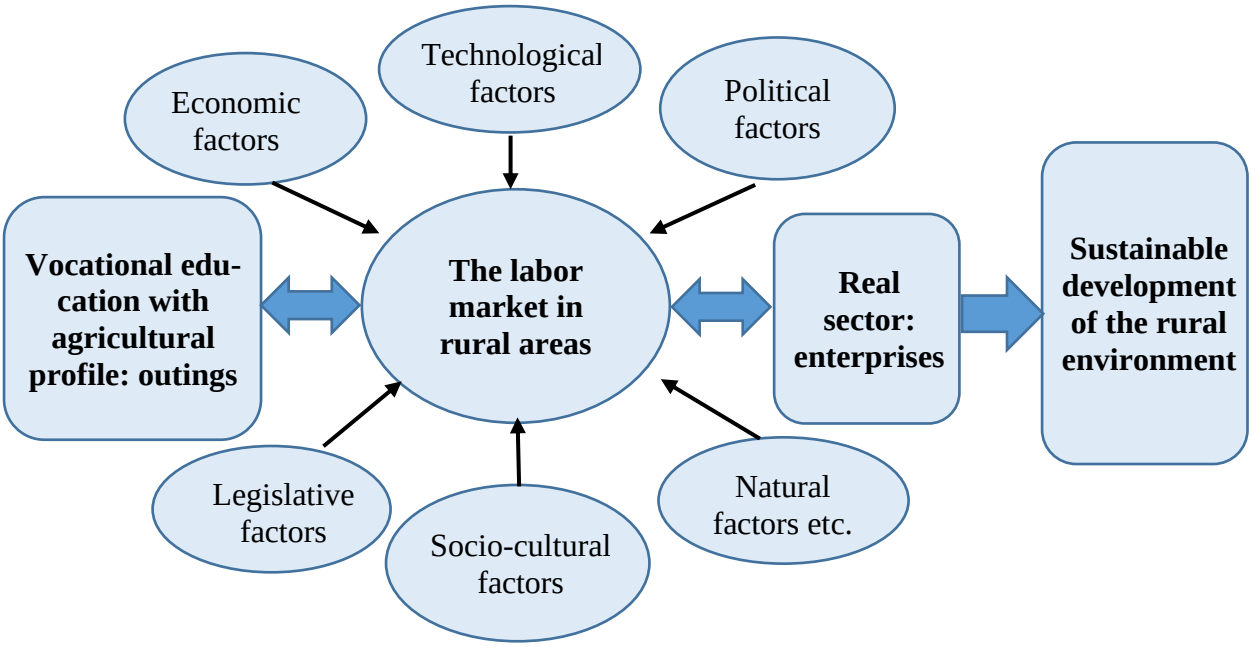

Fig. 1. The cause-effect relationship between the performance of vocational education with agricultural profile and the sustainable development of the rural environment

Source: elaborated by the author

Among the performance indicators of vocational education, those who express the outputs are directly manifested in that relationship, namely: *the number and quality of trained specialists.*

As an "arena" in which the outputs of the agricultural vocational training system face the demands of the real sector and, in particular, of agriculture as a basic economic branch in the nominated environment, the rural labor market imposes itself through the following positive aspects: superior trends in the evolution of the absolute and relative basic indicators compared to the national averages, as well as of the urban environment; non-essential increase in the number of the active population and the employed population; increasing, since 2012, the activity and employment rate; stable reduction of the unemployment rate since 2010. At the same time, we can mention that, even if there is an improvement of labor market indicators in rural areas by comparing the data of 2018 with 2008, the trends are not stable and the level reached is very modest compared to the European Community. Thus, in 2018 the average employment rate of the population of the Republic of Moldova was by 31,2 p.p. lower than the European average, and the employment rate of the rural population - by 30,4 p.p. lower.

By generalizing the results of the labor force analysis in the agricultural sector of the Republic of Moldova, we positively appreciate the following aspects: since 2012 - the quantitative ascent of the labor force of the branch; a high share of the skilled workforce (especially holders of higher education diplomas). We also note the

following problems: the slow pace of growth in the number of employees; the inability of the sector to create new formal jobs; the slow pace of increasing the share of specialists with higher education in the composition of the skilled workforce; continuous reduction of the employees share with professional diplomas (4-5 ISCED levels) and qualification certificates (3 ISCED level) in the composition of the qualified workforce; the continuing persistence of the workforce aging in the concerned sector.

Even if the problems related to the agricultural labor force in the Republic of Moldova are, for the most part, similar to those found at European level [10], arising from the special significance of agriculture as a basic branch for the economic and social development of the state, we can deduce the need for massive efforts, aimed at a more effective and efficient management of the workforce of the branch, its optimal connection to the needs of the sector in terms of quantity and quality. The economic and social context of the Republic of Moldova requires the need to pay attention to the growing trends of the population employed in agriculture, and, implicitly, to take over the practices applied by countries forecasting such a trend in order to achieve this goal, such as Belgium, France, Germany, Lithuania, Portugal and the United Kingdom.

As previously mentioned, among the performance indicators of the vocational education system, the indicators representing the outputs are those that are later manifested in the complex system of cause-effect relationships "performance of vocational education - performance of sustainable development". In quantitative terms, the outputs of vocational education are expressed by the number of trained specialists - graduates of related educational institutions. Qualitatively, they must be assessed by the extent to which the competencies held meet the requirements of the sectors [21, p. 485].

For a deeper investigation of the outputs of the vocational education system with agricultural profile in quantitative aspect, along with the evaluation of the dynamics of the number of graduates, the analysis of the number of pupils and students was performed, thus highlighting not only current trends but also highlighted future trends in the performance of that system (Fig. 2-6).

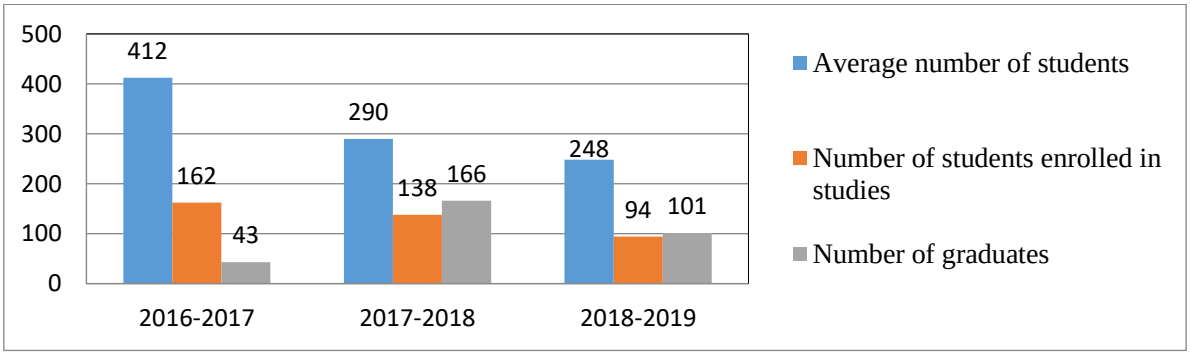

Fig. 2. Evolution of the number of students and graduates in secondary technical vocational education, field "Agriculture, forestry, fish farming and veterinary medicine" in the Republic of Moldova during 2016-2019, pers.

Source: elaborated by the author based on data [6]

The data in figure 2 show a stable reduction in the number of students in secondary vocational education, the field "Agriculture, forestry, fish farming and veterinary medicine" in 2016-2019, a trend that also affects the number of graduates.

We can see a similar evolution of number of students in the field investigated in post-secondary technical vocational education (Fig. 3). We can state that, according to the data shown in figure 4, in the period 2016-2018 the number of graduates has continuously increased. However, this growth trend cannot be maintained by virtue of the steady reduction in the number of students.

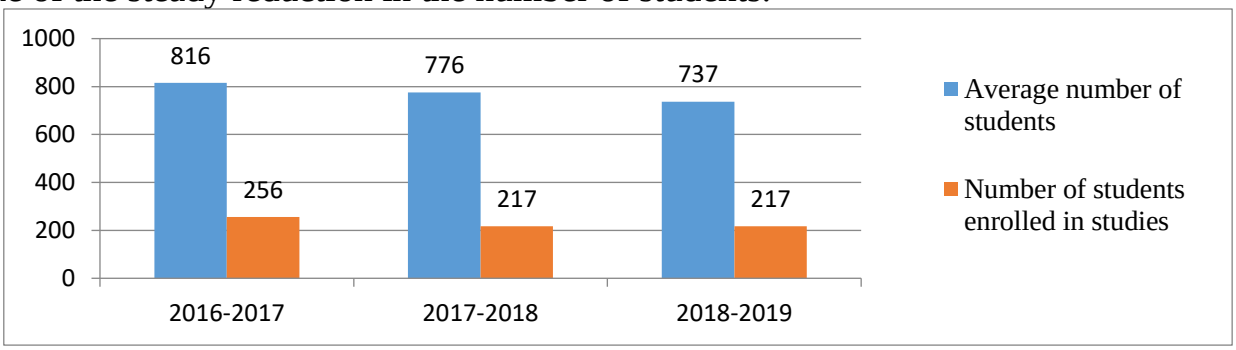

Fig. 3. The evolution of the number of students in post-secondary technical vocational education, the field "Agriculture, forestry, fish farming and veterinary medicine" in the Republic of Moldova during 2016-2019, pers.

Source: elaborated by the author based on data [6]

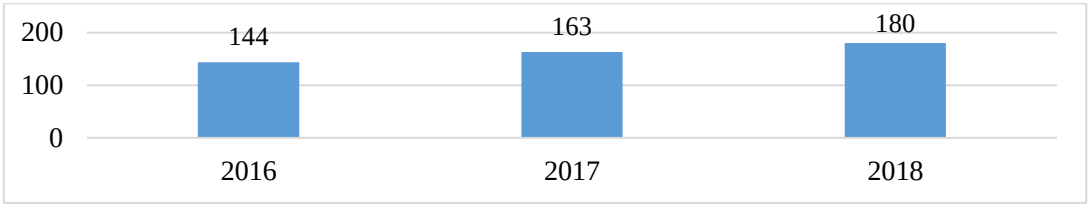

Fig. 4. Evolution of the number of graduates in post-secondary technical vocational education, field "Agriculture, forestry, fish farming and veterinary medicine" in the Republic of Moldova during 2016-2018, pers.

Source: elaborated by the author based on data [6]

Regarding the evolution of the number of students in higher education programs in the field of agricultural sciences (Fig. 5) we can see the existence of a stable downward trend, being attested a less precarious situation in the evolution of the number of students in veterinary medicine. During the same period (2016-2019), if the number of graduates of the integrated study program "Veterinary Medicine" did not change significantly, the number of graduates of agricultural science programs decreased sharply, by over 65% (Fig. 6).

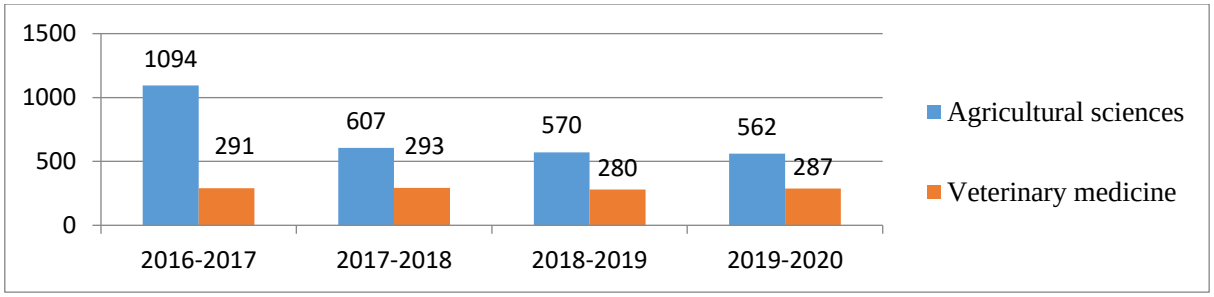

Fig. 5. Evolution of the number of students in higher education programs in the field of agricultural sciences and integrated studies in the field of veterinary medicine in the Republic of Moldova during 2016-2020, pers.

Source: elaborated by the author based on data [6]

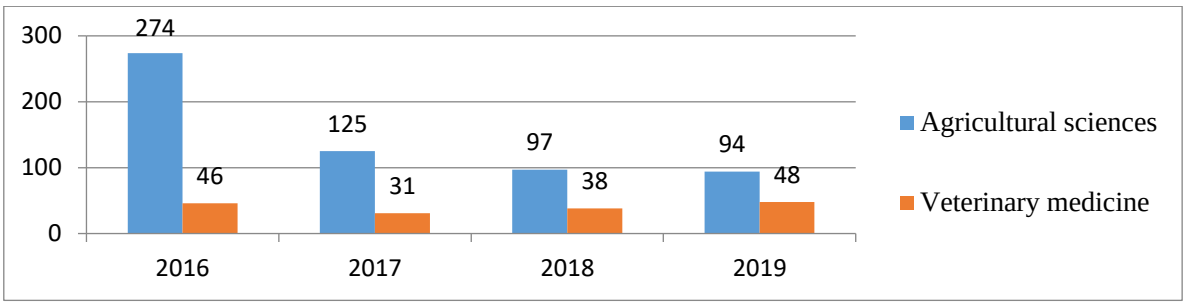

Fig. 6. Evolution of the number of graduates of higher education programs in the field of agricultural sciences and integrated studies in the field of veterinary medicine in the Republic of Moldova during 2016-2019, pers.

Source: elaborated by the author based on data [6]

The comparative analysis of the tendencies in the evolution of the number of pupils and students of the vocational education programs with agrarian profile and of the general average tendencies at national level allowed to deduce the following:

- in secondary and post-secondary technical vocational education in the analyzed period (2016-2019) the rate of reduction of the number of students in the analyzed field was, respectively, by 20,5 p.p. and 7,1 p.p. higher than that recorded on all programs. Implicitly, the share of students in this field in the total number of students, respectively, was continuously reduced by 0,55 p.p. and 0,2 p.p .;
- we can see an even more precarious situation in the comparative evolution of the number of students in higher education. Thus, if the number of students in the field of "Veterinary medicine" has not undergone essential changes, the rate of reduction of the contingent of students in the field of "Agricultural sciences" has exceeded the average trend in the country by 28,83 pp. There is also a reduction in the share of students in the field by 0,68 pp.

With reference to the evolution of the number of graduates in the field of agriculture, forestry, fish farming and veterinary, vocational and technical education, we need to take in consideration that it is qualitatively superior to the situation of the total number of graduates of that level of education, being found a growth rate of graduates by 38,1 p.p. higher in secondary technical vocational education and by 21,5 p.p. - in post-secondary technical vocational education. At the same time, there can be seen a favorable situation in the evolution of the graduates share in the field of agriculture, forestry, fish farming and veterinary medicine.

By correlating the data on the evolution of the contingent of students and graduates, we can deduce that, by virtue of the reduction of the number of students, in a near time, the trends in the number of graduates will change. The programs related to the field "Agriculture, forestry, fish farming and veterinary medicine" will be more affected, being reduced in their attractiveness compared to other initial training programs.

In higher education, the field of "Agricultural sciences", already at the current stage there is an increased rate of reduction of graduates, exceeding by 41,5 p.p. the rate of reduction of graduates on average in all programs, established in the period 2016-2019.

Even if, by comparing the existing situation in the Republic of Moldova with that in the European space, there is a series of similar problems regarding the attrac-

tiveness of vocational programs, we can still see some signs of remedying the situation in the future in EU tertiary education. Thus, the higher share of students in agriculture, forestry, fish farming and veterinary medicine (1,9%), compared to the share of graduates in the same field (1,7%) demonstrates the increase, even non-essential, of the attractiveness of the nominated field [13].

By generalizing everything that was said concerning the dynamics of the educational offer, we can say that ***the trends identified in the number of students and graduates reveal the decrease in the performance of vocational education with agricultural profile approached in terms of quantitative outputs over a period of 3-4 years.***

The significance of the problem of young people's relations with the labor market in the context of the concern for sustainable development is globally recognized, a statement argued by the content of Objective 8 of the famous 2030 Agenda: "Promoting inclusive and sustainable growth, employment and decent work for all" [11]. The increased attention paid to young people is a natural and justified one, there are a whole series of negative phenomena that are manifested in the quantitative and qualitative evolution of the segment of qualified young population. The studies carried out, together with the existing statistical data, reveal that in the Republic of Moldova the employment indicators of young people register lower values compared to the total economically active population [9, p. 6]. Thus, it is estimated that only a third of Moldovan youth work, while at EU level about 46% of young people are employed [14, p. 33]. Based on this finding, ***the problem of the actual transfer of the performance of vocational education in the performance of the targeted sectors is obvious, a problem generated by the insertion in the field of work of a small number of graduates.*** The last reasoning is also confirmed by the analysis of the statistical data on the evolution of the young skilled workforce. Thus, the activity, employment and unemployment rates of the young skilled population in the Republic of Moldova during 2010 and 2018 was analyzed comparatively and the following was found out: the activity and employment rates of the young skilled population decreased during the examined period, the differences being more significant for young people with higher education. Even if at the same time we can see a reduction in the unemployment rate among the segments surveyed by the population, this trend cannot be considered relevant because of the lack of accurate data on the actual number of unemployed.

On the other part, a brief review of the demand for specialists for the agricultural sector shows that, by virtue of the provision of a fairly large number of specialists each year by educational institutions of various levels, an insignificant part of the graduates accept the jobs and an even smaller number keep the jobs.

The reasoning that a large number of graduates with higher education in the field of agricultural sciences and veterinary medicine don’t choose to work in agricultural enterprises is also confirmed by the low share of young specialists with higher education in the total population employed in the sector, as well as the absence of visible qualitative changes in the period 2010-2018, as previously noted. This problem is also confirmed by the results of several studies on the labor market. Thus, an investigation carried out in 2015 highlighted the fact that, if at national level the average employment rate of young people with higher education was about 53%, in rural areas it was only 43%. At the same time, it was found that out that of 10 unemployed in rural areas, 7 were young [9, p. 21].

A similar situation is attested in the level of capitalization by the sectors of the qualified labor force benefits, graduates of technical vocational education institutions. The existing problems in this chapter were also mentioned in the Concept on the restructuring of the research-innovation system, education and rural extension in the agri-food field, being noted that, starting with 2013, the employment rate of graduates from centers of excellence and colleagues decreased continuously, in 2017 being only 31,9% of the total number of graduates, while the highest employment rate of 41,27% was set in 2014. Implicitly, another significant problem was identified - that of the low level of employment according to the field of study. Of the 2017 graduates, only 19,8% were employed in the fields of professional training corresponding to the study act, while 10,2% were employed in other fields, 1,9% were in their own or family business , 13,2% went abroad, and 8,5% did not carry out any activity [2].

Conducting an opinion poll, based on an online questionnaire, made in 2019 on a sample of 91 students (from various post-secondary vocational education institutions) of agricultural specialties in the last year of study, we found out that 28,6%, still on the institution's benches, are already determined to engage in the fields other than agriculture. The data on employment disruptors identified in the survey are shown in figure 7.

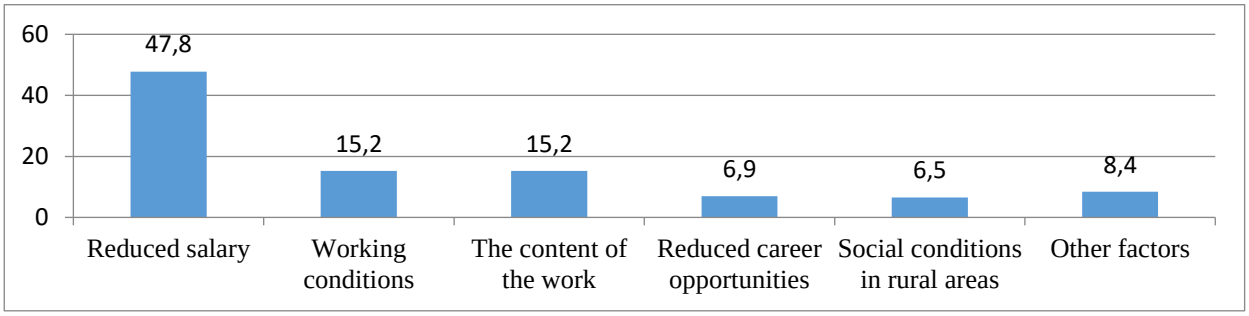

Fig. 7. Ranking of the demotivational factors of graduates' employment availability from technical vocational education institutions at agricultural enterprises, %

Source: elaborated by the author

Both the low level of employment of trained young specialists and the high turnover of the actual staff have conditioned the insufficiency of qualified specialists in the agricultural production sector. An opinion poll of the employers of agricultural graduates, conducted in 2019 on a sample of 310 people, highlighted the fact that, in virtually all agricultural specialties, there is a shortage of qualified staff [19, p. 5], being found an enormous deficit of skilled labor force for the agricultural sector.

By generalizing the above mentioned, we can deduce that, along with the actual reduction in the number of trained specialists previously found, there is the problem of transferring quantitative outputs of the vocational education system with agricultural profile in sector performance, which substantially reduces the potential contribution of human resources in achieving the goals of sustainable development.

The quantitative insufficiency of qualified personnel in the agricultural production sector is not the only problem related to the transfer of vocational education performance in the real sector. In the same vein, we need to mention repeatedly that,

along with the quantitative reflection of vocational education outcomes, the quality of these outputs is also of significant importance, expressed by the skills of graduates and subsequently found in their contribution to the performance of the sector/companies and organizations where they work after graduation.

With regard to the qualitative outputs of the vocational education system with agricultural profile, it is necessary to recognize the existence of the problem of gaps between the requirements of the sector and the quality of educational provision [3; 17; 19]. In this context, we will turn again to the previously mentioned opinion poll [19, p. 76] Thus, as a result of the examination of the employers' appreciation of the training quality of the specialists in the fields related to the researched programs (Phytotechnics, Horticulture, Pedology and soil protection, Production of agricultural crops and animal husbandry, Animal husbandry and Veterinary Medicine, Technology of plant products), it was found out that of the total number of programs, only one (Agronomy, 6 ISCED level) obtained an average grade of 4,7 points, the maximum possible score being 5 points. 13 evaluated programs obtained average marks within the limits of 3,6-4,5 points; 4 programs obtained average marks between 2,1-2 points, and two programs were appreciated with marks between 1,1-2 points. At the same

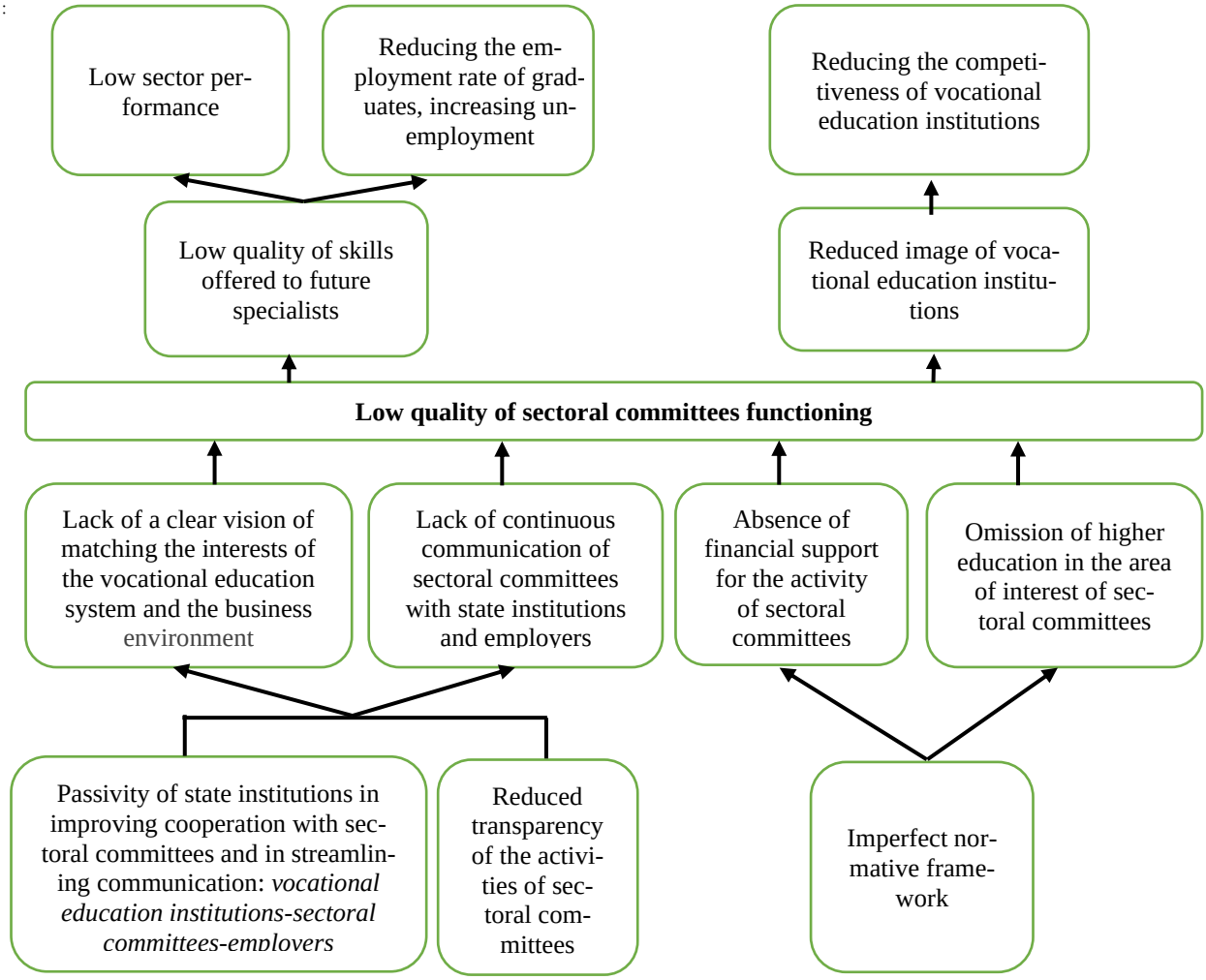

Fig. 8. The problem of the low quality of sectoral committees functioning in the Republic of Moldova

Source: [22, p. 529]

time, a wide range of skills that need to be improved have been identified. The existence of the problem of the skills quality offered in the vocational education system with agricultural profile, was also highlighted through the evaluation of the satisfaction of 194 specialists and managers of agricultural enterprises with the measure to which the skills acquired in the process of vocational training help them to carry out the tasks related to sustainable development at enterprise level, the results of that year being described in detail in the context of the content of chapter 3.

The synthesized data on the causes and consequences of the problems of the sectoral committees functioning in the Republic of Moldova allow to identify the necessary activities to achieve the general objective of increasing the quality of sectoral committees functioning, as well as the expected positive consequences (Fig. 9).

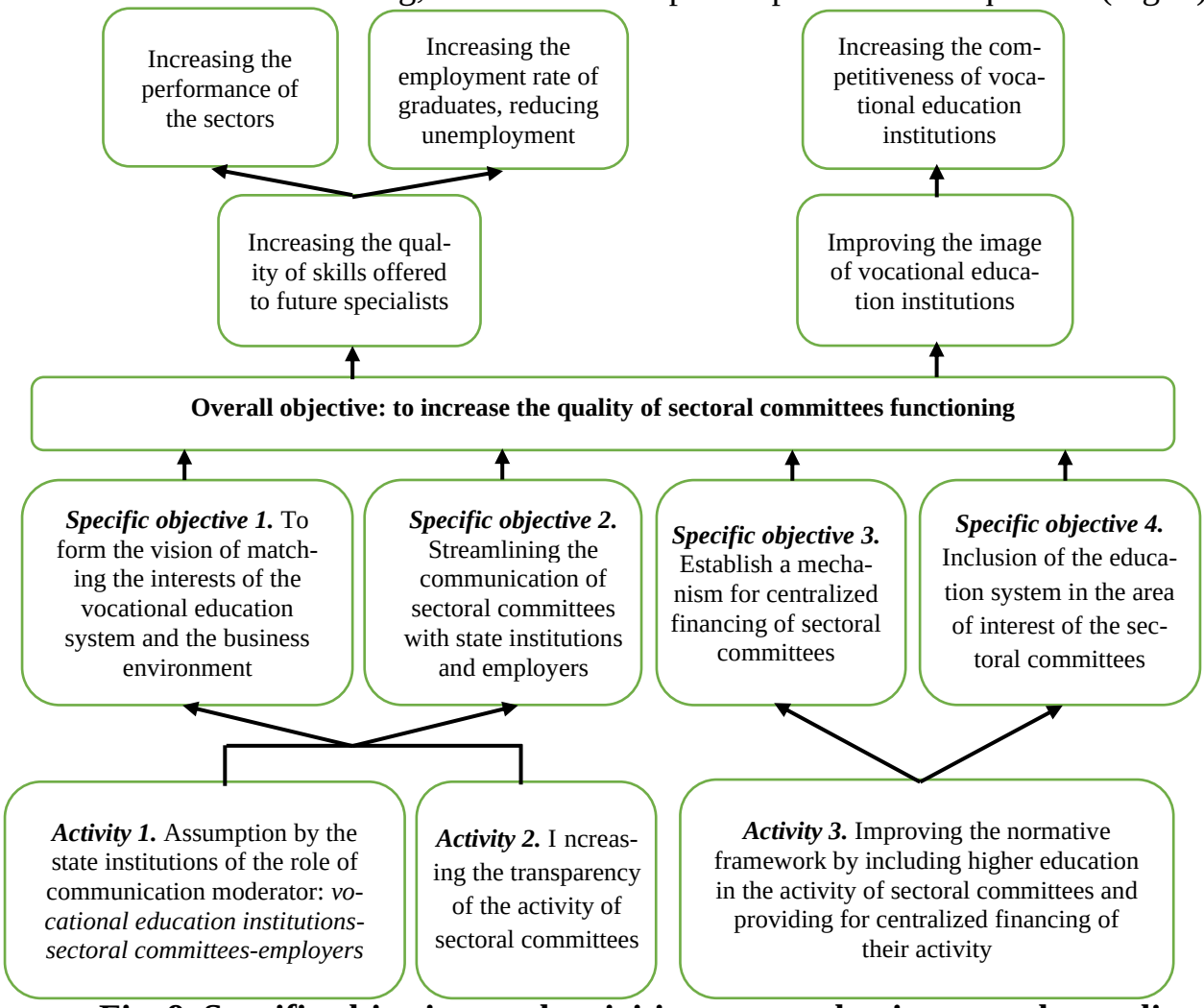

Fig. 9. Specific objectives and activities proposed to increase the quality of sectoral committees functioning in the Republic of Moldova

Source: [22, p. 530]

In the Republic of Moldova, the significance of communication with business representatives, as actual or potential employers, is recognized as an important tool in connecting vocational education to the needs of the labor market, but insufficiently capitalized [16; 24; 29]. Thus, we can mention the actions taken in order to create a normative framework that would facilitate the adaptation of the educational offer to the needs of the labor market by actively cooperating with the representatives of the

sectors, including the adoption of the law on sectoral committees for vocational training no. 244 of 23.11.2017 [1], which establishes the legal status, the organization and functioning of the sectoral committees for vocational training. By examining the existing regulatory framework, however, it was found out that the sectoral committees concentrate only on technical vocational education (along with continuing education), omitting higher education. At the same time, according to the made public reflections on the quality of the activities carried out by the existing sectoral committees, we can state the persistence of a series of problems in the accomplishment of the attributions assumed by the respective structures, such as:

- the absence of a clear vision regarding the match of the interests of the business environment with the educational programs at national level;
- lack of continuous communication between sectoral committees and state institutions;
- the slow pace of actions in order to develop partnerships at local level, participation in the elaboration of public policies in the field of labor, etc. [15].

Making a synthesis of those exposed, we can see the existence of a series of factors with direct and indirect influence on the quality of functioning of the sectoral committees, these being exposed in a tree of the problem (Fig. 8). Implicitly, the direct and long-term consequences of the reduced functionality of sectoral committees are highlighted.

Chapter 3 of the thesis - **„Modeling the relationship between the performance of agricultural vocational education and the sustainable development of the rural environment"** processes the results of an opinion poll conducted on a sample of 194 respondents and models mathematically the impact of the competencies obtained in the vocational education process on the sustainable development of the enterprise. Also, by generalizing the findings, the directions of intervention in the performance management of vocational education with agricultural profile are identified and exposed in order to adapt the educational offer to the requirements of sustainable rural development.

In order to determine the impact of the competencies obtained in agricultural vocational education institutions on the performance in sustainable development, there was carried out a selective research of the managers and specialists of the agricultural enterprises from the rural area, with specialized studies completed in the agricultural field.

In order to ensure an acceptable representativeness of the selective research results, the sample (194 respondents) was taken on the basis of a mixed selection, with a limit error of representativeness of 3,2 employees / enterprise, and a significance of $\alpha = 0,05$.

In order to optimize the results of the selective research and to evaluate the quantitative and qualitative aspects of enterprise performance, correlated with educational variables, the survey questionnaire consisted of a set of 37 questions structured in three blocks:

I. Questions to evaluate the contribution of the competencies obtained in the vocational education institution on the development of the production environment;
II. Questions on the contribution of the stated competencies in the sustainable development of the social environment;

III. Questions to quantify the extent to which the stated skills (professional and transversal) have contributed to increasing labor productivity.

Six variables included in this section (q1) referred to the activities involving:

- q1_1 - Diversification of agricultural crops;
- q1_2 - Diversification of livestock;
- q1_3 - Evaluation and improving genetic heritage;
- q1_4 - Maintaining and increasing soil fertility;
- q1_5 - Rational water management;
- q1_6 - Application of ecological production technologies.

Having interpreted the data, we found out that the most favorable rating was obtained by „Diversification of agricultural crops", the average level tending to the maximum value of satisfaction (3,27), while the lowest value is „Diversification of livestock" (2,10). Small difficulties (values below the average level) can also be noticed in the case of the variables „Assessment and improvement of genetic heritage" and "Rational water management" (Fig. 10).

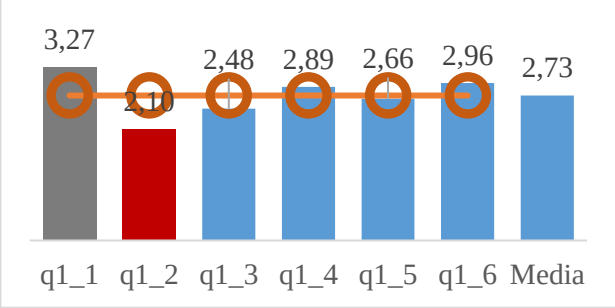

Fig. 10. Media on satisfaction with competencies in the activities from q1 section

Source: elaborated by the author

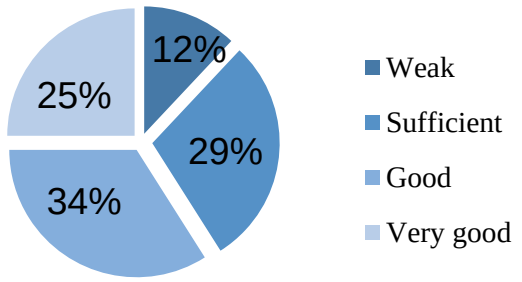

Fig. 11. The average structure of respondents by satisfaction level in the activities from q1 section

Source: elaborated by the author

In general, the most common value selected was 3, which corresponds to the grade „good" (Fig. 11). At the same time, more than 1/5 of the respondents opted on the average for the „weak" option, although, a good thing, this extreme was more than 2 times (25%) advanced by the opposite option („very good").

The results of estimating the partial linear correlation indicate that only the variable q1_2 manifests itself independently of the other variables from the set of variables q1. The eight variables included in section q2 were oriented towards a series of activities:

- q2_1 - Increasing the quality of agricultural products obtained;
- q2_2 - Processing of agricultural waste;
- q2_3 - Optimal use of buildings and landscape;
- q2_4 - Increasing the quality of roads;
- q2_5 - Development of rural services;
- q2_6 - Human resources development under your subordination;
- q2_7 - Ensuring adequate working conditions of the employed staff;
- q2_8 - Ensuring decent salaries of the employed staff.

And in the case of this set of variables, the most favorable qualifier obtained the first variable from the list „ Increasing the quality of agricultural products obtained", which is characterized by an average score of 3,39, which determines this variable as a goal in itself in the preparation agricultural specialists (Fig. 12). The maximum grade was given to this variable by more than half of the respondents, and cumulatively grade 3 and 4 represent almost 90% of the options.

In the case of this set of variables, the options were distributed more evenly, highlighting the „sufficient" rating, by 33%, followed by the „good" rating (27%). In the competition of extreme values, the „ very good" rating gave way to the „weak" rating (Fig. 13).

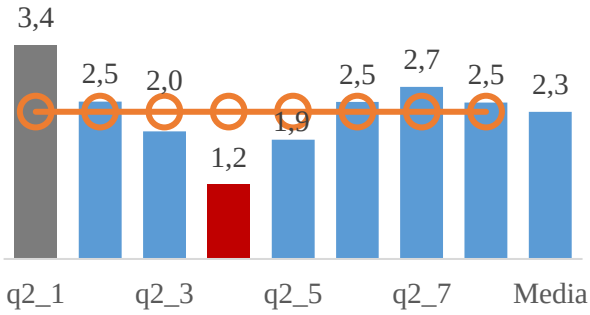

Fig. 12. Media on satisfaction with competencies in the activities from q2 section

Source: elaborated by the author

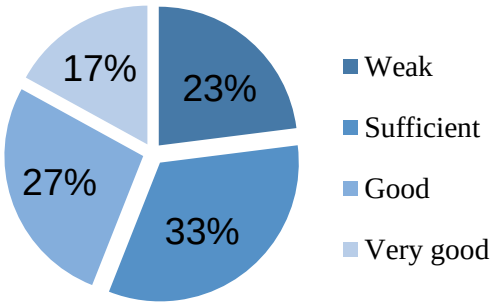

Fig.13. The average structure of respondents by satisfaction level in the activities from q2 section

Source: elaborated by the author

The hypothesis of the existing link between the quantitative variables "age" and the variables expressing the level of satisfaction with the skills formed in the training process necessary for sustainable development of the rural environment (verified by determining the Pearson correlation coefficients) refutes the hypothesis of the link between correlated variables. Regarding "seniority", no significant interdependencies are found with the variables in set q2, except in the case of variable q2_8, where a weak dependence is reflected.

Analyzing the aspects of interdependence between the two sets of variables, we found out a slightly different view of respondents on basic agricultural activities and those for sustainable development, although in some cases significant links, but of low intensity can be seen.The described aspects may cause some difficulties in the case of separate employment of these variables in econometric models, because the existence of an interdependence between factorial variables may prejudice the quality of the estimated model. In this sense, procedures will be undertaken to transform and include these variables in the developed models.

A logical extension of the quantitative analysis process will materialize in elaboration of an econometric model, through which the analyzes performed previously will be deepened, so that the behavior of the entities described through the 194 respondents (survey subjects) will be completed with new quantitative approaches (estimated by econometric models). Likewise, the elaboration of an econometric

model will allow a more thorough knowledge of the extent to which the resultant variable (the effect being expressed by the average annual increase in labor productivity [variable q3]) was determined by the sets of factorial variables (cause), through which the level of satisfaction with the competencies obtained in the process of vocational education is characterized (variables of section q1 and q2).

Starting from the assumption that a higher level of satisfaction would encourage higher results (higher average labor productivity increase), we will try to estimate the model of dependence between the sets of variables q1 and q2. The big difference between the values of the dependent variable (q3) and the values of the independent variables (data sets q1 and q2), but also the different character of the variables (different scales: q3 - of proportional type, while q1 and q2 - of ordinal type), will involve the operation of transformations of the resultant variable by logarithm. In this case, the specified model will have a semilogarithmic analytical expression, of the form:

$$\log y = b_0 + \sum_{j=1}^{k} b_j x_j + e \qquad (1)$$

in which: $\log y$ - Logarithmic values of the variable average productivity increase (q3);

b_0 - Free term of the model - indicates the value of the variable under conditions of zero values of the factorial variables;

b_j - Regression parameters, which indicate by how many units the logarithm of the value of the resultant variable will increase with an increase of the factorial variable by one unit;

x_j - Factorial variable j;

e - Error/residual value of the model (difference between empirical and adjusted resultant value).

The activities of specifying the model and estimating it were performed using the EViews econometric analysis software, and the results were expressed in the graphic style of that software, as follows:

$$\text{LOG(Q3)} = \text{C(1)*Q1\_1} + \text{C(2)*Q1\_2} + \text{C(3)*Q1\_3} + \text{C(4)*Q1\_4} + \text{C(5)*Q1\_5} + \text{C(6)*Q1\_6} + \text{C(7)} \qquad (2)$$

The value of C (free term) shows that if the influence of the factors included in the model is zero, then the average increase in labor productivity for the last three years will be 31,8 thousand lei per employee.

Increasing the appreciation of the level of appreciation compared to the skills obtained in the process of vocational education, in order to diversify agricultural crops, will lead to an increase in labor productivity by about 1,21 thousand lei. The estimation results show that two of the estimators of the model parameters (C and q1_2) have a higher significance, while the significance of the other estimators of the model parameters are characterized by significance levels from low to moderate.

The multiple correlation coefficient indicates a weak to medium interdependence ($R = 0{,}34$),which results in a determination ratio $R^2 = 0{,}15$, or about 15% of the variation of the resulting variable is determined by the variation of the factorial variables employed in the model. The results of estimating the overall quality of the model speak of its acceptable quality (F-statistic = 5,09, Prob(F-statistic) = 0,000077).

A combination of the factorial variables from the two sections (q1 and q2) could contribute to a qualitative strengthening of the model, but also to an associated explanation of the influence of the factors to establish their ranking. In this case, the estimated regression model will take the form:

$$LOG(Q3) = C(1)*Q1\_1 + C(2)*Q1\_2 + C(3)*Q1\_3 + C(4)*Q1\_4 + C(5)*Q1\_5 + C(6)*Q1\_6 + C(7)*Q2\_1 + C(8)*Q2\_2 + C(9)*Q2\_3 + C(10)*Q2\_4 + C(11)*Q2\_5 + C(12)*Q2\_6 + C(13)*Q2\_7 + C(14)*Q2\_8 + C(15) \quad (3)$$

From the estimated results we can notice that the most influential factor of increasing labor productivity is q2_1 – „Increasing the quality of agricultural products obtained", and changing the opinion of respondents to this factor causes a change in the same direction of the resulting variable by about 2,01 thousand lei, following q2_5 – „Development of rural services" (+1,56) and q1_4 – „Maintaining and increasing soil fertility" (+1,26). At the other pole are the variables with a lower influence, the least influential being q1_2 – „Diversification of livestock", q2_6 – „Development of human resources" and, respectively, q2_2 – „Agricultural waste processing".

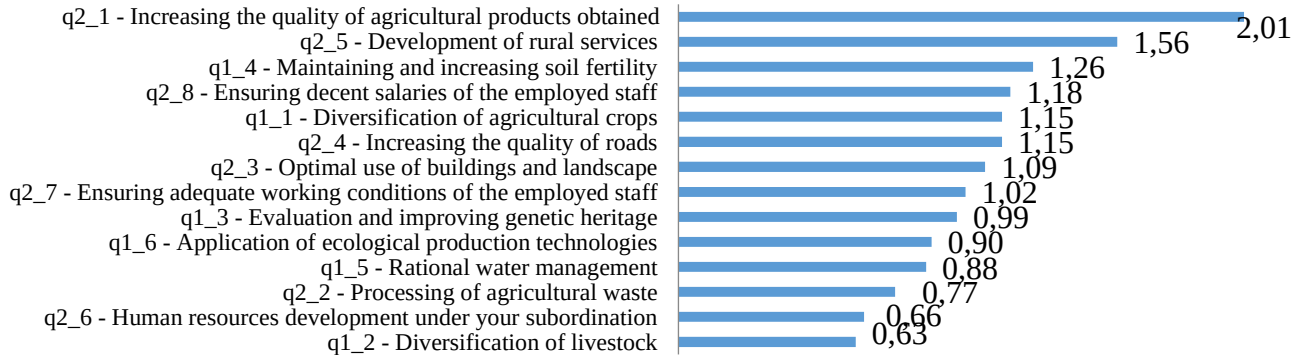

Fig. 14. Ranking of factors according to the level of influence on the labor productivity increase

Source: elaborated by the author

It is obvious that this model presents more favorable results than the two previously presented, in terms of creditworthiness indicators. The model errors are characterized by a little significant positive autocorrelation. It is equally obvious the normality of the model errors distribution (Fig. 15), determined by an approximate lack of asymmetry and excess.

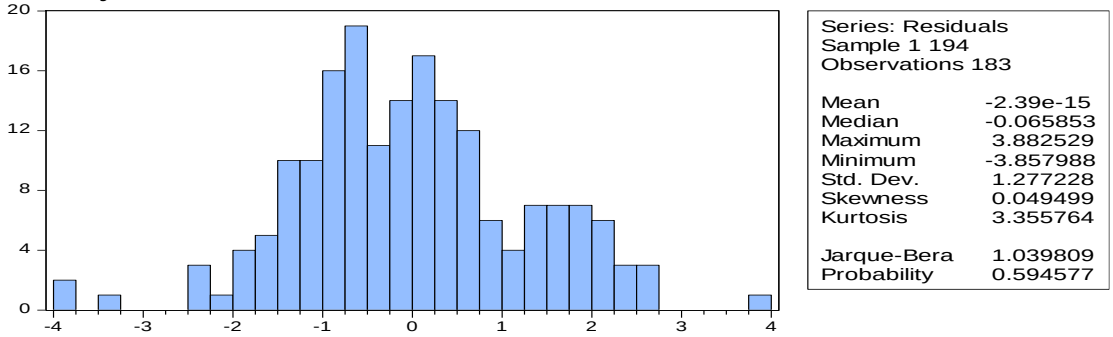

Fig. 15. Distribution of model 3 errors

Source: elaborated by the author

At the next stage there was developped a fictitious econometric model, only to make a detail of the influence of structural factors that contribute to the formation of labor productivity increase. For this purpose, certain transformations of the structural variables q4 set were made in contributions to the formation of the productivity increase in the form of absolute values. The results of the model estimation are as follows:

$$q3 = C(1)*P4\_01 + C(2)*P4\_02 + C(3)*P4\_03 + C(4)*P4\_04 + C(5)*P4\_05 + C(6)*P4\_06 + C(7)*P4\_07 + C(8)*P4\_08 + C(9)*P4\_09 + C(10)*P4\_10 + C(11)*P4\_11 + C(12)*P4\_12 + C(13) \quad (4)$$

The parameter estimators, which in this case have an absolute significance, denote that the most influential factorial variable is the variable q4_7 – „Quality of problem-solving skills", and its change by a monetary unit determines the change of the resulting variable by about 1,33 units. It is followed by the variable q4_3 – „Assurance of the enterprise with labor force" (+1,23), the whole classification of the factorial variables being presented in Fig. 16.

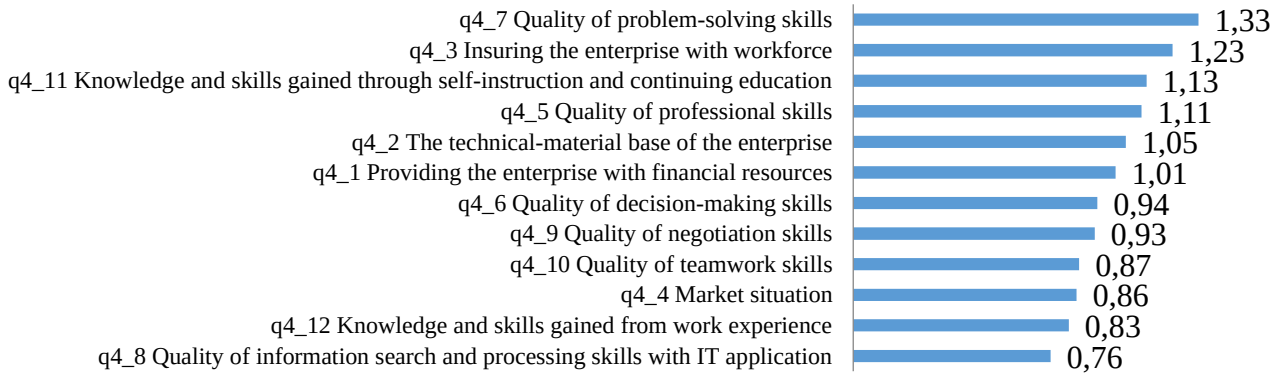

Fig. 16. The influence of q4 factors on the average increase of labor productivity
Source: elaborated by the author

Unfortunately, quite important operational factors are placed on the last three positions, including one related to the involvement of information technologies, the change in value of which has the least influence. It cannot be omitted the fact that, as a whole, the transversal competencies obtained in the process of carrying out specialized studies (q4_6, q4_7, q4_8, q4_9, q4_10), compared to each of the other factors analyzed, would have the greatest influence on the increase of labor productivity, the modification of which by one point would lead to an increase of productivity by about 3,98 thousand lei.

By generalizing the above said, we can deduce that the quality of skills provided by the training process influences the indicators of sustainable development at the level of agricultural enterprise along with other factors (such as, for example, the level of remuneration or the quality of rural services). At the same time, we noticed the needs to prioritize the skills of rational soil management and to increase the quality of products, which are identified as having a greater impact on the economic performance of enterprises.

In order to improve the quality of the educational offer with agricultural profile, in accordance with the objectives of sustainable development, we propose an updated mechanism for its evaluation, which is has the following distinct aspects: updated performance indicators; continuous process of improving performance indicators and evaluation methods and procedures; active and continuous involvement of several actors: educational institutions, employers, pupils / students and graduates, the relevant ministry (Fig. 17).

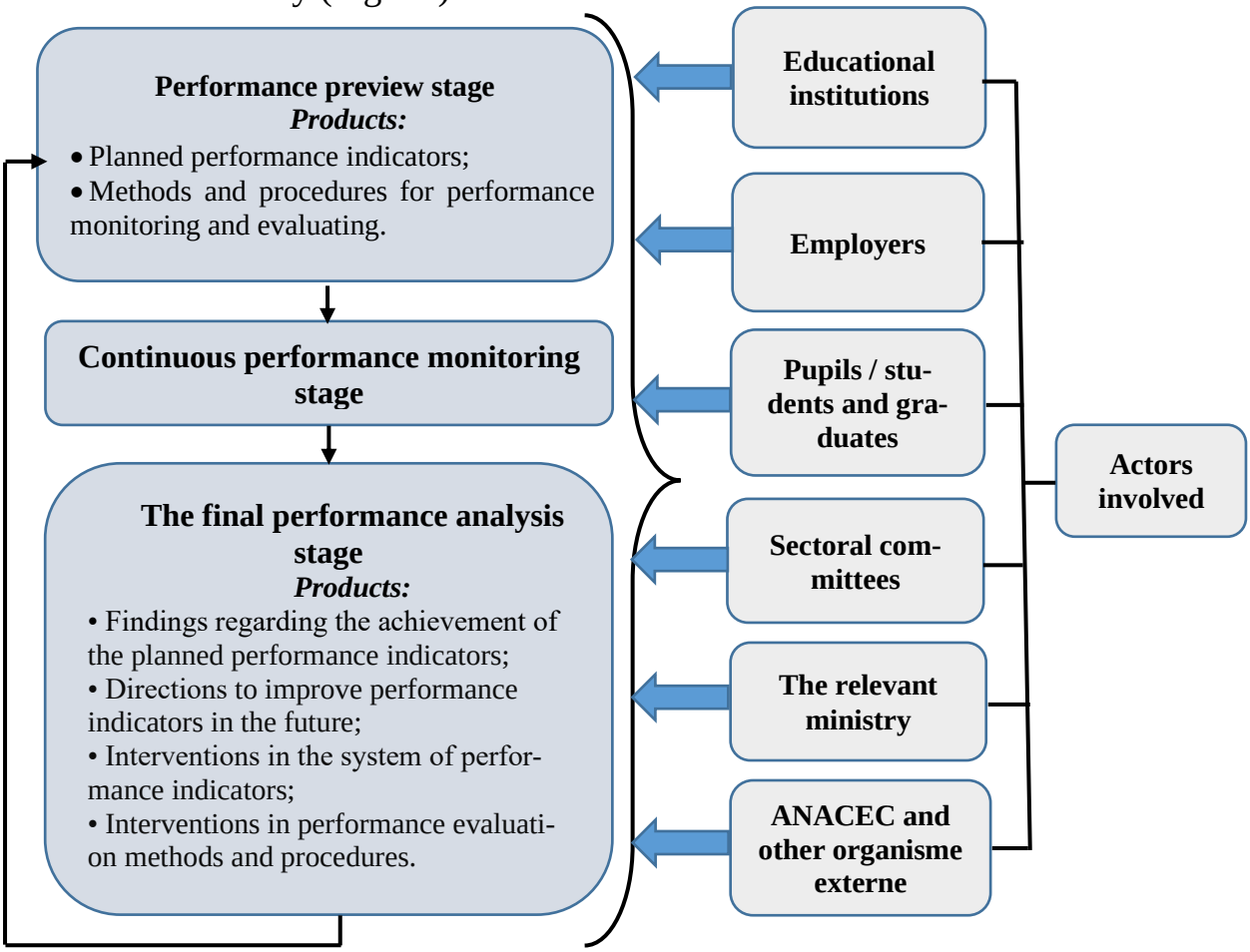

Fig. 17. The updated mechanism to evaluate the quality of vocational education with agrarian profile

Source: elaborated by the author

GENERAL CONCLUSIONS AND RECOMMENDATIONS

Investigations carried out in order to *elucidate the impact of the performance of agricultural vocational education management on the sustainable development of the rural environment*, according to the assumption that *the management of the performance of agricultural vocational education is an important factor in the sustainable development of the rural environment, the impact being exerted through the enterprise - as a basic economic link of the economy and employment unit*, led to the following ***conclusions:***

1. According to the objective – *evaluation of the performance measurement system in vocational education in the Republic of Moldova in terms of the extent to which the adopted indicators correspond to the requirements of education for sustainable development*, with the recognition of the existence of progress in the system for measur-

ing the performance of vocational education in the Republic of Moldova, there was also identifyied the presence of problems (mentioned in subchapter 1.3): insufficient reflection of the objectives of sustainable development in the curricular documents, thus affecting the quality of education for sustainable development. Among the indicators of the exits of the professional training system only quantitative standards are found, but not qualitative ones. Based on extensive research on the subject, it was found out that, even if numerous attempts are made to improve performance measurement systems, due to the complexity of the field, multiple effects, etc., measuring the performance of vocational education remains an area with a deep potential for investigation and intervention.

2. Based on the objective of *identification and description of the cause-effect links between the performance of agricultural vocational education and the indicators of economic and social development of the rural environment based on the contribution of skills obtained by specialists in the initial training process on indicators of sustainable development at enterprise level*, it was found out that between the performances of the vocational education system with agrarian profile and the sustainable rural development there is a cause-effect relationship, mediated by the labor market and the enterprises-employers. Among the performance indicators of vocational education are directly manifested in that relationship those which express the outputs, namely: *the number and quality of trained specialists* (information presented in subchapter 2.1).

3. *Evaluating quantitatively and qualitatively the outputs of vocational education with agricultural profile, as well as the relations of young people with the labor market, being an intermediate link in the transfer of the performance of vocational education in the performance of the sector* (subject analyzed in subchapter 2.2), we can conclude the following: labor market for the agricultural production sector confronts an unsatisfactory demand in terms of quantity and quality. That problem is an essential impediment in achieving sustainable development undertaken by Moldova in relation to Agenda 2030.

4. As a result of *quantifying the contribution of the performance of vocational education with agricultural profile to the sustainable development of the rural environment by modeling the impact of educational performance on indicators of sustainable development of agricultural enterprises* (subchapter 3.2), it was deduced that the quality of skills offered in the training process has an influence on indicators of sustainable development at the level of agricultural enterprise, along with other factors (level of remuneration, quality of rural services, etc.).

5. In the context of the problems identified in the performance management system of vocational education with agrarian profile in terms of the influence exerted on sustainable rural development, *there was proposed an updated mechanism to evaluate the quality of vocational education with agricultural profile*, and *there was developed an economic-mathematical model to evaluate the impact of the performance of agricultural vocational education on the indicators of sustainable development of enterprises, having as an expected effect the efficiency of agricultural vocational education* (subchapter 3.3).

As a result of the research, based on solving the important scientific problems, which consists of:

- ✓ *updating the mechanism of evaluation the quality of professional agricultural management* through the prism of current performance indicators, in order to be used later in the evaluation process, *ensuring the unique application* of the mechanism;
- ✓ *elaboration* of an economic-mathematical model to evaluate the impact of the performance of agricultural vocational education on the indicators of sustainable development of enterprises, *having as effect the efficiency* of agricultural vocational education, *to maximize its contribution to the sustainable development* of rural Moldova, the following recommendations were proposed:

1. We recommend that technical and higher vocational education institutions with agricultural profile should include the following modules in the curricula of the course units: i) sustainable development, ii) human rights, iii) gender equality, iv) sex education, which currently refers only to the school curriculum, disregarding the other levels of education, while in the Incheon Declaration "Education 2030" this indicator refers to all levels (subchapter 1.3).

2. We propose to improve the normative framework of the Republic of Moldova by developing and adopting an education strategy for sustainable development 2030, reflecting the tasks of the Education 2030 program adapted to country-specific conditions, levels and fields of education, including agricultural vocational education (subchapter 1.3), this falls within the competence of the Ministry of Education, Culture and Research.

3. We propose to the Ministry of Education, Culture and Research and the Ministry of Agriculture, Regional Development and Environment *additional indicators to highlight the orientation of curricula to obtain certain skills (professional and transversal) of sustainable development*, namely:

a) in the group of indicators that reflect the quality of the vocational education processes development: the distinct reflection of the sustainable development objectives in vocational education programs of all levels, the orientation of research activities of pupils and students towards the formation of sustainable development skills;
b) in the group of indicators of the outputs of the vocational education system: the contribution of the competencies held by the graduates in achieving the objectives of sustainable development (subchapter 1.3).

4. We propose the elaboration by the Ministry of Agriculture, Regional Development and Environment of a more effective mechanism for recording the employment of graduates (subchapter 2.2) and its application by the educational institutions responsible for vocational education programs with agricultural profile.

5. We recommend the creation by the Ministry of Agriculture, Regional Development and Environment of a legal organizational framework (example: Lantra - Sectoral Competence Council responsible for agriculture, forestry, fisheries and veterinary activities in the UK), which would ensure an interactive, permanent and continuous communication of vocational education institutions with employers (subchapter 2.3).

6. We propose to improve the normative framework on the functioning of sectoral committees by including higher education (in addition to existing technical vocation-

al education) in the attributions of the respective structures (this is possible through government interventions in the Law on Sectoral Committees for Vocational Training) and the creation of an appropriate funding mechanism for them (subchapter 2.3).

7. We recommend streamlining cooperation between sectoral committees and state institutions by assuming the role of moderator of the relationship *"vocational education institutions - sectoral committees - employers"* by the Ministry of Agriculture, Regional Development and Environment (subchapter 2.3).

8. We urge the sectoral committees to ensure maximum transparency of the activities carried out (subchapter 2.3).

9. We recommend vocational education institutions with agricultural profile to pay special attention to the skills of rational soil management and product quality, which are identified (in the opinion poll) as having a major impact on the economic performance of enterprises (subchapter 3.2).

10. We propose to use the econometric model developed in order to determine the impact of performance management indicators for agricultural vocational education on the sustainable development of the rural environment of the Republic of Moldova by vocational education institutions, employers and other stakeholders, including the process of developing policies related to vocational education and rural labor force management (subchapter 3.3).

11. We propose that each actor involved, directly or indirectly, in the process of vocational education, come with a maximum contribution in the functioning of the performance management system, as follows:

- educational institutions - by exercising the management responsibilities of the system;
- pupils / students - by declaring preferences, exposing satisfaction with the quality of the process, offering suggestions for its improvement;
- graduates - by expressing satisfaction with the quality of the skills obtained and offering suggestions for improving their quality;
- employers - by assessing the quality of the prepared workforce, providing information on the development trends of the sector and, implicitly, the contribution in predicting the necessary skills on different time horizons;
- the relevant ministry (in this case - the Ministry of Agriculture, Regional Development and Environment) - by contributing to highlighting the trends of the sector, as well as assuming the role of moderator of the communication of educational institutions with the business environment;
- sectoral committees - by contributing to the connection of the educational offer in a qualitative aspect (within the competences corresponding to the qualifications) to the requirements of each sector;
- National Agency for Quality Assurance in Education and Research and other external bodies (quality certification bodies, professional unions, etc.) - by contributing to the rationalization of the entire quality management system and connection to the needs of the real sector.

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ADNOTARE

Caradja Alina, „Managementul performanței învățământului profesional agrar și impactul acestuia asupra dezvoltării durabile a mediului rural al Republicii Moldova”, teză de doctor în științe economice, Chișinău, 2020

Structura tezei: introducere, trei capitole, concluzii generale şi recomandări, bibliografie din 176 titluri, 21 anexe, 130 de pagini de text de bază, 42 figuri, 31 tabele, 14 formule. Rezultatele obținute sunt publicate în 12 lucrări științifice.

Cuvinte cheie: performanță, managementul performanței, învățământul profesional agrar, educație pentru dezvoltare durabilă, dezvoltare durabilă, mediu rural, piața muncii, Republica Moldova.

Scopul lucrării: elucidarea impactului performanței managementului învățământului profesional agrar asupra dezvoltării durabile a mediului rural.

Obiectivele cercetării:

1. Evaluarea sistemului de măsurare a performanței în învățământul profesional în Republica Moldova prin prisma măsurii în care indicatorii adoptați corespund exigențelor educației pentru dezvoltarea durabilă;
2. Identificarea și descrierea legăturilor cauză-efect între performanța învățământului profesional agrar și indicatorii dezvoltării economice și sociale a mediului rural în baza contribuției competențelor obținute de specialiști în procesul de formare inițială asupra indicatorilor dezvoltării durabile la nivel de întreprindere agricolă;
3. Evaluarea ieșirilor cantitative și calitative ale educației profesionale cu profil agrar, precum și a relațiilor tinerilor cu piața muncii – verigă intermediară în transferul performanței educației profesionale în performanțe ale sectorului;
4. Cuantificarea contribuției performanței educației profesionale cu profil agrar în dezvoltarea durabilă a mediului rural prin modelarea impactului performanței educaționale asupra indicatorilor de dezvoltare durabilă a întreprinderilor agricole;
5. Propunerea unui mecanism actualizat de evaluare a calității prestației educaționale în termeni de indicatori de performanță.

Noutatea şi originalitatea ştiinţifică a lucrării rezidă în următoarele: Elucidarea cronologică și conceptuală a educației pentru dezvoltarea durabilă, ca factor indispensabil al dezvoltării durabile; Evaluarea critică a cadrului normativ al Republicii Moldova prin prisma măsurii în care sunt vizate obiectivele dezvoltării durabile; Evaluarea indicatorilor de performanță în învățământul profesional în Republica Moldova în raport cu obiectivele educației pentru dezvoltarea durabilă; Reprezentarea schematică a relației cauză-efect între performanța educației profesionale cu profil agrar și dezvoltarea durabilă a mediului rural; Modelarea matematică a relației între performanța educației profesionale cu profil agrar (în termeni de ieșiri) și indicatorii dezvoltării durabile ai întreprinderilor agricole - ca celule economice de bază ale mediului rural; Propunerea unui mecanism actualizat de evaluare a calității educației profesionale cu profil agrar.

Rezultatele obținute care contribuie la soluționarea unei probleme științifice importante rezidă în c*rearea* unui mecanism nou de evaluare a calității managementului profesional agrar prin prisma unor indicatori actuali de performanță, *în vederea utilizării ulterioare* în procesul de evaluare, *asigurând aplicarea inedită* a mecanismului, cât și *elaborarea* unui model economico-matematic de evaluare a impactului performanței învățământului profesional agrar asupra indicatorilor dezvoltării durabile a întreprinderilor, *având ca efect eficientizarea* învățământului profesional agrar, *pentru a maximiza contribuția acestuia* în dezvoltarea durabilă a mediului rural al Republicii Moldova.

Semnificaţia teoretică: rezultatele obținute în lucrare constituie un suport de concepte teoretice și metodologice în domeniul managementului performanței învățământului profesional agrar și impactul acestuia asupra dezvoltării durabile a mediului rural al Republicii Moldova.

Valoarea aplicativă a lucrării:

1. Utilizarea recomandărilor propuse într-un spectru larg de domenii: educația profesională cu profil agrar de diverse niveluri, managementul procesului educațional realizat la nivel de stat, activitatea comitetelor sectoriale, gestionarea resurselor umane de către agenții economici cu profil agrar etc.
2. Folosirea modelului economico-matematic de evaluare a impactului performanței învățământului profesional agrar asupra indicatorilor dezvoltării durabile a întreprinderilor în vederea unei racordări mai bune a performanței educației profesionale la exigențele sectorului.

Implementarea rezultatelor ştiinţifice: Rezultatele cercetărilor au fost preluate spre implementare de către Ministerul Agriculturii, Dezvoltării Regionale și Mediului în vederea consolidării competențelor viitorilor specialiști, precum și a actualizării mecanismului de evaluare a calității educației profesionale cu profil agrar.

АННОТАЦИЯ

Караджа Алина, „Управление эффективностью сельскохозяйственного профессионального образования и его влияние на устойчивое развитие сельской среды Республики Молдова”, докторская диссертация по экономике, Кишинев, 2020

Структура работы: введения, трёх глав, выводы и рекомендации, библиография из 176 источников, 21 приложений, 130 страниц осного текста, 42 рисунков, 31 таблиц, 14 формул. Результаты опубликованы в 12 научных работах.

Ключевые слова: производительность, менеджмент производительности, сельскохозяйственное профессиональное образование, образование для устойчивого развития, устойчивое развитие, сельская с реда, рынок труда, Республика Молдова.

Цели работы: выяснение влияния эффективности управления сельскохозяйственным профессиональным образованием на устойчивое развитие сельской среды.

Задачи исследования:

1. Оценка системы измерения эффективности профессионального образования в Республике Молдова с точки зрения того, насколько принятые показатели соответствуют требованиям образования для устойчивого развития;
2. Выявление и описание причинно-следственных связей между производительностью сельскохозяйственного профессионального образования и показателями экономического и социального развития сельской среды с учетом вклада навыков, полученных специалистами в процесс начальной подготовки по показателям устойчивого развития на уровне сельскохозяйственных предприятий, на показатели устойчивого развития на уровне сельскохозяйственного предприятия.
3. Оценка количественных и качественных результатов профессионального образования сельскохозяйственного профиля, а также взаимоотношений молодежи с рынком труда - промежуточное звено в передаче результатов профессионального образования в результативность отрасли;
4. Количественная оценка вклада результатов профессионального образования сельскохозяйственного профиля в устойчивое развитие сельской среды путем моделирования влияния результатов обучения на показатели устойчивого развития сельскохозяйственных предприятий;
5. Предложение обновленного механизма оценки качества образовательной деятельности по показателям индикаторы эффективности.

Научная новизна и оригинальность: Хронологическое и концептуальное освещение образования для устойчивого развития как незаменимого фактора устойчивого развития; Критическая оценка нормативной базы Республики Молдова с точки зрения степени достижения целей устойчивого развития; Оценка показателей эффективности профессионального образования в Республике Молдова по отношению к целям образования для устойчивого развития; Схематическое изображение причинно-следственной связи между производительностью профессионального образования сельскохозяйственного профиля и устойчивым развитием сельской среды; Математическое моделирование взаимосвязи между эффективностью профессионального образования с сельскохозяйственным профилем (по выходам) и индикаторы устойчивого развития сельскохозяйственных предприятий как основных экономических ячеек сельской среды; Предложение обновленного механизма оценки качества профессионального образования сельскохозяйственного профиля.

Решение особенно значимой научной проблемы: заключается в *создании* нового механизма оценки качества профессионального управления сельским хозяйством с точки зрения текущих показателей эффективности, для последующего *использования* в процессе оценки, *обеспечить уникальное применение* механизма и *разработка* экономико-математической модели для оценки профессионального сельскохозяйственного образования о показателях устойчивого развития предприятий, *оказывающие влияние на улучшение* сельскохозяйственного профессионального образования, *для максимального увеличения* своего вклада в устойчивое развитие сельской среды Республики Молдова.

Теоретическая значимость работы: результаты, полученные в статье, являются подтверждением теоретических и методологических концепций в области управления эффективностью сельскохозяйственного профессионального образования и и его влияние на устойчивое развитие сельской среды Республики Молдова.

Практическая значимость работы:

1. Использование предложенных рекомендаций в широком спектре сфер: профессиональное образование сельскохозяйственного профиля разного уровня, государственных учреждениях: профессиональные учебные заведения сельскохозяйственного профиля различного уровня, управление учебным процессом на государственном уровне, деятельность отраслевых комитетов, управление человеческими ресурсами экономическими агентами аграрного профиля и др.
2. Использование экономико-математической модели для оценки влияния эффективности сельскохозяйственного профессионального образования на показатели устойчивого развития предприятий с целью лучшего увязывания эффективности профессионального образования с требованиями отрасли.

Внедрение научных результатов: Результаты исследования были взяты иа реализации Министерством Сельского Хозяйства, Регионального Развития и Экологии с целью консолидации компетенций будущих специалистов, а также актуализации механизма оценки качества профессионального образования сельскохозяйственного профиля.

ANNOTATION

Caradja Alina, „Management of the agricultural vocational education performance and its impact on the sustainable development of the rural environment in the Republic of Moldova", PhD in Economic Sciences thesis, Chișinău, 2020

Thesis structure: introduction, three chapters, conclusions and recommendations, bibliography of 176 appointments, 21 appendixes, 130 pages of the main text, 42 figures, 31 tables and 14 formulas. The results are published in 12 scientific papers.

Key words: performance, performance management, agricultural vocational education, education for sustainable development, sustainable development, rural environment, labor market, Republic of Moldova.

The main goal of this research: elucidating the impact of the performance of the agricultural vocational education management on the sustainable development of the rural environment.

Objectives of the tresis are:

1. Evaluation of the performance measurement system in the vocational education of the Republic of Moldova in terms of the extent to which the adopted indicators correspond to the requirements of education for sustainable development;
2. Identifying and describing the cause-effect links between the performance of agricultural vocational education and indicators of economic and social development of the rural environment based on the contribution of skills obtained by specialists in the initial training process on indicators of sustainable development at the agricultural enterprise level;
3. Evaluation of the quantitative and qualitative outputs of vocational education with agricultural profile, as well as the relations of young people with the labor market - intermediate link in the transfer of the performance of vocational education in the performance of the sector;
4. Quantifying the contribution of the performance of vocational education with agrarian profile in the sustainable development of the rural environment by modeling the impact of the educational performance on the indicators of sustainable development of agricultural enterprises;
5. Proposing an updated mechanism to evaluate the quality of educational performance in terms of performance indicators.

The novelty and scientific originality: Chronological and conceptual elucidation of education for sustainable development as an indispensable factor of sustainable development; Critical evaluation of the normative framework of the Republic of Moldova in terms of the extent to which the objectives of sustainable development are targeted; Evaluation of performance indicators in vocational education in the Republic of Moldova in relation to the objectives of education for sustainable development; Schematic representation of the cause-effect relationship between the performance of vocational education with agricultural profile and the sustainable development of the rural environment; Mathematical modeling of the relationship between the performance of vocational education with agricultural profile (in terms of outputs) and indicators of sustainable development of agricultural enterprises as basic economic cells of the rural environment; Proposing an updated mechanism to evaluate the quality of vocational education with agricultural profile.

The important scientific problem solved reside *in the creation* of a new mechanism for the evaluation of the quality of agricultural professional management in terms of current performance indicators, *for later use* in the evaluation process, *ensuring the unique application* of the mechanism and *the elaboration* of an economic-mathematical model to evaluate the impact of agricultural vocational education performance on indicators of sustainable development of enterprises, *having as effect the efficiency* of agricultural vocational education, *to maximize* its contribution to the sustainable development of the rural environment of the Republic of Moldova.

The theoretical significance: the results obtained in the work are a support of theoretical and methodological concepts in the field of agricultural vocational education performance management and its impact on sustainable development of the rural environment of the Republic of Moldova.

The applicative value:

1. Using the proposed recommendations in a wide range of fields: vocational education with agrarian profile of various levels, management of the educational process carried out at state level, activity of sectoral committees, management of human resources by economic agents with agricultural profile, etc.
2. Using the economic-mathematical model to evaluate the impact of the performance of agricultural vocational education on the indicators of sustainable development of enterprises in order to better match the performance of vocational education to the requirements of the sector.

Implementation of the scientific results: The research results were taken over for implementation by the Ministry of Agriculture, Regional Development and Environment in order to strengthen the skills of future specialists, as well as to update the mechanism for the assessment of the quality of vocational education with agricultural profile.

CARADJA ALINA

MANAGEMENT OF THE AGRICULTURAL VOCATIONAL EDUCATION PERFORMANCE AND ITS IMPACT ON THE SUSTAINABLE DEVELOPMENT OF THE RURAL ENVIRONMENT IN THE REPUBLIC OF MOLDOVA

SPECIALITATEA: 521.03 – ECONOMIE ȘI MANAGEMENT ÎN DOMENIUL DE ACTIVITATE

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