



OPINION

on a dissertation for obtaining the educational and scientific degree "Doctor" in: field of higher education 3. Social, economic and legal sciences, professional field 3.8. Economics, scientific specialty Organization and management of production (agriculture and sub-sectors)

Author of the dissertation: TATJANA IVAN PILJAN, PhD student in independent study at the Department of Management and Marketing at the Agricultural University, Plovdiv

Topic of the dissertation: "OPPORTUNITIES AND BARRIERS FOR SUSTAINABLE AGRICULTURAL DEVELOPMENT IN THE REPUBLIC OF SERBIA"

Reviewer: PROF. Dr. VALENTINA LYUBENOVA NIKOLOVA-ALEXIEVA, University of Food Technologies-Plovdiv, field of higher education: 3. Social, economic and legal sciences, professional field 3.8 Economics, scientific specialty Economics and Management, appointed a member of the scientific jury by order № RD-16-1342 / 02.12.2021 by the Rector of AU, Plovdiv.

1. Relevance of the problem.

Climate change at global level is a major challenge and necessitates continuous change and adaptation of agro-ecosystems under the influence of extreme weather events. Agroecosystems respond differently to these biophysical changes, both locally and globally. Excessive chemicalization of agriculture leads to the accumulation of harmful waste in the land, which migrates to groundwater, which in turn leads to pollution of water surfaces. The development of technology allows for new solutions in the field of agriculture, by monitoring and documenting production, big data processing and workflow management, which leads to its transformation into precision agriculture, applying adequate raw materials in accordance with needs. In the context of the global environmental crisis, digitalisation and a competitive economy, the problem of sustainable agricultural development is becoming vital.

In the context of Serbia's economic interests and prospects, the undisputed topic of the dissertation and the results obtained determine its relevance and significance. Insufficient research in the field of economic sustainability of farms with different specialization and intensification raises the need for scientific work with a similar focus.

In this regard, it can be concluded that the topic of the dissertation was successfully chosen. It is extremely up-to-date, dissertable and has great practical significance.

2. Purpose, tasks, hypotheses and research methods.

In the introduction of the dissertation the main goal is formulated and four hypotheses are raised, related to research and analysis of the impact of global environmental problems and modern technologies on the sustainability of agricultural production. The formulated hypotheses were proved in the course of the research.

The dissertation research is based on the use of the principles of dialectics, the unity of theory and practice, scientific abstraction. The following methodological tools are

used to prove the hypotheses: *system-structural analysis, induction, deduction, generalizations, statistical methods - descriptive statistics, chi-square, correlation and regression analysis*.

The specialized software product SPSS and statistical package of MS Excel were used in the processing of the empirical information.

The methodological tools are appropriately selected in accordance with the set goals and objectives.

In interpreting the data, the doctoral student is based on data from scientific publications and works of Serbian and foreign authors; newsletters of international organizations; reports and bulletins of the Ministry of Agriculture of Serbia, as well as a number of regulations. Empirical information about the study is also provided by surveys, and the sample includes 325 respondents from the territory of Vojvodina in Serbia.

3. Visualization and presentation of the obtained results.

The presented dissertation is in a **volume of 157 pages**. Structurally, it includes an **introduction, 3 chapters and a conclusion**. The results were obtained using modern tools and are illustrated with appropriately selected **29 figures and 38 tables**.

The structure of the dissertation research is logically constructed and corresponds to the set goal and tasks. The paper contains concrete results and empirical evidence that objectively reflects the real achievements of the research.

4. Discussion of the results and used literature.

The dissertation analyzes the current scientific achievements in the field of agricultural management to achieve high quality and sustainable development. The bibliographic reference includes a **total of 89 sources, of which 12 strategic documents, 8 normative documents, 50 scientific publications and 19 electronic sources**. Of the cited scientific publications, 9 are in English. These literature sources are directly related to the topic of the dissertation.

The systematizations and summaries made show in-depth and conscientious work with the literature, skills for application of analytical and deductive techniques for information processing with various research methods. The presented dissertation is a complete, completed study on a topical and significant socio-economic problem. In the course of the research, the most significant theoretical and practical problems related to the threats and challenges for the sustainable development of agriculture in Serbia were raised and discussed.

Tatjana Piljan has in-depth theoretical and methodological training, skills for independent research and the results of the dissertation research prove my assessment.

I appreciate the concrete results obtained, on the basis of which they have been made scientifically

5. Contributions to the dissertation.

Contributions can be divided into **scientific and scientific-applied ones**

- **Scientific** contributions include enriching knowledge in the field of governance and sustainable development through the proposed conceptual framework for assessing the economic sustainability of Serbian agriculture.

➤ **The scientific-applied ones** include:

- On the basis of a scientifically sound methodology is the proposed methodology for analysis of the impact of global environmental problems and modern technologies, in real time;
- The proposed models for increasing sectoral sustainability and cooperation for better economic sustainability of agricultural holdings in Serbia;
- Recommendations for improving the sustainable development of agricultural holdings in Serbia, based on the analysis and assessment of the level of their economic sustainability, as well as the factors that determine it.

I accept the contributions as real, reliable and proven in the course of the dissertation research.

6. Critical remarks and questions.

- **Main opinion:** quality dissertation, excellently illustrated, clearly defined results and with potential for development.
- **Critical remarks:** I have no significant critical remarks on the dissertation research.
- **Recommendations:**
 - It is recommended that each chapter concludes with conclusions that clearly show the implementation of the goal and related tasks.
 - It is necessary to emphasize more clearly and categorically one's own opinion on the considered theoretical problems.

The recommendations made in no way diminish the value of the results achieved and the situation of the doctoral student.

At the same time, I have a question:

- **Question 1:** According to the PhD student, what are the challenges of the development of genetics, artificial intelligence, robotics, 3D printing, nanotechnology, biotechnology, digitalization and can they become serious threats to the management of Serbian agriculture?

7. Published articles and citations.

A total of **18 co-authored publications** for the period 2016-2019 are presented, dedicated to the dissertation, in **12 of which she is the first** author.

These publications largely reflect the main achievements of the dissertation. In terms of volume and quality, they meet the requirements for obtaining an educational and scientific degree "Doctor". *I give very high marks for the active publishing activity of the doctoral student and her ability, both for individual performance and for team work.*

The abstract is presented in the established form and content. It reflects in summary the main results of the research and gives the necessary idea of the theoretical and applied achievements of the author.

CONCLUSION

Given the merits of the dissertation, the relevance and complexity of the researched problems, the need to find effective solutions to them in practice, the good theoretical level of the researched and analyzed problems, it can be summarized that the presented dissertation meets the normative criteria for awarding the educational and scientific degree "Doctor" / ZRASRB and the Regulations of the Agrarian University for its application /.

The results of the research, dedicated to "**Opportunities and barriers for sustainable agricultural development in the republic of Serbia**" provide a sufficient basis for a **HIGH EVALUATION** of the scientific potential and research activities of the doctoral student.

All this allows me to confidently vote in favor of awarding **TATJANA IVAN PILJAN** the scientific and educational degree "Doctor" in professional field 3.8. Economics, scientific specialty Organization and management of production (agriculture and sub-sectors).

Date: 22.01.2022

Plovdiv

REVIEWER:

(Prof. Dr. V. Nikolova-Alexieva)