

## STATEMENT

by **Prof. Dr. Kamen Dimitrov Petrov**, UNWE, according to Order No. RD 38-70 / 07.02.2023 of the Rector of St. Cl. Ohridski" participate in a scientific jury for the acquisition of educational and scientific degree "Doctor"

**Reviewer's professional field:** 3.7 Administration and Management and 4.4 **Earth Sciences**

**Subject.** 4.4 EARTH SCIENCES, DP ECONOMIC AND SOCIAL GEOGRAPHY - REGIONAL DEVELOPMENT OF INDUSTRIALIZATION

**Dissertation topic:** "Regional analysis of the prevalence of infectious diseases of farm animals in the southern border areas of Bulgaria""

**Dissertant:** - Catherine Gottsova

**Requirements regarding the form and content of the review.** Bulgaria, the Regulations for its Application, the Regulations for the Development of the Academic Staff at Sofia University St. Cl. Ohridki, the traditions and academic practices in the review activity in the process of obtaining the educational and scientific degree "Doctor"

### 1. Information about the PhD student

PhD student Katrin Gottsova has studied in the PhD Programme "Economic and Social Geography" - Regional Development of Industrialization. Faculty of Geology and Geography. Department of Regional and Political Geography. Professional field 4.4. Dissertant Gottsova is a graduate of veterinary medicine. Rich. The brief account of the doctoral student's career development is indicative of a wealth of professional experience and good knowledge of practice. PhD student Gottsova has passed all her examinations successfully and has fully completed her individual plan.

### 2. General characteristics of the submitted dissertation

The dissertation on "**Regional analysis of the prevalence of infectious diseases in livestock in the southern border areas of Bulgaria**" was developed on the basis of a defined object, subject, objectives, tasks and conceptual apparatus. The theoretical basis on which the dissertation is based is a study of the works of Bulgarian and foreign authors, data provided by the Ministry of Agriculture, World Organization for Animal Health, European Food Safety Authority and other sources. This work is an attempt to systematize a serious problem and to solve it from the point of view of geographical sciences. The object of the study is the territorial diffusion of selected infectious diseases of farm animals in Bulgaria, namely African Plague, Contagious Nodular Dermatitis and Bluetongue, which exert a socio-economic pressure on our country and are atypical in nature from a historical perspective. The subject of the study is the conditions of spread that influence the characteristics of pathogens,

hosts and the environment, as well as their interrelationship with the spread of infectious diseases of farm animals. The formulated objective is to make a regional analysis of the spread of infectious diseases in farm animals and to report on trends in their diffusion in a broader sense throughout the country and in a narrower sense in the southern border areas of Bulgaria, examining the factors that influence the diffusion of infectious diseases and their territorial spread. The following research tasks are set, first of all to clarify the importance of medical geography among other sciences, its role in the study of epidemiological processes, as well as the conceptual and terminological apparatus for the needs of interdisciplinary research. Secondly, to explore the influence of geographical location and geographical environment in the conduct of medico-geographical research and how these influence the diffusion of infectious diseases in farm animals. The third task is related to the study of diffusion processes in epidemic waves, by analyzing the relationships between the elements of the episodic process. The fourth task is devoted to the attempt to analyze the territorial distribution of specific diseases and to reveal the dependencies in the way they occur. Lastly, it identifies and proposes improvements in measures for the control of infectious diseases of farm animals in Bulgaria.

The sources used are Bulgarian (13), English (97) and other sources (18). The number of cited sources is adequate for such a scientific work, but I am convinced that there are also publications in Turkish, Greek, French, Serbian and other authors. The sources included are generally relevant; well selected; and reflect current advances in the range of issues under consideration. The scholarly sources analyzed attest to the dissertation's good awareness of the issues addressed in the dissertation.

The first chapter outlines the interdisciplinary approach in addition to theoretical and methodological issues. The author Gottsova assumes that this approach contributes to a better understanding of the causal relationships in the development of diffuse waves of infectious diseases. An attempt is made to prove the hypothesis that the advantages of medical geography, proven over the decades, successfully combine the methodology of diverse scientific disciplines. Attention is paid to the multidirectional relationships between the characteristics of the region studied and the course of diseases. As a consequence of the analysis, the need for an appropriate compilation of regions is highlighted. Such an approach is innovative and to a large extent also helps to address purely geographical issues, although there is some conventionality in this approach. Thus, the main analysis where the elements of the epizootic process are considered is situated in Chapter Two. In this part of the study, the characteristics of the conditions under which the processes under study are brought out. The unity of the environment, with its social, economic, ecological and other components, with those of the traditional elements of the epidemic chain - pathogen, host and transmission mechanism - is emphasized. The place of diffusion of infectious diseases as one type of territorial diffusion processes in general is clarified and as such is considered as an object of mathematical and statistical studies. The author assumes that by generating models of diffusion processes, attempts to predict the spread of diseases are possible. In a natural way, a regional analysis of the prevalence of three infectious diseases of farm animals is carried out in chapter three, which must by condition be practically oriented. In practice, in elucidating the spatial distribution trends of three selected diseases, inferences and assessment are made, and findings that do not correspond with the imposition of a policy model of continuous monitoring and a changed environment are presented. Moreover, the author Gottsova assumes that the regional characteristics of the country provide the necessary conditions to sustain an epizootic wave. The conclusion is at a decent level, it attempts to make sense of the dissertation.

In summary, I accept that the thesis has a marked degree of completion and is essentially dissertation-worthy. As a general assessment, we can assume with a high degree of

validity that the studies made and the analysis thereof can be of help to the development of earth sciences and veterinary medicine, and is also an attempt to bring medical geography to the fore. This gives us reason to assume that a variety of methodological tools were used to realize the aim and objectives and to investigate the hypotheses: a systematic approach, analysis, synthesis, statistical analysis: descriptive, correlation and factor analysis, adapted to the specificity of the problems studied. The literature sources used and cited show a satisfactory awareness of dissertant Gottsova on the problems of the dissertation, studied in the Bulgarian and foreign scientific literature.

### **3. Evaluation of the obtained scientific and applied results**

With the conducted research the fulfillment of the tasks and goal set in the dissertation has been achieved. In each of the three chapters the respective tasks are followed and their solution is presented in a coherent, clear and comprehensible manner. The methodology has been correctly chosen and its use justified.

The achievements in the first, second and third chapters provide grounds for the conclusion that there is a good knowledge of the analyzed subject, as well as the doctoral student's ability to carry out scientific and practical research and analysis of a diverse nature and instrumentation. Overall, his work reaches the fulfillment of the purpose of the study in the direction of the importance of geographical location and environment in conducting medico-geographical research, including the specificity of individual regions for the diseases under study. An important contribution is the regional analysis of economically and socially significant epizootic processes, and the proposed measures that address both socio-economic and medical challenges. It also assesses the contemporary place of medical geography among other sciences and analyses its role in the study of epizootic processes with distinct medico-geographical characteristics.

In the conclusion of the dissertation the specific results of the research are presented. In my opinion, the aim of the development has been fulfilled as in practice the implemented tasks allow formulating contributions of scientific and applied nature.

### **4. Evaluation of scientific and applied contributions**

In my opinion, dissertant Gottsova has formulated contributions in the development, which have evaluated truthfully the results of the conducted research and found a correlation between the number of wild pigs in the incubation period and those that reached a lethal end. This correlation has resulted in different results from the same measures over the years. Therefore, the measures taken to contain and eradicate ASF can be tailored to the respective disease levels to achieve better results. I also accept as largely successful the analysis that has been made that the extension of the geographical range of many diseases is assumed to be related to climate change, rarely is it possible for most scientists to conclusively confirm the relationship between the two. In practice, here I think several more contributions can be defined. Firstly in the direction of linking climatic factors, human behaviour and animal husbandry as a factor in limiting disease incidence and secondly in terms of prevention through the production of geographical records over longer periods to show trends and patterns of disease incidence in animals.

### **5. Evaluation of the dissertation publications**

In the abstract, the PhD student has indicated two publications related to the topic of the dissertation as follows: 'Medical geography in the contact zone between natural and social sciences. - In. LOPS Foundation. The second publication is Analysis of the territorial spread of the 2014 Blue tongue epizootic wave in Bulgaria. - In. The publications thus mentioned

are on the topic of the dissertation and have been included and presented at reputable scientific forums.

#### **6. Evaluation of the abstract**

Doctoral student Gottsova has submitted an abstract; a list of publications on the topic of the dissertation; and a list of the contributions sought; therefore, the formal requirements for the dissertation to be reviewed and to proceed to the procedure for the award of the doctoral degree have been met, according to the Law on the Development of Academic Staff in the Republic of Bulgaria, its Implementing Regulations, and the internal regulations of the Sofia University. The object, subject and scope of the research, as well as the main aim and objectives are specifically clarified. The research thesis, research methods and limitations of the research are defined. In my opinion, in the abstract doctoral student Gottsova has faithfully and correctly reflected the content of the dissertation

#### **7. Critical comments, recommendations and questions**

A careful reading of the dissertation gives me reason to summarize that there are no significant omissions, inaccuracies or contradictions. The undoubted merits of the dissertation are present, but comments as well as recommendations can be made. In practice, I have two recommendations for the author. Firstly, to extend the application of the assessment model to the study of disease-environment relationships. Secondly to develop the author's view of the potential of medical geography as a set of relationships in the triad of population, environment and culture to impose a new model of animal husbandry behaviour. These recommendations in no way detract from the merits of the proposed dissertation, and hopefully encourage the author's explorations in the future.

#### **Conclusion**

The dissertation thesis authored by PhD student Katrin Gottsova complies with the requirements of the Law on Economic and Social Geography - Regional Development of Industrialization for the award of the educational and scientific degree "Doctor" to its author in the scientific specialty "Economic and Social Geography - Regional Development of Industrialization".

In accordance with the requirements of Article 10, paragraph 1 of the RRDA, this opinion concludes with a positive evaluation of the dissertation. On this basis, I propose that the members of the Honorable Scientific Council (the Scientific Jury) vote in favour of the award of the degree of Doctor of Education and Science to the doctoral candidate Ms. Katrin Gottsova.

15.03.2023 r.

Town Sofia

Signature:

Prof. Dr. Kamen Petrov