OPINION

by Assoc. Prof. Dr. Petar Petrov Nozharov,

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member of the scientific jury of a competition for the academic position of Professor in scientific field 4. Natural sciences, mathematics and informatics, professional field 4.4. Earth Sciences, academic discipline "Physical geography, landscape science and GIS", announced in State Gazette no. 21/13.03.2020

1. Competition details

The competition for the academic position of professor in scientific field 4. Natural sciences, mathematics and informatics, professional field 4.4. Earth Sciences, academic discipline "Physical geography, landscape science and GIS" has been announced in State Gazette no. 21/13.03.2020. This opinion was prepared on the basis of Order №01-98/03.07.2020 and the decision of the meeting of the scientific jury, Minutes №1/27.07.2020. Documents for the competition have been submitted by one applicant – associate professor Stoyan Nedkov. The review of the submitted documents under the procedure showed that all the requirements of the Development of Academic Staff in the Republic of Bulgaria Act (DASRBA), as well as the regulations for its implementation, are met.

2. Details of the applicant

Stoyan Tsvetanov Nedkov is born on 07.02.1969. In 1997 he graduated from Sofia University "St. Kl. Ohridski" with Master's degree in "Landscape Science and Environmental Conservation". In the period 1999 - 2002 he has been Ph.D. student at the Geographical Institute, BAS. In 2003 he received his Ph.D. degree in academic discipline "Physical geography and landscape science" after successfully defending a dissertation on "Peculiarities of the structure and dynamics of low mountainous landscapes in Western Central Bulgaria". In the period 1998 - 2003 he has been a teacher of geography in English. Since 15.11.2003 he has been working at the Geographical Institute, Bulgarian Academy of Sciences. Initially he has started as a research associate, and since 01.06.2009 he is a senior research associate II degree. After the change of the law from 2011 until now he is an associate professor at the National Institute of Geophysics, Geodesy and Geography, BAS, with a short break in 2014 - 2015 when he was an associate professor at Sofia University "St. Kl. Ohridski". The applicant

is fluent in English and Russian. He also has practical experience in using Geographic Information Systems and specialized software. Stoyan Nedkov has extensive administrative and teaching experience, and participation in numerous professional development courses. His expert work is also serious, both in terms of supporting the activities of governing bodies and as a member of editorial boards of a number of scientific journals.

3. Analysis and evaluation of the submitted scientific papers and scientific contributions of the applicant

The applicant has submitted a total of 55 scientific publications for participation in this competition. 20 of them are included in the group of indicators B in accordance with the regulations for the implementation of the DASRBA, which covers and exceeds the required minimum number and points for this indicator. However, 5 of these publications are editorial articles, which have no scientific contributions and will not be considered in this opinion (B_4_5, B_4_7, B_4_8, B_4_16 and B_4_20). All these publications are in English, in one of which the applicant is the only author and in 7 more he is the leading. The other 35 publications are in the group of indicators G, thus covering the minimum number of points required for this indicator. 2 of these publications are editorial articles, which have no scientific contributions and will not be considered in this opinion (G_7_1 and G_8_23). Publication G_8_30 is an overview of the development of landscape research in Bulgaria and will also not be considered in this opinion. I am a co-author of publication G_8_11, which means that it will not be taken into account in this opinion either. Amongst other publications, 21 are in English, 10 are in Bulgarian and 1 is in Russian. In 4 of them the applicant is the only author and in another 6 the applicant is the leading author. Quantitatively, the scientific output is completely sufficient for the academic position "professor".

Applicant's scientific contributions are in three main areas, the first of which is the development and improvement of the methodology of landscape research, and application of the concept of landscape and ecosystem services. In this first main area, the applicant's scientific contributions can be grouped into several sub-areas. The first of them is related to the development of aspects of the mapping of ecosystems and assessment of the services they provide at different spatial levels (B_4_14, B_4_18), as well as methodological guidelines for the application of this methodology at national level (B_4_15, G_8_26). The second sub-area of scientific contributions is related to the development of a methodological approach for mapping ecosystem services, based on information about landscapes, land cover and a matrix for quality assessment (B_4_3). Here the participation of the applicant is as a co-author, without specifying exactly what his contribution is. This approach has been applied to

assessment and mapping of individual ecosystem services or a set of services for different territories (B_4_2, B_4_9, B_4_10, B_4_11, G_7_2, G_7_4; G_7_5, G_8_17, G_8_18) The third sub-area of contributions is related to the development of a methodological approach that further develops the methodology for classifying landscapes (G_8_19, G_8_27) and justifies the relationship between the landscape structure and ecosystem services (B_4_1).

The second area of scientific contributions is related to the application of geoinformation technologies for sustainable management of the environment and information support of research and management activities with GIS-based information and cartographic products. In this second main area, the applicant's contributions can be grouped into several sub-areas. The first sub-area is related to the development of a methodological approach for modeling and mapping of the ecosystem service water flow regulation and flood protection (B_4_2). It is based on the application of GIS-based tools for hydrological modeling and spatial analysis in combination with a methodology for assessing the capacity of landscapes to provide ecosystem services. The approach is further developed and applied in different regions in the country and abroad (B_4_9, B_4_10, B_4_11, G_7_3, G_8_17). The second sub-area includes the development of a geospatial approach for assessment and mapping of ecosystem services provided by urbanized ecosystems at national level. The approach is presented in publication B_4_19, and some of its components and applications for specific ecosystem services are presented in publications B_4_13, G_7_2, G_7_4, G_7_5, G_8_22. The third sub-area of scientific contributions is related to the development of GIS-based approaches, databases and cartographic products to support the research of the risk of dangerous natural phenomena in relation to various aspects of human activity (G_8_3, G_8_8, G_8_9, G_8_13, G_8_15, G_8_16).

The third area of scientific contributions of the applicant is related to physic-geographical research of the risk of dangerous natural phenomena at the territory of the country, and analysis and assessment of ecological and paleogeographical condition of high mountainous areas. In this third main area, the applicant's contributions can be grouped into several sub-areas. The first sub-area includes the development of an approach to assess the impact of climate change, related to the increase in the amount and intensity of torrential rainfall, on river runoff in cases of river surges, which can determine the phases of river runoff change as a result of increasing precipitation amounts and detect the critical points related to the danger of floods (G_8_2, G_8_12, G_8_15, G_8_24). The second sub-area of scientific contributions is related to the development of a methodological approach for differentiation of the country's territory in terms of the risk of natural disasters for cultural and historical heritage and

application of GIS for differentiating areas with high concentration of dangerous natural phenomena and archaeological sites (G_8_3, G_8_4, G_8_9). The third sub-area includes the development of a system for monitoring of high mountainous ecosystems and assessment of their ecological status (B_4_12, B_4_17, G_8_10), and studies of the glacial and periglacial relief in connection with clarifying the paleogeographic development of high mountainous areas (B_4_4, G_8_5).

4. Conclusion

Stoyan Nedkov has a serious scientific output that includes different fields of research. The contributions are very serious and prove that the applicant is a scientist recognized nationally and internationally. The scientometric indicators (3872 points in total) cover and even significantly exceed the minimum required for the position of professor at the Bulgarian Academy of Sciences, which is 640 points. It should be noted, however, that in the group of indicators D, which includes citations, there are some problems, such as the presence of autocitations (for example, citation 557), and the fact that some citations do not list all the authors of the citing publication, which does not allow to detect easily the presence of same authors in the cited and citing publications. In this case, this is an insignificant problem, given the large number of citations and points in this group.

Considering the above and the fact that the applicant meets all laws and by-laws requirements for the respective academic position, I give my positive assessment and recommend that the members of the scientific jury vote **in favor** of associate professor Stoyan Nedkov to hold the academic position of professor in scientific field 4. Natural sciences, mathematics and informatics, professional field 4.4. Earth Sciences, academic discipline "Physical geography, landscape science and GIS" at the "GIS" division, department of Geography, National Institute of Geophysics, Geodesy and Geography, Bulgarian Academy of Sciences.

Sofia, 24.09.2020 Author of the opinion:

/Assoc. Prof. Dr. Petar Nozharov/