REVIEWS

on the materials submitted for participation in the competition for the occupation of the academic position of " Associate Professor" in the field of higher education 4. Natural sciences, mathematics and informatics, Professional direction 4.4. Earth Sciences, scientific speciality „Ecology and Ecosystem Conservation“, under the discipline "Technology for restoration to damage soil and terrain", announced by the University of Forestry, SG. 101 / 27.12.2019, procedure code ELA - AsP - 1119 - 29

Applicant for the competition:

1. Chief assistant Dr. Petar Gospodinov Petrov

Prepared by: D.Sc. Rossitsa Tsvetkova Petrova, Professor, Professional direction 6.5. Forestry, nominated as a member of the Scientific Jury with Order ZPS № 68 / 18.2.2020 of the Rector of University of Forestry

1. Brief biographical information

Peter Petrov was born in 1977 in the town of Stara Zagora. He graduated from the University of Forestry in 2002 with a bachelor's degree, majoring in ecology and environmental protection. During the period 2002 - 2004 he completed his master's degree at the University of Forestry majoring in Environmental Monitoring and Eco-management. For the period 2002 - 2013 works as a Certified Ecologist at the BALKAN SCIENTIFIC AND EDUCATIONAL CENTER FOR ENVIRONMENTAL AND ENVIRONMENTAL PROTECTION, completing a PhD at the CTMU for the period 2006 - 2009 on the topic: “Characterization of the waste from the Svilosa TPP and their environmentally sound storage and treatment” and gaining an educational and scientific degree “Doctor” in “Utilization Technology and waste treatment. "

Since 2005 he has been the managing director of P-United Ltd. From January 2013 to the present time, Petar Petrov is Ch. Assistant at the Department of Ecology, Conservation and Restoration of the Environment.

Chief assistant Dr. Petar Petrov is a member of the Balkan Ecological Association (B.E.N.A.) and the Association of Environmental Impact Assessment Experts, to which he is a manager.

2. Conformity of the submitted documents and materials of the applicant with the minimum

requirements, in accordance with the Regulations for Development of the Academic Staff at University of Forestry

The scientific production of Chief assistant Dr. Petar Petrov has been established with the minimum national requirements under Art. 2b of ZRARBB and Art. 2a, par.1 of Rules for the Development of Academic Staff at University of Forestry. The reference shows a excess (531.62) of the minimum required points by groups of indicators (400), as follows:

- Category A - 50 points with minimum requirements - 50 points;
- Category B - 100 points with minimum requirements - 100 points;
- Category G – 294.62 points with minimum requirements - 200 points;
- Category D - 87 points with minimum requirements - 50 points;

2. Assessment of the teaching - scholastic activity of the applicant (s)

Chief assistant Dr. Petar Petrov has been a lecturer at the LTU since 2013. The subjects taught by the candidate are:

• Technologies for restoration of damaged soils and terrains (full-time training), Bachelor's Degree, EEA;

• Biological monitoring (full-time training), educational qualification degree Master's, EEA;

• Remediation of disturbed terrains (full-time training), educational qualification degree Master's, EEA;

• Soil resources in settlement systems (full-time education) educational qualification degree Master's, EEA;

• Ecosystem Services, educational qualification degree Master's, EEA;

• Remediation of disturbed terrains (full-time training), educational qualification degree Master's, LA.

According to Ref. FELA - 1217 / 02/19/2020, the guided graduates (4) are in the specialty "Ecology and Environmental Protection", such as 2. are in the Bachelor's Degree Program (one of them he is a co-leader) and 2 at the Master's Degree Program.

The applicant has:

- A PhD Guide, Full-time, Specialty Ecology and Ecosystem Conservation, credited in January 2019;

- Developed new and updated curricula (4) by:

✓ Technologies for the restoration of damaged soils and terrains - a lecture course in the curriculum of the specialty "Ecology and Environmental Protection" for Bachelor Degree;

✓ Reclamation of disturbed terrains - a lecture course in the curriculum of the specialty "Ecology and Environmental Protection" for Bachelor Degree;

✓ Reclamation of disturbed terrains - a lecture course in the curriculum of the specialty "Ecology and Environmental Protection" for the Master's degree program;

✓ Soil Resources Management - Lecture Course in the Curriculum of the Master's Degree in Ecology and Environmental Protection;

- Prepared reviews of 5 pcs. papers developed for the acquisition of Master's Degree Program (Reference with FELA output no. - 1217 / 02/19/2020).

4. Assessment of the applicant's scientific, applied and publication activities

4.1. Participation in scientific, applied and educational projects

Chief assistant Petrov participated in the competition in a total of 54 research and applied projects. From them:

- 2 pcs. international scientific and applied projects, of which 1 is a project manager;
- 10 pcs. national scientific and applied research projects, of which 3 is a leader;
- 1 piece. scientific project funded by NIS - LTU;
- 3 pcs. international scientific and applied scientific projects, developed in other organizations, of which 1 pc. is a manager;
- 38 pcs. national scientific and applied projects.

4.2. Characteristics of published scientific results

The scientific results have been published in 28 scientific works, of which the dissertation for obtaining the educational and scientific degree "Doctor" and the related 5. publications. They are not subject to review.

The characteristics of the published scientific results related to this competition are presented with indicators C and D in the Self-Assessment Report. The submitted information shows that the scientific results were published in total in 23 scientific papers, presented by:

- Habilitation work-monograph (indicator B3) – 1pcs;
- Published book on the basis of a dissertation thesis for the award of educational and scientific degree "doctor" (indicator G6) - 1 pc.
- Articles and reports published in scientific journals, referenced and indexed in world databases (Web of Science and / or Scopus) - (indicator G7) - 14 pcs.
- Articles and reports published in non-refereed scientific peer-reviewed journals or in published collective volumes - Indicator G8 - 7 pcs.

The monograph presented "Approaches to the reclamation of the Eastern Bulk, (B3)

„Elatsite“ mine describes technologies for the reclamation of man-made soils formed after the extraction of copper ore. The technologies have been developed on the basis of soil analyzes performed and applied in field trials.

The published book (G6), on the basis of a dissertation thesis for the award of an educational and scientific degree "Doctor" "Characterization of the waste from TPP "Svilosa" and their environmentally friendly storage and treatment" is peer-reviewed and has some scientific value, although it stands a little distant from the subject of the announced competition.

Of the total of 14 presented. articles and reports published in scientific journals, referenced and indexed in worldwide databases (Web of Science and / or Scopus), 6 pcs. or 43% (G7.2; G7.4; G7.5; G7.10; G7.12; G7.13 and G7.14) are related to the subject of the announced competition; 3 pcs. or 22% (G7.6; G7.8 and G7.9) focused on assessing the status of flora in protected sites and reserves; 2 pcs. or 14% (G7.1; G7.11 related to environmental impact assessment; 1 pc or 7% (G7.3) related to assessment of fauna status in protected sites and reserves; 1 pc or 7% (G7.7) refers to phytocenotic and ecosystem services and 1 or 7% (G6) concerns the environmentally sound storage and treatment of industrial wastes.

Of the total of 7 presented. articles and reports published in non-refereed scientific peer-reviewed journals or in published collective volumes, 3 pcs. or 43% (G8.1; G8.2; G8.7) are related to the subject of the announced competition and 4 pcs. or 57% (G8.3; G8.4; G8.5 and G8.6) were directed to assess the ornithofauna.

The results are published as:

- Independent - 4 pcs. (B3; G6; G7.10 and G7.13), of which 2 are published in international journals indexed in worldwide databases (Web of Science and Scopus) - G 7.10 and G 7.13;
- Leading author - 4 pcs. (G7.2; G7.5; G7.11; G8.7),
- Second author - 9 pcs. (G7.4; G7.8; G7.12; G7.14; G8.1; G8.3; G8.4; G8.5; G8.6).
- With three or more co-authors - 6 pcs. (G7.1; G7.3; G7.6; G7.7; G7.9; G8.2).

4.3. Reflection of the candidate's scientific publications in the literature (citation).

A total of 24 units were established. citations to 21 publications respectively:

- in scientific publications, abstracted and indexed in world-renowned databases of scientific information or in monographs and collective volumes (D10) – 12 pcs.;
- in monographs and collective volumes with scientific review (D11) - 3 pcs.
- in non-refereed scientific peer-reviewed journals (D12) - 9 issues.

All this testifies to the interest of the scientific community in its development and the results of them.

4.4.Contributions to the candidate`s work of the applicant (s) (scientific, applied science,

applied)

Contributions to the scientific publications of Ch. Prof. Petrov are summarized in two scientific fields:

1) Investigation of disturbed soils and disturbed terrains, development of technologies for restoration of soil functions as a component of ecosystems and research on succession processes after reclamation;

2) Research on ecosystem restoration processes and study of biodiversity in territories with different conservation and utilization regimes, development of measures for their management and restoration.

Contributions made by the applicant in the second direction are related to the characteristic of biological and ecosystem diversity in territories with protected land use regime and the characteristic of ornithofauna in territories with economic use, and although they represent the broad competences and interests of the applicant fall outside the scope of the announced competition . Therefore, I will not take any action on them.

In **the first area**, the candidate shall indicate 15. contributions of a scientific and scientific nature. They are based on the results obtained in: monograph (B3); a book on the basis of a dissertation thesis for the award of an educational and scientific degree "Doctor" "Characterization of the waste from TPP" Svilosa "and their environmentally friendly storage and treatment" (G6) and 10 issues. scientific publications (B3; G7.2; G7.4; G7.5; G7.10; G7.12; G7.13; G7.14; G8.1; G8.2; G8.7). The nature of the contributions presented is:

A) Confirmatory science including:

1. Summary and analysis of limiting factors for biological reclamation of disturbed terrains:

- content of essential nutrients (B3; G7.2; G7.5; G7.10; G7.12; G7.14; G8.1);
- acidity of the substrates (B3; G7.4; G7.5; G7.10; G7.12; G8.1);
- presence of pollutants - heavy metals and metalloids in: bulk substrates from coal mining, extraction of copper ore and its processing (B3; G7.4; G7.5; G7.10; G7.12; G8.1), in the ash from TPP (G6) ;
- vegetation growth and development (B3; G6; G7.2; G7.4; G7.5);

2. Analysis of soil formation processes in disturbed terrains (G7.12; G7.14).

B) Proving with new means of significant new sides of already existing scientific problems

Dr. Petrov's studies and research were conducted mainly on sites related to: the extraction of copper ore (Elatsite mine and Chelopech mine), its processing and enrichment (the Elatsite and Chelopech mine tailings ponds) and the extraction of coal (Maritza-East Mines), on which Professor E. Zheleva has been working for more than 30 years. Studies on the possibility of using

the ash from the TPP for the purposes of reclamation were made in the 80 - 90 years of the last century on the territory of "Mini Maritza - East" by scientific teams of the Institute for Soil Science and Crop Programming N. Pushkarov.

In this sense, a large part of the conducted studies related to the effect of the conducted forest biological reclamation and the results obtained from them concern the proving with new means of significant new sides of already existing scientific problems and hypotheses.

C) Applied science

I believe that the applied method of industrial waste recovery (fermentation product from a phygase plant) as a stabilizer and enhancer of the growth medium for reclamation purposes (G7.13) is a progressive method derived from research and experimentation. The method can be applied in practice after the necessary field tests.

An important contribution to the applicant's scientific and applied activities is his participation in the development of a guide for the registration and reporting of contaminated areas (G8.7). This guidance is, in its essence, a synthesis of the guidelines presented by the MOEW (2001) in the "Manual for the Assessment and Treatment of Old Pollution in Bulgaria" and the "Regulation on Inventory and Surveys of Contaminated Soils, the necessary remedial measures and the maintenance of the implemented restoration activities (MOEW, 2007).

5. Assessment of the applicant's personal contribution

The personal contribution assessment was made on the basis of the published independent works - 4, two of which are: own monograph (B3.1) and a book published on the basis of the dissertation for the acquisition of the Doctor of Science (G6.1). The rest are co-authored primarily with members of the research team he is currently working with and his student PhD.

To the personal contribution can be added the participation of Ch. Assist. Petrov in 23 pcs. projects related to the subject of the announced competition, of which projects given in Annex 1-2 (Nos. 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 and 13) and those given in Annex 2-4 (Nos. 20, 21, 22, 23), Annex 2-3 (No. 27), Annex 2-9 (No. 31), Annex 2-13 (No. 35), Annex 2-17 (No. 39) , Annex 2-18 (No. 40), Annex 2-21 (No. 44), Annex 2-22 (No. 45) and Annex 2-23 (No. 46). Of these, the candidate was the head of 4. projects (Nos. 10, 11, 12 and 40). In the rest, he participated as an expert.

6. Critical notes and recommendations

In general, these contributions are highly fragmented and can be easily summarized and grouped, which will make it possible to more clearly highlight the actual and original in the applicant's activities.

With regard to the overall research and application activities of chief assistant Dr. Petrov I have the following comments and recommendations related to:

• Analysis and synthesis of scientific data

In some of the developments following the abundant data presented: there is no analysis of the results of the biological reclamation that has been carried out so far, which raises many questions in the reader (B3; G7.10); there is no analysis of changes in the observed parameters (G7.4; G7.5; G7.12), or conclusions and summaries have been made that are not fully supported by the presented results (G7.4; G7.5; G7.10) .

The content of one of the basic nutrients - phosphorus and potassium, is expressed as an element (P, K), in the form of oxides (P_2O_5, K_2O) or in both forms at the same time. The content of phosphorus and potassium, expressed as oxides, is recalculated as elements by the coefficients: 1. phosphorus (P) = phosphorus pentaoxide (P_2O_5) x 0.436; 2. potassium (K) = potassium oxide (K_2O) x 0.830. The application of these basic rules clearly shows the absence of the effect of applied mineral fertilization (G7.10).

• Terminological inaccuracies allowed

Terminological inaccuracies are identified, such as: *"brown mountain forest soils"; "Deep mineral collmation"; "High relative density creates conditions for strong compaction"; "Primary shale"; "Stones", "self-afforestation"* and more. (B3);

Some English language articles have incorrect translations, such as: *sandy-clay to clay-sandy mechanical structure?* (G7.4); *volumetric density and soil-hidrological qualities* (G7.13).

• Citation of scientific data

It is noteworthy that the literature cited in the individual publications generally lacks the names of established authors in the field of reclamation of disturbed lands and soils, such as Prof. Gencheva, Prof. Banov, and Prof. Petrova, which speaks of some gaps in literary awareness. of the candidate.

I recommend that Dr. Petrov, in his future work in soil characterization, use and apply the basic principles and diagnostic criteria of the international soil classification system World Reference Base for Soil Resources (WRB, 2006, 2007) or the National Classification of Soils.

7. Personal impressions

I have no personal impression on the candidate. The presented materials characterize Dr. Petrov as an established teacher, sought after and valuable in practice. It is characterized by professional efficiency and creative activity.

8. Conclusion

Independently of the remarks made, my overall assessment of the submitted materials for participation in the competition is positive.

In connection with the above, I PROVIDE Candidate CH. ASS. Dr. Peter G. Petrov to occupy the academic position of "Assistant Professor" in the discipline "Technologies for the restoration of damaged soils and terrains" of Professional direction 4.4. Earth Sciences.

Reviewer's signature:

Review delivered on: 4/14/2020