Report
of the Expert Panel
on the REACCREDITATION
of the University Postgraduate (Doctoral) Programme

Agricultural Science

Faculty of Agriculture, University of Zagreb

Date of the visit:
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CONTENTS

INTRODUCTION

The Expert Panel appointed by the Agency for Science and Higher Education (ASHE) created this Report on the Re-accreditation of the University Postgraduate (Doctoral) Programme *Agricultural Science* on the basis of the Self-Evaluation Report of the Programme, other documentation submitted and a visit to the Faculty of Agriculture, University of Zagreb

The Agency for Science and Higher Education (ASHE), a public body listed in EQAR (European Quality Assurance Register for Higher Education) and a full member of ENQA (European Association for Quality Assurance in Higher Education), re-accredits higher education institutions (hereinafter: HEIs) and their study programmes in line with the Act on Quality Assurance in Science and Higher Education (Official Gazette 45/09) and the Ordinance on the Content of a Licence and Conditions for Issuing a Licence for Performing Higher Education Activity, Carrying out a Study Programme and Re-Accreditation of Higher Education Institutions (OG 24/10). In this procedure parts of activities of higher education institutions and university postgraduate study programmes are re-accredited.

Expert Panel is appointed by the Agency's Accreditation Council, an independent expert body, to carry out independent evaluation of post-graduate university study programmes.

The Report contains the following elements:

- Short description of the study programme,
- The recommendation of the Expert Panel to the Agency's Accreditation Council,
- Recommendations for institutional improvement and measures to be implemented in the following period (and checked within a follow-up procedure),
- A brief analysis of the institutional advantages and disadvantages,
- A list of good practices found at the institution,
- Conclusions on compliance with the prescribed conditions of delivery of a study programme,
- Conclusions on compliance with the criteria for quality assessment.

Members of the Expert Panel for the Cluster of Biotechnology:

- Professor Hans Thordal-Christensen, Department of Plant and Environmental Sciences, University of Copenhagen, Kingdom of Denmark,
- Professor Vesna Miličič, Biotehniška fakulteta, Univerza v Ljubljani, Republic of Slovenia,
- Prateek Mahalwar, doctoral candidate, Max Planck Institute for Developmental Biology, Tuebingen, Federal Republic of Germany,
- Professor Marketta Sipi, Faculty of Agriculture and Forestry, University of Helskinki, Republic of Finland,
- Professor Jürgen Pretzsch, Dresden University of Technology, Federal Republic of Germany,
- Hynek Roubík, doctoral candidate, Faculty of Tropical AgriSciences, Czech University of Life Sciences Prague, Czech Republic,
- Professor Claes Niklasson, Chalmers University of Technology, Kingdom of Sweden,
- Professor Colette Fagan, University of Reading, United Kingdom of Great Britain and Northern Ireland,
- Professor Susanne Knøchel, Faculty of Science University of Copenhagen, Kingdom of Denmark,
- M. Sc. Kathirvel Alagesan, doctoral candidate, Max Planck Institute of Colloids and Interfaces, Federal Republic of Germany.

The higher education institution was visited by the following Expert Panel members:

- Professor Hans Thordal-Christensen, Department of Plant and Environmental Sciences, University of Copenhagen, Kingdom of Denmark,
- Professor Vesna Miličič, Biotehniška fakulteta, Univerza v Ljubljani, Republic of Slovenia,
- Prateek Mahalwar, doctoral candidate, Max Planck Institute for Developmental Biology, Tuebingen, Federal Republic of Germany

In the analysis of the documentation, site visit and writing of the report the Panel was supported by:

- Vlatka Šušnjak Kuljiš, coordinator, ASHE,
- Đurđica Dragojević, interpreter at the site visit,
- Đurđica Dragojević, translator of the Report, ASHE.

During the visit to the Institution the Expert Panel held meetings with the representatives of the following groups:

- Management (Dean, Vice Deans),
- Head of PhD programme,
- Doctoral candidates,
- Supervisors,
- Alumni and External stakeholders,

The Expert Panel also had a tour of the library, IT rooms, student register, selected laboratories and the classrooms.

SHORT DESCRIPTION OF THE STUDY PROGRAMME

Name of the study programme contained in the licence: **Agricultural Science**
Institution providing the programme: **University of Zagreb**
Education provider(s): **Faculty of Agriculture**
Place of delivery: **Zagreb, Svetošimunska 25**
Scientific area and field: **Biotechnical Sciences; fields: Agriculture (Agronomy)**

Learning outcomes of the study programme:

1. Identify research problem in the field of agriculture and rural development and to evaluate basic types of research in agriculture and related fields.
2. Categorize basic concepts of scientific research: set-up explicable hypothesis, determine the measurable research goals and design original research in the field of agriculture, primary processing and food production, environmental protection and rural development.
3. Select and use appropriate scientific methods in the research process (analytical, synthetic, quantitative, statistical and socio-economic analysis, etc.).
4. Critically analyse and evaluate the results of its own scientific research, interpret and argue against larger and more complex social groups and present the latest technical, technological and socio-economic knowledge in the field of agriculture and related activities.
5. Publish research results in high-ranking journals with the aim of disseminating new knowledge and to apply new knowledge and skills in production and economic practices in the field of agriculture and related activities.
6. Actively participate in the preparation of studies, project proposals, strategic and operational documents in the field of agriculture and rural development.
7. Guide and/or monitor the implementation of projects and business activities in more complex production and socio-economic systems in the field of agriculture, food processing and food production, environmental protection and rural development with the highest level of social responsibility.
8. Create new proposals (individually and/or in teams) to solve the problem of agricultural production and rural development in changing and unknown natural, productive, economic and socio-political conditions and circumstances.
9. Apply the latest scientific knowledge, cognitions and technologies to improve production and organizational processes in the field of agriculture, food processing and food production, environmental protection and rural development (through the field, laboratory and social research etc.).
10. Individually suggest and take part in the adoption of measures for agricultural, environmental and rural development policies.
11. Develop research and learning skills necessary for lifelong learning and continuous improvement and development of the acquired knowledge (formal, unformal and informal).
12. Follow, synthesize and evaluate national and international scientific and professional literature and to evaluate the scientific and professional work in the field of agriculture.

Number of doctoral candidates: **235**
Number of teachers: **128**
Number of supervisors: **75**
Doctoral student : supervisor ratio: **3.1:1**

RECOMMENDATION BY THE EXPERT PANEL TO THE ASHE'S ACCREDITATION COUNCIL

Upon the completion of the re-accreditation procedure and the examination of the materials submitted (Self-Evaluation Report etc.), the visit to the higher education institution and interviews with HEI members in accordance with the visit protocol, the Expert Panel renders its opinion in which it recommends to the Accreditation Council of the Agency the following: (leave what is recommended, delete the rest):

1. **issue a confirmation on compliance** for performing parts of activities.

RECOMMENDATIONS FOR THE IMPROVEMENT OF THE STUDY PROGRAMME

1. More active collaboration with other European (incl. non-Balkan) HEIs to improve the level of excellence (teachers and PhD candidates)
2. Forming a PhD students association – club where PhD candidates can express their own recommendations for the improvement of the study programme
3. Enlarge and extend the workshops for mentors and teachers in order to acquire new supervisor competencies for work with students and PhD candidates
4. Organizing workshops for teachers and mentors on how to present their work and research in English, in order to improve their knowledge in written and oral English; or how to apply for European funding, aiming at lifting the research level for the students and in general
5. Allocate funds to widen the horizon of students and supervisors, rather than spending on new buildings (e.g. a library)
6. We encourage that student are not allowed to cover laboratory costs themselves.

ADVANTAGES OF THE STUDY PROGRAMME

1. Large number of students enrolled
2. Good PhD study programme, very diverse selection of courses
3. Excellent choice of supervisors and other external experts
4. High level of satisfaction and harmony between students and supervisors.

DISADVANTAGES OF THE STUDY PROGRAMME

1. Lack of business oriented modules, e.g. some of the PhD candidates express a wish that they would like to start their own company, but they don't have enough knowledge and information to do that.
2. Too many of the PhD project are based on industry collaborations, which has the negative consequence that advanced basic research projects largely are missing
3. Shortage of international co-operation
4. Too little use of English, which is required for lifting the research level. A module on writing in English (e.g. academic language sessions addressing the appropriacy of English language use in an academic context) or professional use of English is highly recommended.

EXAMPLES OF GOOD PRACTICE

1. Excellent collaboration with the national agricultural and food processing industry
2. Good international co-operation, especially with other HEIs from Balkan region (teachers and students exchange)
3. Excellent collaboration between PhD candidates and mentors on joint research project activities resulting in publishing of scientific papers
4. Organizing workshops and trainings related to defining the learning outcomes in order to acquire new competencies for work with PhD candidates.

Note: At both universities, Zagreb and Osijek, teachers were complaining that the state does not encourage scientific research and that more funding should be dedicated to that in the future. We think this is an overall European problem.

COMPLIANCE WITH THE PRESCRIBED CONDITIONS FOR THE DELIVERY OF A STUDY PROGRAMME

Minimal legal conditions:	**YES/NO notes**
1. Higher education institution (HEI) is listed in the Register of Scientific Organisations in the scientific area of the programme, and has a positive reaccreditation decision on performing higher education activities and scientific activity.	**YES**
2. HEI delivers programmes in the two cycles leading to the doctoral programme, i.e., first two cycles in the same area and field/fields (for interdisciplinary programmes), and employs a sufficient number of teachers as defined by Article 6 of the Ordinance on the Content of a Licence and Conditions for Issuing a Licence for Performing Higher Education Activity, Carrying out a Study Programme and Re-Accreditation of Higher Education Institutions (OG 24/10).	**YES**
3. HEI employs a sufficient number of researchers, as defined by Article 7 of the the Ordinance on Conditions for Issuing Licence for Scientific Activity, Conditions for Re-Accreditation of Scientific Organisations and Content of Licence (OG 83/2010).	**YES**
4. At least 50% of teaching as expressed in norm-hours is delivered by teachers employed at the HEI (full-time, elected into scientific-teaching titles).	**YES**
5. Student: teacher ratio at the HEI is below 30:1.	**YES**
6. HEI ensures that doctoral theses are public.	**YES**
7. HEI launches the procedure of revoking the academic title if it is determined that it has been attained contrary to the conditions stipulated for its attainment, by severe violation of the studying rules or based on a doctoral thesis (dissertation) that has proved to be a plagiarism or a forgery according to provisions of the statute or other enactments.	**YES**
Additional/ recommended conditions of the ASHE Accreditation Council for passing a positive opinion	**YES/NO notes**
1. HEI (or HEIs in joint programmes) has at least five teachers appointed to scientific-teaching titles in the field, or fields relevant for the programme involved in its delivery.	**YES**
2. In the most recent reaccreditation, HEI had the standard Scientific and Professional Activity (e.g. Artistic for those in the arts field) marked as at least "partly implemented" (3).	**YES**
3. The doctoral programme is aligned with the HEI's research strategy.	**YES**
4. The candidate: supervisor ratio at the HEI is not above 3:1.	**YES**
5. All supervisors meet the following conditions: a) PhD, elected into a scientific title, holds a scientific or a scientific-teaching position and/or has at least two years of postdoctoral research experience; b) active researcher in the scientific area of the programme, as evidenced by publications, participation in scientific conferences and/or projects in the past five years (table 2, Supervisors and candidates); c) confirms feasibility of the draft research plan upon admission of the candidate (or submission of the proposal); d) ensures the conditions (and funding) necessary to implement the candidate's research (in line with the draft research plan) as a research project leader, co-leader, participant, collaborator or in other ways; e) trained for the role before assuming it (through workshops, co-supervisions etc.); f) received a positive opinion of the HEI on previous supervisory work.	**YES**
6. All teachers meet the following conditions: a) holds a scientific or a scientific-teaching position; b) active researcher, recognized in the field relevant for the course (table 1, Teachers).	**YES**
7. The supervisor normally does not participate in the assessment committees.	**YES**

8. The programme ensures that all candidates spend at least three years doing independent research (while studying, individually, within or outside courses), which includes writing the thesis, publishing, participating in international conferences, field work, attending courses relevant for research etc.	**YES**
9. For joint programmes and doctoral schools (at the university level): cooperation between HEIs is based on adequate contracts; joint programmes are internationally recognized, and delivered in cooperation with accredited HEIs; the HEI delivers the programme within a doctoral school in line with the regulations (it is based on contracts in the case of multiple institutions, and the HEIs ensure good reaccreditation aimed at supporting the candidates); at least 80% of courses are delivered by teachers employed at HEIs within the consortium.	**-**

QUALITY ASSESSMENT

	Quality assessment ("high level of quality" or "improvements are necessary") and the explanation of the Expert Panel
1. RESOURCES: TEACHERS, SUPERVISORS, RESEARCH CAPACITIES AND INFRASTRUCTURE	
1.1. HEI is distinguished by its scientific/ artistic achievements in the discipline in which the doctoral study programme is delivered.	**Improvements are necessary** We asses this criterion good, but improvement needed to meet excellence. HEI participated in 489 national and international projects: Coordinators and/or partners in a 150 projects; 2 HORIZON 2020, 3 FP7, 8 COST Action, 3 IPA, 12 bilateral, 5 other research projects and 6 international educational projects. (Self-evaluation Report, SER for further reference; p. 1 in pdf p. 10). Mentors have published a total of 1738 papers with total citations of 7864 (WOS) and 7869 (Scopus) over the last five years. PhD students published a total of 335 scientific papers over the last five years. (SER, p. 5, 6 in PDF p. 14, 15) This citation level is not high according to an international scale. The reason for this is probably that many of the projects are collaborations with industry and applied in nature, and therefore the results have limited general interest.
1.2. The number and workload of teachers involved in the study programme ensure quality doctoral education.	**Improvements are necessary** Teachers are somewhat overloaded, but we have been informed that 15 assistant professors are being hired. Faculty has recently been approved the election of a large number of assistant professors (38). (SER, p. 4, in PDF p. 13). In the Table 1 (Teachers) on p. 62 of the SER PDF file loading in norm hours is stated for each teacher. Out of 128 teachers, 37 have more than 360 NH. Out of 75 supervisors, 23 have more than 360 NH and 2 of them have more than 3 PhD candidates under their supervision. The average teaching load per Faculty teacher (including teaching at undergraduate, graduate and postgraduate studies) is 304 NH which is in line with the Collective Agreement regulating 300±20% NH. (SER, p. 4, in PDF p. 13).
1.3. The teachers are highly qualified researchers who actively engage with the topics they teach,	**High level of quality** HEI's teachers are dedicated and open-minded, but they have to widen their horizon to ensure a research level of European status. More basic

providing a quality doctoral programme.	research is needed to meet future needs.
1.4. The number of supervisors and their qualifications provide for quality in producing the doctoral thesis.	**High level of quality** Overall this criterion is fulfilled, but there are cases where individual supervisors are overloaded with teaching activities. Over the last five years, at postgraduate doctoral programme *Agricultural Sciences* 75 mentors were engaged in supervision of 171 PhD students. PhD student : mentor ratio was 3:1.
1.5. The HEI has developed methods of assessing the qualifications and competencies of teachers and supervisors.	**High level of quality** SER 1.5. states that the HEI has developed methods of assessing the qualifications and competencies of teachers and mentor. "The Council of the Doctoral Study Programme monitors, analyses and evaluates the work of mentors" (SER, p. 6 in PDF p.15). Mentors' quality and success is continuously monitored through the Faculty Annual Report which is published on line at the faculty web site. The criteria for mentoring a PhD candidate is 5 published scientific papers in the field of dissertation topic, of which at least one must be published in journal indexed as group a1. The faculty is taking into consideration this rule while assigning PhD candidates to mentors.
1.6. The HEI has access to high-quality resources for research, as required by the programme discipline.	**Improvements are necessary** The laboratories are equipped at a rather basic level. Very little advanced up-to-date instruments were presented. Apart from the laboratories, HEI has also centres for teaching and training (research polygons) and mechanization. HEI has 8 very important dislocated experimental stations. PhD students have access to Central Agricultural Library with a collection of about 69,000 titles and on-line database of the National and University Library in Zagreb.
2. INTERNAL QUALITY ASSURANCE OF THE PROGRAMME	
2.1. The HEI has established and accepted effective procedures for proposing, approving and delivering doctoral education. The procedures include identification of scientific/ artistic, cultural, social and economic needs.	**High level of quality** The SER explains in a number of points that they are fully aware of the needs to have such procedures (p. 10). At the visit, we experienced that procedures exist.
2.2. The programme is aligned with the HEI research mission and vision, i.e. research strategy.	**Improvements are necessary** The programme is more directed towards applied research, to an extended degree and defined by the collaborating industry's needs, desires and willingness to fund. We fully acknowledge this situation, and respect HEI's ability to maintain this high industry involvement. Nevertheless, the research strategy describes a wish to obtain excellence and international

	research level through increased mobility, and this is challenging to obtain with the high industry involvement. Therefore, we find that the HEI is lacking behind on becoming aligned with its mission and vision. There are some language issues. More use of English should be implemented. International collaboration should be improved. We experienced reluctance towards using English in our dialogue with the professors during the visit, and this for obvious reasons does not facilitate establishing of e.g. international collaborations. We assess teaching as satisfactory, but there is a need for widening the horizon and inspiration from basic sciences. Research work needs more visibility. Modern instrumentation suffers. Spendings on buildings: We understood that the Faculty is planning to build a new library. We are puzzled by this, as we find the resources should be spend otherwise. Nowadays literature is accessed through the internet, and not at physical libraries.
2.3. The HEI systematically monitors the success of the programmes through periodic reviews, and implements improvements.	**Improvements are necessary** Concerning the periodical international and/or national programme reviews, we are uncertain if there are national reviews. Concerning the continuous monitoring and analyses of research productivity of supervisors and candidates, we believe this is compliant. HEI has annual PhD student reports in place and monitors the publication activity. Concerning the collecting and analysing feedback from candidates, alumni and drop-outs (especially the supervision system and the support provided by the HEI, or reasons for drop out), HEI collects the numbers, but findings (e.g. reasons for drop out) may not be analysed. Concerning the collecting and analysing feedback from other stakeholders (e.g. employers), there were no data, but as the stakeholders keep long-term collaborations, this indicates that they are satisfied. We have not found evidence on changes implemented on the basis of these procedures.
2.4. HEI continuously monitors supervisors' performance and has mechanisms for evaluating supervisors, and, if necessary, changing them and mediating between the supervisors and the candidates.	**High level of quality** The supervisors' research performances and supervision performances are recorded (Table 2 in SER), and the completion rates for the candidates are monitored. However, there is no systematic procedure for collecting feed-back from current and former candidates. There are procedures for changing supervisors, but it would be favourable if a system for conflict management would existed, e.g. assisted by a student representative. Also the system allows for recognition of successful supervisors.
2.5. HEI assures academic integrity and freedom.	**High level of quality** Concerning the integrity of academic work, the programme includes discussions on ethics at an early time-point (in the first semester of the first year of doctoral study) and tests for plagiarism, as discussed on p. 20 in the SER. More discussion is recommended. Freedom: Industry-related projects are defined with little chance for adaptation. However, nationally funded and internal student projects can be adapted, especially later on when the PhD candidate starts with research

	and writing process.
2.6. The process of developing and defending the thesis proposal is transparent and objective, and includes a public presentation.	**High level of quality** PhD topic acceptance and procedure for defence exist at university level. PhD committees are formed with at least one member from another institution. A detailed proposal defence protocol, templates as well as presentation guidelines exist. Templates for proposal assessment are published and made available to the reaccreditation panel.
2.7. Thesis assessment results from a scientifically sound assessment of an independent committee.	**High level of quality** HEI has developed the procedures of developing and defending the doctoral thesis (as described in an ordinance, or other documents such as: Regulations on doctoral studies at the University of Zagreb). HEI encourages participation of external international examiners in the thesis defence committee in some cases only (some English thesis shown). HEI encourages candidates to have at least one publication with an internationally competitive peer-review in the field of the thesis, prior to completion of doctoral education. Although a requirement, papers in reality are not published in internationally competitive journals. HEI accepts a variety of formats for the theses. HEI has created and published thesis guidelines (made available to the reaccreditation panel). Doctoral assessment template is publicly available. Detailed guidelines for dissertation writing are created as a template and published at the website. HEI has created and published thesis assessment guidelines (made available to the reaccreditation panel). Application forms and instructions for creating presentation are publicly available. A detailed protocol for the dissertation defence is published as a template. The panel was presented with template for recording the thesis defence (viva) as well as other forms and templates.
2.8. The HEI publishes all necessary information on the study programme, admissions, delivery and conditions for progression and completion, in accessible outlets and media.	**High level of quality** All the info are published on the Faculty website: http://www.agr.unizg.hr/en/category/agricultural_sciences/204 and regularly updated.
2.9. Funds collected for the needs of doctoral education are distributed transparently and in a way that ensures sustainability and further development of doctoral education (ensures that candidates' research is carried out and supported, so that doctoral education can be completed successfully).	**Improvements are necessary** I**n some cases students themselves need to cover expenses for experiments.** The panel has received this information from staff members of the faculty, stating that some PhD candidates were buying the chemicals and lab equipment at their own expense. It seems there is a lack of transparency in how the money from tuitions is being spent. Tuition amounts to 6.306,66 EUR (48 000 HRK). The head of the PhD programme was asked this question many times, but he refused to answer this question clearly and openly. The panel would like that annual financial report of the PhD study programme is announced publically and made available to all employees. In the SER (p. 24 - 25, in PDF p. 33, 34) it is said that: “Funds raised for the

	doctoral education are distributed according to the Regulations on post-graduate scientific and specialist studies (Article 86, 87 and 88). Part of the funds are directed for the study programme improvement (modernization of teaching process, procurement of scientific and professional literature, cost of workshops for PhD students and mentors) and study programme promotion. Part of the funds are directed to teaching process in order to cover fees of external teachers and teachers with teaching overload and other organizational activities of the study. A part of the income from tuition fees is used to cover the costs of the members of the Committee for evaluation of the dissertation topic and the Committee for dissertation defence as well as material costs incurred in the process. In addition, PhD students can use funds (fully financed or co-financed) for participation at various workshops, seminars, symposiums etc. A part of the tuition fees is intended for Faculty overheads and material costs." **A more detailed information on distribution of actual funds is needed.**
2.10. Tuition fees are determined on the basis of transparent criteria (and real costs of studying).	**Improvements are necessary** According to SER p. 25 (p. 34 in PDF): "Tuition fee is determined in order to enable the organization and smooth implementation of the study programme. Tuition fee includes material costs of teaching, the average price of an hour of teaching and costs of the members of the Committee for evaluation of the dissertation topic and the Committee for dissertation defence, which also include travel costs of external (often foreign) members. Costs of mentorship and co-mentorship as well as the costs of researchers and teachers are funded. Tuition fee includes overhead, material and administrative costs. The cost of research work is formed in agreement with the mentor, Board for doctoral studies and doctorates and a PhD student. Material costs of PhD dissertation and participation of PhD students at conferences are funded by scientific and professional projects within which the dissertation research is conducted; or by institution where PhD student is employed; or by a PhD student own funds in case of education for personal need". Yet, this score is given based on the input in 2.9.
3. SUPPORT TO DOCTORAL CANDIDATES AND THEIR PROGRESSION	
3.1. The HEI establishes admission quotas with respect to its teaching and supervision capacities.	**Improvements are necessary** Programme provides high quality admission policy for internal candidates, but not for external candidates. External candidates should also go through rigorous selection and selective admission process to maintain the quality. Concerning the capacities of supervisors, the qualities of supervisors' research are average; most of the supervisors don't aim for high quality basic research in PhD thesis work. Some supervisor have very high teaching load, which even exceed the legal working limit. This in turn suggests less time for the supervision of the PhD candidate. The supervisor to student ratio is slightly above 1:3.
3.2. The HEI establishes admission quotas on the basis of scientific/ artistic, cultural, social, economic	**Improvements are necessary** Number of candidates finishing PhD indicates a good completion rate. However, a number of students have dropped out in last five years and it

and other needs.	was hard to find the reasons behind that. Many PhD candidates are concerned about jobs and career prospects after completing PhD. Most of PhDs stay at University of Zagreb for their postdoctoral studies to increase their chance for a future career there. The internal recruitment culture should be minimized in order to attract staff with wider scientific horizons. Most of the research is done in respect to economic prospective of agriculture. However, not many innovative companies and intellectual property was established. The Programme needs several improvements in this prospective. Some of the suggestion are mentioned below: (1) Fostering culture of innovation-based entrepreneurship (2) Seminars on "how to set up your own company" (3) Seminars on jobs outside academia (4) Establish a culture of doing post-doctoral work and science in foreign countries (5) Make patents and copyright courses.
3.3. The HEI establishes the admission quotas taking into account the funding available to the candidates, that is, on the basis of the absorption potentials of research projects or other sources of funding.	**Improvements are necessary** All internal candidates are fully funded by scholarships via a grant or other scholarships through the Ministry. On the other hand, external candidates (self-financed) have to pay high level tuition fees with no option to apply for scholarship. To further improve the process, external candidates (self-financed) should be given a chance to apply for scholarships (or reduction in fees). This scholarship (or fee reduction) should be awarded on the basis of merit.
3.4. The HEI should pay attention to the number of candidates admitted as to provide each with an advisor (a potential supervisor). From the point of admission to the end of doctoral education, efforts are invested so that each candidate has a sustainable research plan and is able to complete doctoral research successfully.	**Improvements are necessary** Some structural planning has been used for the PhD program. The HEI for instance allocates students to professors according to expertise area. The HEI has installed status reporting and evaluation of this at university level. However, external and internal member committee should be formed (thesis advisory committees). These committees should check the progress for each candidate on the yearly basis and also look at their proposed research plan for whole PhD. Despite our suggested PhD courses (e.g. in soft skills), course work should be reduced as much as possible to allow more focus on lab and research work. Most of the European institutes have much less focus on course work during PhD studies.
3.5. The HEI ensures that interested, talented and highly motivated candidates are recruited internationally.	**Improvements are necessary** The programme appears to have very few international students and most of the calls are not published internationally. To make the position more attractive and competitive, open PhD project positions should be published on international portals.
3.6. The selection process is public and based on choosing the best applicants.	**Improvements are necessary** There is a selection process that is public for internal PhD candidates and they are selected on the basis of merit and examinations. When industry sends the candidates to the faculty, they usually send good and reliable

	candidates in order to improve their industrial processes and to get highly skilled and educated employees. It is in the interest of the industry to constantly gain new knowledge and expertise through sending their employees back to the University. However, for those who are paying the tuition by themselves (or through their employers) there is no specific selection process.
3.7. The HEI ensures that the selection procedure is transparent and in line with published criteria, and that there is a transparent complaints procedure.	**High level of quality** The selection process was found to be clear and open. However, proper quota should be established between self-funded and non-self-funded candidates. This statement also concerns points 3.1, 3.2 and 3.3 above.
3.8. There is a possibility to recognize applicants' and candidates' prior learning.	**High level of quality** The HEI can transfer merits previously obtained by students. See SER p. 32.
3.9. Candidates' rights and obligations are defined in relevant HEI regulations and a contract on studying that provides for a high level of supervisory and institutional support to the candidates.	**Improvements are necessary** Candidates' right and duties are informed. The student and the HEI enter a contract on this matter. Each PhD student signs a study agreement with the Faculty. However, internal candidates (non-self-financed) were more satisfied with this point as compared to external candidates (self-financed). The panel suggests that the rights and obligations have to be clearly presented to each candidate, especially to self-financed, at the beginning of the study.
3.10. There are institutional support mechanisms for candidates' successful progression.	**Improvements are necessary** Several examples were seen to help the candidates in their success progression:– (1) On average at least one international conference (2) Support by exchange within ERASMUS exchange for working in other European universities (Five students were exchanged) (3) Most of the internal candidates were funded with the institutional or grant based research funding. These areas need further improvement : More support to the external candidates (self-financed) for doing experiments and using labs. HEI is currently charging extra for using lab equipment and materials. Only few European Union grants have been attracted for specialised training.
4. PROGRAMME AND OUTCOMES	
4.1. The content and quality of the doctoral programme are aligned with internationally recognized standards.	**High level of quality** Formal enrolment prerequisites, criteria for successful completion of the study programme and mentors' competences are in line with international standards.
4.2. Programme learning outcomes, as well as the learning outcomes within it, are aligned with the	**High level of quality** The programme learning outcomes (LO) are aligned with level 8.2 – acquiring a qualification shall include at least 3 years of scientific or artistic

level 8.2 of the CroQF. They clearly describe the competencies the candidates will develop during the doctoral programme, including the ethical requirements of doing research.	research in full-time equivalent, resulting in original articles with a relevant international peer review. The competencies are very well defined and described in the SER document. More emphasis should be put on the ethical requirements in scientific research at the beginning as well as in the later stage of the research.
4.3. Programme learning outcomes are logically and clearly connected with teaching contents, as well as the contents included in supervision and research.	**High level of quality** Learning outcomes (LO) are defined and aligned throughout the study programme. LO are in line with specific competencies as well as basic competences PhD candidate gains at the end of the study. LO also include the applicability of scientific research results in practice as it is written in the SER document.
4.4. The doctoral programme ensures the achievement of learning outcomes and competencies aligned with the level 8.2 of the CroQF.	**High level of quality** Concerning our positive assessment of LO achievement, see our input on thesis assessments above (2.7). To ensure students achieve learning outcomes, the teachers have repeatedly participated in workshops and trainings related to defining the learning outcomes and competencies of students. Recommendation is to continue with that kind of workshops for teachers and to expand the topics in order to improve teaching skills for teachers at the beginning of their career, e.g. for research assistants, etc.
4.5. Teaching methods (and ECTS, if applicable) are appropriate for level 8.2 of the CroQF and assure achievement of clearly defined learning outcomes.	**High level of quality** Combination of different teaching approaches is used, such as lectures, seminars, lab and field work, working on projects as well as e-learning in order to achieve more student-oriented learning. HEI has implemented and organized a few workshops for teachers in order to improve teaching and mentoring at all study levels, as it is seen in 2 online documents: 1. radionica za nastavnike: http://www.agr.unizg.hr/hr/article/1285/radionica_za_nastavnike_podizanje_kvalitete_izvedbe_visoko%C5%A1kolske_nastave 2. Sveučilište jučer, danas, sutra: http://www.unizg.hr/o-sveucilistu/sveuciliste-jucer-danas-sutra/osiguravanje-kvalitete/ured-za-upravljanje-kvalitetom/ The Faculty has organized a workshop for mentors on March 11, 2016 in order to train mentors how to acquire new competencies for work with PhD students Recommendation is to continue with that kind of workshops for teachers and expand the topics in order to improve teaching skills for teachers at the beginning of their career, e.g. research assistants etc.
4.6. The programme enables acquisition of general (transferable) skills.	**Improvements are necessary** As explained in the SER, PhD students are acquiring new generic skills through trainings in Croatia and abroad. No detailed list is provided. However, business skills and English writing classes are missing. The panel suggest that HEI introduces a few modules (classes) on managerial, marketing and business skills for students. Some of the

	students said that they would like to have courses like that in order to achieve additional skills and to be more competitive once they enter the labour market. Some of them also said they would like to hear more about the financing options, how to apply for scholarships in order to get skills, how to apply for funding for projects either on national or European level. The panel recommends that HEI organizes a few invited lectures with previous PhD students who successfully finished the study and were successful in these skills in order to show the examples of good practice and to exchange real life experiences. This is what PhD students at the beginning of their career path actually need.
4.7. Teaching content is adapted to the needs of current and future research and candidates' training (individual course plans, generic skills etc.).	**Improvements are necessary** During the 1st semester PhD students are taking 5 courses for 15 weeks (6 ECTS per course). For smaller student groups employed at other institutions outside the city of Zagreb, these courses can be organized as block lectures. Some of the students have complained that this is not done appropriately and that it should be done in consensus with the students. Some of the students have to wait for a particular course for one additional year, because they have missed the classes due to their work or personal reasons. In few cases some professors were rarely available and students are waiting for weeks for their seminar work to be checked and graded. During the 2nd semester PhD students are required to pass a guided practicum, followed by experimental work in the lab or experimental stations and studies. The work in the Faculty's facilities must be related to the dissertation topic. This can be successfully done in practice. During the visit we have seen PhD students working in the lab. During the 3rd semester PhD students are expected to work in guided practicums, but only related to the dissertation topic.
4.8. The programme ensures quality through international connections and teacher and candidate mobility.	**Improvements are necessary** Some teachers and PhD candidates are having international connections. However, this is a point where the HEI should improve significantly. The industry collaboration is occupying time and resources, which makes this (international research profile) difficult. Independent financial resources need to be directed to this area. The HEI recognises this need. Concerning whether internationalisation of the doctoral programme is achieved by providing opportunities for and using research staff and PhD students mobility schemes – this is achieved only to some extent. This depends on the candidates' willingness to go and do research abroad, and in some cases candidates have obligations, such as family with small children which restricts the option of mobility. But improvements are necessary. It does not appear that HEI systematically provides information on opportunities for candidate mobility, encourages them to go and achieve it, nor ensures means to attract and attracts international faculty and excellent candidates to the programme (or a part of it). The HEI is acquainted with the European Charter of Researchers and Code of Conduct and implements its principles. Evidence have seen for this criterion during the site visit include: - the lists of supervisors and teachers from foreign HEIs who participate in

	the doctoral programme (the list of co-mentors from other scientific areas is on p. 36 or 45 of the PDF). One co-mentor is from BIH (Tuzla), 2 from abroad (Cornell University, Roslin Institute). Most of them, though, are from other HEI or institutes from Croatia. - International reviews of the programme, as stated in SER. - Evidence on mobility opportunities and encouragements to participate – noting that only a few PhD students have being sent abroad. - Evidence on encouraging candidates to participate in international conferences - a number of students are being sent. - Opportunities to write the thesis in a foreign language – this opportunity exits, and a number English theses were presented. - Opportunities to replace the thesis by publication in internationally recognized outlets – noting that only a few students do this.

Notes:

The literature we have read in order to complete the report for Zagreb

1. Agricultural sciences- Faculty of Agriculture-self evaluation report ZG-April 2016 (p 91.)
2. Faculty of Agriculture-Strategy-ZG-2010 (p. 37)
3. Final Report of institutional re-accreditation – April 2013 (p.25)
4. Agronomski fakultet ZG-pdspz-modules-2016-05-30 (p.4)
5. Regulations on doctoral studies at the University of ZAGREB (p.48)
6. Excerpt from the results of the survey conducted in 2015 (p.38)