Environment and Resource Management

VU University, Amsterdam

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This report was finalized on 19 November 2013

Report on the master programme Environment and Resource Management of VU University Amsterdam

This report takes the NVAO's Assessment Framework for Limited Programme Assessments as a starting point.

Administrative data regarding the programme

Name of the programme:	Environment and Resource Management
CROHO number:	60045
Level of the programme:	master
Orientation of the programme:	academic
Number of credits:	60 EC
Specializations or tracks:	Energy Studies Ecosystem Services and Biodiversity Climate and Water Policy Environmental Studies
Location(s):	Amsterdam
Mode(s) of study:	fulltime
Expiration of accreditation:	31-12-2014

The visit of the assessment committee Environmental Sciences to the VU University took place on 10 September 2013.

Administrative data regarding the institution

Name of the institution:	VU University Amsterdam
Status of the institution:	publicly funded institution
Result institutional quality assurance assessment:	pending

Quantitative data regarding the programme

The required quantitative data regarding the programme are included in Appendix 5.

Composition of the assessment committee

The committee that assessed the master Environment and Resource Management consisted of:

- Prof. W.A. Hafkamp, chair, professor in Environmental Economics, Erasmus University Rotterdam;
- Prof. I. Janssens, research professor at the University of Antwerp, affiliated to the research group of Plant and Vegetation Ecology;
- Prof. A.J. Jordan, professor of Environmental Politics, University of East Anglia, Norwich (UK);

- Prof. K.M. Bäckstrand, professor at the Department of Political Science, Lund University;
- Mrs. L.H.A. van der Sanden, master student in Social and Political Sciences of the Environment, Radboud University Nijmegen.

The committee was supported by Dr. A. Venemans-Jellema, who acted as secretary.

Appendix 1 contains the curricula vitae of the members of the committee.

Working method of the assessment committee

Preparation
The assessment of the master programme in Environment and Resource Management of VU University is part of a cluster assessment of eleven Environmental Sciences degree programmes offered by six universities.

The preparatory meeting for the cluster assessment took place on 25 March 2013. During this meeting the committee members received an introduction to the assessment framework and evaluation procedures and agreed upon their general working method. Furthermore, the domain-specific requirements and the most recent developments concerning the Environmental Sciences domain were discussed. These domain-specific requirements and the actual context form the starting point for the evaluation of the quality of the degree programmes.

In preparation for the assessment of the programmes, a critical reflection was prepared by the programme management. It was sent to QANU and forwarded to the committee members, after a check by the secretary of the committee to ensure that the information provided was complete. The committee prepared for the site visit by studying the critical reflection and a selection of bachelor and master theses. The secretary of the committee selected 10 theses from each programme (30 theses in total) out of a list of all graduates of the last two years. The following stratification was used: ten theses with low grades (6-6.5), eleven theses with moderate grades (7-8) and nine theses with high grades (9-9.5). QANU asked the programme to send the theses along with their assessment forms and divided them among the committee members. Each committee member therefore assessed six theses.

When a thesis was assessed as questionable or unsatisfactory by a committee member, a reassessment was done by another committee member. If more than 10% of the theses were assessed as questionable or unsatisfactory by two committee members, the selection of theses for the programme was extended to 20. This was not the case for VU university.

Site visit
The committee members formulated questions raised by studying the critical reflection in advance. These questions were circulated among the committee members prior to the site visit.

The committee visited the programme on 10 September 2013. A preparatory meeting was scheduled on 9 September. The programme of the site visit was developed by the committee's secretary in consultation with the chair and the programme management. The committee interviewed students, teachers and alumni, the programme management and representatives of the Faculty Board, the Examination Board and the student and teacher

members of the Programme Committee. An open office hour was scheduled and announced (but not used).

During the site visit, the committee studied additional material made available by the programme management. Appendix 7 gives a complete overview of all documents available during the site visit. The last hours of the site visit were used by the committee to discuss the members' assessments and to prepare the presentation of the findings to the representatives of the programme.

Report
The secretary wrote a draft report based on the committee's findings. The draft report has been amended and commented on by the committee members. After approval of the draft report by the committee, it was sent to VU University for a check of any factual errors. The comments by VU University were discussed by the committee. This discussion resulted in some changes in the report, and subsequently the committee approved the final report.

Frameworks and decision rules
The assessment was performed according to the NVAO (Accreditation Organization of the Netherlands and Flanders) framework for limited programme assessment (as of 20 November 2011).

In the framework, a four-point scale is prescribed. The committee used the following definitions for the assessment of the standards, the programme as a whole, the standards and criteria on internationalisation, and the overall assessment on internationalisation.

Generic quality
The quality that can reasonably be expected in an international perspective from a higher education bachelor or master programme.

Unsatisfactory
The programme does not meet the current generic quality standards and shows serious shortcomings in several areas.

Satisfactory
The programme meets the current generic quality standards and shows an acceptable level across its entire spectrum.

Good
The programme systematically surpasses the current generic quality standards across its entire spectrum.

Excellent
The programme systematically well surpasses the current generic quality standards across its entire spectrum and is regarded as an (inter)national example.

Assessment rules of limited programme assessment
When standard 1 or standard 3 is assessed as 'unsatisfactory', the general assessment of a programme is 'unsatisfactory'.

The general assessment of the programme can be good when at least two standards, including standard 3, are assessed as 'good'.

The general assessment of the programme can be excellent when at least two standards, including standard 3, are assessed as 'excellent'.

Summary judgement regarding the master programme Environment and Resource Management

This report provides the findings and considerations of the Environmental Sciences committee on the master programme Environment and Resource Management (ERM) at VU University. The assessment is based on information in the critical reflection, interviews held during the site visit and a selection of theses.

Standard 1: Intended learning outcomes

The ERM master's programme is oriented to the social aspects of environmental issues. It includes insights from public administration, political science, economics, geography and spatial planning, making it interdisciplinary. The programme is also very internationally oriented. The committee believes that ERM fits well in the domain of Environmental Sciences.

The committee verified the aim and intended learning outcomes of the programme. The learning outcomes are multidisciplinary and offer a broad perspective. They are in line with the Dublin descriptors, but are too generically formulated in the committee's view. A feature of ERM is the problem-driven and solution-oriented approach. The committee appreciates this approach, but suggests a better and more precise articulation of it.

The committee concludes that graduates of the ERM programme will have acquired the knowledge and academic skills to become successful professionals in the field of environmental sciences, especially in consultancy.

Standard 2: Teaching-learning environment

The programme has a study load of 60 EC and takes one year. It consists of three compulsory courses and four specialization tracks ('Energy Studies', 'Climate and Water Policy', 'Ecosystem Services and Biodiversity' or 'Environmental Studies'). Students also learn some of the fundamental methods in environmental research in the 'Environmental and Energy Policy Tools' course. The programme concludes with the Research Project.

The committee concludes that the curriculum is well structured and well balanced. It reflects the broad, interdisciplinary field of Environmental Sciences. The curriculum also has an applied perspective as a result of its focus on concrete problems. The main criticism of the committee is the lack of a course in 'methodological thinking'. The committee also suggests paying attention to the structure and timing of the 'Environmental and Energy Policy Tools' course.

The programme has several educational features. First, it has a problem-driven, solution-oriented approach. Second, attention is paid to the ambitions and talents of individual students. Third, it has an interdisciplinary approach. The committee agreed with these aspects, but had difficulty identifying them as a specific didactic concept. It advises formulating an overarching didactic concept on the programme level.

The committee was impressed by the involvement and quality of the teaching staff. Some 84% of all teachers have completed or will soon have completed the obligatory 'Basic

Teaching Qualification' of VU Amsterdam (BKO). The committee appreciates that the staff is part of a research culture while they are simultaneously highly committed to teaching.

Student intake varies between 51 in 2006 and 118 in 2010, with an intake of approximately 100 students in the last two years. The committee considers the level of student intake as healthy. It applauds the broad range of nationalities and backgrounds. According to the committee, the study load is high, but acceptable.

Standard 3: Assessment and achieved learning outcomes

According to the committee, the programme provides a balanced set of assessments. The quality of the examinations the committee inspected was good. For each course, the tests and assignments are described in detail in a study manual.

The ERM programme concludes with a Research Project. The ERM Examination Board has recently implemented the independent assessment of each thesis by two lecturers (supervisor and second, independent assessor), and strongly limited the pool of second assessors to a group of eight staff members. The committee applauds the assessment procedure with two independent assessors and a small pool of second assessors. It agrees with the programme that this procedure ensures standardization. The programme uses a rubric for thesis assessment. The committee concludes that this assessment form might be a very useful document but needs to be updated and kept alive.

All theses selected by the committee were of sufficient quality to pass, some were even of high quality, especially for the number of credits given to the Research Project (18 EC). It noted that the methodology and research design of some theses it studied could be improved. This supports the idea of introducing a course in methodology as described under standard 2.

The committee is positive with regard to the quality assurance offered by the Examination Board. It is convinced that the programme has a good testing system in place. However, it does not support the plan to have all exams approved by a test committee before the start of the courses. In its opinion, this would restrict the teachers' flexibility.

The committee concludes that the master theses and the performance of graduates in the labour market demonstrate the achieved level of the ERM master programme.

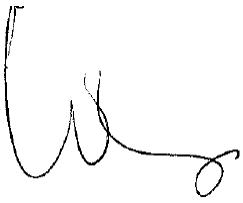
General conclusion

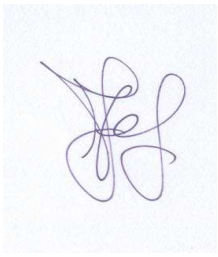
The committee assesses the standards from the Assessment framework for limited programme assessments in the following way:

Standard 1: Intended learning outcomes	satisfactory
Standard 2: Teaching-learning environment	satisfactory
Standard 3: Assessment and achieved learning outcomes	satisfactory
General conclusion	satisfactory

The chair and the secretary of the committee hereby declare that all members of the committee have studied this report and that they agree with the judgements laid down in it. They confirm that the assessment has been conducted in accordance with the demands relating to independence.

Date: 19 November 2013





Prof. Dr. W.A. Hafkamp

Dr. A. Venemans

Description of the standards from the Assessment framework for limited programme assessments

Standard 1: Intended learning outcomes

The intended learning outcomes of the programme have been concretised with regard to content, level and orientation; they meet international requirements.

Explanation:
As for level and orientation (bachelor's or master's; professional or academic), the intended learning outcomes fit into the Dutch qualifications framework. In addition, they tie in with the international perspective of the requirements currently set by the professional field and the discipline with regard to the contents of the programme.

Findings

The domain of environmental sciences
The field of Environmental Sciences examines human-environment interactions and the resulting problems from an integrated and interdisciplinary perspective. Environmental scientists in the Netherlands, Flanders and abroad have proclaimed themselves to be interdisciplinary by nature. The Environmental Sciences discipline comprises the natural sciences, social sciences, and technical and medical sciences, and attempts to integrate the myriad of perspectives within these disciplines into one complementary whole. Its domain and initiatives towards establishing international benchmarks are described in the Dutch-Flemish referential framework for academic environmental education (Appendix 2). This framework is the result of discussions between the academic heads of the Dutch and Flemish environmental educational programmes.

The committee established that the domain-specific framework reveals that the participating institutes are well aware of current developments and relevant questions in the field of environmental sciences. It confirms that the framework is a solid basis for programmes in this discipline. The framework also shows that the discipline is intrinsically international.

According to the critical reflection, the master's programme Environment and Resource Management (ERM) is oriented to the social aspects of environmental issues. It includes insights from public administration, political science, economics, geography and spatial planning, making it interdisciplinary. The programme is also internationally oriented, with all course material in English and a large intake of foreign students.

The committee agrees that ERM fits well in the domain of Environmental Sciences. It covers a broad range of aspects of the social environmental sciences. The committee noted that, according to the critical reflection, part of the aim of the ERM programme is to focus on spatial planning. However, it does not see this focus reflected in the programme.

Programme objectives and intended learning outcomes
The ERM programme is designed to enable students to study the scientific concepts and methods that are required for understanding the causes of environmental change, and for contributing to solutions for environmental problems. The main learning aim of the ERM programme is that students understand theoretical concepts and have acquired academic skills and operational techniques that allow them to find theoretically informed solutions for societal problems related to natural resources and the environment.

ERM is decidedly interdisciplinary: the programme is open to students from all disciplinary backgrounds and encourages them to bring in their disciplinary knowledge while co-operating in multidisciplinary teams.

According to the critical reflection, the distinctive feature of ERM is its problem-driven and solution-oriented approach. ERM graduates take their newly acquired knowledge and skills to new work environments in the public or private sector that deal with natural resources and the environment. The committee appreciates this approach, but is not convinced that it is a distinctive feature of this programme. It suggests embedding this approach better in the programme.

The intended learning outcomes are listed in Appendix 3. The committee observed that all Dublin descriptors are reflected in the intended learning outcomes. The learning outcomes are multidisciplinary and offer a broad perspective, which the committee finds relevant, taking into account the domain concerned. It noted that the learning outcomes were satisfactory, but very generally and loosely formulated. It suggests making these outcomes more specific.

Requirements of the professional field and discipline
According to the critical reflection, the programme emphasizes the knowledge and understanding of policy instruments and institutional arrangements for managing environmental problems. ERM graduates can judge how these instruments and institutional arrangements perform in terms of effectiveness, efficiency and the distribution of welfare in society. They also understand and can apply a range of relevant practical tools for investigating and assessing environmental problems and are aware of their value and limitations. Finally, they can work in multidisciplinary teams.

The committee is convinced that graduates of the ERM programme have acquired the knowledge and academic skills necessary to become successful professionals in the field of environmental sciences. It also concludes that graduates acquire qualifications that especially allow access to consultancy. There are examples of graduates entering a PhD programme, but the committee feels that the programme is more practice-based.

In the near future it is likely that the Institute for Environmental Studies (IVM) will be integrated into the VU-UvA Amsterdam Faculty of Science with an explicit focus on 'science for sustainability'. Currently, IVM is developing a two-year research master in Sustainability Sciences. In the committee's view, these new developments will give the current ERM programme the opportunity to reconsider its aim and focus with regard to practice and research orientation.

Considerations
The committee believes that ERM fits well in the domain of Environmental Sciences. It covers a broad range of aspects of the social environmental sciences, is interdisciplinary and internationally oriented.

The learning outcomes of the programme are in line with the Dublin descriptors, but are too generically formulated in the committee's view. The committee also suggests a better articulation of the problem-based and solution-oriented approach of the programme.

The committee concludes that graduates of the ERM programme have acquired the knowledge and academic skills necessary to become successful professionals in the field of environmental sciences, especially consultancy. With the development of a new research

master, the committee suggests reconsidering the aim and focus of the ERM programme with regard to professional practice.

Conclusion
Master programme Environment and Resource Management: the committee assesses Standard 1 as **satisfactory**.

Standard 2: Teaching-learning environment

The curriculum, staff and programme-specific services and facilities enable the incoming students to achieve the intended learning outcomes.

Explanation:
The contents and structure of the curriculum enable the students admitted to achieve the intended learning outcomes. The quality of the staff and of the programme-specific services and facilities is essential to that end. Curriculum, staff, services and facilities constitute a coherent teaching-learning environment for the students.

Findings

Structure and cohesion of the programme
The programme has a study load of 60 EC and takes one year (see Appendix 4 for an overview of the curriculum). It starts with three compulsory courses. In the 'Sustainability and Growth' course (6 EC), students are introduced to a general framework to address the causes and consequences of environmental change. Next, they study two broadly disciplinary perspectives in parallel. In 'Environmental Economics' (6 EC), students learn about economic policy instruments for managing environmental problems. In the parallel course 'Environmental Policy' (6 EC), students delve into the theory and practice of environmental governance and the role of different political actors, such as governments, international bodies, civil society, or transnational corporations.

The programme consists of four specialization tracks (12 EC each): 'Energy Studies', 'Climate and Water Policy', 'Ecosystem Services and Biodiversity' or 'Environmental Studies'. These specializations are closely linked to the research programmes of IVM.

After the specialization tracks, students learn some of the fundamental methods in environmental research, notably system analysis, spatial analysis, scenario analysis, stakeholder research, multi-criteria analysis, and valuation and cost-benefit analysis ('Environmental and Energy Policy Tools' course, 12 EC). The programme rounds off with the Research Project (18 EC), which integrates all previous building blocks. The student demonstrates that s/he can link theory to practice and use proper academic methods and tools. The Research Project is often linked to current research projects at the institute, often funded by the EU or external partners.

The committee studied the curriculum of the programme to establish whether it fulfills the requirements, which hold for a programme in Environmental Sciences. It concludes that the curriculum reflects the broad, interdisciplinary field of the Environmental Sciences. It is well structured and well balanced. It also has an applied perspective as a result of its focus on concrete problems. This starting point fits in well with the needs of both the students and the professional practice.

The committee was very impressed by the course material, which was very extensive and complete. This was confirmed by the students, who appreciated the course manual with all information regarding the aim, learning outcomes, content, and assessment of each course.

A minor concern with regard to the curriculum was the low evaluation score of the 'Environmental and Energy Policy Tools' course. The committee discussed this course with students, staff and management. They mentioned the timing and the broad perspective of the course as the main reasons for this poor score. The committee agreed with the staff that the course would fit better in the curriculum before the specialization tracks. It also suggests

reconsidering the content of the course. At this moment a lot of tools are discussed during the course, none of which can be mastered completely. Although this gives a good overview, the course might be too broad.

The committee feels there should be a course in 'methodological thinking'. Staff members mentioned during the site visit that this was integrated in other courses, especially during the specialization tracks. However, the committee suggests teaching this more explicitly.

Assimilation of the intended learning outcomes in the programme
The committee examined how the various components of the programme contribute to the intended learning outcomes. It studied the matrix included in the critical reflection, setting out the components of the programme linked to the intended learning outcomes, and the study material of the different courses. It concludes that in general, the programme offers students the possibility to achieve the necessary knowledge and skills of use in the field of Environmental Sciences.

The intended learning outcomes of the programme are translated per course into specific learning objectives. Students told the committee during the site visit that they are well aware of the objectives of each course. The committee appreciates this.

Didactic concept and teaching methods
The critical reflection does not contain an explanation of the didactical principle. Several aspects of the programme could possibly fit under a didactical concept. First, the programme has a problem-driven, solution-oriented approach, as already mentioned under Standard 1. Second, attention is paid to the ambitions and talents of individual students. The committee applauds the way students are engaged to learn from each other and can bring in their former experiences. Third, the programme has an interdisciplinary approach. Students learn to see the interdependencies between different components of the programme and develop a vision that encloses and surpasses their discipline. The committee had difficulty identifying these educational aspects as a specific didactical concept. It advises formulating an overarching didactical concept on the programme level, which includes the three aspects mentioned above.

Each individual course has a mix of teaching methods varying from lectures, workshops, group work, individual papers to presentations and discussion meetings. During the site visit the committee learnt that there is a good balance between the different teaching methods.

Academic staff and student-teacher ratio
The average lecturer-student ratio is 1:25. The weighting ranges from 0.8 per 25 students (general introductions) to 1.3 per 25 students (small intense specialization modules). The Research Project has the highest weight.

The ERM programme is primarily taught by members from IVM. IVM has institutionalized a formal IVM Teaching Faculty; this is a group of staff members who are particularly qualified for teaching and who share the core responsibility for the teaching programmes of the institute. Most teaching is done by members of the IVM Teaching Faculty, along with some specialized lectures provided by other researchers affiliated with the institute. The Research Projects are occasionally supervised by researchers who are not part of the Teaching Faculty if highly specialized expertise is required. All members of the IVM Teaching Faculty hold a doctoral degree and have academic positions at the level of assistant, associate, or full professor. All have permanent positions or clear tenure-track agreements. Of all teachers,

84% have completed or soon will complete the obligatory 'Basic Teaching Qualification' of VU Amsterdam (BKO).

During the site visit the management of the institute stressed the fact that IVM is research-driven and that the research conducted by staff members will increasingly be integrated in the curriculum of the master's programme. The committee learnt that staff members spend between 20% and 40% of their time on average on teaching, assessing and supervising students. The committee appreciates that the staff is part of a research culture while they are simultaneously very committed to teaching.

During the site visit, the committee noted the extensive involvement and enthusiasm of the staff. It appreciated the large, skilled group of staff that is involved in teaching. In addition, in the interviews with students, it did not receive any signals of inadequate teaching skills.

Student intake and study load
The programme has no admission restrictions for any specific discipline and accepts students from all disciplinary backgrounds, both natural and social sciences. However, their previous study programme must show a clear and solid link to environmental problems.

The interdisciplinary and international approach of the ERM programme is only feasible if students are intellectually capable of operating easily with different disciplinary perspectives and different methods, and in teams of international students. Criteria for admission are:

- Bachelor's degree from a good university;
- Grade point average of 7/10 and higher or equivalent (often bachelor's degree with distinction);
- VU requirements for English language proficiency, including sufficient scores for each test component;
- Proven interest in environmental issues by courses taken and/or work experience, expressed in a motivation statement;
- Other information such as reference letters, course descriptions, thesis or reports, curriculum vitae.

During the site visit the committee discovered that on average half of the applicants are admitted to the programme. Of this group two-thirds actually start the programme. Student intake varies between 51 in 2006 and 118 in 2010, with an intake of approximately 100 students in the last two years. The committee considers the student intake as healthy. It really applauds the broad range of nationalities and backgrounds.

In the National Student Survey 2012, ERM students indicated that they dedicate 40.8 hours per week to their study, which is slightly above the 40 hours that are formally envisaged. According to the students, the workload of parts of the programme is high, and the curriculum is demanding. At the same time, they are not in favour of reducing the size of the curriculum or the number of courses. The committee noticed that the students it talked with during the site visit were able to live up to the demands, because they are highly motivated and strongly interested in the issues dealt with in the programme. Some of them even took two specialization tracks or extra courses from other programmes.

According to the critical reflection, the programme is perceived as being relatively well balanced. An analysis of the students' study results shows that there are no specific courses in the curriculum that hamper study progress.

Different backgrounds and internationalities could possibly lead to different levels at the beginning of the programme. However, according to students and staff, there seems to be no gap between Dutch students and students from abroad or between students with different educational backgrounds.

Tutoring system and quality management
Students are given a study manual at the beginning of each course. This provides detailed information on the programme, staff, schedules, regulations, special facilities, assessments, etc. Information regarding programmes, courses and schedules is also available on Blackboard. During the site visit, students stated that they were really satisfied with the information they obtained about the courses. It provided a lot of clarity about what to expect.

The Master Coordinator plays an important role in the programme. She is the main source of information for prospective students, acts as an intermediary with the lecturers and the Examination Board, monitors study progress, and provides advice to students on topics related to their study and career. She also keeps track of the students' course results.

In addition, students can consult a Faculty study advisor, who provides advice on issues outside of the programme. If necessary, students can be referred elsewhere within the university, e.g. to student counselors, student psychologists or specific courses aiming to improve study skills or career planning.

The committee appreciates the support and guidance the institute offers to its students.

Considerations
The committee concludes that ERM manages to create a coherent learning environment for its diverse student body. The curriculum is a good realization of the programme's intended learning outcomes. The committee suggests paying attention to the structure and timing of the 'Environmental and Energy Policy Tools' course. It would also like to see a course in 'methodological thinking'.

The programme has a problem-driven, solution-oriented, interdisciplinary approach where attention is paid to the ambitions and talents of individual students. However, the committee had difficulty identifying this educational philosophy as a specific didactical concept. It advises formulating an overarching didactical concept on the programme level.

The committee is impressed by the highly motivated and skilled academic staff and extensive course materials, which contribute to the establishment of the learning environment

Conclusion
Master programme Environment and Resource Management: the committee assesses Standard 2 as satisfactory.

Standard 3: Assessment and achieved learning outcomes

The programme has an adequate assessment system in place and demonstrates that the intended learning outcomes are achieved.

Explanation:
The level achieved is demonstrated by interim and final tests, final projects and the performance of graduates in actual practice or in post-graduate programmes. The tests and assessments are valid, reliable and transparent to the students.

Findings

Assessment system
According to the programme, the general objective in assessment is to realize a balance between the testing of knowledge and insight, application skills, general skills, and attitudes. Testing consists therefore of the assessment of written or computer assignments, presentations, advanced environmental insights and methodological skills, as well as the assessment of the Research Project.

Interim examinations are evenly spread over the academic year. Exams take place in the last week of each period. Opportunities to re-sit an interim examination are scheduled as much as possible in class-free periods.

As for the examinations themselves, the programme closely follows the Faculty's policy document on testing and assessment (*Toetsbeleid' FALW,* 2012). This document describes in detail the objectives, responsibilities, organization and regulations of good assessment practice. There are quality requirements regarding the subject of tests, the construction of tests and exam questions, the format of exams and tests, the cover page of exams, and the assessment. They are found in a novel test matrix that enables teachers to check whether their test meets the requirements.

The committee was satisfied with the assessment system. In its opinion, the programme provides a balanced set of assessments. The quality of the examinations the committee inspected was good. For each course, the tests and assignments are described in detail in the study manual. In that way, students were well informed about what to expect.

Theses
The ERM programme concludes with a Research Project of 18 EC. The Research Projects build on a national or international research activity, occasionally combined with a work placement in a research-oriented public or private sector organization. They are often embedded in one of the numerous research activities at IVM, and hence usually involve international research partners.

The ERM uses the Faculty's standard 'Final assessment of the student placement' form, including the Go/No-go evaluation shortly after a student has started the Research Project. In line with Faculty regulations, the ERM Examination Board has recently implemented (starting with the cohort of 2012/2013) the independent assessment of each thesis by two lecturers (supervisor and second, independent assessor) and strongly limited the pool of second assessors to a group of eight staff members.

Assessments are based on four criteria, which follow the Faculty regulations: report (70%), oral presentation (10%), execution (i.e. including an evaluation of the time planning and the

use of the work plan) (20%) and attitude (pass or fail). For the report itself, the programme has adopted the rubrics system from Murray State College and University of Wisconsin. The 'rubrics' describe the characteristics of a typical grade 6 report as well as reports at level 7-8, above 8 (distinction), and 5 and below (fail), based on content features, design, and writing style. The Examination Board closely monitors the grades of the theses to ensure the academic quality of the work (especially those theses that receive a grade of '5' and '6') and the consistency of the assessment between examiners.

The committee applauds the assessment procedure with two independent assessors and a limited pool of second assessors. It agrees with the programme that this procedure ensures standardization. The programme makes use of a rubric for thesis assessment. During the site visit, the committee discussed the rubrics system with staff, students and management. It concludes that this assessment form might be a very useful document but needs to be updated and implemented better in the programme.

The committee studied a selection of 15 theses from a list of the most recent master's theses (2010-2011 and 2011-2012 academic cohorts). The selection was made by the secretary on behalf of the committee on the basis of a range of marks. The student numbers of the selected theses are provided in Appendix 7. The committee found that the theses it studied were in general of good quality, especially for the number of credits given to the Research Project (18 EC). It noted that the 'methods' part of some theses it studied could be improved. This supports the idea of introducing a course on 'methodological thinking' as described under standard 2.

The committee studied the assessment forms attached to the theses and concluded that in general the written evaluation provided on the assessment form was extensive and helpful for the students. It noted that the written evaluation was missing from some theses. During the site visit the Examination Board confirmed that since the 2012-2013 academic year, the provision of written feedback by the assessors is verified.

Examination Board
VU University Amsterdam and its Faculty of Earth and Life Sciences have central standards and guidelines to ensure examination quality and to define the role of the Examination Board. The Examination Boards follow specific rules and regulations regarding the Faculty's assessment criteria. The Faculty has developed a manual for tests and exams.

All written examinations (exams, papers, assignments) are carefully monitored and evaluated by the Board. If the exams do not meet all of the quality requirements, the examiners receive detailed feedback. If examiners do not meet the required standards, the department head is advised to encourage them to take a refresher course, or they are replaced. While most exam evaluations by the Board were done after the exam (to be able to evaluate the rating applied), it has been decided to also evaluate tests beforehand from 2013 onwards. In addition, the Examination Board conducts random checks on the evaluation of the Research Projects in order to monitor the consistent quality of the supervision and grading. During the site visit the committee learned that ERM has introduced a test committee that specifically deals with the quality of assessments. Two members of this committee are also members of the Examination Board.

Additional anti-fraud measures have recently been implemented, by using Blackboard's Safe Assignment for checks on plagiarism. 'Free-riders' in group work assignments are addressed by using a special form ('group assignments appreciation form') for each course.

The committee is positive with regard to the quality assurance offered by the Examination Board. It is convinced that the programme has a good testing system in place. It applauds the use of test matrices and model answers. However, it does not support the plan of having all exams approved by a test committee before the start of the courses. First, it feels this restricts the teachers' flexibility too much. Sometimes excellent teaching opportunities arise during a course, and the proposed system would not allow teachers to take advantage of them. Second, the pressure on teachers and researchers is already so high that excessive control systems such as the one proposed by VU University is more likely to have negative than positive effects. Rather than having exams evaluated beforehand, the committee suggests developing a system of remediating where necessary, when problems are reported by students.

Professional activities after graduation
The percentage of ERM students receiving their diploma within one year is 57%, which is considerable higher than comparable master programmes at VU University. The percentage of students receiving their diploma after two years ('nominal percentage plus one year') is 88%.

Most of the graduates (72%) find a job within six months after graduation. The 2012 alumni survey shows that 24% of the alumni work at a university or research institute. In addition to research positions, graduates start outside academia in a wide variety of functions in the domain and level of the programme.

Graduates are positive about the basis to enter the labour market provided by the programme.

Considerations
According to the committee, the ERM programme provides a balanced set of assessments. The quality of the examinations the committee inspected was good. It appreciates the use of test matrices and model answers.

All theses selected by the committee were of sufficient quality to pass, some were even of high quality, given the 18 credits awarded to writing a thesis. The 'methods' part of some theses the committee studied could be improved.

The committee is positive with regard to the quality assurance offered by the Examination Board. It applauds the introduction of a test committee. However, it does not support the VU University's decision to introduce assessment evaluations beforehand. In its opinion, this restricts the teachers' flexibility.

The committee concludes that the master theses and the performance of graduates in the labour market demonstrate the achieved level of the ERM master programme.

Conclusion
Master programme Environment and Resource Management: the committee assesses Standard 3 as **satisfactory**.

General conclusion

The committee concludes that the ERM programme fits well in the domain of Environmental Sciences. The learning outcomes are interdisciplinary and broad, but too general.

According to the committee, the content of the curriculum and the available staff constitute a coherent, attractive teaching and learning environment for the students. It has a few recommendations for further improvement.

The committee is satisfied with the assessment system. It appreciates the use of test matrices and model answers. The theses were of good quality. The assessment system and theses demonstrate that the intended learning outcomes are achieved.

Conclusion

The committee assesses the *Master programme Environment and Resource Management* as **satisfactory**.

Appendices

Appendix 1: Curricula Vitae of the members of the assessment committee

Prof. W. Hafkamp (chair of the committee) is professor in Environmental Economics, Erasmus University, Rotterdam (1994-present). He graduated in Econometrics at the Tilburg University in 1977 and got his PhD in economics at the Free University, Amsterdam (thesis: 'Triple Layer Model; An Economic-Environmental Model for The Netherlands'). He was head of the Economic-Technological Department of the Institute for Environmental Studies of the Free University Amsterdam (1984-1998) and a professor of Environmental and Nature Conservation Studies of Tilburg University, Faculty of Economics and Econometrics (1990-1995). He was Dean of the Faculty of Social Sciences of Erasmus University, where he was also involved in setting up the Master of Strategic Urban Studies (2001-2005). Besides being professor he is a policy advisor for the industry. He worked for KPMG Environmental Consulting and was a member of the Management Board of the Joint Programming Initiative Urban Europe. He was Scientific director of Nicis Institute, The Hague, the Netherlands Institute for City Innovation Studies. He has over 25 years of experience in research, policy and practice, on issues ranging from transport and the environment, urban development and spatial policy, environmental management in industry, waste management and safety to sustainable development.

Prof. I. Janssens is research professor at the University of Antwerp (since 2003), affiliated to the research group of Plant and Vegetation Ecology. He studied Analytical Chemistry (bachelor, 1987), Environmental Sciences (master, 1991), Biology (bachelor + master, 1995) at the University of Antwerp. He obtained a PhD on Soil carbon cycling in 1999 (highest distinction, University of Antwerp, funded after obtaining a highly competitive grant from the Flemish National Science Foundation). After his PhD, he obtained two consecutive, highly competitive, post-doctoral grants from the Flemish National Science Foundation. During this period, he worked at the Australian National University (Canberra, Australia, to get acquainted with stable isotope applications in ecology) and at the University of Tuscia (Viterbo, Italy, to specialize in the eddy covariance technique to study ecosystem-atmosphere interactions, and in ecosystem manipulation methodologies). His overarching research focus is the functioning of terrestrial ecosystems, with a strong emphasis on soil processes, ecosystem biogeochemistry (carbon, nitrogen, and recently also phosphorous cycles), greenhouse gas emissions, and on how these ecosystem responses are affected by climate change and by atmospheric pollution. He was a member of the review committee on Climate Studies at Wageningen University (2012).

Professor Andrew J Jordan has a longstanding interest in EU and British environmental politics and policy making. He has conducted work on the long-term impact of the European Union on the traditional style, structures and procedures of British environmental policy (aka 'Europeanization'), as well as sustainable development, environmental policy integration and new modes of governance. He has published over a hundred peer reviewed papers and chapters in edited books, as well as authored or edited 10 books on these themes. In the past, Jordan has had leadership roles in many large EU funded projects including MATISSE, ADAM and EPIGOV (all Framework 6) and CONSENSUS, RESPONSES and LIAISE (Framework 7). He has also undertaken work *inter alia* for the Cabinet Office, the UK environment ministry (DEFRA), the Countryside Agency, the UK Foresight, the European Commission and the Dutch Environment Ministry. In 2010 Jordan was awarded a Major Research Fellowship by the Leverhulme Trust to undertake work on policy innovation in multi-levelled systems of governance. In 2008 he was elected as an Academician of the Academy of Social Sciences (AcSS).

Karin Bäckstrand is a Professor in Political Science at Lund University and Visiting Fellow at the Department of Politics and International Relations at University of Oxford. She received her doctorate in Political Science at Lund University in 2001. Between 2002 and 2004 she held a postdoctoral position as a Wallenberg Fellow for Environment and Sustainability at the Laboratory for Energy and Environment at the Massachusetts Institute of Technology. Her research revolves around four areas: global environmental politics, the role of scientific expertise and risk in environmental decision-making, the politics of climate change, the democratic legitimacy of global governance and the role of public-private partnerships in world politics. Karin's work is published in *Global Environmental Politics*, *European Journal of International Relations, Global Environmental Change* and *Environmental Politics*. She teaches courses in Environmental Politics, International Relations and Policy and Governance. Some of her recent publications are the co-edited anthology *Environmental Politics After the Deliberative Turn. Examining the Promise of New Modes of Governance (*Edward Elgar, 2010) and "The Democratic Legitimacy of Global Governance", in John Dryzek, Richard Noorgard, and David Schlosberg (eds.) *Oxford Handbook of Climate Change and Society (*Oxford University Press, 2011) and the co-edited special issue "The Politics and Policy of Carbon Capture" and Storage in *Global Environmental Change* (2011).

Mrs. L.H.A. van der Sanden is a master student in Social and Political Sciences of the Environment, Radboud University, Nijmegen. She also obtained her Bachelor in Environmental Sciences at Radboud University, Nijmegen. She studied abroad at Aalborg Universiteit, joining the Environmental Management & Sustainability Science. She was a member of the board of the Student Union for Environmental Sciences 'Milieuprisma' (2009-2010) and of the educational committee (2008-2011).

Appendix 2: Domain-specific framework of reference

Dutch-Flemish referential framework for academic environmental education

This text is the result of discussions between the academic heads of the Dutch and Flemish environmental education programmes. In anticipation of the visitations and accreditations scheduled in 2013/14 and 2015/16 respectively, they deemed this an appropriate time to draft a collective referential framework.

Generally speaking, this Dutch-Flemish referential framework aligns with the Bologna Process, from which the 'Framework of Qualifications for the European Higher Education Area' (FQ-EHEA) was borne. In formulating this referential framework, close attention was paid to the demand for a 'domain-specific referential framework' (DSF) by the Dutch QANU and the demand for 'domain-specific intended learning outcomes' (DSL) in Flanders.

All Dutch and Flemish environmental education programmes offered at university level – as well as those offered at the vocational level in Flanders – were invited to discuss this collective referential framework. Many attended these meetings and have made substantial contributions to this text. These meetings offered attendees the opportunity to identify and assess the similarities and differences between the programmes, and much progress was made. While this referential framework partially builds on earlier international benchmarks (see below), it also strives to take a bold new step towards a European benchmark for academic environmental education, the added value of which needs no further explanation.
Although many Dutch and Flemish environmental programmes collaborated on this referential framework, they do not all intend on formally implementing it: some are seeking accreditation as environmental programme, while others prefer to focus on specific environmental themes and attach more importance to visitations with colleague institutions in the fields of e.g. engineering or chemistry. Even the programmes that do endorse this DSF/DSL are not expected to identify with every element. They are, however, expected to use their respective 'self-evaluation' and 'critical reflection' reports to position their programme within the general framework of this document. In both cases, this document will serve as a general frame of reference only.

The document begins with a description of the environmental sciences domain (1) and moves on to discuss earlier initiatives taken towards establishing an international benchmark (2). It then offers a brief history of academic environmental education in the Netherlands and Flanders (3), including their similarities and differences. This will be used to discuss the academic competencies for bachelor's and master's degree programmes (4). The document will then explore the labour market for environmental scientists (5) and will conclude with the academic goals for environmental education at the bachelor and master levels (6).

1. Environmental Sciences: a description of the discipline

With the advent of environmentalism in the 1970s, academic environmental research and education gained a serious international foothold. As a result of this academic research and education, the environmental sciences domain developed into an established and accredited field in the

Netherlands, Flanders and abroad, with its own 'body of knowledge' (Scholz, 2011), chairs, departments, academic education and research programmes, scientific organisations and journals. Environmental education now enjoys excellent contacts with professionals in the

environmental market, bolstering it with skilled experts and collective research. These environmental professionals have since organised themselves into distinct associations.

Several definitions of environmental sciences are available in both the Low Countries and the international arena (see Udo de Haes, 1984; Stern, 1993; Boersema and Reijnders, 2009). A closer examination, however, will reveal certain parallels: the environmental sciences concern the study of human-induced environmental problems. The word 'problem' is crucial here: from the outset, the environmental science discipline has profiled itself as a solution-oriented and mission-oriented field, deeply rooted in society (Broekhans, 2003). With its problem-solving nature, the environmental sciences focus on analysing and explaining environmental issues in order to find a suitable approach and solution. For the natural sciences, this means an examination of the physical, chemical and biological mechanisms of environmental degradation. The ensuing explanations provide for the design, implementation and evaluation of technical and engineering strategies. For the social sciences this means that, in addition to research on societal causes such as demography, economy, technology and culture, the discipline also offers political and policy solution strategies. All of the environmental sciences position their diagnostic and solution-driven approach within spatial and temporal dimensions – including interactions between the 'here and now' and the 'there and later' – with an eye for the complexity and uncertainty of environmental issues. For all environmental scientists, the effectiveness, political robustness and social legitimacy of any approach or solution must also be the object of research and reflection. From the very start, environmental scientists in the Netherlands, Flanders and abroad have proclaimed themselves to be interdisciplinary by nature. The environmental science discipline comprises the natural sciences, the social sciences, and the technical and medical sciences, and attempts to integrate the myriad of perspectives within these disciplines into one complementary whole.

In short: the environmental sciences examine human-environment interactions and the resulting problems from an integrated and interdisciplinary perspective. Much like Crutzen and the 'anthropocene' (2002), environmental scientists, borrowing from cognitive and ethical insights, believe that human activities have led to the serious degradation of our natural environment, the repercussions of which affect society as a whole.

Since the publication of Our Common Future in 1987, the sustainability sciences have gained considerable ground. Interdisciplinary by nature and borrowing heavily from cognitive and ethical insights, this discipline promotes the necessary transition towards a more sustainable society. The sustainability sciences also embrace dozens of concepts, approaches and themes from the environmental sciences, including systems thinking, modelling, and transitions, among others. The environmental sciences, however, take their own stance within this field: to them, sustainable development is a distinct object of (diagnostic and solutions-oriented) research and the driving force behind ethical scientific and social actions. Although 'sustainable development' is often viewed in its broader context, environmental scientists primarily focus on the ecological aspect of the 'planet' pillar. Like sustainability sciences, environmental sciences primarily emphasise different yet cohesive time-space scales, constantly connecting the 'here and now' with the 'there and later'. Both the environmental and sustainability sciences appreciate the complexity of environmental issues, the limits of human knowledge and the ethical implications of both in terms of their uncertainty, precautions and risk governance.

Of course, environmental science activities – or in this case environmental education programmes – cannot pay equal attention to all of these aspects. Environmental scientists can decide to highlight the natural or social science aspect, the cognitive or ethical aspect, or the

design or analysis aspect. They can also focus on specific themes, such as water, biodiversity, energy, industrial processes or global governance. Regardless of how they position themselves, environmental programmes must always keep a keen eye on the different dimensions and aspects of the environmental sciences.

2. Environmental Sciences: inspiring international benchmarks

The environmental science programmes offered in the Netherlands and Flanders were inspired by earlier benchmarks published abroad. In this case, 'benchmark' should be defined in the broadest sense of the word as a set of desires, demands, aspirations, qualifications and conditions for environmental science education, independent of the demand for formal status as an instrument of accreditation. Moreover, inspiration is sometimes roused by the content or substantive aspects and sometimes by the method or approach. In short: three inspirational reference points.

ES3

In 2007, the English Quality Assurance Agency for Higher Education published a revised version of their 2000 benchmark for Earth Sciences, Environmental Sciences and Environmental Studies (ES3) (see: www.qaa.ac.uk/academicinfrastructure/benchmark/statements/earthsciences.asp). This report largely focuses on the substantive benchmark for bachelor's programmes in these fields. Various substantive elements – including (sub) disciplines (geochemistry), themes (environmental hazards), and concepts (renewable energy) – are presented as (sub) categories in a virtual field. The advantage of such an approach is that it clearly traces the historical transformation of the ES3 fields, starting with their classification under more traditional natural sciences, like geology, to their reclassification under the earth sciences, to the more interdisciplinary environmental sciences. What is more, the report identifies a wide variety of essential substantive elements, to which different subsets apply in environmental sciences rather than in earth sciences. In identifying these substantive elements, the ES3 report reveals striking similarities to an earlier report: 'Wisconsin's Model Academic Standards for Environmental Education' (1998). The drawback of the ES3 approach is its strong inclination to the natural sciences. Disciplines and niches such as environmental economics, environmental sociology, environmental policy science, environment and nature education, and science and technology studies are not included. It also fails to highlight the importance of the ethical aspects described above and the continuum between fundamental and applied, and explanatory and design research. A logical counterpart to this strong substantive focus is the limited attention paid to academic, professional, methodological and reflexive skills.

AUDES

In the 1990s, several European academic environmental programmes founded the Association of University Departments in Environmental Sciences (AUDES). Biennial conferences were held to discuss the exchange of knowledge and academic curricula and to draw up individual country reports. These meetings inspired Jamison and Maarleveld (2001) to draft an assessment report which stated that, as a whole, European environmental education pays due attention to scientific, social and ethical themes. With an eye towards the further professionalisation of these programmes, the report defined a common knowledge base that could serve as a kind of core curriculum for all environmental programmes.

This core curriculum consisted of five elements: moral and ethical issues, the relationship between the environment and society, technical orientation, theoretical orientation and a variety of practical skills, each of which receiving further elaboration. It was never their intention to have all environmental education programmes blindly adopt these five elements

as part of their core curriculum, nor was it their intention to incorporate them into a rigid accreditation process. These elements were intended to set the common standard for all environmental programmes and facilitate the international exchange of information in the short term and lead to the creation of professional standards for environmental professionals in the long term. The advantage of this approach lies in its identification of broad and coherent fields of interest and its ability to bridge the gap between what they considered to be classic contradictions: academic versus professional; natural versus social sciences, and so on. The disadvantage is that such broad fields of interest are also subject to various interpretations. With a European ambition, it is easy to see how the latter may seem inevitable.

Multilateral benchmarks
Some Dutch and Flemish environmental programmes are involved in multilateral and/or European agreements with sister institutions, while others prefer to focus on North-South themes only. This does not lead to an all-embracing benchmark for the whole field, but rather to independent agreements about the design, content and implementation of programmes resulting in the gradual convergence of departments. The following is a non-exhaustive list of environmental programmes with Dutch and Flemish participants, founders and coordinators:

- JIMiSD is de Joint International Master in Sustainable Development. The programme connects natural scientific and social scientific knowledge to the development and evaluation of sustainable development policies in developed and developing countries. This programme was developed by University Utrecht in cooperation with four other European and four non-EU universities (http://www.uu.nl/faculty/geosciences/EN/studying/informationforstudents/masterprogrammas/SUSD/JointProgramme/Pages/default.aspx).
- IMETE is the International Master of Science in Environmental Technology and Engineering. This programme is coordinated by the University of Gent (www.imete.ugent.be).
- EMMEP, the Erasmus Mundus Minerals and Environmental Programme, offers a specialised European Geotechnical and Environmental Course that highlights the environmental and geotechnical aspects of mining. This programme is coordinated by TU Delft (www.master-emae.org).
- Planet Europe is a Joint Master's Programme initiated by Radboud University Nijmegen in cooperation with the Blekinge Institute of Technology and Cardiff University that prepares graduates for a career in environmental and spatial planning in Europe (www.planet-europe.eu).
- LECH-e stands for Lived Experience of Climate Change. This master track (30 EC) was developed by the Open University in collaboration with six other European universities and focuses on developing interdisciplinary knowledge and skills in the field of climate change and personal experience (http://www.leche.open.ac.uk/).

These and other collaborations between Dutch, Flemish and foreign environmental education programmes do not provide for an all-embracing benchmark. The programmes that collaborated on this referential framework and continue to collaborate in lasting partnerships can certainly claim moments of international exchange and coordination; of choices made and positions taken. In this sense, they are indeed a source of inspiration.

3. Environmental science education in the Low Countries: similarities and differences

It is impossible to describe the forty-year history of the environmental sciences in the Low Countries and abroad in just a few sentences. This section is by no means exhaustive. Instead,

this historical sketch aims to describe the choices made in environmental education in the Netherlands and Flanders. These choices can be partly attributed to the different institutional contexts, but also to how each country dealt with the multitude of disciplines, perspectives and themes. This diversity also exposes the many similarities in the environmental science discipline. As the next section will reveal, the latter greatly contributed to the communal competencies we see today.

In the 1970s, environmental education was introduced in the Netherlands, predominantly in the form of interdisciplinary and interdepartmental (elective) courses. In the 1980s, many universities also began offering specialisations or four-year programmes in environmental science. From the early 1980s, environmental science institutes and departments – since then grouped in the ICM, the Interuniversity Committee Environmental Sciences - began making agreements on distinct thematic specialisations (energy, space, nature, policy and others) in their education and research. This allowed for a sharper classification of these programmes within the natural sciences, social sciences and other academic disciplines. During the first visitation of environmental education (VSNU, 1995), this interdisciplinary categorisation and specialisation was easy to identify. This type of profiling helped form the basis of the 2000 CROHO reforms, which divided these programmes into environmental natural science, environmental technology, environmental health, and environmental social science categories. The 1990s and early 2000s also ushered in new changes in the Netherlands: in addition to an interest in specific environmental education programmes, general environmental issues were receiving increasing attention from the more classic programmes like urban planning, chemistry, law, and engineering. To a certain extent, both of these variants played communicative roles. Participation in successive environmental science visitations continued over the years, with eleven visitations in 1995 (VSNU, 1996), five in 2002 (VSNU, 2002) and four bachelor's and eight master's visitations in 2007 (QUANU, 2007 and 2008). This amplified environmental focus led other programmes to sharpen their environmental profiles as well, or develop environmental masters – as was the case in Flanders from the very start (see below). Due in part to the Bologna Process, the Netherlands now has four environmental science bachelor's programmes (UU x2, WUR and OU). The other, formerly undivided, programmes gradually merged their bachelors with broader programmes in biology, chemistry, geography and administration. This not only fits the trend of following up a broader bachelor's programme with a more specific master's programme, but has also led to a wider range of more specialised master's programmes (see below).

Flanders has also seen the emergence of environmental science programmes since the 1970s. Like the Netherlands, some were based on interdepartmental collaboration, but most were specialised tracks offered within existing programmes. Unlike the Netherlands, however, these tracks never intended becoming independent programmes. In 2011, 20 to 25 environmental majors, electives and advanced master's programmes were offered by various faculties within the disciplines of engineering, biology, applied medical and biomedical science, economics, management, and law. The continued development of environmental science programmes and specialisations was largely a result of new environmental policies and regulations following the Flemish constitutional reforms of 1980 and 1988. That development led to a growing demand for environmental activities. Some of the more established environmental occupations (environmental coordinator, soil remediation expert, EIA expert, environmental expert, environmental auditor, environmental verifier (EMAS), and energy expert), started demanding specific graduate or postgraduate degrees.

In Flanders, certain government regulations stemming from the Bologna Process led to further streamlining: while master's programmes were required to have at least one related

bachelor's programme, the advanced study programmes were becoming financially unfeasible. As a result, many of the advanced master's programmes were demoted to the status of regular master's to ensure better alignment with multiple non-environmental bachelor's programmes. While Flanders currently has two specialised environmental science bachelor's programmes (HUB and HoWest), a structured dialogue between the various environmental science programmes has yet to be initiated. In 2007, seven environmental science programmes participated in the VLIR visitations (UA, UG x2, VUB x4). Flanders now has three specialised environmental master's programmes; the rest are accredited as separate programmes within healthcare, (applied) biology, industrial science and other disciplines.

While the first impression to be drawn from this brief development history is one of great disparity, the following axes have introduced more structure to the field and allowed for the positioning of independent environmental education programmes.

The first axis is formality: there are undivided four or five-year programmes; three-year bachelor's programmes; and one or two-year masters' programmes. This, according to FQ-EHEA regulations, has implications for the required competencies (see below). The second, substantive axis concerns the nature and extent of interdisciplinarity: this is used to define the interdisciplinary nature of the environmental science programmes within the natural or social science disciplines. Combined with the first axis, this differentiates the broad, interdisciplinary (environmental science) bachelor's programmes in the Netherlands from the more disciplinary ones. Both types can be followed with a interdisciplinary but thematically strong master's programme (Environment and Resource Management, VU; Energy and Environmental Sciences, RUG; and others) or a more general master's programme (Environmental Sciences, OU,UA, UU, WUR).

According to the CROHO format, the Dutch master's programmes are considered interdisciplinary within the divisions nature (Environmental Sciences, UU; Environmental Sciences, OU; Energy and Environmental Sciences, RUG), engineering (Industrial Ecology, TU Delft/UL), agriculture and natural environment (Environmental Sciences, WUR; Urban Environmental Management, WUR) or society and politics (Social and Political Sciences of the Environment, RU). They are all accessible to a relatively wide range of bachelor's graduates, albeit often with the requirement of a pre-master's programme. In Flanders, the seven visited master's programmes (VUB, UG and UA) were all interdisciplinary yet all very different. Although sometimes accessible to a wider range of bachelor's programmes, they were often limited to programmes within their own disciplines. The general pattern is that the more interdisciplinary in nature, the higher the student intake (Environmental Sciences, Human Ecology). This is in stark contrast to the selective entrance requirements held by specific natural science and engineering master's programmes, with the latter often involving a more specific thematic focus (Environmental Sanitation, Environmental Remediation and Environmental Management).

An equally large number of other environmentally relevant master's programmes in both Flanders and the Netherlands are not truly interdisciplinary. In this context, the term 'environmental programme' refers to an environmental specialisation in another programme or discipline, often in the natural science and engineering disciplines. Several of these Flanders-based programmes were involved in the development of this referential framework, even though they intend to maintain their accreditation as a natural science or engineering programme.

Thirdly, programmes can be positioned on the continuum between research-oriented and career-oriented profiles. Those who use terms like 'the academic professional' indicate their need for a middle ground between research and career-oriented skills. This applies in particular to the master's programmes. While the Social and Political Science of the Environment programme (RU) and the Environmental Science programme (UU) highlight the research-oriented approach, the Environment and Resource Management programme (VU) and the Environmental Science programme (OU) prefer a more career-oriented approach. In Flanders, the interdisciplinary nature of the programmes offers a wide variety of career prospects in the research, management and policy sectors. Several programmes have integrated the aforementioned – and for some programmes compulsory – entry requirements (e.g. Environmental Coordinator). For some of these occupations, strict conditions have been set for the accreditation of the profession, but not for the programme itself.

The fourth and final axis on which environmental programmes revolve is that of internationalisation: in terms of content, they all pay close attention to transnational and global perspectives on environmental issues. Where they differ is in their linguistic and thematic preferences (e.g. English instruction with a strong affiliation for development issues). These preferences can be easily identified by the cultural diversity of their student bodies (which may or may not be supplemented by Erasmus exchange programmes, Erasmus Mundus programmes or Joint Curriculum Development programme – see list), their pursuit of international benchmarks and the career prospects of their graduates.

Flanders is in a very different position here: introducing a language of instruction other than Dutch is a considerable responsibility (Decree by the Flemish government on regulating the responsibilities and requirements of introducing a language other than Dutch, B.S. 08/11/2004). For this reason, the influx of foreign students in Flanders is largely regulated by specific programmes that target an international audience, primarily 'the global South'. The internationalisation of Flemish education is often supported by ICP programmes aimed at students from developing countries. Together with Erasmus Mundus, they strive to develop joint master's programmes in international partnerships (see above). Other programmes work with foreign guest lecturers, short study trips to supplement courses or the master's thesis, or with virtual environments for foreign students.

4. Competences of an academic environmental scientist (m/f)

Any observation regarding the competences after having completed an academic environmental study should distinguish between bachelor and master level, as defined by the FQ-EHEA (the Framework of Qualifications for the European Higher Education Area). The next step is to distinguish between generalist and the more specialised studies. The final step is the consideration of ethical and reflexive competences.

In general terms, the academic bachelor's graduate is expected to be able, with some support, to reason at a scientific level and to apply the knowledge and insights acquired. This implies that graduates from an environmental study at bachelor level can, without further qualifications, carry out fieldwork and supportive or executive tasks in, for instance, for EIA-related research, standard policy development or project work. Screening of the pre-masters for higher vocational education graduates reveals that they are particularly focused on complementing the professional skills already acquired with the scientific skills needed to take up the academic environmental study at master level (entry level master). Following their master's, the graduate is capable of independently functioning at a scientific level, i.e. able to develop ideas in research or expertise in an original way, and also to apply these ideas in new, more complex or uncertain situations.

As stated, environment-generalist studies can be distinguished from environment-specialist studies. Generalist studies are oriented toward a more generic job profile and, consequently, need to cover a broader spectrum of disciplines and methods. They educate students to become an all-round researcher, environmental advisor, process supervisor, environmental coordinator, sustainability expert etc., in both private and public organisations. The substantive, methodical, strategic and communicative skills aspired to are focused on being able to reason and to constantly be alert to the context in broad areas of science, both scientifically (interdisciplinarity, complexity, uncertainty), and socially (political sensitivity, social unrest). This is expressed in (the demands on) the problem theorem of the master's research and thesis, and possibly in the inclusion of practical aspects in execution and assessment. In addition, where specific environmental themes such as water pollution or sustainable production processes are involved, the generalist gives priority to the interaction between environmental subdivisions and sustainability aspects, to social opportunities and effects, and to the multiple-layered character of issues and solutions in time and space. The avoidance of 'shifting' of environmental problems in time, space or otherwise is thereby a crucial motive. The compilation of often dissimilar knowledge, maintaining an overview, making integral assessments, comparison and integration are essential cognitive and methodical competences. The specialist is more geared to concentrating on a specific component, such as polluted riverbeds, eco-design and environmental law. Even though these studies also comprise several disciplines, there is one key discipline. Furthermore, the quality of this process, subdivision or field of effect is the central point, and the context is not the deciding factor.

Environmental education programmes also differ in the motivation and social attitude of the environmental sciences and the environmental professional. They can be more or less focused on the analytical competences required to understand environmental issues, or more intent on solution-focused skills. Other divisions of focus are social motivation, passion and ethical reflexes. At bachelor level, social motivation and ethical aspects are recognised, if nothing else; they are, incidentally, related to a cognitive analysis of the background of environmental issues, and are therefore also objects for study. At master level, students are challenged to involve normative principles in their research, based on assumptions like environmentally responsible solutions, sustainability, socially responsible entrepreneurship, intra- and inter-generational justice, prevention and precaution, safety, etc. Programmes can, however, also compel the environmental professional to steer away from social choices and to seek the ethical norm in classical attitudes of the scientific sphere: scientific curiosity and innovation, but also dissemination of knowledge and service provision. Whereas the first type of study places more emphasis on practical issues, interventions and finding solutions, the second type focuses on scientific research and design routines. This differentiation should not, however, be interpreted as the difference between fundamental and applied or intervention-oriented work, nor as an indicator for academic levels.

Finally, environmental programmes pay attention, albeit in varying degrees, to skills aimed at the reflexivity of the –future- environmental professional. Apart from interdisciplinarity and methodical diversity, this also involves the necessary skills for coping with scientific uncertainty and social sensitivity, and with homing processes. Communicative skills are indispensable in this regard. Simultaneously, there must be a firm basis of classical rational target-oriented strategic thinking and systematic action, and of result-oriented process control. The ability to work under given personal, financial and temporal conditions is thereby of importance. The aforementioned skills lead to a certain level of classical and contemporary management skills. The skills areas, professionalism, and reflexivity are essential for intellectual quality. Those publishing on the subject of bio-fuels or who create

designs for a new generation of refining techniques must, by means of an argumentative attitude, be able to deal with the critical reactions of peers and, at the same time, be sufficiently structured and thorough to be able to continue on the determined path. Nevertheless, in a context of global risks and complex environmental issues, reflexive skills are of more value to the environmental professional than 'classical' strategic thinking and acting.

5. Labour Market

Although no recent and systematic research is available, all the signs indicate that the labour market for environmental scientists is, in quantitative terms, reasonably stable whereas, in qualitative terms, it shows an increasing diversity of professional profiles. Some scenarios even show a future shortage of 'green professionals' (Bakker, 2011; ROA, 2011). Rather than speculating on this, in this section we pay attention to the manner in which programmes are attuned to the needs of the field, and to the degree of success of graduates.

Tuning to the needs of the professional field

Programmes in both the Netherlands and Flanders are in fairly regular consultation with the professional field through a variety of channels: through participation in advisory councils, professional field committees or sounding board committees, often following curriculum reviews and/or visitations; through interaction at all kinds of congresses and workshops; through research programmes, traineeships and graduation projects on behalf of and at organisations in the associated field, and, more recently, through professional social media such as LinkedIn. In the Netherlands, moreover, there are continuous contacts with the VVM (Association of Environmental Professionals), in particular via the VVM-section 'Environmental Education and Labour Market' (MO). In Flanders, master's course providers are in consultation with, for instance, the employers and professionals of VOKA (Flemish Employers Association), UNIZO (Employers' Network) and VIK (Flemish Chamber of Engineers), with Vmx (The Association of Flemish Environmental Coordinators), with VMD (Flemish Environmental Experts), and with FEBEM (Federation of Environmental Companies). Whereas these national associations are, as a rule, members of international professional associations, such as ENEP/EFAEP (European Network of Environmental Professionals), the synchronisation with the professional field is usually oriented toward the Netherlands and Flanders.

From a historical viewpoint (see section 3 above), it has become clear that environmental education in Flanders is partly determined by the fact that certain profiles and competences are laid down in the regulations required for certain recognised jobs and professions. This is also a mechanism for connecting to the labour market.

Graduate success

Although academic bachelors can, in principle, start on the labour market, there is little systematic information available on the civil effect of the bachelor study. In the field of environmental education, the impression prevails that bachelor graduates, sometimes with a number of years' experience, go on to take a master's degree, since neither the student nor the employer regard the bachelor level as a final qualification. In Flanders, the government Higher Education Register literally states in 2011-2012: 'The academically oriented bachelor study is, in fact, not aimed at the labour market. (…). However, this does not mean that these graduates cannot find a position on the labour market, as there is also a demand for graduates from academic bachelor programmes (e.g. IT professionals)'. And further: 'For academically oriented bachelor programmes, the move to a master's is the main goal'. Therefore, also in

Flanders environmental professionals who only hold an academic bachelor's degree are an exception.
Environmental education providers are, through surveys among their graduates, reasonably well informed about the labour market for their graduates. In a general sense, the job opportunities for environmental scientists follow the economic climate of the general labour market. The environmental labour market does, however, exhibit specific trends with regard to specific environmental themes: from soil sanitation to EIA in the eighties and nineties, and, more recently, from sustainability assessments to renewable energy projects. The cessation of a specific demand (recent example: nature conservation) also becomes quickly apparent.

The survey of graduates from all academic environmental programmes shows, across the full spectrum, that these graduates tend to succeed and that, even when the public interest in the environment declines (after 1992-93, and after 2001) and in a poorly-performing economy, jobs are still available for environmental scientists with good qualifications. These opportunities can be mainly found in professional profiles on a continuum from research to advice. On the Dutch market, the proportion of private consulting firms is much larger, whereas in Flanders the emphasis is more directed to public organisations. A recent communal trend which is also visible in the environmental labour market, is the continual increase in the number of independent businesses, particularly consultancies in the field of environmental and energy technology, environmental communication, etc. NGOs are also increasingly active as environmental service providers, advisors etc. All this contributes to an increasing diversity of profiles on the environmental labour market. As already indicated, more and more academic programmes are providing courses with an 'environmental aspect' in addition to the existing academic environmental programmes.

Finally: although academic environmental programmes increasingly focus on foreign students, there is only limited information available regarding the labour market situation of graduates who have returned to their country of origin. This also applies to 'native' students who have gone abroad.

6. Consequences for the final attainment levels
This DSF/DSL is, by definition, not the platform to formulate final attainment levels of specific programmes. This will be done by the programmes themselves through their 'self-evaluation' or 'critical reflection' reports. In this last section, we have formulated implications for the final attainment levels in the form of points of attention which should be worked out in more detail.

In the first place, final attainment levels should cover the essence and the entire breadth of the field of environmental sciences, as described in section 1, including the positioning in that field. On the level of the specific programmes, not only the international benchmarks stipulated in section 2 may serve as a source of inspiration, but also the involvement in multilateral alliances. Secondly, the final attainment levels of each programme should do justice to the positioning of that particular programme with regard to the various characteristics and dimensions stipulated in section 3. This, of course, concerns the level, bachelor or master, and the way in which the level of access to the master's programme is warranted. It also concerns the positioning of the course in respect of the nature and the degree of interdisciplinarity and, particularly at a master's level, the consolidation in a (dominant group of) discipline(s) and the thematic choices or omissions. In addition, programmes should indicate their positioning with regard to research and/or vocational orientation, and for which social roles and/or professions they primarily aim to educate their

students. Finally, the above means that courses should indicate their policy on internationalisation, both with regard to inflow and outflow.

Bachelor's in Environmental Sciences

Students who have completed an environment-specific bachelor's programme have at least the domain-specific knowledge and skills set out below. The student:

General:

- is able to define environmental issues as human-environment interaction issues, to indicate the multi-faceted nature of these issues, to identify the aspects in this regard that require either typical natural or social science research, and to argue the necessity and the interconnection of a variety of disciplinary approaches.
- is able to identify the nature, the extent or gravity and the background of environmental issues, to further analyse and interpret these aspects using scientific concepts, theories and methods, and to formulate recommendations for dealing with these issues.
- is able to position environmental issues within the context of 'sustainable development' as an object of scientific practice, as a directive and as a background for transition-oriented intervention.

Depending on the specific focus of programmes on natural science or social science:

- is familiar with natural science cause and effect processes and is able to apply natural science approaches and methods of analysis (e.g. generating models, systems analysis).
- is familiar with social cause and effect processes as an object and is able to apply social science approaches and research methods.

In addition, the following applies to both bachelor groups:

The student:

- has, through theme-oriented studies, built up experience with interdisciplinary collaboration and the associated methodical and communicative problems and skills.
- has the basic academic skills for setting up a research plan, formulating a problem, gathering information, processing and interpreting data.
- is able to submit oral and written reports and to clarify, defend, and if required, adjust a scientifically based point of view.
- is experienced in and able to recognise and address the ethical aspects of an environmental issue, and can choose and defend an ethical position.

Incidentally, as a consequence of the increasing mobility of students between the bachelor's and the master's programmes, it is also important for academic environmental bachelor's programmes that students have a sufficiently broad and generic level of academic knowledge and skills, in order to enable their inflow to other, non-environment-specific, master's programmes if desired.

Master's programmes in Environmental Sciences

As indicated above, mobility of students between bachelor's and master's programmes is on the rise. As a result, environmental programmes are increasingly faced with an inflow of students to the master's programme, without having followed a 'logical' preliminary bachelor's. The increasing division of bachelor and master implies that courses need to warrant both the final level as well as the entry level to the master. All environmental science programmes apply a number of general rules in this connection. For trained academics the following (mix of) conditions apply: a sufficient basic level in either the social or the natural sciences, sufficient analytical, methodical and research knowledge and skills, and – this does

not apply to Flanders – a basic knowledge of issues regarding the environment and sustainability. For non-academics, in most cases in addition to the requirements noted above, a switch programme varying from 30 to 60 EC applies, with the possible requirement of a minimum average score and a letter of motivation or an introductory interview as a condition for entry. The objective of this is twofold: improving general scientific skills or competences, and upgrading basic scientific discipline (www.hogeronderwijsregister.be , 2011).

The competences of a master's student on completion of their academic training in environmental sciences can be summarised as follows:

- is able to assess the relevance of environmental issues in the context of both the natural and the social sciences.
- is able to position environmental issues within the context of sustainable development.
- is able to carry out in-depth research and analysis of environmental issues, starting from a set of concepts, theories and research methods based on either the natural or the social sciences, or from a twofold approach.
- is able to independently set up an investigation into an environmental issue, to carry out this investigation, to report on the progress, and to formulate recommendations for further intervention and research.
- is able to make a profound contribution at an academic level to the transition to a sustainable society, on the basis of acquired substantive and methodical knowledge, skills in the field of the integration of knowledge, and reporting and advisory skills.
- is able to communicate both in a scientific and a non-scientific context about environmental issues and the way to deal with those issues, to assume scientifically sound points of view in that connection, and to argue those points of view.
- is able to critically reflect on environmental issues, the contribution of environmental scientists in that respect, and the associated questions of complexity and uncertainty.
- is trained to assume the role of an environmental professional, acting as a researcher, an advisor and/or an operative for academic, government or private (profit and non-profit) organisations.

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VSNU (2002), Onderwijsvisitatie Milieuwetenschappen, Utrecht.

Appendix 3: Intended learning outcomes

The final attainment levels described below closely follow the 'Dublin descriptors'. These are student qualifications included in a quality assurance framework for higher education that is being formulated within the European Union. The student that has graduated in Environment and Resource Management has attained the following knowledge and skills:

Knowledge and understanding

General

- Has demonstrated knowledge and understanding that is founded upon and extends or enhances the level that is typically associated with Bachelor's level, and that provides a basis or opportunity for originality in developing and/or applying ideas, often within a research context.

Specific

- Can understand the concept of sustainable development and can elaborate its principles in scientific, technological and socio-economic terms;
- Is able to understand, and to apply in multidisciplinary teams, a range of relevant practical tools for investigating and assessing environmental problems, in particular impact assessment, life cycle analysis, (economic) valuation and policy evaluation, and is aware of the value and the scope of these tools;
- Can apply and interpret the scientific principles and guiding regulations for environmental management, notably in the field of his/her specialization;
- Can recommend practices for environmental management;
- Has an overview of policy instruments and institutional arrangements for managing environmental problems; and
- Is able to judge how well certain policy instruments and institutional arrangements perform in terms of effectiveness, efficiency and the distribution of welfare in society.

Applying knowledge and understanding

General

- Can apply his/her knowledge, understanding and problem solving abilities in new or unfamiliar environments within broader or multidisciplinary contexts related to his/her field of study; has the ability to integrate knowledge and handle complexity.

Specific

- Is able to formulate a problem based on empirical data or literature study and design a scientific approach for researching and investigating the problem;
- Can formulate a research workplan, which includes the problem formulation, the hypotheses or research questions, the proposed execution including methodology, the planning and the envisaged products of the project;
- Is able to independently acquire and compile relevant information on current environmental problems, by doing literature research, modelling and empirical research;
- Can deal with environmental issues in co-operation with other experts;
- Can write environmental (policy) reports and critically evaluate such reports.

Making judgements

General

- Can formulate judgements based on incomplete or limited information, that include reflection on social and ethical responsibilities linked to the application of their knowledge and judgements.

Specific

- Can understand professional literature and academic journal articles and judge their quality
- and usefulness for own research;
- Can determine independently which data or methods are required to obtain a specific result or to finish a project;
- Understand the subject area's limits, i.e. realise when other expertise should be brought in;
- Can recognise and acknowledge the different perspectives of relevant stakeholders on society and the environment;
- Can argue which solutions are appropriate for environmental problems, based on the information available (including the uncertainties involved);
- Understands his/her personal strong and weak points, affinities, development potential and preferences in relation to the specialisationspecialization chosen;
- Can consciously decide whether he/she prefers to continue studies for obtaining a PhD or take up a position outside the academic world.

Communication

General

- Can communicate conclusions, and the knowledge and rationale underpinning these, to specialist and non-specialist audiences clearly and unambiguously.

Specific

- Can complete a report that meets academic standards;
- Can communicate effectively (in writing and orally) with professionals, industry managers and employees, community groups, and the media;
- Can read (scientific) publications in English;
- Can contribute to academic and professional forums;
- Can actively and constructively participate in discussions, debates, negotiations, workshops and meetings;
- Can operate individually and in multidisciplinary groups at a level that is at the frontier of research in Environment and Resource Management;
- Can inform society on (potential) environmental problems, and on the uncertainties concerned.

Learning skills

General

- Has the learning skills to continue to study in a manner that may be largely self-directed or autonomous.

Specific

- Can distinguish truth from convention;
- Can explore, investigate, analyse environmental problems (i.e. have a scientific attitude driven by curiosity);
- Has enough knowledge of relevant disciplines to assess the contribution of each individual discipline;
- Use modern techniques to maintain up-to-date knowledge;
- Read and understand scientific journals and policy reports about environment and resource management;
- Can adjust to new working environments and new views and cultural norms.

Appendix 4: Overview of the curriculum

The Master's specializations (a) `Climate and Water Policy', (b) `Ecosystems Services and Biodiversity', (c) `Energy Studies' and (d) `Environmental Studies' are made up of 60 EC of compulsory components. The four specializations share a compulsory programme worth 48 EC.

The compulsory components (48 EC) of the four Master's specializations are:

Code	Name	EC
AM_468012	Environmental and Energy Policy Tools	12
AM_468020	Environmental Economics	6
AM_468021	Environmental Policy	6
AM_468017	Research Project	18
AM_468011	Sustainability and Growth	6

Supplemented by two compulsory components (12 EC) of the Master's specialization **'Climate and Water Policy'**

AM_450188	Climate and Policy	6
AM_468023	Water and Policy	6

Or supplemented by two compulsory components (12 EC) of the Master's specialization '**Ecosystems Services and Biodiversity':**

AM_468025	Governance of Ecosystems and Biodiversity	6
AM_468024	Valuing Ecosystems and Biodiversity	6

Or supplemented by two compulsory components (12 EC) of the Master's specialization '**Energy Studies':**

AM_468019	Energy Systems Transitions	6
AM_468018	Sustainable Energy Analysis	6

Or supplemented by components (12 EC) of the Master's specialization '**Environmental Studies':** At least one of the following modules is compulsory for this specialization (choose at least one)

AM_450188	Climate and Policy	6
AM_468019	Energy System Transitions	6
AM_468025	Governance of Ecosystems and Biodiversity	6
AM_468018	Sustainable Energy Analysis	6
AM_1015	Sustainable Land Management	6
AM_468024	Value of Ecosystems Services	6
AM_468023	Water and Policy	6
AM_468026	Workshop Governance for Sustainable Development	7

Other elective components (choose at most one of these components)

AM_450137	Aquatic Ecology	6
AM_450004	Climate Modeling	6
AM_1029	International Development Issues in the Context of Sustainable Development	6
AM_450185	Modern Climate Systems	3
AM_450313	Modern Geo-ecosystems	3
AM_450330	Sedimentary Environments and Climate Archives	6

SPPS&RM_O	Philosophy of Political Science & Research	5
SPCP_O	MethodsPolitical Concepts and Processes	5
S_T&AIR_O	Theories & Approaches of International Relations	5

Students who opt for the specialization Environmental Studies should note that the study load of the elective components differ. Students should take at least 12 EC of the modules listed above.

Appendix 5: Quantitative data regarding the programme

Data on intake, transfers and graduates

Intake	Total registered students	# New registered students	# students diploma in 1 year	# graduates	% students diploma in 1 / and 2 years	Drop outs (# and %)	Duration study in months
2006	51	54	38	41	70 / 91	2 (4%)	12
2007	85	76	45	56	59 / 84	7 (9%)	13
2008	72	60	25	45	42 / 80	7 (12%)	14
2009	102	79	51	74	65 / 82	5 (6%)	14
2010	118	97	55	72	57 86	7 (7%)	13
2011	97	61	35	71	57	4 (7%)	17
2012	97	67					

Teacher-student ratio achieved

Ratio	1:25

Average amount of face-to-face instruction per stage of the study programme

Semester	1	2
Contact hours	14	11

Appendix 6: Programme of the site visit

Monday 9 September		
18:00 – 20:00	Preparatory meeting	
Tuesday 10 September		
08:45 – 09:30	Reviewing documents	Committee only
09:30 – 10:15	Management of the programme	• Dr. Nellie Harms, Education Director of the Faculty • Prof. dr. Frank Biermann, ERM Programme Director • Drs. Mathilde Molendijk, ERM Programme Coördinator
10:15 – 10:30	*Break*	
10:30 – 11:15	Students	• Mrs. Soukeyna Gueye (2013-2014) • Mr. Stijn Heemskerk (2013-2014) • Mrs. Natalia Zawada (2013-2014) • Mrs. Jennifer Bansard (2013-2014) • Mr. Coen Wagner, Msc (2012-2013) • Mrs. Marijn Korndewal (2012-2013)
11:15 – 12:00	Lecturers	• Dr. Alison Gilbert, lecturer Sustainability and Growth (Now: Causes and Consequences of Environmental Change) • Dr. Pieter van Beukering, lecturer Value of Ecosystem Services and Biodiversity • Dr. Agni Kalfagianni, lecturer Environmental Policy • Dr. Elissaios Papyrakis , lecturer Sustainable Energy Analysis • Dr. Matthijs Hisschemöller, lecturer Energy System Transitions • Dr. Wouter Botzen, lecturer Environmental Economics • Dr. Hans de Moel, lecturer Water Policy
12:00 – 12:40	*Lunchbreak and consultation hour*	
12:40 – 12:45	*to VU MediaXperience*	
12:45 – 13:15	Videoconference with alumni	Via Skype: • Mr.Torleiv Stien Grimsrud, MSc. • Mr. Kim van der Leeuw, MSc. • Mr. Ruben Zondervan, MSc. Physically present: • Mrs. Antonia Protka, MSc.
13:15 – 13:20	*back to C541/C543*	

13:20 – 14:00	Board of Examiners	• Prof. dr. Roy Brouwer, chairperson Examination Committee • Dr. Philip Pattberg, member Examination Committee • Dr. Harry Aiking, member Examination Committee
14:00 – 14:45	Educational Committee	• Prof. Dr. Jeroen Aerts, chairperson Educational Committee • Dr. Ron Janssen, Educational Committee • Drs. Mieke Tromp Meesters, Educational Committee • Ilyana Arnaudova, BSc.
14:45 – 15:30	Preparing for the final meeting	Committee only
15:30 – 16:15	Final meeting with management	• Prof. dr. Bauke Oudega, Dean of the Faculty • Dr. Nellie Harms, Education Director of the Faculty • Prof. dr. Frank Biermann, ERM Programme Director • Drs. Mathilde Molendijk, ERM Programme Coördinator
16:15 – 17:30	Committee meeting (drafting conclusions)	
17:30 – 17:45	Oral presentation by the chairman	
17:45 –	*Drinks*	

Appendix 7: Theses and documents studied by the committee

Prior to the site visit, the committee studied the theses of the students with the following student numbers:

1996657	2112892
1835203	1473921
2113090	2123541
2508840	2139219
2133059	2112957
2112930	1951491
2500887	2205903
2166526	

During the site visit, the committee studied, among other things, the following documents (partly as hard copies, partly via the institute's electronic learning environment):

- Reports of consultations with relevant committees / organs (programme committee and examinations committee, relevant ad-hoc committees);
- Examination tasks and a representative selection of completed examinations (presentations, internship and/or research reports, portfolios, etc.) and their evaluations;
- Summary and analysis of recent evaluation results and relevant management information;
- Thesis regulations and guidelines for preparing projects;
- Internship regulations/handbooks;
- Course, staff and curriculum evaluations, student satisfaction survey(s), etc.;
- Material about the student associations;
- Information material about ERM

Appendix 8: Declarations of independence

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DECLARATION OF INDEPENDENCE AND CONFIDENTIALITY

TO BE SUBMITTED PRIOR TO THE ASSESSMENT OF THE PROGRAMME

THE UNDERSIGNED

NAME: WA HAFKAMP

HOME ADDRESS:

STADE DE COLOMBES 55
1098 VS AMSTERDAM

HAS BEEN ASKED TO ASSESS THE FOLLOWING PROGRAMME AS AN EXPERT / SECRETARY:

ENVIRONMENTAL SCIENCES

APPLICATION SUBMITTED BY THE FOLLOWING INSTITUTION:

QANU

HEREBY CERTIFIES TO NOT MAINTAINING ANY (FAMILY) CONNECTIONS OR TIES OF A PERSONAL NATURE OR AS A RESEARCHER / TEACHER, PROFESSIONAL OR CONSULTANT WITH THE ABOVE INSTITUTION, WHICH COULD AFFECT A FULLY INDEPENDENT JUDGEMENT REGARDING THE QUALITY OF THE PROGRAMME IN EITHER A POSITIVE OR A NEGATIVE SENSE;

1

nvao
nederlands-vlaamse accreditatieorganisatie

HEREBY CERTIFIES TO NOT HAVING MAINTAINED SUCH CONNECTIONS OR TIES WITH THE INSTITUTION DURING THE PAST FIVE YEARS;

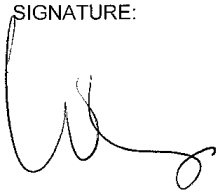
CERTIFIES TO OBSERVING STRICT CONFIDENTIALITY WITH REGARD TO ALL THAT HAS COME AND WILL COME TO HIS/HER NOTICE IN CONNECTION WITH THE ASSESSMENT, INSOFAR AS SUCH CONFIDENTIALITY CAN REASONABLY BE CLAIMED BY THE PROGRAMME, THE INSTITUTION OR NVAO;

HEREBY CERTIFIES TO BEING ACQUAINTED WITH THE NVAO CODE OF CONDUCT.

PLACE: UTRECHT

DATE: 25 March 2013

SIGNATURE:



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nederlands - vlaamse accreditatieorganisatie

DECLARATION OF INDEPENDENCE AND CONFIDENTIALITY

TO BE SUBMITTED PRIOR TO THE ASSESSMENT OF THE PROGRAMME

THE UNDERSIGNED

NAME: Ivan Janssens

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2980 ZOERSEL. BELGIUM

HAS BEEN ASKED TO ASSESS THE FOLLOWING PROGRAMME AS AN EXPERT / SECRETARY:

ENVIRONMENTAL SCIENCES

APPLICATION SUBMITTED BY THE FOLLOWING INSTITUTION:

QANU

HEREBY CERTIFIES TO NOT MAINTAINING ANY (FAMILY) CONNECTIONS OR TIES OF A PERSONAL NATURE OR AS A RESEARCHER / TEACHER, PROFESSIONAL OR CONSULTANT WITH THE ABOVE INSTITUTION, WHICH COULD AFFECT A FULLY INDEPENDENT JUDGEMENT REGARDING THE QUALITY OF THE PROGRAMME IN EITHER A POSITIVE OR A NEGATIVE SENSE;

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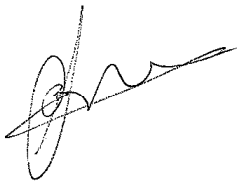
nederlands - vlaamse accreditatieorganisatie

HEREBY CERTIFIES TO NOT HAVING MAINTAINED SUCH CONNECTIONS OR TIES WITH THE INSTITUTION DURING THE PAST FIVE YEARS;

CERTIFIES TO OBSERVING STRICT CONFIDENTIALITY WITH REGARD TO ALL THAT HAS COME AND WILL COME TO HIS/HER NOTICE IN CONNECTION WITH THE ASSESSMENT, INSOFAR AS SUCH CONFIDENTIALITY CAN REASONABLY BE CLAIMED BY THE PROGRAMME, THE INSTITUTION OR NVAO;

HEREBY CERTIFIES TO BEING ACQUAINTED WITH THE NVAO CODE OF CONDUCT.

PLACE: Antwerpen DATE: 20/3/2013

SIGNATURE: 

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DECLARATION OF INDEPENDENCE AND CONFIDENTIALITY

TO BE SUBMITTED PRIOR TO THE ASSESSMENT OF THE PROGRAMME

THE UNDERSIGNED

NAME: ANDREW JORDAN

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UK.

HAS BEEN ASKED TO ASSESS THE FOLLOWING PROGRAMME AS AN EXPERT / SECRETARY:

Environmental Sciences

APPLICATION SUBMITTED BY THE FOLLOWING INSTITUTION:

VU amsterdam

HEREBY CERTIFIES TO NOT MAINTAINING ANY (FAMILY) CONNECTIONS OR TIES OF A PERSONAL NATURE OR AS A RESEARCHER / TEACHER, PROFESSIONAL OR CONSULTANT WITH THE ABOVE INSTITUTION, WHICH COULD AFFECT A FULLY INDEPENDENT JUDGEMENT REGARDING THE QUALITY OF THE PROGRAMME IN EITHER A POSITIVE OR A NEGATIVE SENSE;

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nederlands - vlaamse accreditatieorganisatie

HEREBY CERTIFIES TO NOT HAVING MAINTAINED SUCH CONNECTIONS OR TIES WITH THE INSTITUTION DURING THE PAST FIVE YEARS;

CERTIFIES TO OBSERVING STRICT CONFIDENTIALITY WITH REGARD TO ALL THAT HAS COME AND WILL COME TO HIS/HER NOTICE IN CONNECTION WITH THE ASSESSMENT, INSOFAR AS SUCH CONFIDENTIALITY CAN REASONABLY BE CLAIMED BY THE PROGRAMME, THE INSTITUTION OR NVAO;

HEREBY CERTIFIES TO BEING ACQUAINTED WITH THE NVAO CODE OF CONDUCT.

PLACE: AMSTERDAM DATE: 9-9-13

SIGNATURE: 

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nederlands-vlaamse accreditatieorganisatie

DECLARATION OF INDEPENDENCE AND CONFIDENTIALITY

TO BE SUBMITTED PRIOR TO THE ASSESSMENT OF THE PROGRAMME

THE UNDERSIGNED

NAME: KARIN BÄCKSTRAND

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222 21 LUND
SWEDEN

HAS BEEN ASKED TO ASSESS THE FOLLOWING PROGRAMME AS AN EXPERT / ~~SECRETARY:~~

Environmental Sciences
VU Amsterdam

APPLICATION SUBMITTED BY THE FOLLOWING INSTITUTION:

VU Amsterdam

HEREBY CERTIFIES TO NOT MAINTAINING ANY (FAMILY) CONNECTIONS OR TIES OF A PERSONAL NATURE OR AS A RESEARCHER / TEACHER, PROFESSIONAL OR CONSULTANT WITH THE ABOVE INSTITUTION, WHICH COULD AFFECT A FULLY INDEPENDENT JUDGEMENT REGARDING THE QUALITY OF THE PROGRAMME IN EITHER A POSITIVE OR A NEGATIVE SENSE;

1

nvao
nederlands - vlaamse accreditatieorganisatie

HEREBY CERTIFIES TO NOT HAVING MAINTAINED SUCH CONNECTIONS OR TIES WITH THE INSTITUTION DURING THE PAST FIVE YEARS;

CERTIFIES TO OBSERVING STRICT CONFIDENTIALITY WITH REGARD TO ALL THAT HAS COME AND WILL COME TO HIS/HER NOTICE IN CONNECTION WITH THE ASSESSMENT, INSOFAR AS SUCH CONFIDENTIALITY CAN REASONABLY BE CLAIMED BY THE PROGRAMME, THE INSTITUTION OR NVAO;

HEREBY CERTIFIES TO BEING ACQUAINTED WITH THE NVAO CODE OF CONDUCT.

PLACE: Amsterdam

DATE: Sept 9, 2013

SIGNATURE:

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nederlands - vlaamse accreditatieorganisatie

DECLARATION OF INDEPENDENCE AND CONFIDENTIALITY

TO BE SUBMITTED PRIOR TO THE ASSESSMENT OF THE PROGRAMME

THE UNDERSIGNED

NAME: Lieke van der Sanden

HOME ADDRESS: Pegasusplaats 103-3
6525 JJ Nijmegen

HAS BEEN ASKED TO ASSESS THE FOLLOWING PROGRAMME AS AN EXPERT / SECRETARY:

environmental sciences
RUG, Wageningen University, Univ. Utrecht University

APPLICATION SUBMITTED BY THE FOLLOWING INSTITUTION:

QANU
~~Radboud University Nijmegen.~~

HEREBY CERTIFIES TO NOT MAINTAINING ANY (FAMILY) CONNECTIONS OR TIES OF A PERSONAL NATURE OR AS A RESEARCHER / TEACHER, PROFESSIONAL OR CONSULTANT WITH THE ABOVE INSTITUTION, WHICH COULD AFFECT A FULLY INDEPENDENT JUDGEMENT REGARDING THE QUALITY OF THE PROGRAMME IN EITHER A POSITIVE OR A NEGATIVE SENSE;

nvao
nederlands-vlaamse accreditatieorganisatie

HEREBY CERTIFIES TO NOT HAVING MAINTAINED SUCH CONNECTIONS OR TIES WITH THE INSTITUTION DURING THE PAST FIVE YEARS;

CERTIFIES TO OBSERVING STRICT CONFIDENTIALITY WITH REGARD TO ALL THAT HAS COME AND WILL COME TO HIS/HER NOTICE IN CONNECTION WITH THE ASSESSMENT, INSOFAR AS SUCH CONFIDENTIALITY CAN REASONABLY BE CLAIMED BY THE PROGRAMME, THE INSTITUTION OR NVAO;

HEREBY CERTIFIES TO BEING ACQUAINTED WITH THE NVAO CODE OF CONDUCT.

PLACE: Utrecht

DATE: 25-03-2013

SIGNATURE:

nvao
nederlands-vlaamse accreditatieorganisatie

DECLARATION OF INDEPENDENCE AND CONFIDENTIALITY

TO BE SUBMITTED PRIOR TO THE ASSESSMENT OF THE PROGRAMME

THE UNDERSIGNED

NAME: Annemarie Veneman

HOME ADDRESS: Vondellaan 58
2332 AH Leiden

HAS BEEN ASKED TO ASSESS THE FOLLOWING PROGRAMME AS AN ~~EXPERT~~ / SECRETARY:

Environmental Sciences

APPLICATION SUBMITTED BY THE FOLLOWING INSTITUTION:

QANU

HEREBY CERTIFIES TO NOT MAINTAINING ANY (FAMILY) CONNECTIONS OR TIES OF A PERSONAL NATURE OR AS A RESEARCHER / TEACHER, PROFESSIONAL OR CONSULTANT WITH THE ABOVE INSTITUTION, WHICH COULD AFFECT A FULLY INDEPENDENT JUDGEMENT REGARDING THE QUALITY OF THE PROGRAMME IN EITHER A POSITIVE OR A NEGATIVE SENSE;

nvao
nederlands-vlaamse accreditatieorganisatie

HEREBY CERTIFIES TO NOT HAVING MAINTAINED SUCH CONNECTIONS OR TIES WITH THE INSTITUTION DURING THE PAST FIVE YEARS;

CERTIFIES TO OBSERVING STRICT CONFIDENTIALITY WITH REGARD TO ALL THAT HAS COME AND WILL COME TO HIS/HER NOTICE IN CONNECTION WITH THE ASSESSMENT, INSOFAR AS SUCH CONFIDENTIALITY CAN REASONABLY BE CLAIMED BY THE PROGRAMME, THE INSTITUTION OR NVAO;

HEREBY CERTIFIES TO BEING ACQUAINTED WITH THE NVAO CODE OF CONDUCT.

PLACE: Utrecht

DATE: 25-03-2013

SIGNATURE: