

International Land and Water Management

**Faculty of Agricultural and
Environmental Sciences,
Wageningen University**

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Project number: Q277

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This report was finalized 16 November 2012

Report on the bachelor programme Internationaal Land- en Waterbeheer and the master programme International Land and Water Management of Wageningen University

This report takes the NVAO's Assessment framework for limited programme assessments as a starting point.

Administrative data regarding the programmes

Bachelor programme Internationaal Land- en Waterbeheer

Name of the programme:	Internationaal Land- en Waterbeheer
CROHO number:	50100
Level of the programme:	bachelor
Orientation of the programme:	academic
Number of credits:	180 EC
Specializations or tracks:	
Location(s):	Wageningen
Mode(s) of study:	full time
Expiration of accreditation:	31-12-2013

Master programme International Land and Water Management

Name of the programme:	International Land and Water Management
CROHO number:	60104
Level of the programme:	master
Orientation of the programme:	academic
Number of credits:	120 EC
Specializations or tracks:	Land Degradation and Development, Irrigation and Water Management, Integrated Water Management.
Location(s):	Wageningen
Mode(s) of study:	full time
Expiration of accreditation:	31-12-2013

The visit of the assessment committee International Land and Water Management to the Faculty of Agricultural and Environmental Sciences of Wageningen University took place on 7 and 8 June 2012.

Administrative data regarding the institution

Name of the institution:	Wageningen University
Status of the institution:	publicly funded institution
Result institutional quality assurance assessment:	positive

Quantitative data regarding the programmes

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

Composition of the assessment committee

The committee that assessed the bachelor programme in Internationaal Land- en Waterbeheer and the master programme in Land and Water Management consisted of:

- Prof. F. Zwarts (chair), professor at University of Groningen and professor and manager at University Campus Fryslân;
- Mrs. R.L. Prenen, MSc, independent educational adviser;
- Prof. J.T.A. Allen, head of the London Water Research Group at King's College London and SOAS (UK);
- Prof. M. Stocking, emeritus professor of International Development, University of East Anglia (UK);
- Mrs. T.I.E. Veldkamp, BSc, master student in Earth Sciences, VU University Amsterdam.

The committee was supported by M. Maarleveld, MSc, who acted as secretary.

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

General information regarding Wageningen University

Educational programme assessments in Life Sciences at Wageningen University

A total of 31 educational programmes of Wageningen University which could not be included in a national disciplinary assessment had to be assessed in 2012 in order to apply for reaccreditation. In consultation with QANU, Wageningen University decided to divide the work among fourteen committees in the period between March and July 2012. For each site visit different expert committee members were invited to assess the programmes. In addition to the expert committee members, two non-expert committee members were involved as core members in all site visits and programme assessments. These non-expert committee members were the chairman, Prof. F. Zwarts, and the educational expert, Mrs R.L. Prenen, MSc. This construction was chosen to guarantee consistency between the fourteen assessments as well as to respect the diversity between the programmes. Prior to the site visits an extended kick-off meeting was held in February 2012, during which subjects applicable to all programmes were discussed (for the programme, see Appendix 6). In addition to the core members of the committee, an expert member (Prof. E. Van Damme), a student member (Mrs T.I.E. Veldkamp, BSc) and both secretaries to the committees (Dr M.J.V. Van Bogaert and Mrs M. Maarleveld, MSc) were present. During the kick-off meeting, interviews were held with representatives of the Education Institute, Programme committees, study advisers, Examining Boards and alumni. The findings of the kick-off meeting were used as input for the fourteen site visits and are incorporated in the committee reports on the 31 educational programmes. Based on the information received in the first five site visits, the core committee members held another interview with the Examining Boards and a selection of study advisers. This meeting was held on 6 June 2012 and provided additional insight into the functioning of and relation between the Examining Boards and study advisers.

Wageningen University

Wageningen University is comprised of one faculty, the Faculty of Agricultural and Environmental Sciences. The Faculty consists of 80 chair groups, arranged in five departments. All educational programmes, bachelor and master, are organized by the Education Institute (OWI). The Board of the OWI is responsible for the content, quality and

finances of the educational programmes. Every programme has a programme director and a Programme Committee, consisting of equal numbers of students and academic staff. The Programme Committee is responsible for the content and quality of the programme, though in a formal sense this is subject to approval by the Board of the OWI. The programme director is responsible for the realization of the programme.

The courses are provided by staff of the chair groups, the 'supply side'. The Programme Committees are considered the 'demand side', with the programme director being the 'matchmaker'.

Wageningen has four Examining Boards, usually consisting of five to eight people from different disciplines. Before the site visit period, these boards were in the process of strengthening the quality management of assessment processes and procedures.

Each programme has one or more study advisers, who are tasked with supporting students throughout their study career. Study advisers provide information and invite students for progress evaluations and meetings to plan the student's individual curriculum. Each student needs the study adviser's approval for the elective parts of the programme s/he has chosen.

Internationalization

Wageningen University has an international reputation, in terms of both research qualities and the number of international master students. The committee especially considered the latter point since there are both possible drawbacks and advantages to having many international students. Extensive discussions during the site visits made it clear to the committee that despite the fact that it will always be difficult to assess the quality of enrolling international students, the programme managements are well aware of the imperfections of its procedures and have tightened the selection in the past few years. Overall the committee thinks that the advantages of having many international students outweigh the disadvantages.

Working method of the assessment committee

Preparation

After receiving the critical reflection, the project manager checked the completeness of the information provided. After approval, the critical reflection was forwarded to the committee, in both printed form and digitally. In addition, the committee members selected and read a total of 15 theses for each programme that was assessed (see Appendix 7).

Before the site visit the project manager created a draft programme for the interviews (see Appendix 6). The draft programme was discussed with the chair of the committee and the coordinator of the Education Institute. As requested by QANU, the coordinators of the programmes carefully composed a select and representative panel for all interviews.

Site visit

During the initial meeting at the start of each site visit, the committee members discussed among themselves their findings regarding the critical reflection and the theses. They also discussed their task and working methods and the proposed domain-specific requirements (see Appendix 2).

During the site visit, interviews were held with representatives of the programme, students, staff members, the Educational Committee, Programme Committee, and a student adviser.

The Examining Boards were interviewed in the extended kick-off meeting (see page 6). The committee also received additional information, for example, study books and reports from the meetings of the Educational Committee Programme Committee. This information was examined during the site visit. When considered necessary, committee members could read additional theses during the site visit. A consultation hour was scheduled to give students and staff of the programmes the opportunity to talk to the committee. No requests were received for the consultation hour.

The committee used part of the final day of the site visit to discuss the assessment of the programmes and to prepare a preliminary presentation of the findings. The site visit concluded with an oral presentation by the chairman of the general assessment and several specific findings and impressions of the programme.

Report

After the site visit the project manager wrote a draft report based on the committee's findings. The draft was first commented upon by the committee members and then sent to the faculty to check for factual irregularities. All comments made by the faculty were discussed with the chair of the committee and, if necessary, with the other committee members. After revision, the report became official.

Decision rules

In accordance with the NVAO's Assessment Framework for Limited Programme Assessments (as of 22 November 2011), the committee used the following definitions for the assessment of each individual programme, both of the standards and the total programme.

Generic quality

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

Summary of judgement

This report covers the findings and considerations of the committee on the bachelor and master programmes in International Land and Water Management at Wageningen University. Its assessment is based on information provided in the critical reflection, interviews held during the site visit and a selection of theses.

Standard 1: Intended learning outcomes

The bachelor programme focuses on the management of land and water resources with the view of safeguarding sustainable agricultural production and equitable socio-economic development in different eco-regions in the world, especially in countries and areas in political and economic transition. The master programme focuses on the scientific analysis of the physical, technical and socio-economic aspects of land and water management. Students acquire a comparative insight into the development of land and water management, an academic approach to various research paradigms, and a problem-oriented, interdisciplinary attitude towards land and water management and rural development issues.

Wageningen University led the way in the 1980s and 1990s in showing that there is more to land and water management than just technical issues, and both programmes are built on the idea that the integration of natural and social sciences is needed for a thorough understanding of the domain of Land and Water Management.

Standard 2: Teaching-learning environment

The curricula show that the programmes have come far in bridging and integrating the disciplines. The programme management and the lecturers of both programmes are very aware of the possibilities in research and in practice, and also have a strong awareness of the difficulties of overcoming differences in the use of concepts and theories, methodologies, ontologies and epistemologies. The level of the intended learning outcomes meets the international criteria for both programmes, as indicated by the Dublin descriptors. In terms of content, the intended learning outcomes of both programmes surpass the international standards in the domain of Land and Water Management. The programmes are academically oriented, but pay considerable attention to the requirements of the professional field as well. Especially the master programme has a clear view on educating students towards different employment tracks. For the bachelor programme this is less clear, and the committee believes that the relation to the professional field could be better articulated. It is of the opinion that elements such as an excellent staff, a variety of teachings methods paying attention to real-world practice and fieldwork, very well practised student participation in conceiving, planning and operating programmes, well-organized student support and specific attention paid to multidisciplinary create together an excellent teaching-learning environment. The committee also studied the programme-specific services, student intake and workload, and established that they are all good. The curriculum of the master programme is well structured and coherent. The bachelor programme has made some good improvements to the curriculum. A few minor suggestions were made on the coherence and structure of the bachelor programme, to strengthen it further. The educational concept of concentric learning is used as the starting point for the design of the programme, and structures it in a logical way. The committee believes it would be worthwhile to explore whether these principles can be implemented further throughout the programme. This could strengthen the integration between different courses. The difficulty the bachelor programme has to deal with is the balance between depth and breadth. The programme aims for a broad overview of a quite narrow domain. This is visible in the curriculum and needs some further attention.

Standard 3: Assessment and achieved learning outcomes

The committee is very positive with regard to the initiatives Wageningen University is currently implementing in the bachelor and master programmes. Both programmes provide a balanced set of assessments, but need some fine-tuning. The quality of the bachelor and the master theses is good. Fruitful discussions about the theses during the site visit led to suggestions to the programmes that could be explored in the future. Bachelor students are well prepared for a master programme, but the success rates could be better. In the master programme the success rates are very high. Graduates of the master programme perform well in research and are professionally qualified as well.

Overall, the committee established that the master programme is a top-rated programme, and with minor improvements, the bachelor programme has the potential of also becoming one.

The committee assesses the standards from the Assessment Framework for Limited Programme Assessments in the following way:

Bachelor programme Internationaal Land- en Waterbeheer:

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

Master programme International Land and Water Management:

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

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 criteria relating to independence.

Date: 16 November 2012



Prof. F. Zwarts



M. Maarleveld, MSc.

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.

1.1 Findings

In this standard the committee assesses the programme's objectives and profile, intended learning outcomes, and level and orientation. Furthermore, this standard describes the requirements of the professional field and discipline.

Programme objectives and profile

Bachelor programme

The bachelor programme focuses on the management of land and water resources with the goal of providing degree level education on how to safeguard sustainable agricultural production and equitable socio-economic development in different eco-regions in the world, especially in countries and areas in political and economic transition. For a thorough understanding of the domain of land and water management, the programme aims to integrate the natural and social sciences.

The interrelation and interaction between people, land and water, and technology are at the core of the programme. Students need a thorough knowledge and understanding of three sets of factors that greatly influence land and water management:

- The biophysical, agro-ecological and technical conditions and criteria;
- The institutional environment and the agrarian structure, the rules and regulations applying to land and water and its management;
- Civil society, with its cultural and socio-political dimensions.

The programme takes a generalist approach and aims to offer a broad perspective with a limited choice of specialist subjects from which students may choose. The committee agrees that the broad character fits the bachelor programme very well, but it had doubts about whether it is possible to offer a broad programme in the somewhat narrow domain of Land and Water Management. It was explained to the committee that the focus is on Land and Water Management issues, but the knowledge and skills can be applied in multiple settings, also in other domains. The bachelor programme has been given a broader character by eliminating the specializations and introducing an internship, linked to the bachelor thesis, to further enhance the perspectives for students.

The critical reflection specifies the programmes' objectives as follows:

1. Students acquire the knowledge, skills and attitude in the domain of Land and Water Management to analyse and understand the issues at stake, as well as the proposed socio-

technical designs to counter land and water management problems, and to design and propose possible alternatives.

2. Students acquire generic professional and academic competences. These include competences in the field of meetings and group work, computer and information literacy, presentation, writing, debating techniques, criticism, self-reflection, philosophy of science, professional ethics and research methodology.
3. Students acquire the ability to continue to learn and further develop already acquired competences as well as new ones. They know where to find additional, required knowledge and skills, and how to critically reflect on the knowledge and skills that they uncover. Hence, they develop the ability to design their own learning pathway and future careers.
4. Students consciously take the first steps towards multidisciplinary. They move from a dualistic position at the start of their studies – when issues are often either right or wrong and stakeholders good or bad – towards appreciating the multiplicity of the land and water management issues at stake. They recognize that multiple disciplines and views exist, and that all can have some truth in them. They acquire state-of-the-art knowledge of the auxiliary disciplines and are encouraged to integrate and apply this to problem-oriented cases and design assignments.
5. Students become acquainted with the domain in a real-world, international land and water management setting during excursions and during an internship. In addition, they learn:
 - Intercultural communication with peers and stakeholders from farm to policy levels;
 - To carry out a research or design project under supervision in a real-life situation;
 - To manage practical assignments in the area of agricultural and rural development.

The committee believes the objectives are well described and established that the objective and profile of the bachelor programme meet international standards.

Master programme

The master programme focuses on the scientific analysis of the physical, technical and socio-economic aspects of land and water management. It educates students to be able to design sustainable and efficient interventions and technical structures in land and water management, together with stakeholders. They acquire a comparative insight into the development of land and water management, an academic approach to various research paradigms, and a problem-oriented, interdisciplinary attitude towards land and water management and rural development issues. They choose one of three specializations:

- Land Degradation and Development;
- Irrigation and Water Management;
- Integrated Water Management.

Within these specializations, the courses are socio-technical in nature. The committee believes that the specializations reflect important current themes and academic discourses. During the site visit the committee and the lecturers exchanged ideas on future themes, for example taking an interest in the globalization of water and the food supply chain, with a focus on the private sector. The committee thinks that Wageningen is in a very strong position to adopt a food supply chain structure which would inevitably involve the private sector.

The lecturers explained that they are content with the specializations as they are, but on the course level, there are dynamics and changes to keep the programme up to date and explore new developments. These discussions made it clear to the committee that the master

programme's profile is state of the art, with relevant current themes and an open mind for the themes of the future in the domain of Land and Water Management. An important future aspect, according to the committee, is adopting the food supply chain structure. According to the critical reflection, the master programme is unique in the sense that different science paradigms are used, including modelling-based land and water use assessments, and policy research inspired by systems approaches and social constructivist approaches focussing on power relations. The committee appreciates the combination of science paradigms very much.

The fivefold objective of the master programme can be described as follows:

1. Students acquire advanced and specialized knowledge, skills and attitudes in the domain of Land and Water Management and in the field of their chosen specialization;
2. Students acquire professional and academic competences at the master's level; they execute research projects independently, including the development of a conceptual framework for their thesis research project;
3. Students acquire the ability to continue to learn and further develop both acquired competences and new ones. They know where to find additional required knowledge and skills, and critically reflect on the knowledge and skills that they uncover. Students are confronted with different scientific views;
4. Students acquire an inter- or trans-disciplinary attitude. They move from a multidisciplinary background towards a stage where they are able to link different disciplines and realities and manage the paradox of different realities, integrate them and act accordingly;
5. Students independently carry out at least one academic research project in a real-world foreign country.

The committee believes the master programme has a clear profile that is state of the art, and very well described objectives.

Intended learning outcomes

The intended learning outcomes for both programmes are provided in Appendix 3. They are based on the objectives described in the previous section. According to the committee the intended learning outcomes reflect the needs of science, and provide graduates with the skills and knowledge that they require.

Level and orientation

The critical reflection shows that the intended learning outcomes of both programmes correspond to the Dublin descriptors. Both have a strong academic orientation. Bachelor students acquire basic academic competences, and the learning outcomes are at an introductory-intermediate level. The master programme has an emphasis on functioning on an academic level, with a considerable degree of independence. The critical reflection states that the programme is designed to educate students for different employment tracks, not only research (applied and theory oriented), e.g. consultancy, policymaking, education, training and capacity building, and design, management and interventions in the domain of Land and Water Management. The committee appreciates the explicit orientation on both research and other employment tracks in the master programme. Regarding the bachelor programme, the critical reflection states that in general, potential employers tend to hire master graduates for academic positions rather than bachelor students, as they have not yet discovered the potential of the bachelor students in Land and Water Management. The committee believes the programme could take a more specific and explicit position on how the bachelor

programme is relevant to the professional field, and clarify how bachelor graduates would contribute to the professional field.

Requirements of the professional field and discipline

The requirements of the professional field and discipline have been laid down in the subject-specific framework (see Appendix 2). According to the critical reflection, this frame of reference has been drawn up in close cooperation with the External Advisory Committee (EAC) consisting of external professionals in the field of Land and Water Management. To ensure compatibility with the professional field, the Programme Committee and the EAC regularly discuss the programmes' strengths, weaknesses and issues for improvement. The programme team organizes an annual meeting and holds consultations by e-mail, as half of the members in the EAC work abroad. In discussing the requirements of the professional field, it was concluded that both specialists as well as generalists in the field of Land and Water Management will continue to be needed to fill vacancies in the domain. Therefore, the bachelor offers a generalist approach while the master programme is designed to educate specialists.

Overall, the committee was impressed with the awareness that the curriculum and the intended learning outcomes may need to change in order to match the needs of the professional field and discipline, especially in the master programme. The students the committee spoke to were generally satisfied and pointed out that even though the programmes are oriented towards research, they offer multiple experiences and perspectives to prepare for many differing types of job. The lecturers to whom the committee talked confirmed that students learn to apply their knowledge and skills to different topics, and engage in the type of critical reflection that is appreciated in the professional field.

1.2 Considerations

The committee is very impressed with both programmes. The critical reflection was written well and gave a good impression of the programmes; the interviews during the site visit confirmed and enhanced this positive view. Both programmes have a strong profile and clear objectives. According to the committee, Wageningen University has led the way in showing that there is more to land and water management than just technical issues. The intended learning outcomes relate directly to the objectives and are connected to the Dublin descriptors, indicating that the education and training are operating at an international level. Both programmes are academically oriented. The committee is convinced that the requirements of the discipline are met: both programmes surpass the international standards in the domain of Land and Water Management. Regarding the requirements of the professional field, the master programme has a clear approach to the degree level education of students towards different employment tracks not only in research but in a number of professional fields as well. The attention paid to the professional field impressed the committee. For the bachelor programme, this aspect is less clear, and the committee believes that the bachelor programme could be more clearly articulate how the programme relates to the professional field.

1.3 Conclusion

Bachelor programme Internationaal Land- en Waterbeheer: the committee assesses Standard 1 as **good**.

Master programme International Land and Water Management: the committee assesses Standard 1 as **excellent**.

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.

2.1 Findings

Curriculum and coherency of the programmes

The academic year of Wageningen University consists of two semesters, each with 3 periods. In periods 1, 2 and 5 (six weeks each) two courses are taught, one in the morning and one in the afternoon. Periods 3 and 4 are short periods with 4 weeks of teaching and only one course each. Period 6 lasts nine weeks. Each year students can take one exam and two resits for each course. Currently, this system is being reviewed, concerning the number of resits and the timing of the exams.

Bachelor programme

A schematic overview of the schedule, courses and structure of the bachelor programme is presented in Appendix 4. In the bachelor programme the principle of concentric learning is applied. This means the curriculum is built on repetition, increasing in-depth learning and cyclic integration. At the end of each year, students are required to mobilize, repeat and integrate what they have learned at an increasingly difficult, abstract and complex level.

In general, each year can be typified by a specific focus and set of learning outcomes that have to be achieved by the end.

Year 1: The aim of year 1 is to help students become acquainted with the domain of international land and water management, some of its (multi)disciplinary building blocks, its final competences and its working field. In two courses in period 1, students are introduced to the domain of the environmental sciences in general and to land and water management in particular. In the Orientation on International Land and Water Management course, students meet alumni who share their working and field experiences with them. Students write a short motivation on why they chose this study and an application letter for a real vacancy in the domain. This gives students a better picture of the professional field and the rationale and philosophy behind the programme; in fact, it offers an explanation for why all the different courses are part of the curriculum. The courses that follow in periods 2, 3, 4 and 5 are a mixture of introductory and auxiliary courses. The year is concluded by an introductory integrated land and water management design course, with fieldwork in Limburg, the Netherlands. During this course students can repeat and apply competences obtained in previous courses.

Year 2: The focus in year 2 is on designing interventions and the accompanying managerial skills. Additionally, some new and advanced (multi)disciplinary courses are offered. The year starts with the two core courses on land degradation and soil and water conservation and on irrigation and water management, including a greatly appreciated excursion to Morocco or Tunisia, where students visit a variety of land and water management measures in different climate zones and cultural settings. A set of more advanced disciplinary courses on sociology, economy and engineering strengthen the students' knowledge base.

Year 3: The focus in year 3 is on research and practical experience through an internship and thesis (together 30 credits) plus 30 credits of free choice. The thesis research concludes this year and the entire programme.

Based on the critical reflection, the committee received the impression that the bachelor programme is dominantly technical. This was surprising as Wageningen University has always pioneered the integration of natural sciences with social sciences for a better understanding of Land and Water Management. This was discussed during the visit, and to demonstrate the balance in the programme, the committee received an overview of the curriculum (Appendix 4). In the overview, natural sciences, social sciences and integration courses had each been coloured differently. This showed a good balance over each year and over the programme as a whole.

The committee believes the bachelor programme is well structured, and all intended learning outcomes are covered in one or more courses. The themes for each year (1. orientation; 2. designing interventions; 3. research and practical experience) and the principles of concentric learning organise the programme in a logical way. The principles of concentric learning are most visible in the courses at the end of the first and second years. These courses are designed to repeat and integrate what students have learned throughout the year. The committee can also see that the level of complexity increases throughout the programme, but this can be expected of any bachelor programme. In the other parts of the curriculum, the principles of concentric learning are less evident. The committee recommends exploring whether the principles can be implemented throughout the programme. This could further strengthen the integration between different courses.

As noted earlier, the committee supports the decision to have no specializations in the bachelor and instead to offer an internship related to the bachelor thesis. It believes, however, that the ambition to offer a broad programme within the quite narrow domain of Land and Water Management has given rise to some friction in the curriculum. Several small (3 credit) courses in year 1 and 2 indicate the difficulty of fitting both a broad basic education and depth in the specialist domain into the curriculum.

The programme team is aware of this, and the interviews during the visit showed that they have come a long way in this discussion. The committee is confident that the balance between breadth and depth is on the programmes' agenda and will receive the needed attention.

The committee commends the fieldtrips in the curriculum, and the possibilities they create for students; these activities provide a very positive element in both programmes.

Master programme

The master programme consists of three compulsory domain courses (18 credits) for all students, two compulsory courses per specialization (12 credits), one restricted optional course per specialization (6 credits), a number of electives (18 credits), a major thesis (36 credits) and a second thesis (18 credits). Finally, students participate in the Academic Master Cluster (12 credits). Appendix 4 gives an overview of the programme and its three specializations.

The curriculum of the master programme is thesis-oriented, and the choice of thesis topic inspires the choice of restricted optional and elective courses. The set of mandatory courses forms a logical preparation for the thesis research and the 'skeleton' for the design of the

thesis, from proposal to data collection, to analysis, discussion and conclusions in the final report, and to presentation and defence during the colloquium. The preparation for the thesis consists of the following three courses:

- Sustainable watershed management. The course aims to help students from different backgrounds achieve a similar starting level. In terms of content, this course focuses on sustainable management principles of watersheds in the world as the spatial units for land and water management.
- Research paradigms. A central premise of the course is that all land and water management knowledge is socio-technical or socio-natural, which is why the question of 'how' to integrate natural sciences with social sciences approaches and the different ways of doing this are dealt with in detail. The course is based on the important insight that the choice of data collection plans and research methodologies is intrinsically interwoven with (1) the objectives and goals of the research and (2) the way in which the student makes sense of, and indeed conceptualizes, land and water management realities.
- Sustainable land and water management in Spain. Excursions and field visits clarify the specific land and water problems in the area, and students get an overview of the different land and water management systems in the area.

Along with these three common courses, students follow specialization courses. In addition to the courses chosen in the restricted optional part and two modules in skills training, students take 18 credits of electives, after approval by the study adviser.

In the second year of the master programme, students take the mandatory Academic Consultancy Training, in which they work as consultants in a multidisciplinary project. They also take 18 credits of electives. Two individual thesis projects have to be carried out. The first is a mandatory thesis project worth 36 credits. As a rule, it includes fieldwork and data collection in an international land and water management setting. The second thesis (18 credits) can in some cases be replaced by an internship, depending on the students' background and motivation.

The committee is of the opinion that the curriculum of the master programme is very well structured. The different courses together make a coherent programme. The specializations are coherent as well, and they are sufficiently distinct. The three courses in the thesis trajectory form a common core of the programme, and ensure that all the intended learning outcomes are dealt with. In the committee's opinion this programme shows that in the context of Wageningen University, a very structured and balanced programme is possible without losing the benefits of freedom of choice for students.

Multidisciplinarity

Wageningen University aims to offer programmes with a multidisciplinary and holistic approach. This is meant to stimulate students to develop a broad view and a wide range of interests. Most of the courses are attended by students from different programmes, creating a setting that favours multidisciplinary education. This could also lead to a possible friction between breadth and depth. The committee assessed whether students receive a multidisciplinary programme with sufficient depth, making them experts in a specific discipline.

Bachelor programme

The bachelor programme offers a broad programme, while the master programme is more focused on specialization and in-depth knowledge. In the bachelor programme, the first steps

are taken towards multidisciplinary, as stated in objective 4. Apart from the discussion on the balance of breadth and depth that still needs attention, the committee is very positive about how the bachelor programme deals with multidisciplinary within the courses. It believes the programme provides students with a solid knowledge base and skills to enter a master programme. This was confirmed by the students the committee talked to during the visit.

Master programme

The subject-specific framework explains the difficulty of trying to integrate natural and social sciences disciplines and various stakeholders; the organization of academic knowledge along disciplines promotes and rewards disciplinary specialization rather than the ability to communicate across disciplines and combine knowledge. Bridging and integrating disciplines implies overcoming differences in the use of concepts and theories, methodologies, as well as ontologies and epistemologies. To bridge disciplines, students need critical and reflective skills and attitudes. In the master programme, this is made explicit in the intended learning outcomes. Graduates are expected to develop a cross-disciplinary attitude (intended learning outcome 7) and function in multidisciplinary and multicultural teams or groups in the complex land and water management context (intended learning outcome 8). Several courses pay explicit attention to these intended learning outcomes. For example, in the mandatory 'Research approaches to land and water management' course, the different science paradigms meet, including modelling-based land and water use assessments, policy-relevant research inspired by systems approaches and social constructivist, empirical research inspired by a realist approach.

Based on the critical reflection, the committee notes the programme has strong ideas on the importance of bridging disciplines and compliments it on this. During the interviews with lecturers, it became clear that it remains a difficult process that needs constant attention. The committee is convinced that it is an essential part of education in the domain of Land and Water Management and encourages the programme to keep focussing on it.

Teaching methods

Wageningen University strives to train its students to become academics with domain knowledge, a multidisciplinary attitude, interested in problem-solving, and an international orientation with a multicultural attitude. The programmes therefore work with small, diverse student groups to stimulate the interaction between students and lecturers. A variety of didactic and learning methods are offered, including lectures, tutorials, group work, practical training, excursion and individual papers. According to the critical reflection, the teaching methods prepare graduates to work in multidisciplinary teams as well as individually, and often in a global context. Appendix 9 provides an overview and explanation of the teaching methods.

In both programmes the committee established that a variety of teaching methods is used. The critical reflections show that in nearly half of the contact hours, the teaching methods are practice-oriented, focusing on 'real world' land and water solutions, fieldwork and learning by doing. The committee appreciates the attention paid to international field experience in the bachelor programme. The fieldtrip to Spain in the master programme offers a valuable experience for students. Overall, the committee believes the teaching methods are well chosen to achieve the intended learning outcomes in both programmes.

Improvements to the curriculum

The individual Programme Committees are responsible for improving the curricula, although occasionally improvements are introduced for all programmes jointly. One example is the introduction of scheduling of electives in one semester, including minors.

Ideas for improvement usually come from online course evaluations. Detailed results are reported to the lecturers and Programme Committees. Summaries of the results are published on the intranet. In addition to the course evaluations, there are bachelor first-year evaluations, bachelor and master graduate evaluations, career surveys among alumni, and the Education Monitor.

The Programme Committees regularly discuss the outcomes of the evaluations and take action, when considered necessary. In addition to the online evaluations, many programmes hold panel meetings with students to obtain oral feedback on the courses and the programmes. Since many of the programmes are small and the attitude between students and lecturers is informal, many issues are often dealt with informally rather than in a formal procedure.

The critical reflections mention several changes made in courses, varying from rescheduling and restructuring to designing new ones. A major change in the bachelor programme involved replacing the specializations with an internship. As mentioned before, the committee is positive about these changes. In the master programme, a specialization was added in 2007 (Integrated Water Management), and the structure was improved by introducing two mandatory courses in each specialization. The committee gained the impression that the programmes take input very seriously and continuously work on improvement. According to the critical reflection, the bachelor programme has ambitions and plans for the future, but now it is time to consolidate the current programme by focussing on integration and fine-tuning. The committee fully agrees with this strategy. Regarding the master programme, the critical reflection does not indicate any major changes planned for the future, but the programme will keep facilitating and stimulating a coherent set of courses. The committee emphasizes that Wageningen is now leading in this field, but should take an approach that engages much more closely with the agents who manage water in the private sector food supply chain to stay in this leading position.

Staff

Wageningen University staff members generally teach in several programmes, making it difficult to provide exact student-staff ratios. The estimated student-staff ratio is 7.4 for the bachelor programme and 5.27 for the master programme, which is about the Wageningen University average. The staff indicates their staff:student ratios lie between those of the social sciences programmes that generally have fewer small-scale practicals and the natural sciences programmes with intensive practical courses. The programme staff feels comfortable with their staff:student ratio.

Wageningen University introduced the University Teaching Qualification (Basis Kwalificatie Onderwijs, BKO) for new permanent staff and staff on tenured track positions. Quality of teaching is evaluated after each course, which also evaluates the course content, position of the course in the curriculum, presentation and examination. Results of these evaluations form input for the annual performance and development interviews of staff members. Tailor-made training courses are provided by the Educational Staff Development unit for those interested, or as a result of the course evaluation

Staff members are required to be both an expert in their discipline and a skilful lecturer. This combination allows them to make use of new scientific insights in their teaching. Most lecturers hold a PhD degree. The committee is of the opinion that the staff members have an international reputation, and their ideas are of global significance.

Programme-specific services

Wageningen University has chosen to centralize all teaching facilities like lecture rooms, labs, rooms for group work and the university library on the new campus. The main education building is the Forum. The Orion education building is under construction and will add to the existing facilities in 2013. Education in the Social Sciences is concentrated in the Leeuwenborch building. Most Chair Groups are – or will be – located on the campus. The programmes use a series of programme-specific facilities both on the university campus and at field locations elsewhere:

- The Kraijenhoff van de Leur Laboratory for water and sediment dynamics;
- The Soil Physics Laboratories;
- The Ir W. Genet irrigation tunnel;
- Greenhouses of Plant Research International (PRI);
- Several field locations, in the Netherlands, Tunisia, Morocco, Tanzania and Spain.

The committee has established that the programmes have a rich variety of programme-specific services.

Student support

Although differences exist between programmes, all Wageningen programmes provide a lot of freedom for the individual student, making the programmes student-centred. The chair groups and their research strongly influence the courses offered, making the programmes also course-oriented. The study advisers support students to make well-considered choices within their individual programmes, and they track and stimulate study progress. Students meet with their supervisor several times a year, starting from the annual introduction day or even before that day for international students. Students can request an appointment, and the study advisers arrange talks to discuss choices in the study programme. They also invite students with a study delay for a talk. Together with the study adviser, each student makes a study contract that describes what courses they intend to take, to ensure a coherent package of courses. If students want to change the content of their individual programme, they contact the study adviser and discuss the changes. This makes the position of the study adviser crucial and demands certain qualities of him/her. The committee thinks that the study adviser should be a member of the academic staff to be able to support students in their choice for certain courses. Together with the study association NITOCRA, an internship evening is organised. Overall, the organization of student support impressed the committee.

Student intake and study load

Students for the bachelor programmes are admitted on the basis of their pre-university qualifications. Applicants for the bachelor programme need to have a secondary school pre-university (VWO) diploma or equivalent. School graduates can enter with any profile, as long as mathematics (A or B) and physics have been included. Students with a foreign diploma equivalent to that of Dutch school leavers can enter the programme, provided that their Dutch is adequate (NTII-2 level). Individual admission of students who do not meet the standard requirements is centralized. In the past few years, the intake of European students in the bachelor programme has gradually increased, especially the number of German students,

which grew from 3 in 2008 to 9 in 2010. Other nationalities include Belgian, Italian, Swiss and Austrian.

The general admission requirements of master students are published on the internet, including detailed information on admission procedures. These requirements include a relevant bachelor degree, a grade point average of 70%, fluency in English, good skills in mathematics and statistics, and fundamental computer skills. Master students are admitted following approval by the Admission Committee. In the past few years, the intake of students in the master programme has gradually increased.

In total, there are four Admission Committees, reflecting the four domains. These Admission Committees consist of the relevant Programme Directors, supported by central staff. The four Admission Committees participate in the joint Admission Policy Committee. In total, approximately 5,600 applications are handled each year. Workload is not an issue for either programme.

2.2 Considerations

The committee has studied the various aspects of the teaching and learning environment of both programmes.

The committee believes that the teaching-learning environment of the master programme is excellent. The teaching-learning environment of the bachelor programme is also very well organized, and the committee has only some minor remarks to make on its structure and coherence.

The bachelor programme has improved its structure significantly by replacing the specializations with the internship. Still, the difficulty of aiming for a broad programme in the rather narrow domain of land and water management is visible in the curriculum; breadth and depth are not yet in optimal balance. The committee is of the opinion that the intended learning outcomes have been translated into a coherent programme. It was very impressed to see the programme has given a considerable amount of thought to the design of its curriculum, using concentric learning as the starting point, and structuring it in a logical way.

However, the principles of concentric learning are not evident throughout the whole programme. The committee recommends exploring whether these principles can be further implemented throughout the programme. This could further strengthen the integration between different courses within the programme. The committee agrees with the strategy of the bachelor programme to focus on integration and fine-tune the improvements that have been made over the last couple of years.

The curriculum of the master programme is well structured and coherent. The specializations are coherent as well, and they are sufficiently distinct from one another. The three courses in the thesis trajectory form a common core of the programme, and ensure that all intended learning outcomes are covered.

Both programmes aim to integrate the social sciences with the natural sciences. The committee believes the programmes have come far in bridging and integrating disciplines. The programme management and the lecturers of both programmes are very conscious of the possibilities in research and in practice, and also well aware of the difficulty of overcoming differences in the use of concepts and theories, methodologies, ontologies and epistemologies. In the bachelor programme, students are introduced to multidisciplinary and

interdisciplinary views on land and water management; in the master programme this is intensified further. The committee is of the opinion that the programmes manage to deal very well with multidisciplinary in the context of land and water management.

The committee looked into the student support, student intake, study load, and programme-specific services and concludes that they are all good. The staff is internationally respected, and the committee was impressed with their high quality, both in research and in education. It realises that the study adviser plays a crucial role in ensuring that students achieve a coherent study programme, and s/he should be a member of the academic staff to be able to support students in their choice for certain courses.

Overall, the committee commends the teaching-learning environment of both programmes very highly. It believes the bachelor programme has a few minor details to work out regarding the integration within the programme and the balance between breadth and depth. This results in the following assessment.

2.3 Conclusion

Bachelor programme Internationaal Land- en Waterbeheer: the committee assesses Standard 2 as **good**.

Master programme International Land and Water Management: the committee assesses Standard 2 as **excellent**.

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.

3.1 Findings

Assessment system

For each course the lecturers have to formulate five to eight intended learning outcomes, which are published in the Study Handbook and course guides. The course guide is obligatory for each course and explains what a course is about, how it is organized, and how students are expected to participate. Part of the course guide covers the assessment strategy, for which requirements have recently been introduced. The assessment strategy clarifies how and when a learning outcome is assessed, who is involved in assessing students, and how the final mark will be determined. It also shows the transparency and validity of the assessment. To enhance the reliability of the assessment, examiners need to explain which elements in the student's answers lead to a certain mark. For multiple choice questions this is embodied in the answer key, and for open answer questions this is shown by model answers, assessment criteria or rubrics (for an example, see Appendix 9). The previous practice was similar to the new theory, but had a less formalized manner. Currently, all Wageningen programmes are in the transition phase from the previous practice to the new situation. The critical reflections showed several examples of assessment strategies. Within each course, several types of assessments are used, and the assessment procedure is transparent, but still needs fine-tuning. Overall, the committee thinks that the programmes provide a balanced set of assessments.

With the changes in the Higher Education and Research Act, the position of the Examining Boards has changed. They are currently in the process of strengthening their role in assuring the quality assessment, both via interim course exams and the evaluation of internships and theses. The new role of the Examining Boards has two elements. The first is that each examiner will be made explicitly responsible for ensuring that an assessment of a course is valid, reliable and transparent. This was made a regular part of the University Teaching Qualification. Wageningen University produced documents to help examiners and lecturers achieve this, and meetings between the Examining Boards and examiners were held in the spring of 2011. The second element is that the Examining Boards will visit chair groups on a regular basis to verify the quality of assessment of courses provided by the groups. Additional visits will take place when required, for example when indicated by the results of course evaluations.

The committee learned during the site visit that students can do many resits for each course if they don't pass the first time. Each year three exam possibilities are offered for each course and students can retake the exam as often as needed to pass.

Quality and assessment of the thesis work

The thesis work is always graded by two assessors: the supervisor and the examiner. Both are present during the presentation and final discussion of the thesis. In the study year 2011-2012 the assessment procedure for the thesis will be further improved by developing a rubric. A rubric is an assessment tool based on a set of criteria and standards linked to learning

outcomes that is used to assess or communicate about product, process and performance. The rubric provides guidelines for the thesis evaluation. In appendix 9 an example of a rubric is provided.

Bachelor programme

The bachelor thesis has a total of 12 credits and is considered the final stage of the bachelor programme. The thesis and the internship of 18 credits are integrated in the thesis project. Students collect data during their internship and use it in their thesis.

For the assessment of a thesis, a standard form is used throughout Wageningen University. Criteria for the assessment are: research competencies (10-40%), design qualification (10-40%), report (40%), presentation (5%) and final discussion (5%). The weight of each criterion is determined after approval of the research/project proposal. The thesis work is always graded by two assessors: the supervisor and the examiner. Both are present during the presentation and final discussion of the thesis. In the study year 2011-2012 the assessment procedure for the thesis will be further improved by developing a rubric.

Prior to the site visit, the committee members received a total of 15 recent theses, selected from a list in the critical reflection of all theses that were completed during the last two years. The selection was done by the secretary on behalf of the chairman of the committee. When selecting the theses, the grading and the graduation date were considered. Student numbers of the selected theses are provided in Appendix 7. For all 15 theses the committee read the thesis report; several of these theses were accompanied by a reflection report. The use of the assessment form filled out by the supervisor has only recently been introduced, but all theses had one.

Overall, the committee is positive about the bachelor theses. They are well written and address relevant topics. The committee agreed with the marks given to them. However, in most cases the theses were mainly descriptive and did not display many analytical skills. The committee has sympathy for the argument that it is a student's first attempt at individual research; it agrees that it is a good exercise for students to gain experience with data collection and/or a literature study and writing a coherent report on the findings. However, the actual analysis was often not very strong. The committee suggests investing more in the students' research skills to get truly outstanding research projects which would help to differentiate between exceptional candidates and good ones. It would also be comfortable calling it an independent research project instead of a research thesis. The committee suspects this would also match the requirements of the professional field better.

Master programme

For master programmes, the thesis, internship and Academic Master Cluster (AMC) form important parts of the learning outcomes. There is an extensive assessment format for the ACT to evaluate each student's individual contribution to the final product and collaborative process. It aims at securing grading reliability across the large number of teams participating each year. For the internship an assessment form is used which is common to all programmes. An external and an internal supervisor are appointed for the internship: the external supervisor advises on the quality of the student's performance, the internal supervisor grades the internship.

The weighting of the criteria for the assessment of the master's thesis differs slightly from that for the bachelor's thesis: research competencies (20-50%), thesis report (20-50%), design competences (20-50%), colloquium (5%) and examination (5%). The critical reflection

includes the rubric with the assessment criterion. The thesis is always assessed by at least two assessors: the supervisor and the examiner. Each thesis process involves at least five aspects: a thesis proposal, a final draft report, the thesis report, a colloquium and an examination.

Prior to the site visit, the committee members received a total of 14 recent theses, selected from a list in the critical reflection of all theses that were completed during the last two years. This selection was done by the secretary on behalf of the chairman of the committee. When selecting the theses, grading (the same number of high, middle and low scores were selected) and graduation date were considered. Student numbers of the selected theses are provided in Appendix 7. The use of the assessment form filled out by the supervisor has only recently been introduced, but all theses had one.

The committee has no doubt about the high quality of the theses, but it did get the impression that they are marked slightly generously. It noted that qualitative methods were used in many of the theses examined, on both the bachelor and master level, and there was a lack of quantitative research skills. The lecturers the committee talked to explained that they are experienced with conducting case study research. In the master programme the student's background partly determines what methods are used. The lecturers are aware of the tendency towards qualitative methods and actively encourage students to integrate quantitative data. More importantly, lecturers emphasize that the integration of qualitative and quantitative methods is not their goal; rather, it is about understanding that Land and Water Management issues require different levels of analysis. The committee believes the programmes succeed in that aspect quite well.

Success rates and performance of graduates

Bachelor programme

The average success rate in the bachelor programme is quite low. Most first-year students enter the second year, only a few students switch to other bachelor programmes. This is quite normal. The students take a long time to finish their bachelor degree: 55% of the 2006 cohort needed more than 4 years to finish. Since students were allowed to enter a master programme before graduating from their bachelor programme, the committee is not able to give a valid opinion on the success rates.

Most graduates continue with an academic master programme. Graduates have unconditional access to the following master programmes at Wageningen University:

- International Land and Water Management;
- Geo-Information Science;
- Development and Rural Innovation;
- Climate Studies;
- Landscape Architecture and Planning.

If graduates opt for other master programmes, they may follow an admission minor in the bachelor electives or first successfully complete a linkage programme. In recent years, graduates have enrolled in programmes such as Organic Agriculture, Plant Sciences, Earth and Environment and International Development Studies.

Master programme

The success rates for the master programme have been consistently high. In the 2007 cohort, 59% of the students graduated after two years, and 96% finished after three years.

International students from outside Europe mostly return to their jobs from which they were allowed to take unpaid leave for the study. The time pressure on international students partly explains the high success rates. Most graduates find a job within six months of graduation. The alumni group in LinkedIn, consisting of 150 alumni, showed that about 30% work in research, including PhD research. Nearly half of the alumni found a job in consultancy. They also work in policy-making, education, design, project management, and interventions. This shows that the master programme prepares students for jobs in research and the professional field.

3.2 Considerations

The committee is very positive with regard to the initiatives Wageningen University is currently implementing in the bachelor and master programmes. The Examining Boards are in the process of strengthening their role in ensuring the quality of assessment and seem committed to formalizing the assessment system. The committee agrees that having only four Examining Boards is stimulating the consistency and equality of the procedures. However, these four Examining Boards are responsible for a total of 49 programmes. The committee is worried that the limited number of Examining Boards leads to a certain distance from the programmes, making it difficult for the Examining Boards to really be in control at the programme level.

The committee established that both programmes provide a balanced set of assessments, and it is confident that the efforts put into fine-tuning will further improve the assessment system. It is of the opinion that the bachelor theses are of good quality but very descriptive. Discussions with the management team on future improvements led to the suggestion either to focus more on the research skills to create outstanding research projects, or to put less emphasis on research and more emphasis on the experience of carrying out an independent study project. Regarding the master theses, the committee thinks they are very good. The tendency towards qualitative methods is not a problem, the lecturers are aware of the need to keep encouraging students to bridge and connect different research paradigms in their research. The success rates of the bachelor programme could be improved, but at the same time the committee observed that students are well prepared for a master programme. In the master programme the success rates are very high. Graduates perform well in research, and they are professionally qualified as well.

The committee is of the opinion that with the current pressure on graduating in time in the Netherlands, the number of possible resits at Wageningen University is outdated. If students don't feel the need to pass an exam, they might not take the exam seriously. Chances are that this will lead to study delays.

3.3 Conclusion

Bachelor programme Internationaal Land- en Waterbeheer: the committee assesses Standard 3 as **good**.

Master programme International Land and Water Management: the committee assesses Standard 3 as **good**.

General conclusion

Overall, the committee enjoyed the visit very much, and it has established that the master programme is a top programme and that with minor improvements, the bachelor could become one as well. Taking the decision rules into account, the overall assessment of the programmes in Land and Water Management are as follows:

The committee assesses the *bachelor programme Internationaal Land- en Waterbeheer* as **good**.

The committee assesses the *master programme International Land and Water Management* as **good (+)**.

APPENDICES

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

Professor Frans Zwarts was Rector Magnificus of the University of Groningen between 2002 and 2011. He studied linguistics at the University of Amsterdam (1967-1973) and at the Massachusetts Institute of Technology (1974), and wrote a doctoral dissertation on Categorical Grammar and Algebraic Semantics (cum laude). He was appointed lecturer at the University of Groningen in 1975 and became Professor of Linguistics in 1987. He was the initiator of the European Summer School in Logic, Language and Information (ESSLLI) in 1989. In 1992, Zwarts was a visiting scholar at UCLA (University of California, Los Angeles). Between 1995 and 2002, he was chair of the Netherlands Steering Committee for Research on Developmental Dyslexia, initiated by the NWO as part of a multidisciplinary national research programme. In 1999, he became academic director of the Graduate School of Behavioural and Cognitive Neurosciences of the University of Groningen. In 2003, he and the Rector Magnificus of Uppsala University established a close partnership between Groningen and Uppsala. This was extended in 2006, when the Universities of Ghent, Göttingen, Groningen, and Uppsala decided to form the U4. In 2011 he was appointed professor and manager to realise the University Campus Fryslân. Zwarts was a member on several NQA assessment committees. He has been a Fellow of the Royal Netherlands Academy of Arts and Sciences (KNAW) since 1999.

Mrs. Renate Prenen, MSc, is educational advisor and independent entrepreneur educational advice. She studied Applied Educational Sciences at Twente University. She worked at Randstad employment agency as advisor and programme manager. Later, she worked at the Academic Medical Centre (AMC) of the University of Amsterdam, where she was educational advisor for the Board of the AMC. In September 2009 she started as an independent educational advisor. She has been a committee member on other QANU assessment committees.

Ms. Ted Veldkamp, BSc, is a student in the master Earth sciences, specialization Earth Sciences and Economics (VU University Amsterdam). Earlier she finished the interdisciplinary bachelor Aarde en Economie at the VU University Amsterdam (cum laude) and currently she is working on her master's thesis. During her study she was actively involved in the educational management (participant educational committee, board study association, participant selection committee Professor Earth Science and Economics) of the Earth Science and Economics bachelor and master.

Professor John Anthony Allan [BA Durham 1958, PhD London 1971] heads the London Water Research Group at King's College London and SOAS. He specialises in the analysis of water resources in semi-arid regions and on the role of global systems in ameliorating local and regional water deficits. In his early career he was concerned with hydrological and environmental issues but gradually turned his attention to the social and political when it became evident that environmental science could not explain why people manage water as they do. He pointed out that the water short economies achieve water and food security mainly by importing water intensive food commodities. The concept of *virtual water*. He provides advice to governments and agencies especially in the Middle East on water policy and water policy reform. His ideas on water security are set out in *The Middle East water question: hydropolitics and the global economy* and in a new book entitled *Virtual water*. He is currently working on why the accounting systems in the food supply chain are dangerously blind to the costs of water and of mis-allocating it. He also works on the water/energy nexus. In 2008 he was awarded the Stockholm Water Prize in recognition of his contribution to water science and water policy.

Professor Michael Stocking is Emeritus Professor of Natural Resource Development at the School of International Development, University of East Anglia, Norwich, United Kingdom. Having lived and worked in central Africa (Zambia and Zimbabwe) for many years, he has been involved in tropical agricultural development, land resources, conservation of biodiversity and soil conservation since 1969. With field experience in sub-Saharan Africa, South America, and South and South-east Asia, his work involves soils investigations, agrobiodiversity assessment and the relationship between land degradation and vegetation productivity. He has been – and continues to be - an adviser/consultant to several international agencies including FAO, UNEP, World Bank, DFID and the Global Environment Facility. Currently, he is Special Adviser to the Chair of the science panel to the Global Environment Facility based in Washington DC, with specific responsibilities for the focal area of ‘land degradation’ and for the science of multi-focal projects dealing with sustainable land management, biodiversity and climate change. He has recently completed a major review for UNDP’s Evaluation Office on ‘Poverty and the Environment’ with case studies from 30 countries. He is the author of eight books and over a hundred scientific papers, book chapters and reports on various aspects of environment and development.

Appendix 2: Domain-specific framework of reference

Introduction

International Land and water management related studies comprise a mix of fields of study, both disciplinary as well as multi- and interdisciplinary in nature. Understanding and addressing contemporary issues related to land and water worldwide can entail a multitude of angles in scientific disciplines in the environmental sciences (soil science, geology, hydrology, agricultural engineering, physical geography, ecology, geodesy and GIS), plant and nutritional sciences, and the social sciences (social geography, sociology, economy, management, law and policy and public administration, international development studies and so on). Since the bachelor's programme International land and water management is rather specific and unique in the Netherlands, this framework in fact draws on elements of each of the mentioned fields of science and this framework results from discussions with representatives in the professional field and on two consecutive consultations of our External Advisory Committee both in person as by email.

Land and water in the world

On one hand, more than 75% of the world's fresh water supply is being used to irrigate crops and on the other hand half of the agricultural land in the world is based on rain-fed or rain dependent agriculture, where sustainable use and conservation of the available soil and water resources are crucial. Sound international land and water management is an essential element in the world's major human challenges, such as poverty alleviation, achieving food security, preventing or mitigating conflicts, natural hazards and disasters, that are related to land and water resources.

August 2011, the Food and Agriculture Organisation of the United Nations (FAO) published its first issue of a periodic publication:

State of the World's Land and Water Resources for Food and Agriculture (SOLAW) stating: "Land and water resources are central to agriculture and rural development and are intrinsically linked to global challenges of food insecurity and poverty, climate change adaptation and mitigation, as well as degradation and depletion of natural resources that affect the livelihoods of millions of rural people across the world."

Current projections indicate that world population will increase from 6.9 billion people today to 9.1 billion in 2050. In addition, economic progress, notably in the BRICS countries India, China, Brazil and South Africa, translates into increased demand for food and diversified diets. World food demand will surge as a result, and according to FAO it is projected that food production will increase by 70% in the world and by 100 % in the developing countries. Yet, both land and water resources, the basis of our food production, are finite and already under heavy stress, both in terms of quantity as well as quality. In addition to agricultural production, there are plenty of competitors for land and water. Land and water managers increasingly have to consider land and water for cities, biofuels, industry, fisheries, tourism, nature and the environment.

"We will see a rise in the importance of irrigation on the international agendas again with issues of food security. One of the key issues in irrigation is that it needs to respond to a number of drivers outside of water management – commodity prices, environmental concerns, water scarcity and competing demands from water. No longer can a land and water manager be concerned solely about soil and water for crops. No longer can those who consider issues of land and water resources and/or food security ignore irrigation. Land grabs – probably better stated as natural resource management grabs - are quickly changing the face of agriculture."

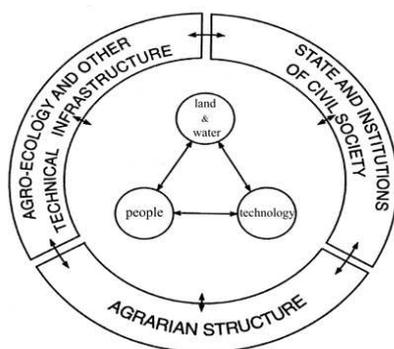
David Molden PhD, Deputy Director General and Director Research at the International Water Management Institute (IWMI), Colombo, Sri Lanka.

Natural resource grabs are not really new phenomena but increasingly formalized and accepted ways of expropriation, especially in sub-Saharan Africa, where for instance Chinese agricultural production companies are growing crops for China's home consumption with the help of local production factors, including land, soil fertility, water resources and water rights. However, also local elites acquire lands for commercial agricultural production to profit from the high food prices. Recent research by the World Bank shows that claims that local economies and people would benefit from these investments do not hold true.

Understanding the dynamics of changing rural livelihood patterns will be increasingly important for land and water management. Who is farming – old, young, women, men, migrants and minorities? 80 to 95% of the land and water rights in the world are vested in men, whereas among poor households, household level food security is a function of income earned and controlled by women. FAO estimates that women account for more than half the labour required for producing the food consumed in the developing world and in Sub Saharan Africa even three quarter. In addition, it is important to grasp what else farming family members are doing besides agriculture. For the first time in history, half of the world's population lives in urban areas and at the same time the distinction between urban and rural areas is getting less firm. People are moving both directions in search for – seasonal – jobs and other sources of income.

Urban agriculture is gaining ground and importance and the proximity of markets and other knowledge and capital infrastructures are appealing features. Finally, urban waste and waste-water reuse for agricultural purposes is growing too.

There is a second swell in dam construction across Africa and in parts of Asia. In Africa this opens the door to questions about new ways of soil and water conservation and new ways of irrigation development whether it is large or small scale. Next to government or private sector services and initiatives, there is a growing demand for simple technologies to cope with problems related to water scarcity and soil quality throughout the world. The developments presented above represent just a random pick of the issues and challenges at play and at the same time offer a justification for the framework of our bachelor and master International Land and Water Management, within which we place our research, teaching and learning of staff and students alike.



International land and water management

The core of the programme and the issues that are centrally addressed, evolve around the interaction between people – land & water – technology. In order to manage the natural resources land and water, a range of physical and social technologies are being used, designed or developed and implemented either by internal actors, such as the direct users or by external actors, including science, authorities and private companies. The interaction between

people, land and water and technology is very context specific both locally as well as regionally and (inter)nationally.

One way to visualize the domain of land and water management is shown in Figure 1 (adopted from Peter Mollinga PhD, Professor of Development Studies, School of Oriental and African Studies, University of London, and MIL and PhD graduate from WU).

In addition, the sphere in which this interaction is taking place, is being based on and shaped by the three outer spheres in the picture – the biophysical, agro-ecological and technical conditions and criteria; the institutional environment and the political, economic and cultural environment in which agriculture and rural development is being shaped and in which it is being embedded. This model helps in prioritising the various issues that need to be addressed in the programmes International Land and Water Management.

International

The reason for having an international focus is threefold:

1. Comparative research and analyses focus on land and water management issues worldwide, traditionally in countries in transition in Africa, Asia and south and central America but since a decade or two increasingly in southern and eastern Europe, Australia and the USA too.
2. Although context specific, land and water for agricultural production never takes place in isolation. Agricultural production – even in traditional subsistence farming systems – is embedded in international contexts, such as international trade relations, price developments on (world) markets for products and agricultural inputs, national and international political and legal arrangements and developments in agro-food chains, to name a few examples.
3. Teaching and learning taking place in an international, multidisciplinary and intercultural class room is an objective in itself in order to create an inducing environment with a wealth of different experiences, Backgrounds and views and in addition to stimulate a critical attitude towards the various discourses in the domain of land and water management. Finally it stimulates reflective skills in individual learners, enabling them to reflect on their own competences and performance, on the functioning of the group and the role of the engineer and, finally, on the domain of land and water management as a whole.

Reflective, critical and interdisciplinary attitude

In line with the focus on land and water, technology and people, an interdisciplinary approach is logical. In our bachelor we try to focus on developing an interdisciplinary attitude and appreciate the fact that bachelor's graduates achieve a *multidisciplinary* attitude and that our master's graduates have an *interdisciplinary* attitude. The development towards multidisciplinary and towards interdisciplinary attitudes can be described quite straightforwardly by using Perry's model on developing interdisciplinarity (or transdisciplinarity) in adolescents (2001), following the steps below:

- Dualism: things are “good or wrong”
- Multiplicity: there are more realities, views that have some truth in it
- Relativism: link the different realities
- Accept the paradox of different realities integrate them and act accordingly

Interdisciplinary – combine more academic fields or disciplines into a new one.

Transdisciplinary – crossing disciplinary boundaries to create a holistic approach.

Inter-, and transdisciplinary ambitions between the mentioned natural and social science disciplines and various stakeholders in reality are huge, and meeting them is challenging and difficult. The organization of academic knowledge along disciplines promotes and rewards disciplinary specialization, rather than the ability to communicate across disciplines and combine knowledge. Bridging and integrating disciplines implies overcoming differences in the use of concepts and theories, methodologies, as well as in ontologies and epistemologies. Bridging disciplines challenges and clashes with the realworld divisions that exist between disciplines and sectors. In terms of epistemology, natural scientists, for instance, tend to assume that reality can be known in an ‘objective’ sense, whereas social scientists tend to stress the situatedness and embeddedness of all truth claims. Policymakers, in their turn, often have a preference for generalizable water knowledge based on modelling and statistics, that can form the basis of, and politically legitimize, blueprint policy solutions and ‘toolkits’. Linked to interdisciplinarity, critical and reflective skills and attitudes are essential character traits for graduates in the domain of land and water management (if not for any university graduate). This was also voiced by the majority of the members of our External Advisory Committee.

Appendix 3: Intended learning outcomes

Intended learning outcomes for the bachelor programme in International Land and Water Management

	Learning outcomes	Dublin Descriptors
	After successful completion of the programme graduates are expected to be able to:	(description of bachelor level)
Domain specific knowledge and understanding and applying that knowledge and understanding	1 understand and apply the aspects of agro-ecological systems and its interlinked components, including soil, water, plants and derived products; and land and water related technical infrastructures to manage these natural resources;	<ul style="list-style-type: none"> • Knowledge and understanding • Applying knowledge and understanding • Making judgments
	2 understand the social-economic, legal, institutional and political contexts of land and water management;	<ul style="list-style-type: none"> • Knowledge and understanding • Applying knowledge and understanding • Making judgments
	3 identify the various stakeholders and their interest and influence in land and water contexts;	<ul style="list-style-type: none"> • Knowledge and understanding • Applying knowledge and understanding • Making judgments
Scientific learning outcomes (research)	4 identify and analyse the various problems at stake with regard to the use, distribution and management of land and water resources in the world;	<ul style="list-style-type: none"> • Applying knowledge and understanding • Making judgments
	5 formulate a problem definition, research objective, and research questions, resulting in an adequate research design, in the domain of international land and water management (research design under supervision).	<ul style="list-style-type: none"> • Applying knowledge and understanding • Making judgments
Domain specific skills	6 apply appropriate methods and techniques to collect, analyse and interpret data from the literature and empirical research in the domain of international land and water management (carry out a research or design project under supervision);	<ul style="list-style-type: none"> • Applying knowledge and understanding • Making judgments
	7 apply scientific knowledge, individually and in teams, together with relevant stakeholders, for designing land and water management alternatives at a technical, organizational and/or institutional level;	<ul style="list-style-type: none"> • Applying knowledge and understanding • Making judgments
General academic learning outcomes	8 communicate their findings in a clear and concise manner, both in writing and verbally, geared toward various audiences;	<ul style="list-style-type: none"> • Communication • Making judgments
	9 have developed a problem oriented and multidisciplinary attitude;	<ul style="list-style-type: none"> • Communication • Making judgments • Learning skills
	10 reflect critically on personal competences and also on problems, theories and research results in the domain of international land and water management;	<ul style="list-style-type: none"> • Making judgments • Learning skills
	11 identify the ethical and value-driven aspects of research and intervention strategies, and the various roles of the specialist in the domain;	<ul style="list-style-type: none"> • Making judgments • Learning skills
	12 design and plan their own learning path.	<ul style="list-style-type: none"> • Communication • Making judgments • Learning skills

Intended learning outcomes for the master programme in International Land and Water Management

	Learning outcomes	Dublin Descriptors
	After successful completion of the programme students are expected to be able to:	(description of master level)
Domain specific knowledge and understanding and applying that knowledge and understanding	1 • understand and apply knowledge on scientific paradigms and theoretical approaches to land and water management issues;	• Knowledge and understanding • Applying knowledge and understanding • Making judgments
	2 • understand and apply interactive approaches with stakeholders and actors at the respective levels for different agro-ecological systems;	• Knowledge and understanding • Applying knowledge and understanding • Making judgments
Scientific learning outcomes (research)	3 • formulate a problem definition, research objective, and research questions, resulting in an adequate research design (research design).	• Applying knowledge and understanding • Making judgments
	4 • apply appropriate methods and techniques to collect, analyse and interpret data from literature and empirical (carry out a research or design project);	• Applying knowledge and understanding • Making judgments
Domain specific skills	5 • analyse policies and policymaking processes, the institutional contexts and the multi-faceted consequences of interventions in land and water management;	• Applying knowledge and understanding • Making judgments
	6 • propose interventions for alternative management systems for land and water issues at local and watershed level;	• Applying knowledge and understanding • Making judgments
General academic learning outcomes	7 • have developed a inter or cross-disciplinary attitude and function in multidisciplinary and multicultural teams or groups in complex land and water management contexts;	• Communication • Making judgments
	9 • convincingly communicate their research or design findings in a clear and concise manner, both in writing and verbally, geared toward different audiences;	• Communication • Making judgments • Learning skills
	9 • reflect critically on personal competences and also on problems, theories and research results;	• Communication • Making judgments • Learning skills
	10 identify the ethical and value-driven aspects of research and intervention strategies, and the various roles of the specialist in the domain;	• Learning skills • Making judgments
Specialization A: Land Degradation and Development		
	11 • assess and analyse, in a cross-disciplinary manner, land degradation processes; • analyse, develop and evaluate, interactively with stakeholders, institutional and infrastructural design for land and water management interventions in a cross-disciplinary manner.	• Applying knowledge and understanding • Communication • Making judgments • Learning skills
Specialization B: Irrigation and Water Management		
	12 • assess and analyse, in a cross-disciplinary manner, different forms of water use and water resources management strategies applied at field, scheme and catchment level by different stakeholders; • analyse and evaluate, interactively with stakeholders, institutional and infrastructural designs for sustainable irrigation and water management interventions in a cross-disciplinary manner.	• Applying knowledge and understanding • Communication • Making judgments • Learning skills
Specialization C: Integrated Water Management		
	13 • understand and apply theoretical concepts that play a role in integrated water management and related policy processes; • analyse and evaluate from a researcher's perspective, in a cross-disciplinary manner, complex, multi- scale and multi-stakeholder water issues in catchments.	• Applying knowledge and understanding • Communication • Making judgments • Learning skills

Appendix 4: Overview of the curricula

Curriculum bachelor programme in International Land and Water Management

The internship and thesis combination can be followed in period 1, 2 & 3 or period 4, 5 & 6, depending on free choice or specific minors.

		Period 1 September-October	Period 2 November-December	Period 3 January	Period 4 February	Period 5 March-April	Period 6 May-June/July			
year 1	morning	NCP 10503 Ecology I	IWE 11303 Orientation on Land and Water Management	MAT 14903 Mathematics 2&3 MAT 15003 Mathematics 2&3	ECH 13303 Introduction Economics	AEW 21306 Soil & Water 2	TAD 10806 Technology, development and natural resources	LDD 11806 Design land & water management 1	CSA 10306 Cropping systems & knowledge of crops	
	afternoon	YEI 10306 Intro. Environmental sciences		LAD 10806 Soil & Water 1	RSO 13303 Science, technology & society		HWM 21806 Introduction to hydraulics			
year 2	morning	IWE 10306 Irrigation & water management (Tunisia / Morocco excursion)		LDD 20306 Land and Water Engineering	GRS 10306 Introduction geo-information science	DEC 20306 Rural households and livelihood strategies	LAW 21806 Law & legal complexity in natural resources management	IWE 21312 Design land & water management 2	YRM 21306 Research methodology for human - environment interactions	
	afternoon	LDD 10306 Land Degradation and soil & water conservation (Tunisia/Morocco excursion)		MAT 15303 Statistics 1& 2 MAT 15403 Statistics 1& 2						
year 3	morning	Free choice or minor				YEI 80812 Thesis (combined with Internship including international fieldwork experience)				
	afternoon					YEI 70318 BSc Internship (combined with Thesis including data collection)				

Curriculum master programme in International Land and Water Management

		Period 1 September-October	Period 2 November-December	Period 3 January	Period 4 February	Period 5 March-April	Period 6 May-June/July (not AM-PM but 1 st & 2 nd half)
MIL1	AM	Free choice	ENP 34306 Environmental Policy: Analysis and evaluation	ESS 33806 Integrated Water Management	IWE 30306 Water Systems Design at Catchment Level	RDS 35306 Natural hazards and disasters	ESS 90836 Thesis Integrated Water Management Preparation thesis work & proposal presentation
	PM	LDD 30306 Sustainable Watershed Management	LDD 31306 Impact Assessment of Land and Water Management			IWE 32306 Research Approaches to Land and Water Management	IWE 33306 Sustainable Land and Water Management (Spain)
MIL2		ESS-90836 Thesis Integrated Water Management			YMC 60809 Academic consultancy training ACT & YMC 60303 Modular Skills Training MOS	Choose one of the following: • XXX 80418 Second thesis	

Preparation for the M2 thesis starts in period 5 of the first year and is concluded by a research proposal that is presented and discussed for a mixed audience of fellow master and bachelor students and supervising staff.

Appendix 5: Quantitative data regarding the programmes

Data on intake, transfers and graduation

Success rates for the bachelor programme in International Land and Water Management

Cohort	2003	2004	2005	2006	2007	2008	2009	2010
Size at the outset	22	29	09	26	42	46	55	34
Size of re-enrolment T+1	14	23	15	20	38	38	46	
Diploma after 3 years (%)	7	4	7	15	13			
Diploma after 4 years (%)	36	30	40	55				
Diploma after 5 years (%)	64	57	80					
Diploma after 6 years (%)	86	83						
Drop-outs 1 October 2011 (%)	14	9	0	15	5	3		

Success rates for the master programme in International Land and Water Management

Cohort	2003	2004	2005	2006	2007	2008	2009	2010
Size at the outset	17	22	26	30	27	39	49	39
Diploma after 2 years (%)	71	45	50	50	59	59		
Diploma after 3 years (%)	100	82	88	90	96			
Diploma after 4 years (%)	100	86	92	90				
Drop-outs 1 October 2011 (%)	0	14	8	7	0	10	0	

Teacher-student ratio achieved

For the bachelor programme in International Land and Water Management the student/staff ratio is 7.4.

For the master programme in International Land and Water Management the student/staff ratio is 5.27.

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

Number of programmed contact hours

Year	Contact hours	Contact hours (% of 1680)
B1	792	47
B2	786	47
B3	397	24
M Courses	567	17
M Thesis	18	0.5
M Free Choice	117	4

Appendix 6: Programme of the site visit

7th June 2012

14:45 – 16:15

Preparatory meeting by committee

16:15-17:15

Management (responsible for content of the programme)

Prof. L.F. (Linden) Vincent (Chair holder Irrigation and Water Engineering)

ir. C.F. (Erik) Heijmans (Programme director BIL-MIL)

dr.ir. M.J.P.M. (Michel) Riksen (Assistant professor and chair of the Programme Committee -Irrigation and Water Engineering)

ir. N.C. (Nynke) Post Uiterweer (Study adviser BIL-MIL)

M. (Mieke) Hulshof (Daily board and student member of the Programme Committee)

8th June 2012

9:00-10:00

Students BIL/MIL

D.E. (Doris) Wendt (BSc)

G. (Galli) Giacomo (MSc)

S. (Sophia) Beunder (MSc)

A.C. (Amelie) Huiber (MSc)

R. (Rosella) Alba (MSc)

B. (Bram) Berkelmans (BSc)

D.J. (Dirk) Rolker (MSc)

10:00-11:00

Lectures BIL/MIL

dr.ir. E.J.J. (Erik) van Slobbe - Lecture (Earth System Science)

dr.ir. G.J.A. (Gert) Veldwisch - Assistant professor (Irrigation and Water Engineering)

dr.ir. CA. (Aad) Kessler - Assistant professor (Land Degradation and Development)

dr.ir. M. (Margreet) Zwarteveen – Assistant professor (Irrigation and Water Engineering)

dr.ir. S.R. (Sietze) Vellema – Assistant professor (Technology and Agrarian Development)

dr. D.(Dik) Roth – Assistant professor (Rural Development Sociology)

dr.ir. P. (Flip) Wester –Assistant professor (Irrigation and Water Engineering)

11:00-11:15

Break

11:15-11:45

Programme Committee BIL/MIL

C.(Chris) de Bont -MSc student and Programme Committee member

J.(Jasper) van der Woude - MSc student and Programme Committee member

H.A. (Staarink) Hendrik – MSc student and Programme Committee member

S.(Sjoerd) Postma -BSc student and Programme Committee member

dr.ir. (Alex) Bolding – Assistant professor and Programme Committee secretary (Irrigation and Water Engineering)

dr.ir. Jan de Graaff – Associate Professor and Programme Committee member (Land Degradation and Development)

12:30-13:15

Lunch

13:00-13:45

Final meeting with management (final responsibility for programme)

Prof. L.F. (Linden) Vincent (Chair holder Irrigation and Water Engineering)

ir. C.F. (Erik) Heijmans (Programme director BIL-MIL)

dr.ir. M.J.P.M. (Michel) Riksen (Assistant professor and chair of the Programme Committee -Irrigation and Water Engineering)

ir. N.C. (Nynke) Post Uiterweer (Study adviser BIL-MIL)

M.(Mieke) Hulshof (Daily board and student member of the Programme Committee)

13:45 – 14:45

Deliberation by committee and preparing of preliminary findings

14:45 – 15:00

presentation of preliminary findings by committee

Programme for Kick-off meeting, 21 February: Common part of critical reflections

09.00-09.15	Welcome by the Rector and the Director of the EI¹
09.15-11.00	Preparatory meeting of assessment panel
11.00-12.15	General management programmes: P. (Paulien) Poelarends (member, Board of the EI) R.A. (Rosella) Koning (member, Board of the EI) Prof. T.W.M. (Thom) Kuyper (member, Board of the EI) Prof. L.E. (Leontine) Visser (member, Board of the EI) Prof. E.W. (Pim) Brascamp (Director of the EI) J.J. (Jan) Steen (Quality assurance and enhancement officer)
12.15-12.45	Lunch
12.45-13.30	Study Advisers: Dr. A.E.M. (Anja) Janssen (BSc and MSc Food Technology, Food Safety, Food Quality Management) C.M. (Neeltje) van Hulten (BSc and MSc Agriculture and Bioresource Engineering) C.Q.J.M. (Stijn) Heukels (BSc and MSc Landscape Architecture and Planning) W.T. (Willy) ten Haaf (MSc Geo-Information Science) Dr. W. (Wouter) Hazeleger (MSc Animal Sciences) [not present] R.N.M. (Gineke) Boven (BSc Management and Consumer Studies)
13.30-14.30	Examining Boards: Dr. P.B.M. (Paul) Berentsen (secretary, EB ² Social Sciences) Dr. M.C.R. (Maurice) Franssen (secretary, EB Technology and Nutrition) C.P.G.M. (Lisette) de Groot (chair, EB Technology and Nutrition) Dr. D. (Dick) van der Hoek (secretary, EB Environment and Landscape) Dr. K. (Klaas) Swart (secretary, EB Life Sciences) Prof. W. (Willem) Takken (chair, EB Life Sciences)
14.30-14.45	Break
14.45-15.45	Lecturers of Programme Committees: Dr. A.J.B. (Ton) van Boxtel (Biotechnology and Bioinformatics) Dr. J. (Jan) den Ouden (Forest and Nature Conservation) Dr. K.B.M. (Karin) Peters (Leisure, Tourism and Environment) Dr. W.A.H. (Walter) Rossing (Organic Agriculture) Dr. R. (Rico) Lie (International Development Studies) Dr. W.T. (Wilma) Steegenga (Nutrition and Health)
15.45-17.15	Meeting of assessment panel: evaluation and first findings
17.15-18.00	Graduates: Francesco Cecchi, MSc (MSc International Development Studies) Prof. Charlotte de Fraiture (MSc International Land and Water Management) Dr. Dinand Ekkel (MSc Animal Sciences) Loes Mertens (MSc Organic Agriculture) M. Visser (MSc Forest and Nature Conservation)

¹ EI = Education Institute

² EB = Examining Board

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:

Bachelor programme Master programme

880401793050	821015268060
870923752010	850902764010
821015268060	831226540040
880107832110	830725036050
871118005030	850318348100
890409544050	800830173130
890211209030	850709846090
881010200070	800820249060
880206161120	830503013080
870121314010	850426692050
870528017060	820112763080
880804660060	760909167070
870905916010	780628605120
860205401120	

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 with associated evaluation criteria and standard (answer keys) and a representative selection of completed examinations (presentations, internship and/or research reports, portfolios, etc.) and their evaluations;
- List of required literature;
- 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.;
- Alumni/exit questionnaires;
- Material about the student associations;
- Documentation on teaching staff satisfaction;
- Course guides.

Appendix 8: Declarations of independence



DECLARATION OF INDEPENDENCE AND CONFIDENTIALITY TO BE SUBMITTED PRIOR TO THE ASSESSMENT OF THE PROGRAMME

THE UNDERSIGNED

NAME: FRANS ZWARTS

HOME ADDRESS: PETROUS CAMPERSINGEL 253
9719 AP WAGENINGEN

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

LIFE SCIENCES, SEE ATTACHMENT

APPLICATION SUBMITTED BY THE FOLLOWING INSTITUTION:

WAGENINGEN UNIVERSITY

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.



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: Nageningen DATE: March 30, 2012

SIGNATURE:

Bijlage bij onafhankelijkheidsverklaring

Vaststelsbezoek	Opleiding (CROHO-nummer):	Variant
A. Food Technology	B Levensmiddelen technologie (BLT; 56973)	Volgt
	M Food Safety (MFS; 60112)	Volgt
	M Food Technology (MLT; 66973)	Volgt
B. Biotechnology en Bio-informatica	M Food Quality Management (MQ; 60109)	Volgt
	B Biotechnologie (BBI; 56841)	Volgt
C. Agricultural and Bioresource Engineering	M Biotechnology (MT; 66841)	Volgt
	M Bioinformatics (MBI; 60195)	Volgt
D. Forest and Nature conservation	B Agrotechnologie (BAT; 56831)	Volgt
	M Agricultural and Bioresource Engineering (MAB; 66831)	Volgt
E. International Land and Water Management	B Bos- en Natuurbeheer (BBN; 56219)	Volgt
	M Forest and Nature Conservation (MFC; 66219)	Volgt
F. Landscape, Architecture and Planning	B Internationaal Land- en Waterbeheer (BL; 50100)	Volgt
	M International Land and Water Management (ML; 50104)	Volgt
G. Leisure, Tourism and Environment	B Landschapsarchitectuur en ruim. Planning (BLP; 56848)	Volgt
	M Landscape, Architecture and Planning (MLP; 66848)	Volgt
H. Geo-Information Science	M Leisure, Tourism and Environment (MLE; 60111)	Volgt
	M Geo-Information Science (MG; 60108)	Volgt
	B Plantensociologie (PSO; 56835)	Volgt
I. Plant Sciences	M Plant Sciences (MPS; 66835)	Volgt
	M Organic Agriculture (MOA; 66300)	Volgt
	M Plant Biotechnology (MPB; 60105)	Volgt
J. Animal Sciences	B Dierwetenschappen (DFW; 56840)	Volgt
	M Animal Sciences (MAS; 66840)	Volgt
K. Climate Studies	M Climate Studies (MCL; 60103)	Volgt
	B Internationale Ontwikkelingsstudies (BIN; 56837)	Volgt
L. International Development Studies	M International Development Studies (MID; 66837)	Volgt
	B Development and Rural Innovation (MRI; 60102)	Volgt
M. Management, Economics and Consumer Studies	B Beheer en Consumentwetenschappen (BSC; 56830)	Volgt
	M Management, Economics and Consumer Studies (MME; 66830)	Volgt
N. Nutrition and Health	B Voeding en Gezondheid (VVG; 56868)	Volgt
	M Nutrition and Health (MNH; 66868)	Volgt



DECLARATION OF INDEPENDENCE AND CONFIDENTIALITY
TO BE SUBMITTED PRIOR TO THE ASSESSMENT OF THE PROGRAMME

THE UNDERSIGNED

NAME: RENATE PRAEVEN

HOME ADDRESS: Simon Stevinweg 21
1401 TB Bussum

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

LIFE SCIENCES - SEE ATTACHMENT

APPLICATION SUBMITTED BY THE FOLLOWING INSTITUTION:

WAGENINGEN UNIVERSITY

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



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, IN SO FAR 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: Wageningen DATE: 29-03-12

SIGNATURE:

2

Bijlage bij onafhankelijkheidsverklaring

Visieteabezoek	Opleiding (CROHO-nummer):	Variant:
A. Food Technology	B Levensmiddelen technologie (BLT; 56973)	Volgjd
	M Food Safety (MS; 50112)	Volgjd
	M Food Technology (MLT; 69973)	Volgjd
	M Food Quality Management (MQ; 60109)	Volgjd
B. Biotechnology en Bio-informatica	B Biotechnologie (BBT; 56841)	Volgjd
	M Biotechnology (MBT; 66841)	Volgjd
C. Agricultural and Bioresource Engineering	M Bioinformatics (MBIF; 50103)	Volgjd
	M Agricultural and Bioresource Engineering (MAB; 66831)	Volgjd
D. Forest and Nature Conservation	B Bos- en Natuurbeheer (BBN; 56219)	Volgjd
	M Forest and Nature Conservation (MFN; 66219)	Volgjd
E. International Land and Water Management	B International Land- en Waterbeheer (BIL; 50100)	Volgjd
	M International Land and Water Management (ML; 60104)	Volgjd
F. Landscape, Architecture and Planning	B Landschapsarchitectuur en ruim. Planning (BLP; 56848)	Volgjd
	M Landscape, Architecture and Planning (MLP; 66848)	Volgjd
G. Leisure, Tourism and Environment	M Leisure, Tourism and Environment (M.L.E. 60111)	Volgjd
H. Geo-Information Science	M Geo-Information Science (MGI; 60109)	Volgjd
I. Plant Sciences	B Plantenwetenschappen (BPW; 56835)	Volgjd
	M Plant Sciences (MPS; 66835)	Volgjd
	M Organic Agriculture (MOA; 66300)	Volgjd
	M Plant Biotechnology (BPB; 60105)	Volgjd
J. Animal Sciences	B Dierwetenschappen (BDW; 56849)	Volgjd
	M Animal Sciences (MAS; 66849)	Volgjd
K. Climate Studies	M Climate Studies (MCL; 60107)	Volgjd
L. International Development Studies	B Internationale Ontwikkelingsstudies (BIS; 56837)	Volgjd
	M International Development Studies (MID; 66837)	Volgjd
M. Management, Economics and Consumer Studies	M Development and Rural Innovation (MDR; 60103)	Volgjd
	B Bedrijfs- en Consumentenwetenschappen (BBC; 56836)	Volgjd
N. Nutrition and Health	M Management, Economics and Consumer Studies (MME; 66836)	Volgjd
	B Voeding en Gezondheid (BVG; 56858)	Volgjd
	M Nutrition and Health (MNH; 66858)	Volgjd



DECLARATION OF INDEPENDENCE AND CONFIDENTIALITY
TO BE SUBMITTED PRIOR TO THE ASSESSMENT OF THE PROGRAMME

THE UNDERSIGNED

NAME: PROF. MICHAEL STOCKING

HOME ADDRESS: 299 UNTHAMK RD
NORWICH NE4 7SA
UK

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

INT. LAND AND WATER MANAGEMENT

APPLICATION SUBMITTED BY THE FOLLOWING INSTITUTION:

WAGENINGEN

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



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: Wageningen DATE: 7th Jun 2012

SIGNATURE: [Signature]

2



DECLARATION OF INDEPENDENCE AND CONFIDENTIALITY
TO BE SUBMITTED PRIOR TO THE ASSESSMENT OF THE PROGRAMME

THE UNDERSIGNED

NAME: PROFESSOR JOHN ANTHONY ALLAN

HOME ADDRESS: 6A WOODSOME ROAD,
LONDON NW5 1RY, UK

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

International Land and Water Management

APPLICATION SUBMITTED BY THE FOLLOWING INSTITUTION:

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



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: LONDON DATE: 6 JUNE 2012

SIGNATURE: [Signature]

2



DECLARATION OF INDEPENDENCE AND CONFIDENTIALITY
TO BE SUBMITTED PRIOR TO THE ASSESSMENT OF THE PROGRAMME

THE UNDERSIGNED

NAME: Ted Isis Elize Veldkamp

HOME ADDRESS:
Burg van Tenhuysengraet 20-15
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HAS BEEN ASKED TO ASSESS THE FOLLOWING PROGRAMME AS AN EXPERT / SECRETARY:

Bachelor International Law & Water Management
Master Int. Law & Water Management → Wageningen University

APPLICATION SUBMITTED BY THE FOLLOWING INSTITUTION:
Wageningen University

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



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: 30-03-2012

SIGNATURE: [Signature]

2



DECLARATION OF INDEPENDENCE AND CONFIDENTIALITY
TO BE SUBMITTED PRIOR TO THE ASSESSMENT OF THE PROGRAMME

THE UNDERSIGNED

NAME: MARLOUS MAARLEVELD

HOME ADDRESS:
SMC
Smalle pad 34
3811 MG AMERSFOORT

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

SEE ATTACHMENT

APPLICATION SUBMITTED BY THE FOLLOWING INSTITUTION:
WAGENINGEN UNIVERSITY

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



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: WAGENINGEN DATE: 29-03-2012

SIGNATURE: [Signature]

2

Bijlage bij onafhankelijkheidsverklaring

Visittatiebezoek	Opleiding (CRCHO-nummer)	Variant
A. Food Technology	B Lebensmitteltechnologie (BLT; 56973)	Voltd
	M Food Safety (MFS; 60113)	Voltd
	M Food Technology (MLT; 66973)	Voltd
	M Food Quality Management (MQ; 60109)	Voltd
B. Biotechnology en Bioinformatics	B Biotechnologie (BBT; 56841)	Voltd
	M Biotechnology (MBT; 60541)	Voltd
	M Bioinformatics (MBF; 60106)	Voltd
C. Agricultural and Bioresource Engineering	B Agrotechnologie (BAT; 56831)	Voltd
	M Agricultural and Bioresource Engineering (MAB; 66831)	Voltd
D. Forest and Nature conservation	B Bos- en Natuurbeheer (BRN; 56216)	Voltd
	M Forest and Nature Conservation (MFN; 60219)	Voltd
E. International Land and Water Management	B Internationaal Land- en Waterbeheer (BL; 50100)	Voltd
	M International Land and Water Management (ML; 60104)	Voltd
F. Landscape, Architecture and Planning	B Landschapsarchitectuur en ruim. Planning (BLP; 56848)	Voltd
	M Landscape, Architecture and Planning (MLP; 66848)	Voltd
G. Leisure, Tourism and Environment	M Leisure, Tourism and Environment (MLE; 60111)	Voltd
H. Geo-Information Science	M Geo-Information Science (MG; 60108)	Voltd
I. Plant Sciences	B Plantenwetenschappen (BPV; 56838)	Voltd
	M Plant Sciences (MPS; 66838)	Voltd
	M Organic Agriculture (MOA; 60205)	Voltd
	M Plant Biotechnology (MPB; 60105)	Voltd
J. Animal Sciences	B Dierwetenschappen (EDW; 56849)	Voltd
	M Animal Sciences (MAS; 66849)	Voltd
K. Climate Studies	M Climate Studies (MCL; 60107)	Voltd
L. International Development Studies	B Internationale Ontwikkelingsstudies (BIN; 56837)	Voltd
	M International Development Studies (MID; 66837)	Voltd
M. Management, Economics and Consumer Studies	B Development and Rural Innovation (MDR; 60103)	Voltd
	M Bedrijfs- en Consumentwetenschappen (BSC; 66836)	Voltd
	M Management, Economics and Consumer Studies (MME; 66836)	Voltd
N. Nutrition and Health	B Voeding en Gezondheid (BVG; 56868)	Voltd
	M Nutrition and Health (MNH; 66868)	Voltd



Appendix 9: Rubric for the assessment of a MSc-thesis

Author: Arnold F. Moene, Meteorology and Air Quality Group, Wageningen University

Version: 1.1 (December 15, 2010)

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Item	Mark for item					
	2-3	4-5	6	7	8	9-10
1. Research competence (30-60%) *						
1.1. Commitment and perseverance	Student is not motivated. Student escapes work and gives up regularly	Student has little motivation. Tends to be distracted easily. Has given up once or twice	Student is motivated at times, but often, sees the work as a compulsory task. Is distracted from thesis work now and then.	The student is motivated. Overcomes an occasional setback with help of the supervisor.	The student is motivated and/or overcomes an occasional setback on his own and considers the work as his "own" project.	The student is very motivated, goes at length to get the most out of the project. Takes complete control of his own project. Considers setbacks as an extra motivation.
1.2. Initiative and creativity	Student shows no initiative or new ideas at all.	Student picks up some initiatives and/or new ideas suggested by others (e.g. supervisor), but the selection is not motivated.	Student shows some initiative and/or together with the supervisor develops one or two new ideas on minor parts of the research.	Student initiates discussions on new ideas with supervisor and develops one or two own ideas on minor parts of the research.	Student has his own creative ideas on hypothesis formulation, design or data processing.	Innovative research methods and/or data-analysis methods developed. Possibly the scientific problem has been formulated by the student.
1.3. Independence	The student can only perform the project properly after repeated detailed instructions and with direct help from the supervisor.	The student needs frequent instructions and well-defined tasks from the supervisor and the supervisor needs careful checks to see if all tasks have been performed.	The supervisor is the main responsible for setting out the tasks, but the student is able to perform them mostly independently	Student selects and plans the tasks together with the supervisor and performs these tasks on his own	Student plans and performs tasks mostly independently, asks for help from the supervisor when needed.	Student plans and performs tasks independently and organizes his sources of help independently.
	No critical self-reflection at all.	No critical self-reflection at all.	Student is able to reflect on his functioning with the help of the supervisor only.	The student occasionally shows critical self-reflection.	Student actively performs critical self-reflection on some aspects of his functioning	Student actively performs critical self-reflection on various aspects of his own functioning and performance.
1.4. Efficiency in working with data Note: depending on the characteristics of the thesis work, not all three aspects	Experimental work Student is not able to setup and/or execute an experiment.	Student is able to execute detailed instructions to some extent, but errors are made often, invalidating (part of) the experiment.	Student is able to execute an experiment that has been designed by someone else (without critical assessment of sources of error and uncertainty).	Student is able to execute an experiment that has been designed by someone else. Takes sources of error and uncertainty into account in a qualitative sense.	Student is able to judge the setup of an existing experiment and to include modifications if needed. Takes into account sources of error and uncertainty quantitatively.	Student is able to setup or modify an experiment exactly tailored to answering the research questions. Quantitative consideration of sources of error and uncertainty. Execution of the experiment is flawless.

Item	Mark for item					
	2-3	4-5	6	7	8	9-10
(experimental work, data analysis and model development) may be relevant and some may be omitted	Data analysis Student is lost when using data. Is not able to use a spreadsheet program or any other appropriate data-processing program.	Student is able to organize the data, but is not able to perform checks and/or simple analyses	Student is able to organize data and perform some simple checks; but the way the data are used does not clearly contribute to answering of the research questions and/or he is unable to analyze the data independently.	Student is able to organize the data, perform some basic checks and perform basic analyses that contribute to the research question	Student is able to organize the data, perform commonly used checks and perform some advanced analyses on the data	Student is able to organize the data, perform thorough checks and perform advanced and original analyses on the data.
	Model development Student is not able to make any modification/addition to an existing model.	Student modifies an existing model, but errors occur and persist. No validation.	Student is able to make minor modifications (say a single formula) to an existing model. Superficial validation or no validation at all.	Student is able to make major modifications to an existing model, based on literature. Validation using some basic measures of quality.	Student is able to make major modifications to an existing model, based on literature or own analyses. Validation using appropriate statistical measures.	Student is able to develop a model from scratch, or add an important new part to an existing model. Excellent theoretical basis for modelling as well as use of advanced validation methods.
1.5. Handling supervisor's comments and development of research skills	Student does not pick up suggestions and ideas of the supervisor	The supervisor needs to act as an instructor and/or supervisor needs to suggest solutions for problems	Student incorporates some of the comments of the supervisor, but ignores others without arguments	Student incorporates most or all of the supervisor's comments.	Supervisor's comments are weighed by the student and asked for when needed.	Supervisor's comments are critically weighed by the student and asked for when needed, also from other staff members or students.
	Knowledge and insight of the student (in relation to the prerequisites) is insufficient and the student is not able to take appropriate action to remedy this	There is some progress in the research skills of the student, but suggestions of the supervisor are also ignored occasionally.	The student is able to adopt some skills as they are presented during supervision	The student is able to adopt skills as they are presented during supervision and develops some skills independently as well	The student is able to adopt new skills mostly independently, and asks for assistance from the supervisor if needed.	The student has knowledge and insight on a scientific level, i.e. he explores solutions on his own, increases skills and knowledge where necessary.
1.6. Keeping to the time schedule	Final version of thesis or colloquium more than 50% of the nominal period overdue without a valid reason (force majeure)	Final version of thesis or colloquium at most 50% of the nominal period overdue (without a valid reason).	Final version of thesis or colloquium at most 25% of nominal period overdue (without valid reason)	Final version of thesis or colloquium at most 10% of nominal period overdue (without valid reasons)	Final version of thesis or colloquium at most 5% of nominal period overdue (without good reasons)	Final version of thesis and colloquium finished within planned period (or overdue but with good reason).
	No time schedule made.	No realistic time schedule.	Mostly realistic time schedule, but no timely adjustment of time schedule.	Realistic time schedule, with some adjustments (but not enough or not all in time) in times only.	Realistic time schedule, with timely adjustments. of times only.	Realistic time schedule, with timely adjustments of both time and tasks.

Item	Mark for item					
	2-3	4-5	6	7	8	9-10
2. Thesis report (30-60%) *						
2.1. Relevance research, clearness goals, delineation research	No link is made to existing research on the topic. No research context is described.	The context of the topic at hand is described in broad terms but there is no link between what is known and what will be researched.	The link between the thesis research and existing research does not go beyond the information provided by the supervisor.	Context of the research is defined well, with input from the student. There is a link between the context and research questions.	Context of the research is defined sharply and to-the-point. Research questions emerge directly from the described context.	Thesis research is positioned sharply in the relevant scientific field. Novelty and innovation of the research are indicated.
	There is no researchable research question and the delineation of the research is absent	Most research questions are unclear, or not researchable and the delineation of the research is weak	At least either the research questions or the delineation of the research are clear	The research questions and the delineation are mostly clear but could have been defined sharper at some points	The research questions are clear and researchable and the delineation is clear.	The research questions are clear and formulated to-the-point and limits of the research are well-defined.
2.2. Theoretical underpinning, use of literature	No discussion of underlying theory.	There is some discussion of underlying theory, but the description shows serious errors.	The relevant theory is used, but the description has not been tailored to the research at hand or shows occasional errors.	The relevant theory is used, and the description has been tailored partially successful to the research at hand. Few errors occur.	The relevant theory is used, it is nicely synthesized, and it is successfully tailored to the research at hand.	Clear, complete and coherent overview of relevant theory on the level of an up-to-date review paper. Exactly tailored to the research at hand.
	No peer-reviewed/primary scientific papers in reference list except for those already suggested by the supervisor	Only a couple of peer-reviewed papers in reference list.	Some peer-reviewed papers in reference list but also a significant body of grey literature.	Relevant peer-reviewed papers in reference list but also some grey literature or text books. Some included references less relevant.	Mostly peer-reviewed papers or specialized monographs in reference list. An occasional reference may be less relevant.	Almost exclusively peer-reviewed papers in reference list or specialized monographs (not text books). All papers included are relevant.
2.3. Use of methods and data	No description of methods and/or data.	Research is not reproducible due to insufficient information on data (collection and/or treatment) and analysis methods	Some aspects of the research regarding data-collection, data-treatment, models or the analysis methods are described insufficiently so that that particular aspect of the research is not reproducible.	Description of the data (collection, treatment) or models as well as the analysis methods used is lacking in a number of places so that at most a more or less similar research could be performed.	Description of the data (collection, treatment) or models as well as the analysis methods used is mostly complete, but exact reproduction of the research is not possible due to lack of some details.	Description of the data (collection, treatment) or models as well as the analysis methods is complete and clear so that exact reproduction of the research is possible.
2.4. Critical reflection on the research performed (discussion)	No discussion and/or reflection on the research. Discussion only touches trivial or very general points of criticism.	Only some possible weaknesses and/or weaknesses which are in reality irrelevant or non-existent have been identified.	Most weaknesses in the research are indicated, but impacts on the main results are not weighed relative to each other.	Most weaknesses in the research are indicated and impacts on the main results are weighed relative to each other.	All weaknesses in the research are indicated and weighed relative to each other. Furthermore, (better) alternatives for the methods used are indicated.	Not only all possible weaknesses in the research are indicated, but also it is indicated which weaknesses affect the conclusions most.

Item	Mark for item					
	2-3	4-5	6	7	8	9-10
	No confrontation with existing literature.	Confrontation with irrelevant existing literature.	Only trivial reflection vis-a-vis existing literature.	Only most obvious conflicts and correspondences with existing literature are identified. The value of the study is described, but it is not related to existing research.	Minor and major conflicts and correspondences with literature are shown. The added value of the research relative to existing literature is identified.	Results are critically confronted with existing literature. In case of conflicts, the relative weight of own results and existing literature is assessed. The contribution of his work to the development of scientific concepts is identified.
2.5. Clarity of conclusions and recommendations	No link between research questions, results and conclusions.	Conclusions are drawn, but in many cases these are only partial answers to the research question. Conclusions merely repeat results.	Conclusions are linked to the research questions, but not all questions are addressed. Some conclusions are not substantiated by results or merely repeat results.	Most conclusions well-linked to research questions and substantiated by results. Conclusions are mostly formulated clearly but with some vagueness in wording.	Clear link between research questions and conclusions. All conclusions substantiated by results. Conclusions are formulated exact.	Clear link between research questions and conclusions. Conclusions substantiated by results. Conclusions are formulated exact and concise. Conclusions are grouped/ordered in a logical way.
	No recommendations given.	Recommendations are absent or trivial.	Some recommendations are given, but the link of those to the conclusions is not always clear.	Recommendations are well-linked to the conclusions.	Recommendations are to-the-point, well-linked to the conclusions and original.	Recommendations are to-the-point, well-linked to the conclusions, original and are extensive enough to serve as project description for a new thesis project.
2.6. Writing skills	Thesis is badly structured. In many cases information appears in wrong locations. Level of detail is inappropriate throughout.	Main structure incorrect in some places, and placement of material in different chapters illogical in many places. Level of detail varies widely (information missing, or irrelevant information given).	Main structure is correct, but lower level hierarchy of sections is not logical in places. Some sections have overlapping functions leading to ambiguity in placement of information. Level of detail varies widely (information missing, or irrelevant information given).	Main structure correct, but placement of material in different chapters illogical in places. Level of detail inappropriate in a number of places (irrelevant information given).	Most sections have a clear and unique function. Hierarchy of sections is mostly correct. Ordering of sections is mostly logical. All information occurs at the correct place, with few exceptions. In most places level of detail is appropriate.	Well-structured: each section has a clear and unique function. Hierarchy of sections is correct. Ordering of sections is logical. All information occurs at the correct place. Level of detail is appropriate throughout.
	Formulations in the text are often incorrect/inexact inhibiting a correct interpretation of the text.	Vagueness and/or inexactness in wording occur regularly and it affects the interpretation of the text.	The text is ambiguous in some places but this does not always inhibit a correct interpretation of the text.	Formulations in text are predominantly clear and exact. Thesis could have been written more concisely.	Formulations in text are clear and exact, as well as concise.	<i>Textual</i> quality of thesis (or manuscript in the form of a journal paper) is such that it could be acceptable for a peer-reviewed journal.

Item	Mark for item					
	2-3	4-5	6	7	8	9-10
3. Colloquium (5%) *						
3.1. Graphical presentation	Presentation has no structure.	Presentation has unclear structure.	Presentation is structured, though the audience gets lost in some places.	Presentation has a clear structure with only few exceptions.	Presentation has a clear structure. Mostly a good separation between the main message and side-steps.	Presentation clearly structured, concise and to-the-point. Good separation between the main message and side-steps.
	Unclear lay-out. Unbalanced use of text, graphs, tables or graphics throughout. Too small font size, too many or too few slides.	Lay-out in many places insufficient: too much text and too few graphics (or graphs, tables) or vice verse.	Quality of the layout of the slides is mixed. Inappropriate use of text, tables, graphs and graphics in some places.	Lay-out is mostly clear, with unbalanced use of text, tables, graphs and graphics in few places only.	Lay-out is clear. Appropriate use of text, tables, graphs and graphics.	Lay-out is functional and clear. Clever use of graphs and graphics.
3.2. Verbal presentation and defense	Spoken in such a way that majority of audience could not follow the presentation.	Presentation is uninspired and/or monotonous and/or student reads from slides: attention of audience not captured	Quality of presentation is mixed: sometimes clear, sometimes hard to follow.	Mostly clearly spoken. Perhaps monotonous in some places.	Clearly spoken.	Relaxed and lively though concentrated presentation. Clearly spoken.
	Level of audience not taken into consideration at all.	Level of audience hardly taken into consideration.	Presentation not at appropriate level of audience.	Level of presentation mostly targeted at audience.	Level of presentation well-targeted at audience. Student is able to adjust to some extent to signals from audience that certain parts are not understood.	Clear take-home message. Level well-targeted at audience. Student is able to adjust to signals from audience that certain parts are not understood.
	Bad timing (way too short or too long).	Timing not well kept (at most 30% deviation from planned time).	Timing not well kept (at most 20% deviation from planned time).	Timing is OK (at most 10% deviation from planned time).	Timing is OK.	Presentation finished well in time.
	Student is not able to answer questions.	Student is able to answer only the simplest questions	Student answers at least half of the questions appropriately.	Student is able to answer nearly all questions in an appropriate way.	Student is able to answer all questions in an appropriate way, although not to-the-point in some cases.	Student is able to give appropriate, clear and to-the-point answers to all questions.

Item	Mark for item					
	2-3	4-5	6	7	8	9-10
4. Examination (5%) *						
4.1. Defense of the thesis	Student is not able to defend/discuss his thesis. He does not master the contents	The student has difficulty to explain the subject matter of the thesis.	Student is able to defend his thesis. He mostly masters the contents of what he wrote, but for a limited number of items he is not able to explain what he did, or why.	Student is able to defend his thesis. He masters the contents of what he wrote, but not beyond that. Is not able to place thesis in scientific or practical context.	Student is able to defend his thesis, including indications where the work could have been done better. Student is able to place thesis in either scientific or practical context.	Student is able to freely discuss the contents of the thesis and to place the thesis in the context of current scientific literature and practical contexts.
4.2. Knowledge of study domain	Student does not master the most basic knowledge (even below the starting level for the thesis).	The student does not understand all of the subject matter discussed in the thesis.	The student understands the subject matter of the thesis on a textbook level.	The student understands the subject matter of the thesis including the literature used in the thesis.	Student is well on top of subjects discussed in thesis: not only does he understand but he is also aware of current discussions in the literature related to the thesis topic.	Student is well on top of subjects discussed in thesis: not only does he understand but he is also aware of discussions in the literature beyond the topic (but related to) of the thesis.

Manual for use of the thesis evaluation form and the MSc-thesis assessment rubric (version 1.1) of Wageningen University

User instructions

- Grading the thesis work is generally done by two persons, the daily supervisor and the second reviewer/examiner. For the sake of grading uniformity, it is highly recommended by the Exam Boards that the second reviewer within a chair group is always the same person. Preferably it is the head of the group.
- The thesis evaluation form has four categories. The research competence category can only be filled in by the daily supervisor as this person has worked with the student. The Thesis report category can most objectively be filled in by the second reviewer who was not involved in the thesis process, as grading the thesis report should not be biased by positive or negative experiences with the student. The daily supervisor who has these experiences can take these into account when grading the research competence.
- Use of the comment fields on the thesis evaluation form is highly recommended. It is an extra feedback for the student.
- The assessment rubric has the form of an analytic rubric (see e.g. Andrade (2005), Reynolds *et al.* (2009), URL1, URL2). Each line discusses one **criterion** for assessment. Each column gives a **level** for the grading. Each cell contains the **descriptor** of the level for that criterion.
- The criteria in the rubric exactly follow the items presented in the Excel worksheet “Thesis evaluation Wageningen University” constructed by the Exam Boards. In a few cases the criteria in the original thesis evaluation document were split into two or more parts because the description of the criteria clearly covered different subjects.
- Since the final mark is composed of so many criteria, the scores on individual criteria should be discriminative. Not all levels are equally broad in marks. Since the final marks of theses usually range between 6 and 9, in the rubric individual levels have been established for the marks of 6, 7 and 8. When performance is at the 9-10 level, decide whether the student is on the low edge (9) or high edge (10) of this level. Descriptions at the 9-10 level tend to describe the ultimate performance (10). Hence, if a student performs well above 8, but below the description at the 9-10 level, a 9 would be the appropriate mark.
- Keep in mind that each line in the rubric should be read independently: it could be that a student scores a 2-3 on one criterion and a 9-10 on another.
- Always start at the lowest mark in the rubric, and test if the student should be awarded the next higher mark. In some cases achievements of a next lower level are not repeated at the higher level (i.e. the lower level achievements are implicit in the higher levels). Furthermore, if a level has a range of marks, choose the most appropriate one (consider the description of the level of performance as a continuum, rather than a discrete description).
- Wherever the student is indicated as ‘he’, one can also read ‘she’.

Remarks

- This rubric has been validated by a number of supervisors by comparing the original grade of a number of theses to the grade resulting from this rubric.

- The main intention of using a rubric is enhance homogeneity of assessments and the ability to communicate about assessments both with students and with colleagues. Furthermore, it clarifies to students the expectations of the supervisor and helps the supervisor to structure feedback during the process of thesis research. Although the intention is to homogenize the process of assessment, it should be noted that even with the use of a rubric some arbitrariness will remain.
- The two main categories on the thesis evaluation form (research competence and thesis report) should have an assessment of 'sufficient' (i.e. ≥ 5.5) before the total thesis work can be considered as sufficient. So, no compensation between these main categories is possible to obtain the lowest final mark of 6.0.
- Please report any positive or negative experiences with and suggestions for the rubric to arnold.moene@wur.nl.
- Author of the rubric: Arnold F. Moene (Meteorology and Air Quality Group, Wageningen University), with valuable contributions from Ellis Hofland, Edwin Peeters, Tamar Nieuwenhuizen, Maarten Holtslag, George Bier, Gerard Ros, Lijbert Brussaard, Judith Gulikers and Paul Berentsen.

References

Andrade, H.G, 2005. Teaching With Rubrics: The Good, the Bad, and the Ugly. *College Teaching* **53**, p. 27-31.

Reynolds, J., R. Smith, C. Moskovitz and A. Sayle, 2009. BioTAP: A Systematic Approach to Teaching Scientific Writing and Evaluating Undergraduate Theses. *Bioscience* **59**, p. 896-903.

URL1: <http://jonathan.mueller.faculty.noctrl.edu/toolbox/rubrics.htm> (last visited November 17, 2009).

URL2: [http://en.wikipedia.org/wiki/Rubric_\(academic\)](http://en.wikipedia.org/wiki/Rubric_(academic)) (last visited November 17, 2009).