Assessment Master of Tropical Natural Resources Management

Master of Tropical Natural Resources Management, Katholieke Universiteit Leuven

Restricted procedure
The assessment of the Master of Tropical Natural Resources Management – Restricted procedure

Exemplaren van dit rapport kunnen verkregen worden op het VLIR-secretariaat.
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Part 1 General part
1. Introduction

In accordance with his mission, the assessment panel (henceforth: the panel) Bioscience Engineering visited in 2006 the bachelor and master programmes in Bioscience engineering offered by the K.U.Leuven, the UGent, the Vrije Universiteit Brussel and the Universiteit Antwerpen. The panel conducted its activities under the coordination of the Flemish Interuniversity Council (VLIR), which is responsible for the external quality assurance of the programmes of the Flemish universities.

The panel’s conclusions were published in the report ‘De onderwijsvisitatie Bio-ingenieurswetenschappen. Een evaluatie van de kwaliteit van de opleidingen Bio-ingenieurswetenschappen en de masters in de deeldomeinen Bio-informatics and Molecular Biology, Land and Water Resources, en Nutrition and Food Technology aan de Vlaamse universiteiten’ (December 2006).

On the basis of this report the study programmes applied for an accreditation from the Dutch-Flemish Accreditation Organisation (NVAO). On 17 January 2008, the K.U.Leuven received a negative accreditation decision for the master programme of Tropical Natural Resources Management (TNRM). In accordance with the Decree on the Structure of the Higher Education in Flanders, the K.U.Leuven submitted a request to the minister for a provisional accreditation for the master of TNRM. The Flemish government granted on 11 April 2008 the provisional accreditation until the end of the academic year 2010-2011.

2. Restricted procedure

Upon expiry of the provisional recognition the study programme follows a shorter accreditation process. The assessment (self-evaluation, assessment visit, published assessment report and assessment by the NVAO) is restricted to the subjects that were originally evaluated as negative.

This report concerns the master of Tropical Natural Resources Management in order to a new accreditation request. The assessment is carried out by a panel composed of independent experts under the coordination of the VLIR. It is, conform the Decree on the Structure of the Higher Education in Flanders, restricted to the subjects that were originally evaluated as negative, in this case subject 1 ‘Objectives of the study programme’, with the underlying aspects ‘1.1. Level and orientation’ and ‘1.2. Domain-specific requirements’.
3. Composition of the assessment panel

The assessment panel which assessed the TNRM programme consisted of 4 members. One domain-specific expert was already part of the assessment panel Bioscience Engineering that conducted the external quality control of the programme in 2006. The Recognition Committee for Higher Education ratified the composition of the assessment panel by decision of 11th of June 2010 (without the student member) and 30th of September 2010 (with the student member).

The assessment panel was composed as follows:

Chairman:
- Dr. Kees Jansen, universitair docent chairgroup Technology and Agrarian Development, Wageningen University, the Netherlands

Members:
- Prof. dr. Jean-Pierre Baudoin, hoogleraar Gembloux Agricultural University, hoofd Unit Tropical Crop Husbandry and Horticulture
- Dr. Cis Van Den Bogaert, departementshoofd Onderwijs, Universiteit Antwerpen
- Mevr. Oily de Praetere, student Master of Nutrition and Rural Development, Option Tropical Agriculture, UGent

Mevr. Ilse De Vooght, staff member of the Quality Assurance Unit of the VLIR was the secretary of the committee.

The curricula vitae of the panel members are attached (see Appendix 1).

4. Task of the assessment panel

For the purpose of this restricted assessment, the TNRM programme prepared a self-evaluation report. The Quality Assurance Control Unit of the VLIR received this report on 1 September 2010 and distributed it to the panel members. Hence, the assessment committee had the opportunity to study the information in the self evaluation report and to prepare the visit accurately.

The panel visited the TNRM programme on 14th of October 2010. During the visit, the panel had meetings with the Faculty Board, the programme directors, the students and the academic personnel. The panel had also the opportunity to consult a representative set of study materials. The discussions were held in a very constructive way. The visit schedule is attached (see Appendix 2).

Finally, the panel presented his findings and conclusions about the assessed subject in a draft report. This draft was sent to the TNRM programme under embargo for a response. The panel incorporated the reaction of the programme in its report insofar it agreed with the remarks.
## Overview of assessments

### Score table

#### Explanation of the scores of the aspects (quadruple scale):

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>Excellent, ‘best practice’, an (international) example</td>
</tr>
<tr>
<td>G</td>
<td>Good, the quality stands out above the basic quality</td>
</tr>
<tr>
<td>S</td>
<td>Satisfactory, fulfils the demands with respect to the basic quality</td>
</tr>
<tr>
<td>U</td>
<td>Unsatisfactory, does not fulfil the demands of the basic quality</td>
</tr>
</tbody>
</table>

#### Explanation of the scores of the subjects (binary scale):

<table>
<thead>
<tr>
<th>Subject</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject 1: Objectives</td>
<td>+</td>
</tr>
<tr>
<td>Aspect 1.1.: Level and orientation</td>
<td>G</td>
</tr>
<tr>
<td>Aspect 1.2.: Domain-specific requirements</td>
<td>G</td>
</tr>
<tr>
<td>Subject 2: Programme</td>
<td>+</td>
</tr>
<tr>
<td>Subject 3: Personnel</td>
<td>+</td>
</tr>
<tr>
<td>Subject 4: Facilities</td>
<td>+</td>
</tr>
<tr>
<td>Subject 5: Internal quality assurance</td>
<td>+</td>
</tr>
<tr>
<td>Subject 6: Results</td>
<td>+</td>
</tr>
</tbody>
</table>

De cursief weergegeven onderwerpen en de daaraan toegekende scores werden in 2006 beoordeeld.
I Programme report

Subject 1 Objectives of the Study Programme

The self-evaluation report describes the following objectives and attainment targets for the two year’s master programme:

The master of Tropical Natural Resources Management intends to train Bioscience Engineers with expertise in the sustainable management and development of natural resources in the tropics and sub-tropics for enhancing food security and reducing poverty.

Bioscience engineering in general deals with
1. the description of biological, chemical and physical processes;
2. the design and analysis of production chains based on biological resources
3. the production and processing of food;
4. the care for the environment; and
5. the sustainable management of land and natural resources
this all in a viable market system.

Emphasis is on the design, optimization and management of systems in which biological, chemical and physical processes interact, and with attention to the society and environment where these systems function.
Specifically, the graduates of the programme of the TNRM master the different farming, grazing and forestry systems in the (sub)tropics and understand and are able to analyze their interaction with natural resources (soils, ecosystems, biodiversity) and the social and economic environment (farmers decision making and indigenous knowledge systems; agricultural and food policy, and development of culture and society; world trade and globalization). Furthermore, the graduates are specialized in one of 3 domains (Plant production, Resource economics and policy, and Soil conservation) representing key intervention domains for improving rural livelihoods in the (sub) tropics. Graduates are capable to efficiently function in interdisciplinary and intercultural teams and a wide range of positions (engineering, management, advisory, research and policy functions in international organizations, public and private sector, NGO’s).

The objectives of the programme are translated into attainment targets that are common to the 3 subject majors.

Graduates of the master programme of Tropical Natural Resources Management:
1. can translate knowledge on biological production systems in the (sub)tropics into projects, interventions or policy evaluations of the sustainable management of natural resources and the improvement of food security and the reduction of poverty (engineering-based career):
   - can quantitatively describe biological production systems (farming/grazing systems) and natural resources management in the (sub)tropics;
   - can analyze the interactions between biological production systems and the natural resources (soils, ecosystems, biodiversity) and the socio-economic context (farmers decision making and indigenous knowledge systems; agricultural and food policy and development of culture and society; world trade and globalization) in the (sub)tropics in a systems approach; and
   - can optimize biological production systems by taking into account both technical constraints (e.g. soil production potential, pest and disease pressure) and socio-economic constraints (e.g. technical knowledge and priorities of farmers, market situation, ...);
2. demonstrate research skills and critical scientific attitude (scientific career):
- can summarize and critically reflect on the current state of knowledge and the available scientific methods in at least one specific research domain (plant production, resource economics and policy, and soil conservation)
- can develop research questions and scientific hypotheses in their field of study;
- can collect and analyze data and draw sound conclusions from these results, and argue their findings and conclusions taking into account the context of natural resources management; and
- can communicate their work both orally and in scientific writing;

3. can keep up to date with new scientific and technological developments (life long learning):
- are able to understand and synthesize technical and scientific publications related to their discipline and specialization domain; and
- can recognize and critically assess the value of new developments in their specialization domain (plant production in the (sub)tropics, resource economics and policy in the (sub)tropics, or soil conservation in the (sub)tropics;

4. can operate in interdisciplinary and intercultural teams:
- can present scientific or project results in a clear and coherent manner for a larger group;
- can work in an intercultural group to reach consensus in oral debates as well as in the written output of papers and assignments;
- can situate their domain/discipline specific approach of problems and questions relative to approaches from other domains and disciplines; and
- are aware of the value but also the limitations of their discipline in the sustainable management and development of natural resources in the tropics and subtropics.

Each subject major moreover has specific attainment targets:

Graduates of the subject major Plant production can:
- describe (sub)tropical biodiversity in general and (sub)tropical agro-biodiversity in particular;
- analyze (sub)tropical plant production systems and assess their productivity;
- select and apply integrated pest management and integrated soil fertility management techniques; and
- design and manage high-performance sustainable plant production systems.

Graduates of the subject major Resource economics and policy can:
- analyze and interpret decision making processes in biological production systems;
- assess the economic and policy context of developing countries in a globalizing world;
- analyze the socio-economic aspects of biological production systems (e.g. costs, farm income, food security);
- identify and describe national and international actors (e.g. NGO’s, state, private sector, ...) involved in agri-food production and trade; and
- analyze the interaction between agri-food production and trade and natural resources management in the (sub)tropics.

Graduates of the subject major Soil conservation:
- can rate the production potential of soils;
- can analyze and predict soil processes and soil-water dynamics;
- can formulate and implement sustainable land management strategies; and
- can design and implement land conservation/rehabilitation interventions.
Aspect 1.1. Level and orientation
Assessment 2006
The panel assessed the aspect ‘level and orientation’ in 2006 as ‘unsatisfactory’. In the report, this assessment is motivated in the following way: ‘The objectives pay good attention to general and to academic-oriented competences at an advanced level. The conduct of research by the students is strongly supported by the committee. When comparing the general objectives of the former Master of Tropical Agriculture (TA) and Tropical Natural Resources Management (TNRM), it appears that TNRM is not fundamentally different from TA; it is rather a refocusing of TA with a special emphasis on agro-biodiversity. There is a lack of design and guidelines in the new Master’s programme. The development of the latter should have better pointed out agro-biodiversity as a tool to achieve several objectives within the framework of food security, poverty alleviation and sustainable development in the tropics, considering socio-economic conditions, production system improvement and the valorisation of natural products. The committee finds the aims and objectives as stated in the documents rather unclear. The objectives do not include either a strong engineering component or entrepreneurial capacity building. The committee notes that familiarity with the objectives among students is rather low. The committee recommends that the study programme take measures for improvement. The committee assesses the level of the master’s programme to be academic but the orientation as unsatisfactory.’

Restricted procedure 2010
The panel assesses the aspect ‘level and orientation’ as good.

The panel is of the opinion that the objectives and attainment targets of the programme are in line with the requirements of an academic master level. The objectives/attainment targets pay a lot of attention to general (academic) competences at an advanced level such as the ability to analyze complex problems, the ability to apply knowledge and understanding, and the ability to communicate knowledge and interventions to stakeholders. Furthermore, the panel finds that the objectives/attainment targets are oriented to the instillation of an advanced understanding and insight into the academic-disciplinary state-of-the-art knowledge of the discipline. The objectives/attainment targets are also research-oriented. They focus on research skills and the development of a critical scientific attitude.

The orientation of the objectives/attainment targets is good. Agro-biodiversity is now seen as a tool to achieve food security, poverty alleviation and sustainable development in the tropics. The engineering and management component is clearly defined. Emphasis is on the design, optimization and management of systems in which biological, chemical and physical processes interact. The objectives/attainment targets also pay attention to the socio-economic context in the tropics where these systems function.

To make the students more familiar with the TNRM master, the objectives and attainment targets are included in the online programme guide and explained in an information session for new students at the beginning of the academic year.

Aspect 2.1. Domain-specific requirements
Assessment 2006
The panel assessed the aspect ‘domain-specific requirements’ in 2006 as ‘unsatisfactory’. In the report, this assessment is motivated in the following way: The committee is convinced that the programme directors intended to align the objectives with the requirements set by colleagues and have responded to the global challenges that the ecosystem is facing today. It is not assured, however, that the final qualifications are derived from a full integration of the most appropriate academic disciplines linked with the new orientation. Agro-biodiversity does not appear in the TNRM master as a key component linking the other components present in the programme, in particular in relation to production, economics and anthropology or human sciences.

Since several universities in Belgium offer programmes on agro-biodiversity, genetic resources and management of natural resources, the committee recommends collaborating with them where possible. This will also enhance the possibility to contribute to capacity building in the tropics by working together with a network of alumnae and local universities.’

Restricted procedure 2010
The panel assesses the aspect ‘domain-specific requirements’ as good.

According to the panel, the objectives/attainment targets are in line with the requirements set by (international) colleagues, including the requirements formulated by the assessment panel in its reference framework in 2006. In response to the assessment of 2006, emphasis is now put on a systems approach and a holistic view including social and economic aspects, leading to intervention strategies taking into account weaknesses of current production systems. The new programme focuses on three specialisation domains (plant production, resource economics and policy, and soil conservation) representing key intervention domains for enhancing food production in the tropics. The domains are based on the field and research experience of the contributing academic staff. To check the alignment of the objectives with the needs and wants of the intended professional field, the programme directors solicited feedback from 4 external professional peers.

Instead of collaboration with a Belgian University, the programme directors chose to collaborate with international partners (Kenyatta University and the Swedish University of Agricultural Sciences) by jointly programming a Summer Course. The panel finds that the programme directors provide reasonable arguments not to set up a joint master with Ghent University as their objectives and approaches are too different.

- **General conclusion related to subject 1: Objectives of the study programme**
  Since the aspects ‘level and orientation’ and ‘domain-specific requirements’ are scored as good, the assessment panel assesses the subject ‘objectives of the study programme’ of the Master of Natural Tropical Resources Management positively.

**Integrated assessment of the panel**

Since the subject ‘objectives of the study programme’ is scored as positive in this restricted procedure and given the fact that in 2006 all other subject are scored as positive too, the panel is of the opinion that the study programme meets the quality requirements. Its final conclusion on the master of Tropical Natural Resources Management at the K.U.Leuven is therefore positive.

In response to the assessment of 2006, the TNRM programme directors not only reviewed the objectives but also the curriculum. In order to reach the new objectives and attainment targets of the master programme the curriculum offers training in three specialization domains (plant production, resource economics and policy, and soil conservation). A truncus communis provides the students of all specialization domains with a common basis on biological production systems and soil resources, as well as on economic and cultural aspects that interact with production systems. Students also choose a minor (20 ECTS). They select the minor courses from one major segment of another master programme of the faculty of Bioscience Engineering.

In conformity with the Decree on the Structure of the Higher Education in Flanders, this assessment is restricted to Subject 1 ‘Objectives of the programme’. However, as a logical consequence, the panel also discussed the impact on the curriculum of the thoroughly revised objectives of the TNRM programme. The panel finds that the objectives are in general terms sufficiently translated into the curriculum. However, the panel recommends that the attainment targets should be made more explicit in the different course aims. The curriculum is well structured, coherent and obviously more focused on sustainability, food security and poverty. Very positive, according to the panel, is the comprehensive view of what economics is (gender issues, policy, ...). The panel considers the Summer Course organized in collaboration with Kenyatta University and the Swedish University of Agricultural Sciences as a good initiative. In the major Plant Production, the panel finds that the agrobiodiversity issues (plant genetic resources, plant breeding, etno-botany) were dropped too much. It suggests to create more space for those issues by changing ‘Management and marketing in the agrifood sector’ (5 ECTS in this major) into an elective course. The panel also recommends introducing some interdisciplinary projects or activities. Furthermore, it has some doubts with the translation of the anthropological objective (formulated in attainment target 4) into the curriculum. The panel is of the opinion that the anthropological course ‘Science, technology, culture and society’ is a crucial course for the programme, but should be more in line with the programme, strengthened, and possibly include an extra, dedicated anthropology lecturer. Finally, the faculty should clarify the minor structure. The panel regrets that the students can only choose a minor from a major segment of a programme of their own faculty.
Attachment 1
Personalia van de leden van de visitatiecommissie

Dr ir. Kees Jansen lectures at the Technology and Agrarian Development group at Wageningen University, The Netherlands. He has a background in tropical crop science and sociology of rural development and he researches on the social shaping of technology. His current research focuses on the social analysis of pesticide risk and issues of pesticide regulation, and develops a political ecology approach. He teaches in the fields of technology and society, and development studies. Most of his research took place in Latin America.

Jean-Pierre Baudoin is Professor at the Gembloux Agricultural University (Belgium) and is the head of the Unit of Tropical Crop Husbandry and Horticulture. He is in charge of lectures (at master level), training and research in the following fields: crop husbandry of intertropical regions, cultural associations, general genetics, plant breeding and management of plant genetic resources. In the framework of the InterUniversity Council of the French speaking Universities (CIUF) and the University Commission towards Development (CUD), he is one of the promotor of a Postgraduate Programme (now recognized as Complementary Master) named “Management of animal and plant resources of tropical environments” and organized at interuniversity level in Belgium. J.P. Baudoin is also involved in the Institutional University Cooperation (CUI) through training and research activities with Universities of Peru and Bolivia. Research works in his laboratory and in the tropics concern: organization of genetic diversity in food legumes, cucurbits and root and tuber crops, in situ conservation of wild relatives and cultigens of annual and herbaceous species, plant breeding of food legumes and cotton plants through interspecific hybridisations and improvement of intercrop combinations in tropical and subtropical lowland and highland areas. J.P. Baudoin has coordinated several research projects in these scientific fields in collaboration with CGIAR centres or institutes (IITA, Nigeria; CIAT, Colombia; IPGRI, Italy), with Universities, Foundations and national agricultural centres in Ivory Coast, Colombia, Costa Rica, Peru and Bolivia, all projects financed mainly by European Union, and DGCD (Brussels). Official trips and consultancies were carried out in Africa (Algeria, Burundi, Ivory Coast, Kenya, Mali, Nigeria and Rwanda), in Asia (Sri Lanka) and in Latin America (Bolivia, Brazil, Chili, Costa Rica, Ecuador and Peru). Publications, mainly in the fields of plant genetic resources and breeding, cropping systems, as well as plant biotechnology, have been written in national and international reviews, as well as proceedings of conferences. He also wrote two books as main author on genetic improvement and in situ preservation of food legumes.


# Attachment 2

## Visiting scheme

<table>
<thead>
<tr>
<th>Thursday 14th October 2010</th>
</tr>
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<tbody>
<tr>
<td>09h00 - 10h00</td>
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<tr>
<td>14h30 - 15h30</td>
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<tr>
<td>15h30 - 16h15</td>
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