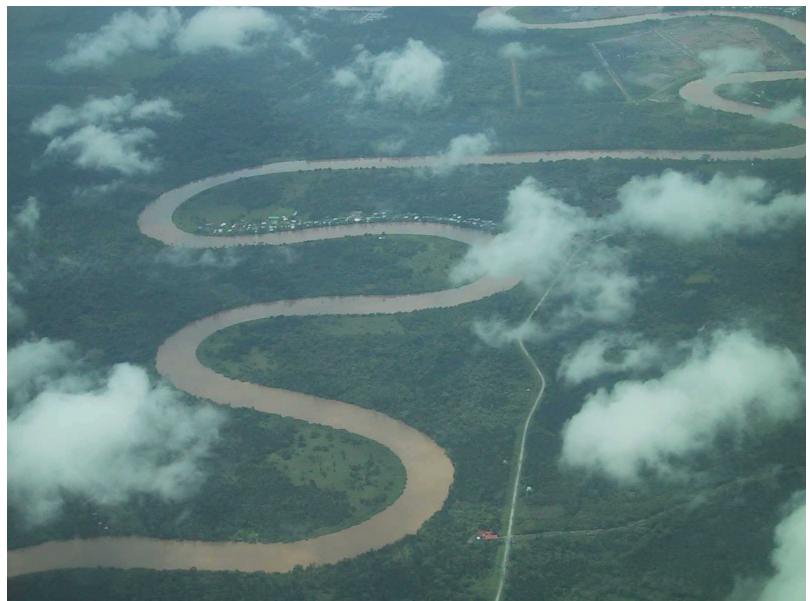




PEATWISE

INCEPTION REPORT



PEATWISE - New Educational Tools for Sustainable Management of Peatlands in the Humid Tropics is a joint project of:

- Wageningen University and Research Centre, Wageningen, The Netherlands
- University of Leicester, Leicester, United Kingdom
- University of Malaysia Sarawak, Sarawak, Malaysia
- University of Palangka Raya, Palangka Raya, Central Kalimantan, Indonesia

PEATWISE project is co-sponsored by the EU Asia-link programme, the Department of Science and Knowledge Transfer of the Netherlands' Ministry for Agriculture, Nature and Food Quality and the four participating universities.



PEATWISE
 New Educational Tools for Sustainable Management of Peatlands in the Humid Tropics

an
 European Commission Asia-Link Programme
 Project

INCEPTION

REPORT

Inception Report.doc

Alterra-ILRI , Wageningen, 2003

ABSTRACT

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This report marks the end of the inception phase of the Peatwise project. Peatwise is a joint activity of the University of Leicester (UK), University of Malaysia Sarawak (Malaysia), University of Palangka Raya (Indonesia) and Wageningen University and Research Centre (The Netherlands). The overall aim of the projects is to develop new educational tools for sustainable management of peatlands in the humid tropics. This report describes the project establishment, an identification of the market needs in both Indonesia and Malaysia, an inventory of the existing curricula and education infrastructure at the four universities and a detailed plan of activities of the phase two of the project.

Keywords: tropical peatland, sustainable use, educational tools, curriculum development

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Contents

1	Introduction	13
2	General Project Matters	15
	2.1 Project Establishment	15
	2.2 Phase 1 – Inception	16
3	Identification of market needs	18
	3.1 University of Malaysia Sarawak	18
	3.1.1 Questionnaire	18
	3.1.2 General Observations	18
	3.1.3 Proposed post-graduate diploma programme	18
	3.2 University of Palangka Raya	19
	3.2.1 Questionnaire	19
	3.2.2 General Observations	20
	3.2.3 Relevance of topics and modules	20
	3.2.4 Gap between existing and required knowledge and skills	20
	3.2.5 Market needs and career opportunities	21
4	Inventory of existing curricula	22
	4.1 University of Leicester: Review of relevant courses	22
	4.1.1 Full-time undergraduate course	22
	4.1.2 Full-time postgraduate course	23
	4.1.3 Part-time undergraduate courses	23
	4.1.4 Part-time postgraduate courses	24
	4.1.5 Synergy between UNILEI and PeatWise project	24
	4.2 University of Malaysia Sarawak	24
	4.2.1 At UNIMAS	24
	4.2.2 At Other Local Institutions	25
	4.2.3 Inventory of Existing Academic Infrastructure and Resources	25
	4.3 University of Palangka Raya	27
	4.3.1 Human Resources and Educational Infrastructure	27
	4.3.2 Existing Curriculum	29
	4.4 Wageningen University and Research Centre	31
	4.4.1. Introduction	31
	4.4.2. Study Load and Credits	31
	4.4.3. Study Planning	32
	4.4.4. MSc Programmes	33
5	Framework for Curriculum Development	35
6	Development of Learning Modules	38
	6.1 Module 1: Ecology and natural sciences	39
	6.2 Module 2: Water resources and hydrology	39
	6.3 Module 3: Integrated Land Evaluation (Soil and Land Use)	40
	6.4 Module 4: Human dimensions and resource economics	40

6.5	Module 5: GIS and remote sensing	41
6.6	Module 6: Field course and research projects	41
7	Detailed Action Plan Phase 2 and 3	42
7.1	Development of modules	42
7.2	Modified plan of action	42
Appendix 1	Peatwise Inception Workshop - Attendance list	47
Appendix 2	Peatwise Inception Workshop - Programme	48
Appendix 3	Peatwise - Project team	50
Appendix 4	Module development – Standard form for modules	52
Appendix 5	University of Palangka Raya - Market Survey	54
Appendix 6	University of Malaysia Sarawak - Market Survey	60
Appendix 7	Reference Material (tentative, to be completed)	69

Abbreviations

BSc	Bachelor of Science
CP	Credit point
ECTS	European Credit Transfer System
EU	European Union
MSc	Master of Science
GIS	Geographic Information Systems
PhD	Doctor of Philosophy
RS	Remote Sensing
SCS	Semester Credit System
UNILEI	University of Leicester
UNIMAS	University of Malaysia Sarawak
UNPAR	University of Palangka Raya
WUR	Wageningen University and Research Centre

Summary

This is the Inception Report of the Peatwise project. The Peatwise project is a joint undertaking of the University of Leicester (UK), University of Malaysia Sarawak (Malaysia), University of Palangka Raya (Indonesia) and Wageningen University and Research Centre (The Netherlands). The Peatwise project is co-sponsored by the EU Asia-link programme, the Department of Science and Knowledge Transfer of the Netherlands Ministry for Agriculture, Nature and Food quality and the four participating universities. The overall objective of the Peatwise project is to develop a curriculum on the sustainable development of peatlands by the introduction of innovative educational methods and tools, in order to promote the wise use of the resource and to enhance sustainable economic development, particularly in the areas of Sarawak, Malaysia and Central Kalimantan, Indonesia.

The PeatWise project started in April 2003 and will run for 3 years. The project is divided in three phases:

- Inception (3 months);
- Development (21 months);
- Implementation (12 months).

In phase 1 the project was established, an identification of the market needs in both Indonesia and Malaysia was started and an inventory of the existing curricula and education infrastructure at the four universities was made. In phase 2 and 3 six learning modules will be developed and introduced focused on the sustainable development of tropical peatlands, i.e.:

- Ecology and natural sciences;
- Water resources and hydrology;
- Integrated Land Evaluation (Soil and land use);
- Human dimensions and resource economics;
- GIS and Remote Sensing;
- Field course and research projects.

These modules will be at postgraduate level and fit into the road to an MSc diploma. The development of the modules will also include the introduction of innovative educational methods and tools, for example distance learning and will for each University targeted towards their own student population.

This report describes the project establishment, the identification of the market needs in both Indonesia and Malaysia, an inventory of the existing curricula and education infrastructure at the four universities and a detailed plan of activities of the phase two of the project.

1 Introduction

This report presents the outcome of the Inception Phase of the PeatWise project. The overall objective of the PeatWise project is to develop a curriculum on the sustainable development of peatlands by the introduction of innovative educational methods and tools, in order to promote the wise use of the resource and to enhance sustainable economic development, particularly in the areas of Sarawak, Malaysia and Central Kalimantan, Indonesia.

PeatWise is a co-operation between two South East Asian and two European Universities, i.e. University of Malaysia Sarawak (UNIMAS), Sarawak, Malaysia, University of Palangka Raya (UNPAR), Central Kalimantan, Indonesia, University of Leicester (UNILEI), UK and Wageningen University and Research Centre (WUR), Wageningen, The Netherlands. The development of innovative educational methods and tools, for example distance learning, is for each University targeted towards their own student population. PeatWise is partly funded by the EU Asia-Link programme, the participating universities and their respective Governments.

The PeatWise project started in April 2003 and will run for 3 years. The project is divided in three phases:

- Inception (3 months)
- Development (21 months)
- Implementation (12 months)

During the inception phase, the project was established, an assessment of the market needs in both Malaysia and Indonesia was initiated and an inventory of the existing curricula and courses and educational infrastructure of the four partner Universities was made. To mark the end of the inception phase a two-day workshop was organized at the University of Malaysia Sarawak in Kuching, Sarawak, Malaysia on 30 September – 1 October 2003. The main objective of the workshop was to synthesize the results of the assessment and inventories and to prepare a detailed work plan for Phase 2. The workshop was organized by UNIMAS, Dr. Murtedza Mohamed (UNIMAS) is thanked for the excellent organisation of the meeting and it is appreciated that all PEATWISE partners were present (Appendix 1). During the workshop, the following topics were addressed (Appendix 2):

- General project matters, in particular the project establishment;
- Final curriculum framework;
- Pooling of expertise;
- Information and material deficiencies;
- Institutional bottlenecks;
- Educational methods and didactics;
- Detailed action plan for Phase 2;
- Detailed logical framework.

This report presents the findings of the inception phase of the project.

2 General Project Matters

2.1 Project Establishment

Start-up

The project formally started on 23 April 2003. Wageningen University and Research Centre, represented by Alterra-ILRI, is the contract partner of the EU. The three other partners, i.e. UNIMAS, UNPAR and UNILEI, have acknowledged their commitment to the project. An informal start-up meeting was held on 10-12 April 2003 in Wageningen, using the opportunity that the project partners were in Europe for a meeting of the STRAPEAT project. During this meeting the work programme for the Inception Phase was drafted.

Project Management

The following persons were appointed as co-ordinators: Susan Page (UNILEI), Suwido Limin (UNPAR), Murtedza Mohamed (UNIMAS) and Henk Ritzema (WUR). Henk Ritzema is also the overall project co-ordinator. Their addresses and phone numbers are presented in Appendix 3.

Scientific and Curriculum Advisory Board

A Scientific and Curriculum Advisory Board will be established. The board will act as a steering committee and will ensure that:

- The project is implemented in accordance with the Project Proposal;
- The project proceeds in a timely and efficient manner;
- The project provides guidance to UNIMAS/UNPAR and the respective project management at these two institutions;
- That project results will be accepted by the institutions.

In addition to the four co-ordinators each University will propose a Senior Staff Member to join the Board (**action co-ordinators**).

Webpage

A Peatwise webpage has been launched (www.peatwise.alterra.nl). The website will have a public domain to disseminate information to all interested parties, and a restricted domain for communication between the project partners. Currently only the public domain has been established. All relevant project documents will be made available on the website (**action project co-ordinator**).

Information brochure

A PeatWise information brochure has been prepared. This leaflet will also be made available on the website. Henk will also explore the possibilities to make the Peatwise logo more in line with the STRAPEAT logo to highlight the links between the two projects (**action project co-ordinator**).

Financial agreements

The advance payment for year 1 has been received from the EU and distributed to the partners.

Reporting

The 1st and 2nd Quarterly Updates have been prepared and submitted on respectively 23 July and 23 October 2003.

2.2 Phase 1 – Inception

During the inception phase (May – September 2003), the following activities, conform the project proposal, were conducted:

- 1a) Identification and assessment of market needs of the Malaysian and Indonesian public and private sectors by UNPAR and UNIMAS:
 - UNIMAS has prepared a questionnaire (Appendix 6) and will distribute this questionnaire after the partners have agreed on the general scope of the modules (outcome of this inception workshop) (**action UNIMAS**);
 - UNPAR has prepared and distributed a market survey among university and governmental organisation in Central Kalimantan (Appendix 5). Response was good (about 70). The survey was followed by a 1/2-day workshop, in which 30 stakeholders participated, to discuss the outcome of the survey and the forth-coming project activities among the stakeholders. The results were presented on the workshop.
The market needs are further elaborated in Chapter 3.
- 1b) Inventory of existing curricula and courses, including other local institutions by all partners:
 - All four partner universities presented their finding during the workshop (Chapter 4).
- 1c) Inventory of existing educational infrastructure, course materials, research information and expertise at the contributing institutions. The inventory also includes the institutions' ambitions and an assessment of development potential by all partners.
 - All four partner universities presented their finding during the workshop (Chapter 4)
- 1d) Synthesis: see Chapter 3 & 4
- 1e) Workshop and set-up of detailed work plans for Phase 2:
 - The Inception workshop was organised by UNIMAS in Kuching on 30 September - 1 October 2003 (Photo 1) and the results are presented in this report. The detailed action plan for phase 2 and 3 is discussed in Chapter 7.



Photo 1 Participants of the workshop during a round the table discussion.

3 Identification of market needs

3.1 University of Malaysia Sarawak

3.1.1 Questionnaire

A questionnaire to assess the market needs for a post-graduate diploma programme in peatland management has been prepared (Appendix 6) and will be conducted by UNIMAS.

3.1.2 General Observations

The opinion of the Malaysian Department of Higher Education is that this capacity building academic programme is very much 'vocational' and 'terminal' in nature. Such programme is better categorised as an advanced vocational training programme as it would suit graduates and mid-career professionals whose job specifications include management of peatland ecosystem or its component, directly or indirectly.

It is also considered as a terminal programme (ends there) in view of the limited depth of academic coverage vis-à-vis the requisites for a doctoral study. The multidisciplinary characteristics of the programme would deliver the breadth excellent for vocational purposes, but it would neither allow for in depth scientific nor engineering discourse because of the limited period of exposure to the core subjects, and the latter cannot be dealt with in sufficient depth i.e. not beyond the grasp of students who are expected to come from various scientific and engineering backgrounds.

3.1.3 Proposed post-graduate diploma programme

Given the aforementioned 'guidance' by the Ministry of Education, UNIMAS has decided to present to respondents a proposal for a study programme leading to Postgraduate Diploma in Peatland Management. The curriculum uses innovative educational methods and tools to make available course materials and training modules that incorporate up-to-date research results and advice for enhancing skills and expertise needed to promote the sustainable use of natural resources in socio-economic development, particularly in the areas of Sarawak and Central Kalimantan.

The curriculum consists of six modules, five of them of equal weight and the sixth (field course and research project) having twice the weight of the others. Designed as a post-graduate programme, it can be completed in ten months of weekend classes, at the end of which successful candidates will be conferred the Post-graduate Diploma in Peatland Management.

Course Title	Credit Hours*
1. Ecology, Natural Resources and Environment	4
2. Water Resources and Hydrology for Peatland Catchments	4
3. Human Dimensions and Resource Economics in Peatland Management	4
4. Peat Soils and Land Use	4
5. GIS and RS for Peatland Management	4
6. Field Course and Research Project in Peatland Management	8
Total Credit Hours	28

* 1 Credit hour = 14 contact (lecture) hours or 3 hours of laboratory work.

An outline of the market survey and the proposed course is presented in (Appendix 6).

3.2 University of Palangka Raya

3.2.1 Questionnaire

During the inception phase of the project, the University of Palangka Raya has conducted a market survey. A questionnaire in the Indonesian language (an English translation is presented in Appendix 5) was distributed to:

- Local government institutions such as Forestry, Agricultural, Regional Planning, the Environmental Impact Agency in several Regencies, and the Palangka Raya Municipality;
- High level staff of the University of Palangka Raya such as Vice Rector, Dean of all Faculties, Head of school/department, and;
- Informal local leaders.

The response was 70 reactions. To discuss the results of the survey and to formulate the need for educational programmes a ½-day workshop was organised. The workshop was attended by 30 participants from the University of Palangka Raya and delegations from several Regencies in Central Kalimantan and the Palangka Raya Municipality. The programme of the workshop included:

- Presentation of the Asia Link project to provide the information on the purpose of the project as well as the activity for this project;
- Discussion of the results of market survey, and;
- Formulation of educational needs.

The results of the survey and workshop are discussed in the following sections.

3.2.2 General Observations

Since 2002, UNPAR has, in collaboration with the University of Brawijaya, Malang, Indonesia, introduced master programmes in Economics, Law, Urban Planning and Counselling. Although UNPAR does not have a post-graduate programme, all respondents as well as the participants of the workshop agreed that the need to improve human resources is high and that the programme should have the master level.

Most respondents prefer a “*general*” programme not specific on peatland. The reasons to prefer a “general programme” are:

- To attract a sufficient number of students from Kalimantan in order to guarantee the continuity of the programme in terms of input of students. It is feared that for the “specific programme on peatlands” UNPAR needs to attract students from other provinces in Indonesia;
- To be in line with the UNPAR mission statement: “*Development of science and technology of river catchments including peatland, wetland, and swamp forest.*”

On the other hand, most participants of the workshop agreed to focus the curriculum on the sustainable development of peatland but also stressed that the project results can be utilised in the Master programme “Management of Natural Resources and Environment” that is currently developed by UNPAR under a project funded by the British Council, Jakarta. The Vice Rector II and the Director of Postgraduate programme said that in 2004, UNPAR is preparing a proposal to establish master programme on “Management of Natural Resources and Environment”, and the result of Asia Link Programme should support this programme.

3.2.3 Relevance of topics and modules

Some respondents suggested to include a module on Sociology. During the workshop it was suggested to incorporate sociology in module 5 “*Human dimensions and resources economics*”.

Module 5 “*GIS and remote sensing for peatland management*” appeared to be a rather unknown subject for quite a number of respondents. The participants of the workshop understand the limitation of knowledge and experience on this subject; however, they fully agree that this subject or module needs to be developed.

3.2.4 Gap between existing and required knowledge and skills

None of respondents fill in suggestions to bridge the gap between existing and required knowledge and skills. For dissemination of knowledge, a wide range of methods can be applied, however blended education, a combination between “classical” classroom lecturers and distance learning with hard copy of material is

recommended (see Chapter 5 for more details). The workshop participants foresee several constraints for e-learning, i.e. the current culture of learning and maintenance of hardware systems (including electricity). All respondents and participants of the workshop recommended a study load of 10 - 20 weeks for the whole curriculum.

3.2.5 Market needs and career opportunities

Three market sectors where graduates from the course may find employment were identified, i.e.:

- Universities, including research institutes;
- Local Government, and;
- Private companies, including consultants.

Three career opportunities that beneficiaries of the course may obtain are:

- Continuation of study at MSc or PhD level;
- Lecturer, researcher, designer and planner (in company), and;
- Policy implementer (government employee).

Three areas of expertise in which beneficiaries of the course may be employed are:

- Environmental management;
- Resource planning, and;
- Specific ecological studies.

In general, most of the respondents have not sponsored any student to study the subject on peatland development yet. For UNPAR Staff following a postgraduate programme, taking the subjects on peatland is their own decision. However, most of the respondents will encourage their staff to take the course of wise use of peatland. The participants of the workshop agree that the decision to choose a subject is in principle taken by the students themselves.

All the respondents agree to take part or to provide their contribution to the programme that Asia Link-UNPAR want to establish, for example through offering practical work to students, assistance in regular field practical, guest lecturing, etc.

4 Inventory of existing curricula

4.1 University of Leicester: Review of relevant courses

Courses are taught at several levels and using a variety of delivery modes:

- Full-time undergraduate;
- Full-time postgraduate;
- Part-time undergraduate;
- Part-time postgraduate;
- Distance learning.

4.1.1 Full-time undergraduate course

Examples of full-time undergraduate courses are:

- BSc Biological Sciences;
- BSc Environment & Ecology.

The full-time undergraduate courses are taught over a period of 3 years.

The study load is expressed in credits. The total load of the full-time undergraduate course is 360 credits, i.e. 120 credits at Level 1, 120 credits at Level 2 and 120 credits at Level 3 (incl. 30 or 40 credits from research dissertation). The relation between the credit system used at UNILEI and the European Credit Transfer System (ECTS) is:

Study load criteria at UNILEI

1 credit = 7.5 hours
1 ECTS = 28 hours
1 credit = 0.27 ECTS

Examples of undergraduate modules are:

Year 1: Environment & Society
Year 1: Diversity of Plants & Animals
Year 2: Ecology of Populations & Communities
Year 2: Quaternary Environmental Change
Year 3: Applied Ecology
Year 3: Nature Conservation

A 10 credit module requires 75 hrs student study time, i.e. lectures (about 20 hrs) plus practices, etc. Between 50-75% of study time is for private study.

4.1.2 Full-time postgraduate course

Examples of full-time postgraduate courses are:

- MSc Natural Resource Management;
- MSc Geographical Information Systems;

The full-time postgraduate courses are taught over a 12 month period. The total credits are 180 (at Level 4), i.e. 60 credits (PG Certificate), 120 credits (PG Diploma) plus 60 credits from a research dissertation (MSc)

Examples of postgraduate modules are:

- Research & Communication Skills;
- Water Basin Management;
- Sustainable Management of Biodiversity;
- Management & Project Planning.

A 10 credit module requires 75 hrs student study time, e.g. lectures, practices etc. and private study (50-75%)

4.1.3 Part-time undergraduate courses

Part-time undergraduate certificate courses are for example:

- Certificate in Practical Ecology & Wildlife Conservation;
- Certificate in Bird Conservation & Field Ornithology.

Total credits are 120 at Level 1, equivalent to first year full-time undergraduate. Post-time undergraduate courses are taught over two years, i.e. in evening lectures/seminars, weekend practical exercises and field visits.

Examples of certificate modules are:

- Principles of Ecology;
- Techniques in Field Ecology;
- Managing Habitats and Species;
- Ecology of Rivers and Lakes.

A 10 credit module is equivalent to an undergraduate module in terms of total study hours.

An example of a part-time undergraduate certificate by Distance Learning is the Certificate in Global Ecology and Wildlife Conservation. This certificate programme was launching in the autumn of 2003. The total credits are 120 (Level 1). The programme is intended to be taught over a 2 year period, but there are options for fast tracking. The modules and course book posted out to students and regular

contact is by e-mail, e.g. Study Support Questions and an Internet Blackboard site. The programme includes occasional practical and residential courses.

4.1.4 Part-time postgraduate courses

An example of a part-time postgraduate certificate by Distance Learning is the Certificate in the Conservation of Biodiversity. This programme is under development and will be launching in 2004. The total credits are 60 (Level 4) and it is intended to be taught over a 1 year period with options for fast tracking. Like the distance learning part-time undergraduate certificates the modules and course book are posted out to students and there is regular contact by e-mail, e.g. Study Support Questions and via an Internet Blackboard site. The programme includes occasional practical and residential courses.

4.1.5 Synergy between UNILEI and PeatWise project

The synergy between the on-going activities at UNILEI and the Peatwise project are:

- Preparation of Distance Learning modules at undergraduate and postgraduate levels based on current full-time and part-time course provision;
- Use of electronic media to facilitate student contact, teaching and discussion (Blackboard), and;
- (Ultimately) Delivery and assessment of courses entirely by electronic means.

4.2 University of Malaysia Sarawak

4.2.1 At UNIMAS

Study load criteria at UNIMAS

1 credit \approx 14 contact hours
1 contact hour requires 2 hours self-study
→ 1 credit \approx 40 hours

The existing academic programme similar to the proposed programme is the M. Env. Sc. Programme in Land Use and Natural Resource Management (SLUSE). SLUSE is a capacity building academic programme for the promotion of sustainable land use and natural resource management. The SLUSE Programme is a coursework master's programme comprising of 12 months of lectures and 4 months of dissertation works. The focus of the programme is on land use and water resource management. It

consists of 13 courses from three modules: Interdisciplinary Module, Experiential Module and Core Module. The courses offered are:

- JSM1 Ecological System: Concept & Issues (3 Credits);
- JSM2 Land Use and Natural Resource Management (3 Credits);
- JSM3 Tropical Forestry and Agricultural System (3 Credits);
- JSM4 Applied Environmental and Resource Economics (2 Credits);
- JSM5 Monitoring Using Earth Observation (Eo) and GIS (4 Credits);
- JSM6 Environmental Management Instruments and Systems (4 Credits);
- JEM1 Interdisciplinary Methodology (4 Credits);
- JEM2 Interdisciplinary Field Work and Report/Project Paper (5 Credits);
- CML1 Ecological Science (3 Credits);
- CML2 Green Management and Technology (3 Credits);
- CML3 Sustainable Soil Resource Management (3 Credits);
- CML4 Water Resource Management (5 Credits);
- CML5 Research Project (Dissertation) (10 Credits).

The SLUSE programme has to date produced 49 graduates from 2 cohorts. The 3rd cohort of 24 students is currently finishing their study. A 'selling point' unique to SLUSE is that the 2-week field course component is always conducted jointly with the master student counterparts from SLUSE programme in Denmark.

4.2.2 At Other Local Institutions

Masters degrees in water resources and environment-related programmes are offered by the following institutions:

- UTM Water Resource Engineering; Env. Engineering;
- UKM Environmental Management; Env. and Development;
- UPM Sustainable Land Resource Management, Masters in Env. Science;
- UM Environmental Technology;
- UNIMAS Sustainable Land Use and Natural Resource Management;
- UNITEN Environmental Management;
- UNITEM Integrated Water Resources Management (IWRM, to be launched shortly).

As indicated, none of these existing programmes overlaps with the proposed Programme in terms of specificity to peat ecosystem.

4.2.3 Inventory of Existing Academic Infrastructure and Resources

UNIMAS commitment to the development and implementation of taught and post-graduate programmes has been well sustained since its establishment 10 years ago.

The academic programme at UNIMAS is offered by eight faculties, complemented by five research institutes through their research activities.

There are 430 academic Staff of various disciplines at UNIMAS. Among these, the number of academic staff that are directly relevant to the proposed PEATWISE Programme are about 15. They are sourced from five different faculties and one research institute, namely:

- Institute of Biodiversity and Environmental Conservation (IBEC);
- Faculty of Resource Science and Technology (FRST);
- Faculty of Social Sciences (FSS);
- Faculty of Engineering (FE);
- Faculty of Information Technology (FIT);
- Faculty of Economics and Business (FEB).

Campus

The present UNIMAS campus has the necessary infrastructure to cater for about 5500 students. The facilities available in the campus include a library (Centre for Academic Information System, CAIS), science, engineering, medical and language laboratories, and an excellent IT network. The Phase I development of UNIMAS Permanent Campus (currently under construction) is capable of accommodating about 10 000 students.

Academic Support Facilities

The proposed programme is to be hosted by the Faculty of Resource Science and Technology (FRST). The spacious permanent building for FRST is expected to be completed in August 2004, in time for the first intake of PEATWISE students. The new faculty block and the existing and newly acquired facilities include:

- Office and Classroom;
- Teaching Aids (AV equipment, reprographic facilities etc);
- Field Work Support Facilities (Water quality (HACH) kit, hydraulic modelling package, hydro lab surveyor and data logging system, GPS, flow meters, depth finders etc.);
- Research and Laboratory Facilities [soils laboratory, chemistry laboratory, GIS laboratory, water quality laboratory, hydrology lab (at the Engineering Faculty) , museum and herbarium facilities, maps & satellite images, PCs and Arc view licenses;
- IT support Facilities (including LAN).

Academic Information Reference Facilities

UNIMAS Centre for Academic and Information Services (CAIS) provides a comprehensive infrastructure of computer services to enable access to information and bibliographic collections. Registered students and staff will have access to a wide range of information and reference materials and computing services.

Resource Persons (tentative)

- Prof Dr Murtedza Mohamed – Centre for Technology Transfer & Consultancy;

- Assoc Prof Dr Lau Seng – Fact of Resource Science & Technology;
- Assoc Prof Dr Dimbab Ngading – Fact of Social Science;
- Prof Salim Said – Fact of Engineering ;
- Assoc. Prof. Dr. Frederik J. Putuhena - Fact. of Engineering;
- Assoc Prof Dr Hamsawi Sani - Fact of Resource Science & Technology;
- Dr Gabriel Tonga Noweg – Fact of Social Science;
- Prof Wan Sulaiman Wan Harun - Fact of Resource Science & Technology;
- Dr Nabil Bessaih – Fact of Engineering;
- Dr Lee Nyanti - Fact of Resource Science & Technology;
- Dr Petrus Bulan - Fact of Resource Science & Technology.

Possible Guest Lecturers

- Dr Tie Yiu Liong (Agrosol Sdn Bhd, Sarawak);
- James Dawos Mamit (Natural Resource & Environment Board, Sarawak);
- Yogeswaran Mailvaganam (Geological Survey Department - retired);
- Counterparts from Wageningen University.

In Appendix 7 a list of reference materials (tentative) is presented.

4.3 University of Palangka Raya

4.3.1 Human Resources and Educational Infrastructure

Human Resources

The number of academic Staff at UNPAR (2003) is 640, consisting of 399 undergraduates, 221 masters and 20 PhD's doctors. 24 Staff members are currently studying for a master or PhD at an Indonesian or foreign university. The Staff members with PhD degree are in the fields: Economics and Agronomy (each 3), Social Science and Environmental Education (each 2) and Resource Economics, Anthropology, Chemistry, Forestry, Plant Breeding, Fishery/limnology, Soil Science and Biology (each 1).

Infrastructure

The main campus of UNPAR covers 89 hectare and has 278 hectares for expansion located near to the main campus. At the main campus the central office (Rectorate), faculty office, classroom buildings, research centre office, community service office, central library, laboratories, experimental field, sport centre, university hall, guest house etc. are located. Outside of the main campus, UNPAR has 5000 hectares of Educational Forest located 68 km north of Palangka Raya with facilitates such as building for teaching and fieldwork activity.

The infrastructures includes:

Building	Building Area (m²)	Remarks
Classroom	13.130	24 buildings
Central Office (2 floors)	2.000	
Faculty Office	3.200	4 faculties
Research Centre	400	
Community Service	200	
Central Library (2 floors)	1.200	
Laboratory	3.635	11 buildings
Experimental house	300	
Field/screen		
Educational Forest	450	
Guess House	170	
Sport Facility	3.000	

Laboratory and Supporting Facilities includes:

Faculty	Laboratory/Unit
Agriculture	Agronomy Lab. Computer Centre (6 unit PC Intel P4) Plant Protection Forest Product Technology Fishery/Limnology Analytical Chemistry/Soil-Plant Analysis Field Lab for Peat (5 ha) Screen house Fish Pond Computer Unit (2 unit PC Intel P4)
Economic	Computer Centre (22 units PC P4)
Engineering	Soil Mechanics Concrete Architecture Studio IT Unit (40 units C Intel P4 with Internet facility)
Teacher Training & Education	Mathematic and Natural Science Lab. Physic Lab. (3 unit PC Intel P4) Chemistry Lab. (2 unit PC Intel P4) Educational Studio Basic Laboratory (Biology, Chemistry, Physic)
University	Computer Centre (12 units PC Intel P3) Centre for International Co-operation in Management of Tropical Peatlands (CIMTROP) Language Centre
Others	15 units PC Intel P4 8 units LCD Projector-distributed in several units 32 unit Overhead Projector-distributed in several units

4.3.2 Existing Curriculum

Credit System

The credit system applied at the University of Palangka Raya follows the national credit system of Indonesia called “Semester Credit System-SCS” (*Sistem Kredit Semester*). One SCS means that the module is to be taught for 50 minutes and applied in the classroom meeting, while or provide 60 minutes can be added for a practical work course (field or laboratory work) for 60 minutes. In addition to the classroom meeting or practical work, the students should spend 60 additional minutes for self study per lecture within the period of one-week. For examples, module A, 2 SCS (2-0) means that it has 100 minutes classroom (2 x 50) without practical time, while module B, 3 SCS (2-2), is given in 100 minutes classroom (2 x 50) and 120 minutes of practical work (2 x 60). In one semester, each module is equivalent to about 16 classroom meetings.

For undergraduates, the range of SCS that can be taken is between 18 and 24 SCS, and the student should spend their time between 33 hours (=18 x [50+60] minutes) and 68 hours (= 24 x [50+60+60] minutes) per weeks or between 528 and 1088 hours per semester.

Undergraduate programme

For the undergraduate programme at UNPAR, several modules are taught at the Department of Fisheries, the Department of Forestry, and the Department of Agronomy, and the Faculty of Agriculture. The modules are:

1. Introduction to GIS (Forestry-optional), 2 SCS (2-0):
 - a. Definition and principle of GIS;
 - b. Background and importance of GIS;
 - c. Data source: data collection and compilation, remote sensed data processing, processing and digitising of secondary data;
 - d. Data management: input process, data processing, data manipulation and analysis, output process, Digital Elevation Model-modelling based;
 - e. GIS application in forestry and land use: Model design for Forest land use functions, Forest damaged evaluation and monitoring, Forest inventory.
2. Peatland Management (Agronomy), 3 SCS (2-2):
 - a. Definition of Peatland;
 - b. Formation, classification and distribution;
 - c. Chemical and physical characteristics, fertility;
 - d. Utilisation of peat soil: agriculture and non-agriculture;
 - e. Peatland management in Indonesia: coastal and inland peat;
 - f. Peatland management: factor that should be considered;
3. Hydrology for Agriculture (Agronomy, for Soil science specialist), 3 SCS (2-2):
 - a. Rainfall: measurement, data analysis;
 - b. Infiltration: definition and importance; measurement; methods to increase infiltration;

- c. Run off;
 - d. River flow: measurement of discharge and data analysis;
 - e. Groundwater;
 - f. Evaporation and transpiration; factor affecting evapotranspiration, measurement;
 - g. Drainage and irrigation: definition and scope, irrigation and drainage methods, water quality, efficiency of irrigation.
4. Forest ecology (Forestry), 3 SCS (2-2):
 - a. Definition and scope of ecology;
 - b. Forest ecosystem as a trees community;
 - c. Forest vegetation classification;
 - d. Relation between trees communities and environments;
 - e. Forest types in Indonesia;
 - f. Tree species selecting for forest estate.
 5. Aquatic ecology (Fisheries), 3 SCS (2-2):
 - a. Definition and principle of aquatic ecosystem;
 - b. Carrying capacity and constraints;
 - c. Biogeochemical cycle and energy flow;
 - d. Adaptation, acclimatisation, bioritmic, phenology, territoriality, migration, concept of bio-saline and eutrophycation;
 - e. Determinant factor on population changes, community and succession process;
 - f. Species diversity and ecological behaviour of aquatic resources relates to fisheries activity.

Note: There is not always consistency in the lecturing of these topics. Especially at the Faculty of Agriculture there is no fixed staff to lecture these subjects. As a result, the contents of the lectures and practical work may vary from year to year. Equipment constraints contribute to this situation.

Master programme

For the master programmes, as part of the collaboration with other Indonesian universities, there is no curriculum available that already contains the subjects identified in the Peatwise project. However several modules, including their syllabi, are available at other universities in Indonesia, i.e.:

- *Ecology* (IPB): Definition and scope of ecology, principle and concepts of ecosystem, energy in ecosystem, biogeochemical cycle, limiting factors and organisation at community level and population, system ecology: system approach and mathematical model in ecology, habitat approach: freshwater, marine and terrestrial, Natural resources, Pollution and environmental health, Remote sensing as a tool for ecosystems management, Applied ecology.
- *Resources Economics* (IPB): Natural resources allocation, population growth, dynamics of social and community changes and the scarcity of resources, Decision on utilisation of natural resources, The use and interpretation of economics on resources allocation for community prosperity, Analysis of natural

resources allocation on spatial and temporal, Property rights that affect efficiency and sustainable use of natural resources.

- *Remote sensing and GIS* (IPB): Basic concept of remote sensing: theory of electromagnetic spectrum (EMS), interaction between EMS and object, type of satellite and sensor, remote sensing for spatial management/allocation, remote sensing for assessment of natural resources, remote sensing for detection of environment, basic concept of GIS, GIS for planning and implementation of development.
- *Peat Soil* (IPB): Process of formation; Classification; Distribution, Chemical and Physical characteristics, Productivity. Utilisation of peat soil for agriculture and non-agriculture. Peatland management in Indonesia.
- *Water resources and hydrology* (UGM): Water resources, planning for water use, traditional and national law on control of water use and distribution, protection of water pollution.
- *Design of water resources system* (IPB): Type of water resources, analysis of water sources characteristics, Exploitation and processing technique of water resources based on conservation and economic principle.

4.4 Wageningen University and Research Centre

4.4.1. Introduction

At the WUR, there are currently (2003) 16 BSc programmes, of which 3 have a direct relevance for the Peatwise project, being Soil, Water and Atmosphere, International Land and Water Management and Environmental Sciences. Next, there are 27 MSc programmes, of which 5 have a strong relevance for the Peatwise project, being Environmental Sciences, Geo-Information Science, Hydrology and Water Quality, International Land and Water Management and Soil Science. The lectures of these programmes are taught in English.

In addition to the regular study programmes, the students have the option of putting together a flexible Master study programme. The flexible programme is not part of a single study programme. The magnitude of such a programme must - like a regular Master programme - be at least 84 credits.

The MSc programmes have a free choice portion. Subjects may be included from other Dutch universities and schools of higher professional education or from institutions abroad. Certain limitations and extra rules apply to these situations.

4.4.2. Study Load and Credits

The nominal study load is expressed in credits. One credit represents the study load norm of 40 hours study (including lectures, practical work and self-study). In the European context, there is a point system for the academic recognition of study

programmes: the European Credit Transfer System (ECTS). The conversion factor of credits to ECTS-credits is 1.43 (rounded off to half credits).

The study load per academic year is 42 credits.

The study load of an MSc programme is 84 credits/120 ECTS credits. It is thus assumed that a student requires 2 years of 42 weeks per year with 40 hours of study per week to complete the MSc programme.

<p style="text-align: center;">Study load criteria at WUR</p> <p style="text-align: center;">1 credit = 40 hours 1 ECTS = 28 hours 1 year = 42 weeks = 42 credits = 60 ECTS</p>
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4.4.3. Study Planning

An academic year is divided into 5 periods:

- Periods 1, 2, 3 and 4: each 8 weeks (study load of 8 credits);
- Period 5: 10 weeks (study load of 10 credits).

The courses offered in periods 1 to 4 have a magnitude of 4 or 8 credits, with the exception of skill subjects. The magnitude of the various parts of the programme in period 5 can differ from 1 to 10 credits.

In principle, the various parts of the programme are scheduled in such a way that they can be taught and tested within a single period.

For each part of the programme, there are three opportunities each year to take an interim examination.

No courses are taught during the holiday periods.

The planning of individual education forms (such as theses and internships) and education that does not lend itself to scheduling (such as distance learning, brush-up courses, summer courses etc), takes place by means of individual agreements between students and instructors, wherever possible in mutual consultation.

4.4.4. MSc Programmes

Set-up of MSc

An MSc study at WUR is constructed of the following curriculum 'building blocks':

- Internship: 16 - 20 credits;
- Thesis: 20 - 26 credits;
- Prerequisites: A maximum of 8 credits for each part of the study programme for which prerequisite knowledge is required;
- Academic Master Cluster: 8 - 10 credits.

The thesis and the internship together amount to a maximum of 42 credits (students can choose to expand this in individual cases).

Academic Master Cluster

In the Academic Master Cluster (8-10 credits), general academic skills and academic research and/or design skills at a high level are applied to a scientific area that is relevant to the Master study programme, possibly in the form of external research or design work. The educational aims, to the extent that they concern academic skills, are established at the university level for the Academic Master Cluster. The Cluster is comprised of a compact block of subjects or a number of related subjects taken in different time periods. The specific content of the Academic Master Cluster is determined in consultation with the student's supervisor.

5 Framework for Curriculum Development

During the workshop a brainstorm session was held to formulate the framework for the curriculum development. It was agreed that the framework should include the following aspects:

1. **Target students** (skills level and expected knowledge)

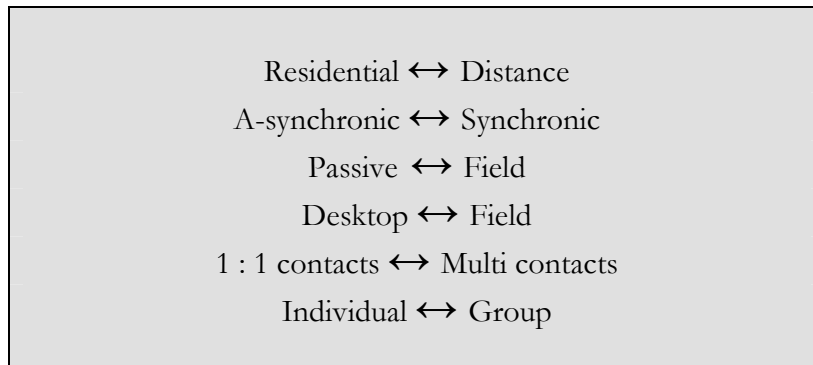
- Undergraduate (BSc);
- Post-graduate diploma/Advanced diploma (PGDip/AdvDip);
- Post-graduate: Masters (MEnvSc, MEnvMgt, MSc).

It was agreed that the entire package should be at post-graduate level and fit into the road to an MSc diploma. The modules can also be offered as short courses. Upon successful completion of a module, certificates, specifying the contents and credits, will be awarded.

2. **Objective of modules:** Imparting knowledge, skills and attitudes.

3. **Learning outcome:** Competence in the subject of the module geared towards knowledge and skills for a sustainable management of tropical peatlands.

4. **Educational methods** /learning style/delivery system. The following modes have been considered:



The appropriate blend of modes will depend on the target groups and can vary between the partner universities.

5. **Content:** The introduction of the module will be generic gradually focussing on the subject, the main text will be written in a generic way, examples (e.g. in boxes) related to the management of tropical peat will be added. General line of thinking:

Natural resource management → general land use → tropical lowlands → tropical peatland

6. Module structure: Modules will be broken up into appropriately sized learning units.

7. Expected innovation:

- Interdisciplinary e.g. eco-hydrology;
- Primary research results will be incorporated in the modules;
- Blended learning, i.e. combination of contact and distance learning.

8. Use of ICT: The use of ICT in the curriculum generally evolves as follows:

No ICT/hardcopy → cd-rom → digital courses/local server → internet based materials → distance learning

The degree of ITC-use is to be studied in terms of effectiveness and appropriateness.

9. Equipment: Expected equipment needed to implement the modules:

- Logistics like transportation, teaching facilities, etc.;
- Running costs (maintenance);
- Costs for licenses (software);
- Cost limitations must carefully be considered by the universities including the options for continuation after the project ends.

10. Embedding/Regularised within the existing academic system of the four Universities:

	Duration of relevant courses (years)				
	BSc	MSc		S1	S2
		Post-graduate	Certificate	BSc	MSc
UNILEI	3	1	1		
UNPAR				4	2
UNIMAS	3 (4)	1 ½ - 2			
WUR	3		2		

Options:

- Modification of Existing Courses;
- Introduction of new modules to existing courses;
- Introduction of new courses/options;
- Introduction of new program/name of Master's degree.

11. Contribution of partners. Funds are available in the project for collaborative efforts between partners. Issues that still have to be addressed are:

- Ownership of developed module;
- Need of a strategy to acquire data/material from different parties;
- Platforms for dissemination;
- The EU-sponsored STRAPEAT project will be approached with the request to provide the input for the modules.

The partners agreed on this framework for the curriculum development. The Scientific and Curriculum Advisory Board will be asked to advise on this framework and the issues that still have to be addressed.

6 Development of Learning Modules

Based on the framework presented in Chapter 3, six learning modules focused on the sustainable development of tropical peatlands will be developed, i.e.

Module	Leading Partner	Credits (ECTS)
1 Ecology and natural sciences	UNILEI	14
2 Water resources and hydrology	WUR	16
3 Integrated Land Evaluation (Soil and land use)	UNPAR	12
4 Human dimensions and resource economics	UNIMAS	14
5 GIS and Remote Sensing	WUR	12
6 Field course and research projects	UNIMAS	20

For the development of each module a leading partner has been appointed. Furthermore, the “credit awards” or approximate study load of each module has been indicated in ECTS (European Credit Transfer System). At present this is only an indication, final credits will depend on how the module fits in the curriculum of each university.

University	Credit points	Equivalent in ECTS (28 hrs study load)
UNIMAS	1 cp \approx 40 hours	1.43
UNILEI	1 cp = 7.5 hrs	0.27
UNPAR	1 cp = 14 contact hours = 42 hrs	1.5
WUR	1 cp = 40 hrs	1.43

During the workshop, the tentative contents of each module has been discussed and agreed upon. A standard form (Appendix 4) will be used to describe each model in more detail.

The project co-ordinator will approach the team leader of the STRAPEAT project with the request to provide input data for the modules. The STRAPEAT project is also funded by the EU (INCO-DEV) and is a joint research project with the overall objectives to:

- Formulate strategies for implementing improved sustainable management of tropical peatlands, in conjunction with stakeholders, based upon evaluation of

existing data and collection of additional bio-physical, hydrological and socio-economic information;

- Strengthen developing country research and institutional capability for the collection and evaluation of environmental, technological and socio-economic information in order to formulate and implement 'wise use' strategies for tropical peatland.

All four Peatwise partners are also participating in the STRAPEAT-project.

6.1 Module 1: Ecology and natural sciences

- 1 Ecology and Natural Sciences
 - 1.1 Ecological Concepts
 - 1.1.1 Key definitions
 - 1.1.2 Autecology - species adaptations
 - 1.1.3 Metapopulation dynamics
 - 1.1.4 Community dynamics – succession
 - 1.1.5 Ecosystem dynamics - nutrient dynamics, carbon & energy flow
 - 1.1.6 Eco-hydrological principles
 - 1.2 Concepts of Biodiversity
 - 1.2.1 Key definitions
 - 1.2.2 Patterns of biodiversity
 - 1.2.3 Scales and measurement
 - 1.3 Managing Biodiversity
 - 1.3.1 Valuation
 - 1.3.2 Approaches to management
 - 1.3.3 Structures and policies
 - 1.3.4 Biological bases, e.g. corridors, patches etc
 - 1.4 Managing Environmental Change
 - 1.4.1 Introduction to risk and uncertainty
 - 1.4.2 Principles for managing risks and disasters
 - 1.4.3 Scales
 - 1.4.4 Case studies
 - 1.5 Restoration of Biodiversity
 - 1.5.1 Principles of restoration of ecology
 - 1.5.2 Wetland restoration ... case studies
 - 1.5.3 (temperate tropicaltrop peatlands)
 - 1.6 Sustainable Resource Management

6.2 Module 2: Water resources and hydrology

- 2 Water Resources and Hydrology
 - 2.1 Hydrological cycle
 - 2.2 Integrated Water Resource Management (at catchment level)
 - 2.2.1 Land use

- 2.2.2 River health
 - 2.2.3 Water use
 - 2.2.4 Water quality and quantity
 - 2.2.5 Groundwater,
 - 2.2.6 Basin → sub-catchment scale (peat catchment)
 - 2.2.7 Wastewater
- Water Management (drainage, irrigation and flood control) for the various
- 2.3 functions:
 - 2.3.1 Preservation/conservation
 - 2.3.2 Restoration of peat swamps
 - 2.3.3 Forestry
 - 2.3.4 Agriculture
 - 2.3.5 Aquaculture and inland fishery
 - 2.3.6 Water supply

6.3 Module 3: Integrated Land Evaluation (Soil and Land Use)

- 3 Integrated Land Evaluation (Soil and Land Use)
 - 3.1 Mapping
 - 3.1.1 Formation
 - 3.1.2 Distribution,
 - 3.1.3 Classification
 - 3.2 Characteristics
 - 3.2.1 Physical
 - 3.2.2 Chemical
 - 3.2.3 Biological
 - 3.3 Land evaluation and soil quality assessment
 - 3.4 Sectoral Use
 - 3.4.1 Agriculture
 - 3.4.2 Forestry
 - 3.4.3 Plantations
 - 3.4.4 Nature
 - 3.4.5 Infrastructure
 - 3.4.6 Conditions require to allow wise sectorial land use
 - 3.5 Land Use Change:
 - 3.5.1 Spatial and temporal monitoring changes
 - 3.5.2 Impact on ecological aspect
 - 3.6 Land Degradation, Erosion and Subsidence

6.4 Module 4: Human dimensions and resource economics

- 4 Human Dimensions and Resource Economics
 - Appraisals of human dimension and issues in development planning and
 - 4.1 evaluations (incl. 'hukum adat', indigenous knowledge etc).
 - 4.2 Nature and scope of development planning; development objectives, project

- cycles and planning processes
- Development and environmental pressure; basic concepts in environmental
- 4.3 economics; institutions, risk, and environment;
- Natural resource accounting/ecological footprint - renewable resource
- 4.4 management; soil and water resource evaluation, air pollution valuation; forest
- management and timber rents.
- 4.5 Social impacts assessment in development planning
- Lessons learned - case studies; analysis of local development projects, cumulative
- 4.6 impacts etc. Project planning and management for the future.

6.5 Module 5: GIS and remote sensing

- | | | |
|-----|--|---|
| 5 | GIS and Remote Sensing | |
| | Topic | Case study |
| 5.1 | Cartography, mapping and projections | Data and maps from Sarawak and C-Kalimantan |
| | Time-Space Representation | |
| 5.2 | (monitoring) of real world phenomena by geo-data | Examples: description 1 time - 1 sites till N times - N sites |
| 5.3 | Geo-references and data capture: GPS / levelling/ total station | Fieldwork areas |
| 5.4 | Remote Sensing: classification vegetation, soil and hydrology | Images + aerial photos of case study areas |
| 5.5 | Spatial analysis: query, compare, neighbourhood, risk management | Geo-data and dedicated peatland related assignments |
| 5.6 | Geo-data: creation of DEM : interpolation | Relation between peat dome elevation and drainage pattern |

6.6 Module 6: Field course and research projects

- 6 Field Course and Research Projects
- 6.1 Technical Writing
- 6.2 Group Formation
- 6.3 Preparation of Project Proposal
- 6.4 Fieldwork at pre-designated location
- 6.5 Reporting

7 Detailed Action Plan Phase 2 and 3

7.1 Development of modules

Activity	Leading	UNIMAS	UNIPAR	UNILEI	WUR
1. Curriculum accreditation and pr		Ted	Suwido	David	Ron
2. Module 1 - Ecology	UNILEI/Susan Page	Siti Rubiah	Sehat	David	Henk R.
3. Module 2 -Water	WUR/Herco Jansen	Lau	Adi, Sulmin	David	
4. Module 3 Land use	UNPAR/Yustinus	Wan Sulaiman		Sue	Henk W.
5. Module 4 Human dimension	UNIMAS/Gabriel Tonga	Ted	Suwido, Kumpiady	Sue H.	Henk H
6. Module 5 GIS	WUR/Ron van Lammeren	Norhadi	Komang	Andy M.	
7. Module 6 Project and field	UNIMAS/Murtedza		Jagau	Sue	Henk R.
8. ICT	WUR/Ron van Lammeren	Fitri	Tampung	Richard	
9. Distance learning	UNILEI/Susan Page	Fitri	Tampung		Ron, Herco
10 Project management	WUR/Henk Ritzema	SCAB			

7.2 Modified plan of action

Year & month	Activity number	Activity	Location (city)	Leading partner
2004				
Jan – Oct	2 (c)	Academic infrastructure, incl. development of ICT facilities	Kuching, Palangka Raya	UNIMAS, UNILEI
Jan – Oct	2 (d)	Curriculum development Ecology and Natural Sciences. Collaborative research	Leicester	UNILEI
Jan – Oct	2 (d)	Curriculum development Human Dimensions and Resource Economics	Kuching/Palangka Raya	UNILEI UNIMAS UNPAR
Jan – Oct	2 (d)	Curriculum development Water Resources and Hydrology Collaborative research programme	Wageningen	WUR
Jan – Oct	2 (d)	Curriculum development Soil Resources and Land Use	Kuching/Palangka Raya	UNIMAS, UNPAR
Jan – Oct	2 (d)	Curriculum development GIS and Remote Sensing	Wageningen	WUR
Jan – Oct	2 (f)	Distance Learning	Leicester (+ Wageningen)	UNILEI (+ WUR)

Year & month	Activity number	Activity	Location (city)	Leading partner
Jan – Oct	2 (b)	Scientific integration / curriculum accreditation	Kuching and Palangka Raya	UNIMAS
Jan – Oct	2 (b)	Support and development ICT facilities	Kuching, Palangka Raya	UNIMAS, UNILEI
Jan – Oct	2 (d)	Curriculum development Ecology and Natural Sciences Collaborative research	Leicester	UNILEI
Jan – Oct	2 (d)	Curriculum development Human Dimension and Resource Economics	Kuching/Palangka Raya	UNIMAS UNPAR
Jan – Oct	2 (d)	Curriculum development Water Resources and Hydrology	Wageningen	WUR
Jan – Oct	2 (d)	Curriculum development Soil Resources and Land Use	Kuching/Palangka Raya	UNIMAS, UNPAR
Jan – Oct	2 (d)	Curriculum development GIS and Remote Sensing Collaborative research programme	Wageningen	WUR
Jan – Oct	2 (f)	Distance Learning Collaborative research programme	Leicester (+ Wageningen)	UNILEI (+ WUR)
10 – 16 April ^a		Partner meeting and workshop	Pontianak	UNPAR
6 – 11 June ^b		Peatwise presentation and participation in the IPS 2004 Congress	Tampere, Finland	WUR
1 – 5 Nov ^c		Mid-term review & evaluation (workshop)	Leicester	UNILEI
2005				
Jan-Dec	2 (e)	Experiential Module / Activities	Kuching and Palangka Raya	UNIMAS, UNPAR
Jan	2 (g)	Financial integration	Kuching and Palangka Raya	UNIMAS, UNPAR
Jan	3	Start of Phase 3: Implementation	-	-
Jan	3 (a)	Marketing of the curriculum	South East Asia	UNIMAS, UNPAR
Jan	3 (b)	Training of lecturers and trainers	Kuching and Palangka Raya	UNIMAS, UNPAR, WUR, UNILEI
Jan	3 (c)	Tests and evaluations	Kuching and Palangka Raya	UNIMAS, UNPAR
Jan	3 (d)	Quality assurance	Kuching and Palangka Raya	UNIMAS, UNPAR, WUR, UNILEI
Jan	3 (e)	Symposium	Kuching or Palangka Raya	UNIMAS, UNPAR, WUR, UNILEI
Jan	3 (e)	Reporting and article writing	Kuching, Palangka Raya, Wageningen, Leicester	UNIMAS, UNPAR, WUR, UNILEI
Jan	3 (f)	Curriculum maintenance	Kuching and Palangka Raya	UNIMAS, UNPAR

Year & month	Activity number	Activity	Location (city)	Leading partner
2006				
Feb/Mar		Symposium	Kuching or Palangka Raya	UNIMAS, UNPAR

Remarks:

- a. The PeatWise Partner Meeting and Workshop on Innovative Educational Tools will be held in Pontianak, Kalimantan, Indonesia. This workshop will be organized in conjunction with the STRAPEAT Meeting also held in Pontianak;
- b. 12th international peat congress, Tampere, Finland, June 2004. The goals and activities of the Peatwise project will be presented in a oral or poster presentation and project members will participate in the Round Table Discussion on the topic of 'Wise Use of Tropical Peatlands in Southeast Asia';
- c. Mid-term review workshop: tentative date: 1 – 4 November 2004 in Leicester, UK: 3 days + 1 day field visit. The project-coordinator will explore the possibility to include a visit to EU in Brussels.

During the workshop, the following “leftovers” of the Inception phase were identified and the partners agreed on the following actions:

Action list		
No.	Action	By
1.1	Approaching members for the Scientific and Curriculum Advisory Board	Co-ordinators
1.2	PeatWise Website: maintenance	Project co-ordinator
1.3	Peatwise logo & leaflet	Project co-ordinator
1.4	Approach the team leader of the STRAPEAT project with the request to provide input data for the modules	Project co-ordinator
1.5	Standard description modules	Module co-ordinators

Appendix 1 Peatwise Inception Workshop - Attendance list

Name	Organisation	E-mail
Adi Jaya	CENTROP, University of Palangka Raya	lgxaj1@nottingham.ac.uk
Bihokda	Forest Services, Govt. of Central Kalimantan Province	bihokda_praya_ina@yahoo.co.uk
Fitri Suraya Mohamad	Centre for Applied Learning and Multimedia, University of Sarawak	mfritri@calm.UNIMAS.my
Harper, David	Department of Biology, University of Leicester	dmh@le.ac.uk
Jansen, Herco	Alterra-ILRI, Wageningen University and Research Centre	herco.jansen@wur.nl
Lammeren, Ron van	Centre of Geo-information, Wageningen University and Research Centre	ron.vanLammeren@wur.nl
Mansor, Mashhor	School of Biological Sciences, University Sains Malaysia	mashhor@usm.my
Murtedza Mohamed	Faculty of Resource Science and Technology, University of Sarawak	ted@frst.UNIMAS.my
Page, Susan	Department of Geography, University of Leicester	sep5@le.ac.uk
Ritzema, Henk	Alterra-ILRI, Wageningen University and Research Centre	henk.ritzema@wur.nl
Rumbang, Nyahu	Faculty of Agriculture, University of Palangka Raya	nyahurumbang@yahoo.com
Suwido H. Limin	CENTROP, University of Palangka Raya	suwido@palankaraya.wasantara.net.id
Wan Sulaiman Wan Harun	Faculty of Resource Science and Technology, University of Sarawak	whwsulaiman@frst.UNIMAS.my
Wösten, Henk	Alterra, Wageningen University and Research Centre	henk.wosten@wur.nl
Yusurum Jagau	Faculty of Agriculture, University of Palangka Raya	jagau@lycos.com

Appendix 2 Peatwise Inception Workshop - Programme

Tuesday 30 September 2003	
8.30 – 9.00	Workshop Programme and Excepted Output by Henk Ritzema
9.00 – 9.30	General Project Matters by Henk Ritzema
9.30 – 10.30	Status report by University of Leicester by Susan Page and David Harper: A review of current courses currently being taught by UNILEI that may be relevant to Peatwise, with a brief synopsis of course content, level, credit rating, etc., with a view to identifying components that are relevant to the Peatwise curriculum. A report on the production of our first distance learning module (Introduction to Ecology). Some comments on IT tools that can be used to provide tutor/student and student/student interaction on distance learning courses partners on market survey and academic inventory UNILEP's Ambitions with PeatWise
10.30 – 11.00	Coffee break
11.00 – 12.00	Status Report University of Palangka Raya by Suwido Limim Inventory of existing curricula and courses at UNPAR Inventory of existing educational infrastructure, course material, etc. Market needs in Indonesia UNPAR ambitions with PeatWise
12.00 – 13.00	Status Report University of Sarawak by Murtedza Mohamed Inventory of existing curricula and courses at UNIMAS Inventory of existing educational infrastructure, course material, etc. Market needs in Malaysia UNIMAS's ambitions with PeatWise
13.00 – 14.00	Lunch
14.00 – 15.00	Status Report University of Wageningen by Herco Jansen and Ron van Lammeren Inventory of existing curricula and courses at UNPAR Inventory of existing educational infrastructure, course material, etc. WUR's ambitions with PeatWise

PROGRAMME (cont.)	
15.00 – 15.30	Framework for curriculum development: Module 1 Ecology and natural sciences Module 2 Water Resources and hydrology Module 3 Soil and land use Module 4 Human dimensions and resource economics Module 5 GIS and Remote Sensing Module 6 Field course and research projects
15.30 – 16.00	Tea break
16.00 – 17.30	Working Groups: Preparation of action plans for the 6 modules
Wednesday 1 October 2003	
9.00 – 13.00	Working Groups (cont.): Preparation of action plans for the 6 modules
13.00 – 14.00	Lunch
14.00 – 15.30	Presentation of results working groups
15.30 – 16.00	Tea break
16.00 – 17.00	Preparation of Work plan: Action plan for Phase 2, specifying contributions of each partner Detailed logical framework
17.00 – 17.30	Partner discussion and meeting wind up

Appendix 3 Peatwise - Project team

Project Partners	Co-ordinator
Wageningen University and Research Centre (WUR) Alterra-ILRI P.O. Box 47 6700 AA Wageningen The Netherlands	Ir. H.P. Ritzema Tel: + 31 317 495 583 Fax: + 31 317 495 590 E-mail: henk.ritzema@wur.nl
University of Leicester (UNILEI) Department of Geography Bennett Building University Road Leicester LE1 7 RH United Kingdom	Dr. Susan Page Tel: + 44 116 252 5493 Fax: + 44 116 252 5408 E-mail: sep5@leicester.ac.uk
University Malaysia Sarawak (UNIMAS) Faculty of Resource Science & Technology 94300 Kota Samarahan Sarawak Malaysia	Prof. Dr. Murtedza Mohamed Tel: + 60 82 671 000 Fax: + 60 82 672 303 E-mail: ted@frst.unimas.my
University of Palangka Raya (UNPAR) Centre for International Co-operation in Sustainable Management of Tropical Peat Jalan Yos Sudarso Palangka Raya 73112 Indonesia	Ir. Suwido H. Limin MS Tel: + 62 536 36 880 Fax: + 62 536 21 002 E-mail: Suwido@palangkaraya.wasantara.net.id

PeatWise - Project Team		
Name	Function/Activity	E-mail
University of Sarawak, Kota Samarahan, Sarawak, Malaysia:		
• Prof. Dr. Murtedza Mohamed	Co-ordinator, Curr. Acc., Module 4	ted@frst.UNIMAS.my
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• Dr. Gabriel Tonga	Module 4	gtnoweg@calm.UNIMAS.my
• Siti Rubiah	Module 2	
University of Palangka Raya, Central Kalimantan, Indonesia:		
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• Yusurum Jagau		jagau@lycos.com
• Kumpiady Widen	Module 4	widen@telkom.net & dayak32@hotmail.com
• Komang Gde Suastika	Module 5	Komang_gs@yahoo.com
• Sehat Jaya	Module 1	sjayatuah@yahoo.com
• Sulmin Gumiri	Module 2, 3	sulmingumiri@yahoo.com
• Yustinus Sulistiyanto	Module 3	sulistiyanto@palangkaraya.wasantara.net.id
University of Leicester, Leicester, UK:		
• Dr. Susan Page	Co-ordinator, Module 3, 4 & 6, ICT	sep5@leicester.ac.uk
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• Dr. Andrew Millington	Module 5	
• Dr. Richard Mobbs	Distance learning	
• Rupert Simms	Module 1	rms21@le.ac.uk
Wageningen University and Research Centre, Wageningen, The Netherlands:		
• ir. H.P. Ritzema	Project co-ordinator	henk.ritzema@wur.nl
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• dr.ir. R.J.A. van Lammeren	Curr. Acc., Module 5 and ICT	ron.vanLammeren@wur.nl

Appendix 4 Module development – Standard form for modules

Course code		Semester	
Course title		Credit/Hours	
Course facilitator(s)		E-mail	
Resource person(s)		E-mail	
Course objectives		Learning Units LU 1. Technical Writing LU 2. Grouping and preparation of project proposal LU 3. Fieldwork LU 4. Report preparation	
Course synopsis			
Course contents			
LU 1	Technical Writing:		
LU 2	Group Formation:		
LU3	Fieldwork:		
LU4	Report preparation		
Key references			
Course highlights			
Assessment			

Appendix 5 University of Palangka Raya - Market Survey

Module	1	2	3	4	5
1. Ecology and Natural Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Water Resources and Hydrology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Soil and Land Use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Human Dimensions and Resource Economics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. GIS and Remote Sensing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Field Course and Research Projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Sociology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please indicate the relevance of subjects of Module

Module 1. Ecology, Natural Resources and Environment Dr. Sehat Jaya (Forest ecology) and Dr. Supramono (Biology)	1	2	3	4	5
1.1 Ecology: Basis for environmental management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2 Biodiversity: Introduction to ecological biogeography.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3 Ecological hierarchy; major ecosystems, communities, populations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4 Environmentally sensitive areas; assessment for conservation and protection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5 Environmental degradation, carrying capacity and new ecology, degradation and change, deforestation, and soil erosion.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6 Aquatic biodiversity and conservation: Bio indicators, bio monitoring, habitat management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.7 Introduction to sustainability and criticality concepts in land use and NRM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.8 Approaches to NRM – political ecology, socio-cultural aspects, local knowledge and participation, and livelihood strategies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.9 Competing land use systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.10 Water rights and governance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.11 Global and regional conventions (UNCED, Ramsar, Dublin, WWForum etc); Agenda 21: Environmental politics and reality.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.12 The Federal Constitution and legal framework for environmental management.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.13 The National Policy on the environment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.14 Institutional framework for environmental management.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.15 Principles of environmental enforcement and compliance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.16 Environmental Acts, Regulations/Orders, guidelines and standards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.17 Paradigm Shift in Natural Resource and Environmental Management Environmental Management System (EMS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.18 Environmental Impact Assessment (EIA)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Module 2. Water resources and hydrology of peatland Dr. Sulmin Gumiri and Adi Jaya, MS.		1	2	3	4	5
1.1	Water resources, introduction : properties, utilisation and economic importance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2	Peatland as a water reservoir	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3	Hydrological cycle and its component	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4	Climatic variation and water balance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5	Rainfall: meteorological factors that affecting rainfall, measurement and its variation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6	Run off and river flow: variations and factors affecting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.7	Watershed morphology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.8	Evaporation and transpiration, including the role of vegetation and soil moisture, its measurement and the estimation for evaporation and transpiration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.9	Watershed management: planning and problems including deforestation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.10	Water policy and management, including legislation, issues on water use: national and international, conflict and the need for water management, effect of global climate change	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.11	Water resources management including surface and groundwater use, its sustainability: utilisation and protection, environmental impact, water table change, salt water intrusion, subsidence and socio-economic impact	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.12	Water quality and pollution: measurement, monitoring, and control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.13	Aquatic diversity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Module 3. Soil and Land use Prof. Dr. Salampak Dohong (Soil Science), Dr. Yusurum Jagau and (Agronomy) Yustinus Sulistiyanto, MP. (Soil Science)	1	2	3	4	5
1.1 Definition of peat and peatland	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2 Formation process of peatland	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3 Peat distribution, especially tropical peat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4 Physical characteristic of peat (Bulk density, porosity, permeability, subsidence etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5 Chemical characteristics of peat (pH, colloid, CEC)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6 Chemical characteristics of peat (Base saturation, macro and micro nutrient, source of acidity)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.7 Biological characteristic of peat (micro organism on peat soil)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.8 Peat classification, especially for tropical peat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.9 Mapping and evaluation of tropical peatland	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.10 Peat for horticulture use (management and its constraint for agriculture)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.11 Nutrient dynamics on agricultural peatland	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.12 Peat for plantation use (management and its constraint for plantation)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.13 Nutrient dynamics on peatland use for plantation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.14 Forestry on peatland (management and its constraint for forestry)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.15 Nutrient dynamics on peatswamp forest	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.16 Peatland for natural conservation area and the restoration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.17 Peat for energy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.18 Wise use of peatland	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Module 4. Human Dimensions and Resources Economics Kumpiady Widen, PhD (Anthropology), Sidik Rakhman Usop, MA, (Sociology), Prof. KMA. M. Usop. (Philosophy), Prof. Cornelis Rintuh (Resource Economics)	1	2	3	4	5
1.1 Concept and pattern of culture (to understand the general concept of culture and its pattern)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2 Universal categories of culture (to understand seven categories of culture and their concepts)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3 Social institution (to understand general perspective on 8 cultural institutions and their concepts)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4 Traditional law (customs): to understand cultural values, philosophy of life, norms and law, ideal, traditional knowledge and belief	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5 Culture and theoretical framework of action (to understand the relation between culture and the frame work of action)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6 Cultural ecology (to understand how human beings have to adapt their life with certain environment)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.7 Ecology and agriculture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.8 Man and ecosystem: mythological perspectives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.9 “Petak Ayungku”: cultural perspective of Dayak	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.10 Sustainable agriculture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.11 Local knowledge in management of environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.12 Cultural perspective on the space management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.13 Shifting cultivation : a case from Dayak	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.14 Causes of forest and peatland fire	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.15 Consequences of forest and peatland fire: cultural, ecological, economic and health perspective	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.16 (Resilience of ecology)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.17 Resources economic :.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.18 Resources economic :.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.19 Resources economic :.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.20 Resources economic :.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Module 5. GIS and Remote Sensing for Peatland Management Drs. Komang Gde Suastika, MS. (Geography) and Ir. R. M. Sukarna, MS. (Forestry)	1	2	3	4	5
1.1 Introduction: understanding of GIS, software and file system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2 Data in GIS and Remote sensing: source, raster, vector, and point; thematic, meta and tabular	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3 Digital Terrain Analyses: map slope, aspect, curvature, profiles and view sheds, perspectives and shaded relief	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4 Spatial Interpretations: density slices, category reclasses, map overlays, spatial querying	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5 Location Analyses: watersheds, proximity and buffers, friction, least-cost paths, raster-vector, simplification algorithms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6 Spatial Analyses: windows, weighting & smoothing, interpolations, splines, kriging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.7 Remote Sensing: data collection, data types, EM spectrum, radiation and earth , simulated- and false-colour images, LUTs and band correlation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.8 Data processing on remote sensing: rectification, band stretching, atmospheric corrections, ratio, principle component analysis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.9 Image Enhancement :edge detection, change detection, GPS data acquisition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.10 Data classification on remote sensing: simple discrimination, supervised and unsupervised classification.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.11 Land and forest fire : detection and the satellite based assessment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix 6 University of Malaysia Sarawak - Market Survey

Introduction

The greater proportion of the world's 11 million hectares of tropical peatlands occurs in the coastal regions of South-east Asia. Many of these regions, including those in Sarawak are earmarked for agricultural development. Being some of the largest remaining areas of lowland forest in South-east Asia, these peatlands have global ecological significance because of their unique and diverse ecosystem having vital roles as reservoirs of biodiversity, as carbon stores and as hydrological buffers. They also play an important regional economic role by providing forest products and land for settlement. Owing to a lack of awareness and understanding about sustainable land management practices, however, many peatland development projects fail to achieve their declared objectives, leading to serious environmental degradation and impoverishment of local communities.

In response to the above, PEATWISE, an EU funded education project undertaken by a consortium of two South-east Asian universities (University of Malaysia Sarawak and the University of Palangka Raya, Kalimantan, Indonesia) and two European universities (Wageningen University and Research Centre, The Netherlands and the University of Leicester, U.K.) have developed a curriculum on the management of peatlands, focusing on the peat-covered lowlands of Borneo. This unique curriculum uses innovative educational methods and tools to make available course materials and training modules that incorporate up-to-date research results and advice for enhancing skills and expertise needed to promote the sustainable use of natural resources in socio-economic development, particularly in the areas of Sarawak and Central Kalimantan.

The curriculum consists of six modules, five of them of equal weight and the sixth (field course and research project) having twice the weight of the others. Designed as a post-graduate programme, it can be completed in ten months of weekend classes, at the end of which successful candidates will be conferred the Post-graduate Diploma in Peatland Management.

We believe your organization, being an important agency directly involved or having interest in land development, would find this programme particularly relevant to the needs of professionals dealing with planning, implementation and evaluation/monitoring. And it is also with this in view that we are sending you the accompanying **Market Survey Questionnaire**. The market survey, as you are probably aware of, is part of the Ministry of Education's procedural requirement for the approval of new academic programmes to be offered by universities in Malaysia. We will be most grateful if you or your representative could kindly complete the questionnaire and return to us in the self-addressed envelope before 20 February 2004. We believe your valuable inputs can help us improve and correct whatever deficiency there is in the proposed curriculum.

We thank you in anticipation of your response.

Post graduate diploma programme in peatland management

Course Title	Credit Hours*
1. Ecology, Natural Resources and Environment	4
2. Water Resources and Hydrology for Peatland Catchments	4
3. Human Dimensions and Resource Economics in Peatland Management	4
4. Peat Soils and Land Use	4
5. GIS and RS for Peatland Management	4
6. Field Course and Research Project in Peatland Management	8
Total Credit Hours	28

* 1 Credit hour = 14 contact (lecture) hours or 3 hours of laboratory work.

Course Outlines

Course 1: Ecology, Natural Resources and Environment (NRM)

- Ecology: Basis for environmental management
- Biodiversity; introduction to ecological biogeography
- Ecological hierarchy; major ecosystems, communities, populations
- Environmentally sensitive areas; assessment for conservation and protection
- Environmental degradation, carrying capacity and new ecology, degradation and change, deforestation, and soil erosion
- Aquatic biodiversity and conservation: Bioindicators, biomonitoring, habitat management
- Introduction to sustainability and criticality concepts in land use and NRM
- Competing land use systems
- Water rights and governance
- Global and regional conventions (UNCED, Ramsar, Dublin, WWForum etc); Agenda 21: Environmental politics and reality.
- The Federal Constitution and legal framework for environmental management.
- The National Policy on the environment.
- Institutional framework for environmental management.
- Principles of environmental enforcement and compliance.
- Environmental Acts, Regulations/Orders, guidelines and standards
- Paradigm Shift in Natural Resource and Environmental Management
- Environmental Impact Assessment (EIA)

Course 2: Water Resources and Hydrology of Peatland Catchments

- Hydrological cycle; Precipitation; Evaporation; Transpiration; Infiltration
- Climatology; Hydrograph
- Geohydrology
- River basin and catchment area

- River flow
- Fundamentals of fluid mechanics and hydraulics
- Water quality classification, standards and guidelines
- Cleanwater treatment, storage and reticulation
- Wastewater treatment and recycling
- Impacts of engineering works on peatland rivers, estuaries and coastal areas
- Optimisation of water use
- Protection areas for drinking water
- Ethics in water resources management
- Concepts in modelling and modelling tools
- Model set-up, data collection, calibration, verification
- Model interpretation
- Case studies for surface, groundwater water and watershed/river basin modelling using MIKE-SHE, MIKE-11, MODFLOW, REPEAT and others packages.

Course 3: Human Dimension and Resource Economics in Peatland Management

- Nature and scope of development planning
- Projects, plans, and development objectives
- Project cycles and planning processes
- Appraisals and human elements / issues in project evaluations
- Environmental and social impact assessment in development planning
- Project planning and management for the future
 - Public health issues in peatland ecosystem
- Availability, distribution and uses of peat resources
- Natural resource accounting (NRA)
- Economic consideration in peat resource planning
- Potential Conflicts to Cooperation Potential (PCCP)
- Case studies: analysis of local project plans.

Course 4: Peat Soils and Land Use

- Introduction to peat soil genesis.
- Evolution and application of peat soil taxonomy.
- Basic principles of peat soil mapping.
- Basic principles of land evaluation.
- Soil performance and soil capability.
- Basic concepts in sustainable land resource management.
- Impact of peat soil degradation, spatial variability and soil diversity on sustainability.
- Soil quality and soil remediation.
- Significance of remote sensing techniques and GIS in precision land use.
- Impact of land use on quality of soils and natural waters – qualitative and quantitative considerations.

- Agricultural Systems.
- Land tenure and social institution.
- Tropical forestry and Agroforestry.
- Animal production in the tropics.
- Tropical crop production.
- Agricultural land and water management on peatland
- Integrated soil conservation and management.

Course 5: GIS and Remote Sensing for Peatland Management

- Decision support systems
- Introduction to mapping & surveying
- Environmental and landuse parameters for mapping
- Earth observation (Eo) technology & system
- Principles of GIS and basic GIS operations
- Elevation and spatial modelling and manipulation
- GPS for Eo and GIS
- Development of integrated water resource management system and system maintenance
- Data/collection and storage/archive and dissemination
- Web based technology for information sharing

Course 6: Field Course and Research Project in Peatland Management

- Technical writing: organisation, illustrations/visuals, language, style, references (prints, on-line), exercises.
- Natural science methodologies
- Statistical methods
- Peat soils monitoring, sampling and analysis
- Biological methods and indices
- Water sampling and analysis
- River classification
- Social science methodologies
- Study population, sample & sampling procedures
- Interviews and etiquette in social inquiry
- Questionnaires & Household Surveys
- Participatory Action Research (PAR) & Participatory Rural Appraisal (PRA)
- Preparation and presentation of proposals for field course
- 10-14 days Field Course followed by report preparation and presentation
- Dissertation projects.

Questionnaire

Kindly return to us only this questionnaire (completed) using the self-addressed envelope

UNIVERSITI MALAYSIA SARAWAK

**MARKET SURVEY FOR POST-GRADUATE DIPLOMA
PROGRAMME IN PEATLAND MANAGEMENT**

**PART I: CONTENTS OF PROGRAMME AND ITS RELEVANCE TO THE
NEEDS OF ORGANISATIONS**

[Please tick (✓) where applicable]

State the type of organisation / industry:

- I. Locally owned organisation / industry
- II. Foreign owned organisation / industry

a. Fulfilment of Theories, Concepts and Principles

1. Does the programme fulfil the basic principles within the discipline?

- Fully
- Partially
- None

2. Are the concepts and principles relevant to the present context?

- Yes
- Fairly
- No

3. Do the course contents help to build a strong programme?

- Yes
- Fairly
- No

4. Does the proposed programme cover all relevant subjects/topics?

- Yes
- Fairly
- No

If your answer is 'Fairly' or 'No', please indicate other additional areas that need to be covered by the programme.

5. Is there any subject that is not relevant in the programme?

- Yes
- No

If your answer is 'Yes', what are the subjects that need to be omitted?

6. State whether the programme fulfils these criteria:

	Fully	Partially	None
a. Basic Theory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Current Concepts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Legal aspects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Use of ICT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- | | | | | |
|----|----------------------------------|--------------------------|--------------------------|--------------------------|
| | | _____ | _____ | _____ |
| e. | Quantitative Treat ^{mt} | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f. | Market / Industry
Relevance | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

7. Is this programme sufficient in terms of:

- | | | | |
|----|-----------------|--------------------------|-----|
| a. | Length of study | <input type="checkbox"/> | Yes |
| | | <input type="checkbox"/> | No |

If your answer is 'No', please suggest the appropriate length of study duration. Please explain your suggestion.

- | | | | |
|----|-----------------------------------|--------------------------|-----|
| b. | Duration of practical
training | <input type="checkbox"/> | Yes |
| | | <input type="checkbox"/> | No |

If your answer is 'No', please suggest the appropriate duration of practical training. Please explain your suggestion.

PART II : CAREER OPPORTUNITIES

- a. Do you think that graduates of this programme are suitable to work in your organisation? If yes, please indicate the areas.
- e.g.
- i. Environmental Management
 - ii. Land and Survey
 - iii. Resource Planning
 - iv. Others (Please specify)

1. _____

2. _____

- 3. _____
- 4. _____

b. Please indicate relevant jobs in your organization for the graduate of this programme.

- e.g. i. Environmental officer
ii. Environmental Consultant
iii. Agriculture Officer

- 1. _____
- 2. _____
- 3. _____
- 4. _____

c. State the number of posts in your organisation that can be filled by graduates of this programme.

- 1 – 3 posts
- 4 – 6 posts
- 7 – 9 posts
- Others. Please specify: _____

d. What is the appropriate range of salary payable to graduates of this programme?

e. Is this programme suitable for articulation to a higher level?

- Yes
- No

If your answer is 'Yes', please tick the appropriate level (s)

- Master level
- PhD

f. This programme will have greater demand at the following level:

- | | |
|--------------------------|-----------------------------|
| <input type="checkbox"/> | Bachelor's level |
| <input type="checkbox"/> | Post-graduate diploma level |
| <input type="checkbox"/> | Master's level |

PART III : OTHERS

1. Sponsorship

a. Has your organisation sponsored students in this field / area?

Yes

No

b. Would you encourage your staff to undergo this course?

Yes

No

If your answer is 'No', please state the reason(s).

2. Outcome of the Programme

In your opinion, will this programme be able to produce the right kind of graduates for the employment market?

Yes

No

Please elaborate.

Thank you

Appendix 7 Reference Material (tentative, to be completed)

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