DARWIN INITIATIVE FOR THE SURVIVAL OF SPECIES

FINAL REPORT:

"Executive Summary"

Project Ref No: 162/07/135

IMPACT OF FIRE AND LAND USE CHANGE ON BIODIVERSITY OF PEAT SWAMP FOREST IN CENTRAL KALIMANTAN, INDONESIA

UNIVERSITIES OF NOTTINGHAM AND LEICESTER, UK

UNIVERSITY OF PALANGKA RAYA, INDONESIA

1. Basic Project Details

1.1 Project Title: *"Impact of fire and land use change on biodiversity of peat swamp forest in Central Kalimantan, Indonesia"*

1.2 Contractor: **The University of Nottingham, UK**

1.3 Host Country Collaborator: **The University of Palangka Raya, Indonesia**

1.4 Grant Round: **5**

1.5 Grant Value: **£119,100.00**

2. Project Expenditure

2.1 Total grant expenditure: **£118,624.30**

2.2 Breakdown of expenditure (using expenditure categories in the original application form)

SUMMARY EXPENDITURE DETAILS 1 APRIL 1998 - 30 SEPTEMBER 2001

	1998/99 £	1999/00 £	2000/01 £	2001+ £	TOTAL £	BUDGET £	VARY £	VARY %
Rents, rates, heating, lighting, cleaning								0
Postage, telephone, stationery								28
Travel, subsistence								-37
Printing								0
Conferences; seminars								27
Capital items								1
Other items								54
Salaries								29
TOTAL								0

Explain any variations in expenditure +/- 10%

The overall spend is very near to the initial budget and there may well be a few small items still to pay for (from the Indonesian partner). Some budget headings vary by more than 10% from the initial estimates for these but in most cases the amounts of money are small. The two items that have changed most are salaries and travel/subsistence but these items were flagged up in previous status reports to the Darwin Secretariat. The reasons for the variations are as follows:

(a) **Postage, telephone, stationery: +28%. The amount initially budgeted was inadequate because much of the administration and management of the project had to be done from a distance between the UK and Indonesia, especially in the first year when numerous logistical and staffing problems had to be overcome. In this way it was not necessary for UK staff to make some visits to Indonesia and was a more efficient and effective deployment of resources. The total amount involved in the overspend is £413.**

(b) **Conferences, seminars: + 27%. This was higher than budget by £270 because more meetings were required in Indonesia for staff training and education and information dissemination than originally planned. This was a productive deployment of resources.**

(c) **Other items: +54%: This overshoot of £1353 was mostly for the purchase of materials, especially books and photography, for the training of Indonesian staff and students of the University of Palangka Raya. It became obvious at an early stage in the project that the University of Palangka Raya did not have available any material suitable for this purpose in its library and the cost of acquiring them could not be borne by the trainees. The success of this strategy is evidenced by the successful completion of the postgraduate training programme by 4 UNPAR staff and a large number of undergraduates and graduates trained as field and research assistants.**

(d) **Salaries and travel/subsistence: these headings show the largest divergences from the original budget in terms of gross amounts: +29% for the former and –37% for the latter. The reason is that the true costs of training staff and researchers at the University of Palangka Raya and the actual number of journeys (especially from the UK to Indonesia) for fruitful involvement in the project could not be anticipated exactly. Once the project was launched it became clear that there were several problems in carrying out the training programme effectively, especially postgraduate training of Indonesians at the University of Nottingham. The main stumbling block was the low level of English language expertise of all likely candidates and a lack of resources earmarked in the budget specifically for this purpose. While the British Council, Jakarta agreed to provide some initial level training to bring the trainees up to UK University Admission level this was insufficient owing to the low starting level of English language proficiency. Additional tuition had to be provided in Nottingham and this had to be paid for. At the same time it was becoming clear that some of the journeys anticipated for UK experts to visit the Indonesian partner university would not be required and therefore some of this money was vired to the salaries component in order to enable the training programme to be carried out as planned. In the event this has been one**

of the major successes of the project because there is now a nucleus of staff and students at the University of Palangka Raya trained in methods and understanding of ecology, environmental management and local natural resources problems affecting tropical peatland. This change in allocation was, I believe, made known also to the Darwin Secretariat some time ago. In order to enable the UNPAR candidates to increase their English language skills the British Council Jakarta made space for them on language courses organized for Chevenning Award candidates but without charging what was probably in the region of £10,000 for teaching, travel and subsistence.

3. Project Background/Rationale

3.1 Why was the project needed? Please explain the project development process.

- **As a result of collaborative field research carried out by members of the University of Nottingham, UK and University of Palangka Raya, Indonesia it was realised that peat swamp forest in Central Kalimantan occupied very extensive areas covering several million hectares of low altitude landscape between major rivers and its biodiversity and natural resource functions were grossly understudied.**

- **This ecosystem is under threat of extinction as a result of land use change, development and fire.**

- **Peat swamp forest is important, not only for biodiversity and ecological reasons but also for its role in maintaining wider environmental quality through its affect on regional climate and global climate change.**

- **It is also important in maintaining the social structure and economy of indigenous people who use it to obtain goods and services. Its disappearance can lead to poverty and racial tension.**

  - **This project will provide baseline information required to inform Indonesian Government Agencies and Ministries of the importance of peat swamp forest biodiversity and ecological functions and the need for sustainable management according to 'wise use' principles.**

  - **The Government of the Republic of Indonesia is a signatory to the Convention on Biodiversity and the information gathered in this Darwin Project will be made available to relevant authorities both nationally and provincially.**

How was the project intended to assist the host country to meet its obligations under the Biodiversity Convention?

- **The 'end users' are various Indonesian Government Agencies and Ministries including (1) Ministry of Forestry (Convention on Biodiversity), Ministry of Environment (Ramsar Convention on Wetlands), Agency for**

Assessment and Implementation of Technology (BPPT), Natural Resources Development; Provincial Government of Central Kalimantan and several Kabupatan and Kecamatan (local governments). As far as it is possible, information will be provided to all of these parties.

4. Project Objectives

- The original objectives of the project were to:

1. determine the biodiversity, overall extent and importance of the peat swamp forest within Central Kalimantan, Indonesia and make comparisons between pristine, logged, degraded and developed peat swamp forest; consideration will be given to problems of peatland restoration;

2. investigate the extent of and damage caused to peat swamp forest by the 1997 fires in Central Kalimantan and establish a database of information from which to determine forest recovery and impact upon biodiversity and sustainability of this ecosystem;

3. study peat swamp forest structure and its variation in response to changes in characteristics of the underlying peat (thickness, hydrology, hydrochemistry and structure);

4. evaluate the natural resource functions of tropical peatlands in Indonesia and man's impact upon them, especially sector development;

5. establish the University of Palangka Raya as a regional centre for research on and management of tropical peatland through the provision of administrative and laboratory facilities and a field research station located in peat swamp forest;

6. persuade Indonesian authorities to gazette large areas of peat swamp forest for wildlife protection;

7. set up and maintain databases and communications facilities to store, process and disseminate project information;

8. train key Indonesian collaborators and associates in environmental awareness and environmentally sustainable peat swamp forest management;

9. ensure continuation of the project after Darwin funding ceases.

- The objectives of the project were not revised.

- All objectives have been achieved with the exception of (6), gazetting land for wildlife protection. The issue of land allocation in Indonesia is politically charged and it will take further time to achieve this objective, although

representations are already being made to relevant authorities and local communities.

- **A few objectives are still being pursued, including completion of masters training of one member of staff of the University of Palangka Raya and finalizing strategies for restoration of tropical peatland**

5. **Project Outputs**

- What output targets, if any, were specified for the project? **(Please refer to Annex 1)**

- Have these been achieved?

  - **Mostly**

- If relevant, what outputs were not achieved, or only partially achieved, and why?

  - **The handbooks of biodiversity and natural resource functions are still being refined. They are behind schedule owing to a lack of manpower and financial resources and problems in Central Kalimantan resulting from the ethnic conflict of 2000/2001. The information to be included in these is presented in Annexes 4, 5 and 6.**

  - **The 'Action Plan for Sustainable Management of Peat Swamp Forest' could not be completed because this requires the commitment of Indonesian National, provincial and Local Government Authorities. The involvement of these could not be obtained by the time the Darwin project ended but the concept for this important next stage is presented in Annex 8.**

  - **The project newsletters scheduled for 2000/2001 could not be produced with the limited resources available and were abandoned.**

- Were any additional outputs achieved?

  - **English language training was provided for three members of staff of the University of Palangka Raya who were selected for master's course training in the UK. The cost of this was not covered by the Darwin Project budget but, fortunately, the British Council, Jakarta kindly provided space in some of its Chevening Scholarship courses and did not charge for these services.**

  - **Additional presentations were made of project results at more conferences, symposia and workshops than were anticipated beforehand. The foremost of these were (1) International Symposium on Tropical Peat Swamps, Penang, Malaysia, 1999, (2) Workshop on Evaluation of the Mega Rice Project, Jakarta, 1999, (3) International Wetlands Congress: Quebec 2000**

and 11th Congress of the International Peat Society, Quebec, Canada, 2000 and (4) International Symposium on Tropical Peatland: Peatlands for People – Biodiversity and Natural Resource Functions, Jakarta, 2001.

- During the course of this Darwin Initiative project two expert peatland scientists visited the field study area in Central Kalimantan in order to evaluate aspects of biodiversity and hydrology of tropical peatlands and to provide advice. These experts are Dr. Olivia Bragg, University of Dundee who provided essential information on peatland hydrology (Annex 9) and Dr. Peter Shepherd, East Midlands Environmental Consultants on plant diversity (Annex 10).

- As a major step towards preparing the 'Action Plan for sustainable management of Tropical Peatland' a strategy document was prepared on the 'Wise Use of Tropical peatland' in order to highlight the global importance of this resource (Annex 11).

- Establishment of the 'Darwin Herbarium' on the UNPAR Campus was a major output of the project and one for which very little money was available in the project budget. This is the only herbarium in the Province of Central Kalimantan and it is the only herbarium in the world that focuses on tropical peat swamp forest plants. It has links to Herbarium Bogoriense that has provided some short course training courses to Darwin Herbarium staff and also to the Edinburgh and Kew Royal Botanic Gardens for confirmation of some plant identifications. A report on the establishment and operation of the Darwin herbarium and a technical manual on 'Preparation of Plant Materials' produced for information and educational purposes are provided in Annex 7)

- As a result of the Darwin Project work supplementary funding was applied for and obtained successfully from the European Union under the INCO-DC budget line to finance capacity development at UNPAR and research into tropical peatland natural resource functions and sustainable management.

- During the course of this Darwin Initiative Project numerous scientific papers were published and many conference presentations made, either by scientists associated directly with the field research or colleagues within the international network that was established and who contributed some of their own work on tropical peatlands to various meetings and proceedings. A list of abstracts of the most important of these is provided in Annex 13.

6. Project Operation/Management

- Research projects - please provide a **full** account of the scientific work undertaken, outlining the methodology adopted, the staff employed and the

research findings. The extent to which research findings have been subject to peer review should be addressed.

- **A full account of the tasks carried out in the field in Central Kalimantan and their associated methods and results are provided in Annex 2 together with a discussion of their implications and conclusions concerning the future of this sensitive and endangered ecosystem.**

- **Further consideration of the importance of the impacts of fire and land use change on the tropical peatland landscapes of Central Kalimantan are expressed in various publications in scientific journals and relevant ones are reproduced in Annex 12.**

· Training projects - please provide a **full** account of the training provided. This should cover the content of the training, arrangements for selecting trainees, accreditation, etc.

- **Refer to Annex 3**

· Did any issues or difficulties arise in running and managing this project?

Problems were mostly concerned with establishing human resource capacity at the host university in Central Kalimantan, finding suitable candidates for high-level training, coping with fluctuations in the value of the Indonesian Rupiah and maintaining project activities during a period of ethnic unrest.

Facilities for project administration, laboratory work and field research had to be established at or by the University of Palangka Raya, Central Kalimantan. This took some time and application for supplementary funding. The level of English language expertise of UNPAR staff was too low to satisfy UK university entrance requirements and steps had to be taken to provide additional English language training.

After the demise of the Suharto regime the Indonesian economy collapsed and the value of the Rupiah fell markedly and was subject to considerable fluctuation. Steps had to be taken to protect the value of the project funding allocated to the Indonesian partner and for the training of Indonesian staff.

There were serious outbreaks of ethnic unrest and violence in parts of Indonesia, especially in Kalimantan, during the early part of 2000. This led to delays in the finalisation of field research and staff training.

7. Project Impact

· To what extent has the project assisted the host country to meet its obligations under the Biodiversity Convention, or to what extent is it likely to do so in the

future? Please take account of the following in preparing this section of the report:

- The way in which research findings have been **used** to address biodiversity objectives.

The data obtained in this project have already been made use of to input into the structure planning of the Province of Central Kalimantan and to provide advice on biodiversity and natural resource functions of tropical peatland.

What actions have been taken, or are expected to be taken, as a result of the project?

The biodiversity information will be provided to the Indonesian Government through the Department of Forestry so that the importance of peat swamp forest as a reservoir of biodiversity can be acknowledged and this will become an important aspect of Indonesia's commitment to the CBD.

How will these contribute towards the conservation of biodiversity in the host country concerned?

It is hoped that the information will be incorporated into National, Regional and Local Biodiversity Action Plans and that the rare, endangered and endemic species of peat swamp forest will be protected more positively in the future than they have been in the past.

It is also hoped that the natural resource functions of tropical peatland will be recognised and that the Indonesian Government will use the information to propose large areas of peatland landscape for designation as Ramsar Sites of International Importance.

It is also hoped that the global importance of the vast store of carbon that is locked up in tropical peat will be recognised as an important feature in the Kyoto Protocol of the United Nations Framework Convention on climate Change (UNFCCC)

- The extent to which training provision has improved the capacity of the host country to conserve biodiversity in the future, and the extent to which the training has addressed real skill needs.

Training of Indonesians, at university staff and student levels, has been the single most important supplementary activity of this Darwin project. Prior to this project none of the staff of UNPAR either taught or had training in biodiversity and allied ecological functions of tropical peat swamps. As a result of this project there is a nucleus of trained personnel aware of these functions and values and operating as a coordinated group to continue the research work commenced under the Darwin project. A 'Centre for International Cooperation in Management of Tropical Peatland

(CIMTROP)' has been established at UNPAR as a catalyst and focus for these continuing activities, which also includes the Darwin Herbarium and the 'Natural Laboratory for Management of Tropical Peatland (NAMTROP)'.

Information should be provided on what **each** student/trainee is now doing (or what they expect to be doing in the longer term), and the extent to which their skills are being used in a positive way to promote biodiversity conservation in the host country.

See Annex 3

The wider impacts of the project in terms of the level of collaboration achieved between UK and host country institutions, and the prospects for greater joint working/information exchange in the future. To what extent has good collaboration been achieved?

As a result of this Darwin project and an allied link between the Universities of Nottingham and Palangka Raya, which was sponsored by the British Council, there has been exchange of numerous scientists between Indonesia and the UK. This has promoted a breadth and depth of understanding on both sides that has led to an increased synergy for the work of the Darwin project. It has also led to further joint activities to apply for additional funding from the European Union under the INCO-DC budget line (RTD for developing countries). This was successful and has provided additional impetus for research on the natural resource functions of tropical peatland and also for the training of two UNPAR staff to doctorate level.

This Darwin Initiative Project would not have been so successful without the support and funding provided by the British Council, Jakarta. British Council provided financial support for staff exchanges between the Universities of Nottingham and Palangka Raya from 1993 to 1997 and again from 2001. In the intervening years they provided training facilities, without cost, to 3 potential Darwin trainees from UNPAR. The value of this important assistance would have been in the region of £15,000.

In addition, as a result of their training obtained under the Darwin project, staff of UNPAR successfully established a research and training link with a Japanese consortium based at the University of Hokkaido funded by the Japan Society for the Promotion of Science (JSPS). This has further increased the research activities on biodiversity, natural resource functions and sustainable management issues.

Consequently, following the Darwin Initiative lead, the University of Palangka Raya is now a focus of major research and evaluation of tropical peatland and is contemplating establishing its own environmental training

programmes for Indonesians at undergraduate, postgraduate and career development levels.

8. **Sustainability**

- Did the host country institute(s) contribute resources to this project (these may have been provided in-kind, for example staff, materials etc)?

Yes, mostly in the form of staff time and expertise, facilitation and buildings (e.g. for CIMTROP, NAMTROP and the Darwin Herbarium).

- If so, what is the monetary value of the resources committed to the project by the host country institute(s)?

This is difficult to determine since money did not change hands and the University of Palangka Raya did not apportion values. These figures are only rough estimates.

Facilities (Building on UNPAR Campus, NAMTROP, Herbarium) **£15,000**

Staff time **£10,000**

- To what extent was Darwin funding a catalyst for attracting resources (including in-kind contributions) from other sources? Please provide details on the other sources from which resources were secured for this project.

Very important. See previous statements on the funding and support obtained from the EU, JSPS and British Council.

Darwin was extremely important because it provided funding at a time when there was no other evident sponsor. Work carried out under Darwin played a key role in securing funding from the EU and JSPS

- What is the monetary value of resources generated for the project from other sources (please provide an estimate for each funding source)?

EU INCO-DC: 735,000 Euros (8 partners over 3 years)

JSPS: not known but is considerable since this large programme will last for 10 years and involves around 150 scientists from Japan and Indonesia. Not all of the effort is focussed on tropical peatland but includes other ecosystems.

British Council: £15,000 for English language training.

- To what extent is work begun by the project likely to be continued in the future (if this is relevant - some projects may come to a natural end at completion)? This is more likely to be relevant for research-based projects.

Work will continue for the foreseeable future as long as funding permits. Some activities have been taken over by the EU and JSPS projects. Certain activities are difficult to guarantee because they require regular funding to cover running costs, e.g. Darwin herbarium and the Natural Laboratory.

- Has the project acted as a catalyst for other projects/initiatives in the host country? Is it likely to do so in the future?

Other small projects are now commencing funded by other sponsors, e.g. WWF and CIDA (Canadian International Development Agency). The future looks quite promising for the continuation of the work commenced under this Darwin Initiative.

9. **Outcomes in the Absence of Darwin Funding**

- Had Darwin funding been unavailable for the project, what would have been the most likely outcome:

  - The project would have proceeded with other funding? **NO**
  - The project would have proceeded at a reduced scale? **YES**

  Please explain.

Preliminary survey work was carried out on the peat swamp forest ecosystem of Central Kalimantan by volunteers from various countries under the leadership of Dr. Jack Rieley, University of Nottingham, UK and Dr. Susan page, University of Leicester, UK and it is likely that some low level of activity would have continued in the absence of Darwin. It would have been impossible, however, to have provided training for staff and students of UNPAR or to provide and maintain the office, laboratory and field facilities in Central Kalimantan. Neither would it have been possible to undertake the range of high-level research activities that have formed the core of Darwin Project outputs. It is doubtful if either the EU or JSPS projects would have commenced without the initial impetus of Darwin.

  - The project would have been delayed? Please explain.
  - The project would not have proceeded?

- Had this project not been undertaken, how would the users/beneficiaries of the project have met their requirements? Would other organisations/ initiatives have been able to meet their needs (at least to some extent)?

The information on biodiversity, ecological functions and sustainable management of peat swamp forest in Central Kalimantan would not have been gathered. The facilities that provide access to the forest wilderness and enable identification and analysis would not have been established. Under those

circumstances it is unlikely that another organisation would have been able or willing to commence this work.

10. **Key Points**

· What would you identify as the key success factors of this project?

1. **A large database of information on biodiversity, especially plants, mammals, birds, reptiles and fish.**
2. **A large database of ecological information on the peat swamp forest ecosystem, especially, peat thickness, land surface topography, hydrology, hydrochemistry and impact of fire and sector development.**
3. **Establishment of a research centre for tropical peatland at the University of Palangka Raya.**
4. **Establishment of the Darwin herbarium at the University of Palangka Raya.**
5. **Training of 4 persons to Masters Degree level at the University of Nottingham and providing them with the expertise to continue work on environmental aspects related to biodiversity and ecological functions. Many other staff and students of UNPAR exposed to environmental processes and implications.**
6. **Links formed with Indonesian National and local government authorities.**
7. **Springboard to obtain funding from other sponsors.**

· What were the main problems/difficulties encountered by the project?

1. **Making initial arrangements with the host university in Indonesia**
2. **Obtaining financial support for English language training**
3. **Persuading Indonesian Government authorities of the importance and need for this work.**
4. **Access to the peat swamp forest wilderness.**
5. **Ethnic unrest (at the beginning of 2000).**
6. **Damage to field study sites by illegal loggers and others entering the swamp forest.**

- What are the key lessons to be drawn from the experience of this project? Please try to provide as much information on this point as you can so that others can learn from the experiences of your project.

1. **It is essential that the UK partner(s) spend as much time as possible in the host country.**

2. **It is essential to work in the field alongside host country staff and set standards.**

3. **Provide as high a level of training as possible and transfer 'ownership' of the research work to individuals at the host institution.**

4. **Ensure there are frequent and regular briefing meetings and information dissemination seminars, involving as many host institution staff as possible.**

5. **Develop a feeling of mutual trust between all partners.**

- Does the experience of this project imply a need to review arrangements for developing and managing projects funded as part of this Initiative?

Probably.

11. Project Contacts

To assist future evaluation work, please provide contact details (name, current address, tel/fax number, e-mail address), for the following:

- UK project leader (and other key UK staff involved in the project)

Professor John Rieley
University of Nottingham, Centre for Environmental Management
School of Geography
University Park
Nottingham, NG7 2RD, UK

Professor Roy Haines-Young and Dr. Michael Steven
School of Geography
University of Nottingham

Dr. Susan Page
Department of Geography, University of Leicester
University Road
Leicester, LE1 7RH, UK

- Host country project leader/co-ordinator (and other key people involved in the project at the host country collaborating institute)

Ir. Suwido H. Limin
Centre for International Cooperation in Management of Tropical Peatland (CIMTROP)
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Ms. Erna Shinta
Ir. Ici Kulu MS
Ir. Adi Jaya, MS
Dr. Sulmin Gumiri, M.Sc., Ph.D.
Dr. Sehat Jaya, M.Sc., Ph.D.
All of CIMTROP/UNPAR Palangka Raya, Indonesia

- 'End users' for the output produced by the project in the host country (i.e. government departments, agencies, universities, local communities etc)

University of Palangka Raya

Governor of Central Kalimantan

Provincial Planning Department (BAPPEDA)

Provincial Forest Department (Dinas Kehutanan)

Various Local Governments

Indonesian Ministries of Research and Technology, Environment, Forestry, Regional Development

- Project trainees/students

Ms. Nabiha Zain Muhamad: M.Sc. in Environmental Management, UNINOT

Drs. Darmae Nasir MS: M.Sc. in Environmental Management, UNINOT

Ir. Rolland Umbing MS: M.Sc. in Environmental Management, UNINOT*

Drs. Alue Dohong : M.Sc. in Environmental Management, UNINOT

*still completing dissertation for final examination in February 2003.

Numerous students of the University of Palangka Raya

- Other project beneficiaries

WWF Indonesia

Orang Utan Foundation

Global Peat Initiative

Ramsar Convention

International Peat Society

Local Communities in Central Kalimantan

- Other key players involved in the funding/operation/utilisation of the project.

EU INCO-DC EUTROP Project

EU INCO-DEV STRAPEAT Project

Global Peatland Initiative

British Council

International Peat Society