

Darwin Initiative for the Survival of Species

Annual Report

1. Darwin Project Information

Project title	<i>Building capacity for biodiversity monitoring and assessment in Nepal</i>
Country(ies)	<i>Nepal</i>
Contractor	<i>UNEP World Conservation Monitoring Centre</i>
Project Reference No.	<i>163/11/020</i>
Grant Value	<i>£148,211</i>
Start/Finishing dates	<i>April 2002 - March 2005</i>
Reporting period	<i>April 2002 – March 2003</i>

2. Project Background

The project is focusing on the Annapurna Conservation Area (ACA), which is the largest protected area in Nepal, covering 7,629 km² and ranging from 1,000m to 8,091m altitude. It contains 1,140 species of plants, 101 species of mammals and 85 species of birds. As well as its biological diversity ACA is home to more than 120,000 people from five major ethnic and tribal groups. Most of them are subsistence farmers, depending on the depleted natural resources for fuel, food, timber and medicine. ACA is also one of the most popular trekking locations in Nepal, with over 70,000 tourists in 2000. An increasing human population and the impacts of tourism led to the ACA being initiated in 1986, to deal with the problems of deforestation, pollution, soil erosion, poverty and loss of cultural values.

ACA is managed by the King Mahendra Trust for Nature Conservation (KMTNC), whose staff have worked with the 55 villages to form a range of village committees and groups. These committees manage issues such as natural resource conservation, electricity, mothers groups, tourism, etc. The ACA has been very successful in addressing many of the development needs of the local people and involving them in the management of the protected area. However, there has been no attempt to monitor the effectiveness of the ACA in delivering biodiversity conservation benefits. There is very little information on even basic subjects such as changes in forest cover, or the populations of key wildlife species. This lack of both information and skills to assess and monitor biodiversity limits the effectiveness of management of the protected area. The KMTNC requested the assistance of UNEP-WCMC in building their capacity to gather and use information biodiversity-related information in the management of ACA, including assessment of the impact of its conservation activities.

3. Project Objectives

The purpose of the project is to improve the effectiveness of protected area management in Nepal by improving the capacity of managers of protected areas to assess status and trends in biodiversity. The project's intended outputs are:

- Tools for assessing biodiversity developed
- Capacity to undertake biodiversity assessments increased
- Impact of community involvement on biodiversity conservation assessed
- Costs and benefits of participation in protected area management on local communities analysed .

The project will develop a manual of tools or methods appropriate for use in Nepal for biodiversity assessment and monitoring, and the provision of training in their use. The tools will be field-tested through a programme of field research. The field research will focus on two aspects: (i) assessment of the status and trends of biodiversity within the Annapurna Protected Area, including methods involving the participation of local people; and (ii) assessment of the impact of protected area designation on the livelihoods of local people, involving a cost-benefit analysis using participatory research techniques. In each case, particular attention will focus on both the positive and negative impacts of tourism within the conservation area.

The project will also produce a report with specific recommendations for the management of the ACA, based on the outcomes of the field research and recommendations on further development of biodiversity assessment and monitoring capacity.

The objectives and operational plan have not been modified over the last year except for the delay from November 2002 to March 2003 of the training course in the UK for six KMTNC staff..

4. Progress

Although the project officially started with the commencement of Darwin Initiative funding in August 2002, fieldwork was commenced by Siddhartha Bajracharya in the Annapurna Conservation Area in April 2002. This involved surveying forest quality and evidence of key wildlife species in transects in relation to distance from villages, as well as interviews with villagers to assess their perceptions and the impact of the ACA conservation measures. Prof. Peter Furley, University of Edinburgh, visited Nepal for ten days in August 2002 to provide technical guidance to the fieldwork and build institutional relations for the project. Siddhartha Bajracharya received training at the University of Edinburgh and UNEP-WCMC from November 2002 in techniques for biodiversity assessment and monitoring and the analysis of the fieldwork results. Philip Bubb, UNEP-WCMC, visited Nepal in February 2003 to prepare the training in scientific and participatory techniques for biodiversity assessment and monitoring for six KMTNC staff at UNEP-WCMC in March. This included training in relevant GIS techniques at the University of Edinburgh for the KMTNC GIS officer. An action plan for establishing biodiversity assessment and monitoring in ACA was produced. This included training of ACA staff by those trained in the UK and further in-country training by UNEP-WCMC.

Planned Output: One Nepalese staff member to undertake fieldwork and analysis in the host country with extensive training and guidance from UK partners; plus a minimum of six months spent in the UK receiving intensive training.

Actual Outcome: Siddhartha Bajracharya conducted fieldwork from April to October 2002, including quadrat and transect surveys of forest biodiversity components and interviews with villagers – see details in the report in appendix 2. From November 2002 to date Siddhartha Bajracharya has been receiving training in the analysis of field data and methods of participatory socio-economic research at the University of Edinburgh.

Planned Output: Five Nepalese staff trained in biodiversity monitoring and assessment techniques. The training will be achieved first by a 3 week training course in the UK [Year 1] followed by training workshops held in Nepal each of three weeks duration in each of [Years 2 and 3];

Actual Outcome: Six Nepalese staff trained in biodiversity monitoring and assessment techniques for three weeks in March 2003 at UNEP-WCMC, Cambridge – see details in the report in appendix 3. This training was originally scheduled for November 2002, but was delayed to March 2003 at the request of KMTNC due to other work commitments.

Planned Output: 2 UK staff in Nepal for 3 weeks.

Actual Outcome: Prof. Peter Furley, University of Edinburgh, in Nepal for ten days in August 2002. This visit established contact between KMTNC and the University of Edinburgh and UNEP-WCMC. It focused on the design of the fieldwork for assessing the biophysical and social impacts of the conservation measures of the ACA, as well as a preliminary identification of training needs - see details in the report in appendix 4. Philip Bubb, UNEP-WCMC, visited Nepal for 7 days in February 2003, to define with staff of KMTNC the content of the training programme in March and subsequent years. Less time was spent by UK staff in Nepal than was originally planned because of delays in establishing the project with KMTNC, due to their other work commitments and uncertainty about conducting fieldwork in some areas due to Maoist rebel activity. The resources not used for travel produced other outputs – see below.

Additional Outputs

Nawa Raj Chapagain trained for two weeks at the University of Edinburgh in digital analysis of aerial photographs for land use mapping – see details in the report in appendix 3. This extra training was identified as a priority because it allows a good time series of aerial photographs of the ACA to be analysed and use in management through a GIS. The results of this will enable the identification of areas of deforestation and recovery and greatly aid planning for the management of the area with local communities.

Production of a report “Bird Conservation Priorities of the Annapurna Conservation Area” by Carol and Tim Inskipp. A 73 page report by the world authorities on the birds of Nepal, describing the importance of the ACA for its 485 bird species, the most important bird sites and species, threats, bird survey methods, and recommendations for surveying and monitoring the most important bird species. See Appendix 5.

- Provide an account of the project's research, training, and/or technical work during the last year.

The fieldwork in the Annapurna Conservation Area was conducted in the villages of Ghandruk and Sikles, where community-based conservation activities have been ongoing since 1993. A biophysical survey was conducted to analyse the present wildlife and plant status, and current pressures on forest resources. Ten distance-time transects were established outwards from village settlements to measure commensurate changes in the level of human input. Ecological and anthropological variables such as tree density, species diversity, regeneration, evidence of wildlife, grazing livestock, and signs of fodder and fuelwood collection were recorded.

A complementary social survey was conducted in the same villages to examine effectiveness of community-based conservation at a community level. A questionnaire survey in 85 households was conducted to measure the economic losses due to crop damage and livestock depredation by wildlife. A structured interview with 114 key persons from different village settlements was also carried out to gather information on conservation awareness, local attitudes toward conservation, resource use patterns, effectiveness of the conservation area regulation, relationships between people and protected area and perceived benefits of conservation. Various participatory tools such as social mapping, seasonal calendars, and matrixes were used to gain further insight on biodiversity conservation.

Results of the social survey found more than 81% of the respondents strongly disagreed on the statement that the villagers still do hunting. The local Conservation Committees are able to control the hunting in the area effectively. Consequently, there are increases in wild animals, but also an increase in crop damage. A majority of the respondents (98%) in the study area reported crop damage by these wildlife. An overwhelming majority of the residents 72.3% (N=114) strongly believed that pest wildlife species must be controlled.

Training was delivered to Siddhartha Bajracharya by the University of Edinburgh in the application and analysis of results from ecological and socio-economic surveys. Mr Bajracharya is an ex-Director of the ACA and will be responsible for scientific surveying and monitoring of biodiversity in all the projects of the KMTNC, throughout Nepal.

A two week training course was delivered by staff and associated consultants of UNEP-WCMC to Mr Bajracharya and five other staff from KMTNC. The content of the training and the participants were selected in close consultation with the senior management of KMTNC. The participants were the Deputy Director of the ACA, two Head of Field Office, the ACA GIS officer, and the GIS officer from the Royal Chitwan National Park. The training topics covered included the purposes of biodiversity assessment and monitoring in protected area management, information management, biodiversity surveying field techniques, participatory methods, the design of a monitoring programme, data analysis, GIS applications, and the production of a work plan. See the report in Appendix 3 for a list of the participants and full details of the training contents and follow-up plan.

Training was also delivered by the University of Edinburgh to the ACA GIS Officer in digital analysis of aerial photographs for land use mapping. This will allow analysis of historical changes in forest cover and aid participatory planning for future management. See Appendix 3.

- Discuss any significant difficulties encountered during the year.

The field work in Nepal has been affected, but not prevented, by the conflict in Nepal between Maoist groups and the government. This has limited the choice of some of the field sites and hampered the function of the village organisations in the management of the ACA. Fortunately, a ceasefire was announced between the Maoists and the Government in January 2003 and negotiations are underway between the two sides. The situation in the villages has returned to more normality and the staff of ACA are able to function.

The Project started with Darwin Initiative funding in August 2002. The training course in the UK for five KMTNC staff was re-scheduled from November 2002 to March 2003, to allow for sufficient preparation time and organisation of the work schedules of the participants.

- Has the design of the project been enhanced over the last year, e.g. refining methods, indicators for measuring achievements, exit strategies?

The design of the biodiversity assessment and monitoring in the ACA has been improved to fully support the management of the Conservation Area. It has been designed to aid improved management decision-making by providing information on the status and pressures on key wildlife species and habitats. This information will be managed by databases and the GIS of the ACA management. KMTNC requested that the project produce a publication of guidelines rather than a manual for biodiversity assessment and monitoring. The Department of National Parks also intends to collaborate with its experience and dissemination in this publication.

Timetable (workplan) for the next reporting period:

	<i>Activity and milestones</i>
<i>April 2003</i>	KMTNC staff trained in UK design biodiversity monitoring programme
<i>May 2003</i>	KMTNC staff trained in UK train colleagues in biodiversity monitoring techniques and design a monitoring programme with them. Start of field surveys.
<i>June 2003</i>	Conclusion of preliminary field surveys (start of rainy season). Start drafting of guidelines for biodiversity monitoring and assessment.
<i>July 2003</i>	Review of field data and monitoring protocols – KMTNC & UNEP-WCMC.
<i>August 2003</i>	
<i>September 2003</i>	
<i>October 2003</i>	Follow-up training in biodiversity assessment & monitoring – UNEP-WCMC with KMTNC in Annapurna. Testing of guidelines material in training and fieldwork.
<i>November 2003</i>	Start Common Leopard survey and Forest Inventory. Continue development of guidelines.
<i>December 2003</i>	
<i>January 2004</i>	
<i>February 2004</i>	Integration of assessment & monitoring results with the Management Information System of the ACA.
<i>March 2004</i>	Produce a progress report and a scientific paper on the project's results.

5. Partnerships

The partnership between UNEP-WCMC and the King Mahendra Trust for Nature Conservation has developed into a strong collaboration. Communication was at times slow after November 2002, with the change of contact point in KMTNC after Siddhartha Bajracharya left Nepal for training at the University of Edinburgh. This was resolved with the visit by Philip Bubb to Nepal to finalise the arrangements for the training in the UK. Now that 5 KMTNC have been in England for 3 weeks training this has strengthened the collaboration and focus of the project.

The project has established collaboration with the Nepalese Department for National Parks and Wildlife, which manages most of the protected areas in Nepal. The DNPW is keen to contribute its experiences in participatory biodiversity monitoring to the training and production of guidelines by the project.

The project has also maintained communication and exchange of information with the other Darwin Initiative project in Nepal: "Institutionalising Participatory Forest Biodiversity Management in Nepal". A joint meeting to exchange experiences was held at UNEP-WCMC in November 2002.

6. Impact and Sustainability

The project has so far remained relatively low-profile within Nepal. This is because the fieldwork and first results are still being established in the first year, and the Maoist conflict has limited the interest in biodiversity issues in Nepal. The enthusiasm of the Nepalese Department for National Parks and Wildlife to collaborate in the project is significant, as this will disseminate its results throughout the protected areas system of the country. The training in Cambridge discussed the sustainability of the project. It was identified that sufficient budgetary resources exist within the ACA management to maintain a biodiversity monitoring programme after the completion of the Darwin Initiative support.

7. Post-Project Follow up Activities (max 300 words)

This section should be completed ONLY if your project is nearing completion (penultimate or final year) and you wish to be considered for Post Project Funding. *Each year, a small number of Darwin projects will be invited to apply for funding. Selection of these projects will be based on promising project work, reviews to date, and your comments within this section. Further information on this scheme is available from the DEFRA website.*

- From project progress so far, what follow-up activities would help to embed or consolidate the results of your Darwin project and why would you consider these as suitable for Darwin Post Project Funding?
- What evidence is there of strong commitment and capacity by host country partners to enable them to play a major role in follow-up activities?

8. Outputs, Outcomes and Dissemination

- Please expand and complete Table 1. **Quantify** project outputs over the last year using the coding and format from the Darwin Initiative Standard Output Measures (see website for details) and give a brief description. Please list and report on appropriate Code Nos. only. The level of detail required is specified in the Guidance notes on Output Definitions, which accompanies the List of Standard Output Measures.

Table 1. Project Outputs (According to Standard Output Measures)

Code No.	Quantity	Description
5	1	Siddhartha Bajracharya – trained over the year in the application and analysis of results from ecological and socio-economic surveys, including participatory methods.
6A	5	Five staff of the King Mahendra Trust for Nature Conservation trained in the principles and methods of biodiversity assessment and monitoring. One staff member trained in digital analysis of aerial photographs for land use mapping.
6B	3 + 2	3 weeks training for each of 5 KMTNC staff members, plus 2 weeks for the GIS officer.
8	3	1.5 weeks by University of Edinburgh in August 2002 and 1.5 weeks by UNEP-WCMC in February 2003, in Nepal.
20	£2,550	Computers and software for KMTNC
22	10	Ten field plots established in the Annapurna Conservation Area
23	£17,000	Stafftime donated by University of Edinburgh and KMTNC

The only project Output not achieved in full was the participation of UK staff in Nepal for a total of 3 rather than 6 weeks. It was not considered necessary for two UK staff to conduct each of the project inception visits. The additional outputs produced were:

Nawa Raj Chapagain, ACA GIS Officer, trained for two weeks at the University of Edinburgh in digital analysis of aerial photographs for land use mapping – see details in the report in appendix 3.

Production of a report “Bird Conservation Priorities of the Annapurna Conservation Area” by Carol and Tim Inskipp. A 73 page report by the world authorities on the birds of Nepal, describing the importance of the ACA for it 485 bird species, the most important bird sites and species, threats, bird survey methods, and recommendations for surveying and monitoring the most important bird species. See Appendix 5.

10. Monitoring, Evaluation and Lessons

The principal methods used to monitor and evaluate the project has been the reports of the KMTNC trainees, in conjunction with field visits in Nepal. The report by Mr Siddhartha Bajracharya on the fieldwork (Appendix 2) shows that capacity is being developed by the management of the ACA to survey and assess both biophysical and socioeconomic factors relevant to the status and trends in biodiversity. The report and workplan produced by the trainees after the course at UNEP-WCMC demonstrates their confidence in undertaking to train their colleagues in Nepal in the techniques of biodiversity assessment and monitoring. This shows a multiplier effect of the training.

The field visit by Prof. Peter Furley, University of Edinburgh, verified the establishment of the field plots in August 2002, as well as the establishment of the project with two village communities

- Are there lessons that you learned from this years work and can you build this learning into future plans?

Lessons learned from this year's work which will be taken into next year's work include:

- biodiversity assessment and monitoring for protected area management needs to include a combination of responding to existing management objectives, such as increasing forest quality, with a review of past priorities and emerging issues. In the ACA past monitoring of wildlife species was sporadic and usually responded to the interests of research scientists, rather than those of the ACA management. The project identified the need to strategically identify the species for which the area is important and establish monitoring programmes for them.
- training is increased in effectiveness when it utilises local examples and actual data produced by the trainees, but the use of case studies from other projects stimulated new thinking and approaches.

11. Author(s) / Date

Philip Bubb

UNEP-WCMC Programme Officer

20 May 2003

Lynn Kisielowski,

UNEP WCMC Finance Director

20 May 2003

Appendix 1.

Logical Framework

<i>Project summary</i>	<i>Measurable indicators</i>	<i>Means of verification</i>	<i>Important assumptions</i>
<p><i>Goal</i></p> <p>To assist countries rich in biodiversity but poor in resources with the conservation of biological diversity and implementation of the Biodiversity Convention</p>		<p>The effectiveness of the protected area network in Nepal improved, as indicated by the improved conservation status of threatened species and habitats</p>	<p>The tools that are developed by the project are effective, are adequately communicated to counterpart staff, and are then adopted widely</p>
<p><i>Purpose</i></p> <p>To improve the effectiveness of protected area management in Nepal by improving the capacity of managers of protected areas to assess status and trends in biodiversity</p>	<p>Tools for biodiversity assessment appropriate for use by protected area managers in Nepal developed and tested</p> <p>Nepali protected area managers trained effectively in the use of biodiversity assessment tools</p>	<p>Reports describing field testing of manual and associated biodiversity assessment tools</p> <p>Reports assessing the implementation of biodiversity assessment tools by protected area staff</p>	<p>Manual produced on schedule, describing tools appropriate for use by counterpart staff</p> <p>Training workshops are effective in developing, testing and disseminating methodologies for the assessment of biodiversity</p> <p>Field research is successfully completed</p>
<p><i>Outputs</i></p> <p>Tools for assessing biodiversity developed</p> <p>Capacity to undertake biodiversity assessments increased</p> <p>Impact of community involvement on biodiversity conservation assessed</p> <p>Costs and benefits of participation in protected area management on local communities analysed</p>	<p>Manual produced for biodiversity assessment</p> <p>Minimum of six Nepali staff trained in biodiversity assessment techniques</p> <p>Publications produced describing impacts on biodiversity</p> <p>Report produced describing effectiveness of protected area management</p>	<p>Manual published by end of project</p> <p>Reports of training workshops held in each year of the project</p> <p>Papers published in international scientific journal</p> <p>Report submitted to protected area administration</p>	<p>Manual publication occurs according to schedule</p> <p>Training workshops held as planned, involving Nepali participants</p> <p>Results of sufficient scientific standard obtained</p> <p>Results of sufficient scientific standard obtained</p>
<p><i>Activities</i></p> <p>Manual written describing biodiversity assessment techniques</p> <p>Training courses held in UK for Nepali staff</p> <p>Workshops held in Nepal for implementation of biodiversity assessment tools</p> <p>Field research programme undertaken in Nepal, assessing impacts of protected area designation</p>	<p>Annual and quarterly progress reports</p> <p>Training course reports</p> <p>Workshop reports</p> <p>Annual and quarterly reports describing progress in field research</p>	<p>Annual and quarterly reports produced on schedule</p> <p>Training course reports produced within 1 month of course completion</p> <p>Workshop reports produced within one month of completion</p> <p>Annual and quarterly reports produced on schedule</p>	<p>Staff available for writing of manual</p> <p>Staff available for attendance at training course</p> <p>Staff available for attendance at workshops</p> <p>Logistical support required for field research made available; field sites accessible and local communities willing to</p>

Appendix 2.

Biodiversity Survey in the Annapurna Conservation Area, Nepal

Conservation for Development

Photo by: Siddhartha B. Bajracharya

Prepared for

Darwin-Nepal Project

Prepared By:

Siddhartha B. Bajracharya

May 7, 2003

12. 4.1 Introduction

This report will describe the recent research carried out as a part of the Darwin Project. The research was carried out in the southern slopes of the Annapurna Conservation Area in Nepal. The conservation area, a relatively new type of protected area designation in Nepal, was established to conserve biodiversity of the Annapurna Himalaya region through careful integration of development activities. In the last 15 years, the Annapurna Conservation Area Project (ACAP) has evolved from an experimental Integrated Conservation and Development Project (ICDP) model to become the largest protected area in Nepal. There is a unique opportunity as well as a monumental challenge to maintain biodiversity whilst incorporating sustainable development.

13. Ecological and Social Survey

Integration of biological and social science has been regarded indispensable in assessment of a community-based conservation programme. Therefore, an integrated biophysical and social survey was designed and carried out recently in the conservation area as an initial contribution to the Darwin project. A



Quadrat setting in a forest in ACA

biophysical survey was conducted to analyse the present wildlife and plant status, and current pressures on forest resources. Ten distance-time transects were established outwards from village communities to measure commensurate changes in the level of human input. A quadrat of 10 m x 10 m was laid out at intervals of 45 minutes uphill walking distance along the transect line. Within each quadrat, sub-quadrat 5 m x 5 m for sapling and 2 m x 2 m for seedling were placed randomly. Ecological and anthropological variables such as tree density, species diversity, regeneration, evidence of wildlife, grazing livestock, and signs of fodder and fuelwood collection were recorded.

A complementary social survey was conducted in the same villages to examine effectiveness of community-based conservation at a community level. A questionnaire survey in 85 households was conducted to measure the economic losses due to crop

damage and livestock depredation by wildlife. A structured interview with 114 key persons from different village settlements was also carried



A structured interview with a villager

out to gather information on conservation awareness, local attitudes toward conservation, resource use patterns, effectiveness of the conservation area regulation, relationships between people and protected area and perceived benefits of conservation. Various participatory tools such as social mapping, seasonal calendars, and matrixes were used to gain further insight on biodiversity conservation.

14. Results and discussion

*The initial results of data analysis are promising. A total of 43 tree species were recorded. The average density of trees (mean \pm SE) was found 1830 ± 256 trees/ha. The averaged basal area (mean \pm SE) was found 114.6 ± 15.5 m²/ha. The impact on forests by local communities for fuelwood and fodder harvesting has been significantly reduced, thereby improving the forest condition. The plantation of fast growing indigenous fuelwood species such as alder (*Alnus nepalensis*), increased awareness on the need for conservation, changes in attitude and behaviour of local communities on resource use, together with the introduction of fuelwood saving devices, have had a cumulative effect in reducing pressure on forest.*

The traditional economy of these people was herding, hunting and slash and burn agriculture adapted to rugged highlands and high forest (Messerschmidt 1976). While this may have been true even two decades ago, it is not the case at present. More than 81% (n=114) of the respondents strongly disagreed on the statement that the villagers still do hunting. The local Conservation Committees are able to control the hunting in the area effectively. Consequently, there are increases in wild animals

such as barking deer (Muntiacus muntjak), Himalayan Tahr (Hemitragus jemlahicus), Mainland Serow (Naemorhedus sumatraensis), Asiatic Black Bear (Ursus thibetanus) and Rhesus Macaque (Macaca mulatta). On the other hand, there is also an increase in crop damage, principally by the Rhesus Macaque (Macaca mulatta), the Indian Porcupine (Hystrix indica) and barking deer (Muntiacus muntjak). A majority of the respondents (98%) in the study area reported crop damage by these wildlife. An overwhelming majority of the residents 72.3% (N=114) strongly believed that pest wildlife species must be controlled.

Despite these problems, the local community residing in the conservation area strongly feel that integrated conservation is beneficial. This has resulted in encouraging participation of the local community in the conservation. More than 98% of the total respondents reported their involvement in various conservation activities, which range from planting trees for fuelwood and fodder on their farms, regular village clean-up and involvement in conservation committees in their village. The higher rates of participation of women in conservation are equally promising and remarkable.

15. Conclusion

A number of important conclusions arise from this analysis. Most importantly, it is clear that a strong positive attitude towards conservation has been developed among the local communities. This has led to control in hunting and rampant use of forest. There is indication of improvement in the forest condition and thereby increasing wildlife population. However, caution should be taken as the ecological observations were limited to a small sample size and for only one season. Nevertheless, these initial results lead to realization of a need for more scientific research in the area to quantify these trends. Thus, as a next step of the Darwin project, a team of staff from the King Mahendra Trust for Nature Conservation will follow up the survey at ACA in Nepal.

Appendix 3.

Building Capacity for Biodiversity Assessment and Monitoring

Training Completion Report

Background

Darwin Initiative project was designed to improve the effectiveness of protected area management in Nepal by improving the capacity of managers of protected areas to assess status and trends in biodiversity. The project has focused on the Annapurna Conservation Area (ACA), which is the largest protected area in Nepal. This is three years long project (2002/2003 to 2004/2005). At the end of the project, it is expected to develop tools for assessing biodiversity, increase capacity of managers to undertake biodiversity assessments, assess impact of community involvement on biodiversity assessment and analyse costs and benefits of participation in protected area management on local communities.

Participants of the BAM Training

As part of the Darwin Initiative project, six staffs of King Mahendra Trust for Nature Conservation (KMTNC) namely Mr. Siddhartha B Bajracharya, Mr. Ram Chandra Nepal, Mr. Ajaya Pandey, Mr. Nawa Raj Chapagain, Mr. Lizan Kumar Maskey and Mr. Rupesh Shrestha took part in the 'Building Capacity for Biodiversity Assessment and Monitoring Training (BAM)' held at World Conservation Monitoring Center (WCMC), Cambridge, UK. The training was designed for two weeks (10-21 March 2003).

Major Course of the Training

Major course of the two weeks training was as follows:

- **Assessment and monitoring – how they differ**
- **Biodiversity assessment and monitoring for protected area (PA) management – definitions, purpose and their role in ACAP**
- *Concept of biodiversity in relation to PA management, and community development*
- *Biodiversity of ACAP and conservation objectives*
- *Information management for effective PA management – including community level natural resource management*
- *Introduction to the DPSIR framework for KMTNC-ACAP situation – to assess its usefulness*
- *Bird diversity and important species and habitats in Annapurna Conservation Area*
- *The design/framework of monitoring systems and field surveys to produce useful data and analyses for PA management*
- *Common pitfalls in designing biodiversity assessment and monitoring including the design of sampling*
- *Data recording formats, storage systems and databases*
- *Biodiversity assessment by communities – principles and techniques, building on existing techniques in ACAP*
- *Field survey techniques – transect, sampling, estimation of animal abundance, forest quality, forest survey, wildlife damage to crops, use of GPs*
- *Data analysis of transect and other field-survey results, for its use in management decisions*

Building capacity for biodiversity assessment and monitoring in Nepal

- *Communication of results for decision support*
- *The role of GIS in biodiversity assessment and monitoring, and identifying its potential for KMTNC/ACAP*
- *Using GIS to assess pressures on habitats*
- *Using GIS to assess fragmentation of habitats*

Training Methods

The methods used in the training were lectures, slide presentations, group works, field visits and assignment. WCMC also organised an interaction programme with the staffs of Fauna and Flora International (FFI) in their office at Cambridge.

Trainers

The persons directly involved in the training course were:

- *Philip Bubb (Programme Officer, WCMC),*
- *Dr. Igor Lysenko (Conservation Analyst, WCMC)*
- *Dr. Gram Tucker (Ecological Consultant and Writer)*
- *Tim and Carol Inskipp (Free lance),*
- *Dr. Anna Lawrence (Senior Research Fellow Environment and Development Oxford University),*
- *Siddhartha Bajracharya (KMTNC),*
- *Dr. Lera (WCMC) and*
- *Dr. Val (WCMC)*

Achievements

We have learned various methods to assess and monitor biodiversity. The most useful subject were the concept of assessment and monitoring, concept of biodiversity, DPSIR framework for information management, biodiversity assessment by communities (stakeholder analysis, mapping, matrix scoring and ranking, etc.), field survey techniques (transect line, sampling, forest survey, bird survey, use of GPS, etc), common pitfalls in designing biodiversity assessment and monitoring as well as design of sampling and participatory data analysis. Based on these knowledge we will conduct other training to develop more human resources to carry out biodiversity assessment and monitoring in Nepal. An action plan and a sample monitoring protocol which had developed to carry out further activities in Nepal is as follows:

Action Plan

Action Plan has been prepared in two ways (i) Structure of the Research Team and (ii) Action Plan for field Research

A. Structure of the Research Team

Individual role of the UK trained research team members:

<i>Name</i>	<i>Responsibility</i>
<i>Ram Chandra Nepal</i>	Field research coordinator (Bio-physical + Social)
<i>Ajay Pandey</i>	Field research (Bio-physical ± Social)
<i>Nawa Raj Chapagain</i>	Data sheet, relevant literature collection & review database
<i>Lizan Kumar Maskey</i>	Field research (Bio-physical ± Social)
<i>Rupesh Shrestha</i>	Data sheet, relevant literature collection & review database
<i>Siddhartha Bajracharya</i>	Co-ordination with WCMC, Edinburgh University and KMTNC,
	Co-ordination of overall research, provide technical back up.

Research team members from the Unit Conservation Offices (UCOs):

<i>Field Members</i>	<i>Responsibility</i>	<i>Selection Process</i>
Field Stations		
<i>Rangers</i>	<i>Biophysical research</i>	<i>As recommended by OIC</i>
<i>Assistants (tourism)</i>	<i>Social research</i>	<i>As recommended by OIC</i>
<i>CEAs</i>	<i>Participatory research</i>	<i>As recommended by OIC</i>
<i>OICs (Ghandruk, Lwang, Manang)</i>		<i>If interested</i>
Sample Villagers		<i>Selected by CAMC</i>
<i>CAMC Member</i>		<i>In recommendation of CAMC</i>
<i>Forest guard</i>		<i>Identify a potential youth</i>
Local youth		

<i>S.N</i>	<i>Research Team</i>	<i>Number</i>
<i>1</i>	<i>Darwin project UK trained staff</i>	<i>6</i>
<i>2</i>	<i>Field level rangers</i>	<i>14</i>
<i>3</i>	<i>Assistants (such as tourism)</i>	<i>14</i>
<i>4</i>	<i>CAMC members</i>	<i>55</i>
<i>5</i>	<i>Forest guards</i>	<i>55</i>
	TOTAL	184

B. Action Plan for the Research

S.N	What	When	Who	Where	How Long
1	Prepare a brief report on the UK training	April 16, 2003	UK Participants	Pokhara	N/A
2	Review and design list of objectives for assessment and monitoring based on ACA management plan objectives	April 6, 2003	All ACAP Officers	Pokhara	1 day
3	Plan & design a biodiversity research training programme	April 7, 2003	UK Participants	Pokhara	1 week
4	Design monitoring protocols	April 7, 2003	UK Participants	Pokhara	1 week
5	Start recording casual observation	May 1, 2003	Field staff	ACA	On-going
6	Run a biodiversity research training	April 27, 2003	UK Participants	Ghandruk	1 week
7	Conduct preliminary survey	May- June	Research Team	Ghandruk	2 months
8	Finalization of monitoring protocols	October	Research Team + WCMC	Ghandruk	1 week
9	Follow up training in biodiversity monitoring	October	Research Team + WCMC	Ghandruk	1 week
10	Conduct common leopard survey	2003 (requires consultation)	Research Team	Southern Belt- ACA	1 month
11	Conduct forest inventory	November 2003	Research Team	Whole ACA	7 months
12	Wildlife damage Questionnaire Survey	November 2003	Research Team	Lwang and Sikles	2 weeks
13	Plan and design a range land survey	July 2003	Research Team	Pokhara	2 months
14	Integrate assessment / monitoring results with ACA MIS				
15	Information Product design, production and distribution				
16	Produce at least a scientific paper	March 2004	Research Team	Pokhara	3 months

Sample Monitoring Protocol

Monitoring protocol is a tool for systematic monitoring of the individual biodiversity resources. A sample monitoring protocol of Common Leopard has been developed for reference, which is as follows:

MONITORING OBJECTIVE:

Biodiversity resource to be monitored: *Common Leopard*

Reasons for importance of the biodiversity resource:

1. *One of the top level predator within ACA,*
2. *Key problem animal identified by local community*

Conservation objective of the resource: *To maintain the population as indicated by sighting index within 20% of current level*

Monitoring area and sub-units: *Southern sectors of ACA (Ghandruk, Lwang, Sikles and Bhujung)*

Frequency: *Annually for 5 years afterwards every 3 years*

MONITORING METHODS

Observation types: *Scat, scratching, pugs mark, and direct sighting*

Data type: *Frequency of observation*

Complete survey or sample survey: *Sample survey*

Sample method: *Time search*

Sample area/time period: *0.5 sq. km/5 hrs per sample plot*

Timing of observation: *To be determined through PRA*

Potential causes of bias and rules for standardization: *Terrain, Avoid stiff cliff (need expert consultation)*

SAMPLING METHODS

Temporary or permanent sample locations: *temporary*

Method for sample location: *Identification of sites by PRA, plots selected randomly over a grid and located using GPS*

Number of samples: *8 = 1 plot in each watershed area (Modi, Mardi, Seti, Madi, Rudi, Midim, Khudi and 1 from Myagdi district)*

Use of Multistage sampling: *Not applicable*

MONITORING REQUIREMENTS

Personnel responsible and time required:

Experience training necessary:

License and access permission requirements:

Equipment required:

Data storage:

Data analysis:

Reporting procedures:

After the two weeks training programme there was an informal visit to Edinburgh (21-25 March) where we visited botanical garden, zoo and historic places. There was also an informal discussion programme with the Professor Peter Furley and Dr. Andrea J. Nightingale at the University of Edinburgh. We also visited the Darwin Library of the University.

Students Conference on Conservation Science

We also participated on the 'Students Conference on Conservation Science' held at the Zoology Department of the University of Cambridge from 26-28 March. There were more than 130 students participated from different countries. The conference was divide in to different sessions like students talk, workshop and poster presentation. 35 students presented their papers through slide talks and 38 students presented their papers through posters. During the conference Mr. Siddhartha B Bajracharya presented a poster on 'Community-based Conservation in Nepal'. We had also participated on the workshop 'Designing Surveys for Biodiversity Conservation' and 'Writing grant proposals and raising funds'. Each workshop was one and half-hours long. We had also distributed KMTNC/ACAP posters and different brochures produced by KMTNC/ACAP during the conference.

Participants of DAAP Training

After completing training program at the UNEP-WCMC in Cambridge, Nawa Raj Chapagain, one of the members of the group, attended another training at the GIS/PAL laboratory of the Geography Department, University of Edinburgh. The training was on digital analysis of aerial photographs for landuse mapping and was organized from March 31 to April 11, 2003. The training was guided by Mr. Stewart Jamieson, Training Co-ordinator with support from Mr. Christopher J. Place, Research Computing Officer. The aerial photographs from ACA region were used to exercise the training in Erdas Imagine 8.5 (with OrthoBase Pro 8.5.1) image processing software.

Aim:

The aim of the training was to acquire skills and knowledge on processing the aerial photographs in geo-referenced digital environment to derive landuse maps.

Training Schedule:

The training was schedule as follows:

Date	Training session	Remarks
<i>March 31, 2003</i>	<i>Sorting of the aerial photographs, scanning</i>	
<i>April 1, 2003</i>	<i>Learn ortho-rectification procedure on Erdas Imagine based on OrthoBase tutorial</i>	<i>Guided exercise based on tutorial exercise</i>
<i>April 2 and 3, 2003</i>	<i>Import 3 aerial photographs of Ghandruk region to Erdas Imagine and ortho-rectify (including DEM extraction from aerial photographs)</i>	<i>Exercise guided by experts</i>
<i>April 4, 2003</i>	<i>Mosaic ortho-rectified photographs, digitize them and prepare landuse map</i>	<i>Exercise guided by experts</i>
<i>April 5 and 6, 2003</i>	WEEK END	
<i>April 7, 8 and 9, 2003</i>	<i>Import 3 aerial photographs of Lwang region to Erdas Imagine and ortho-rectify (including DEM</i>	<i>Independent working</i>

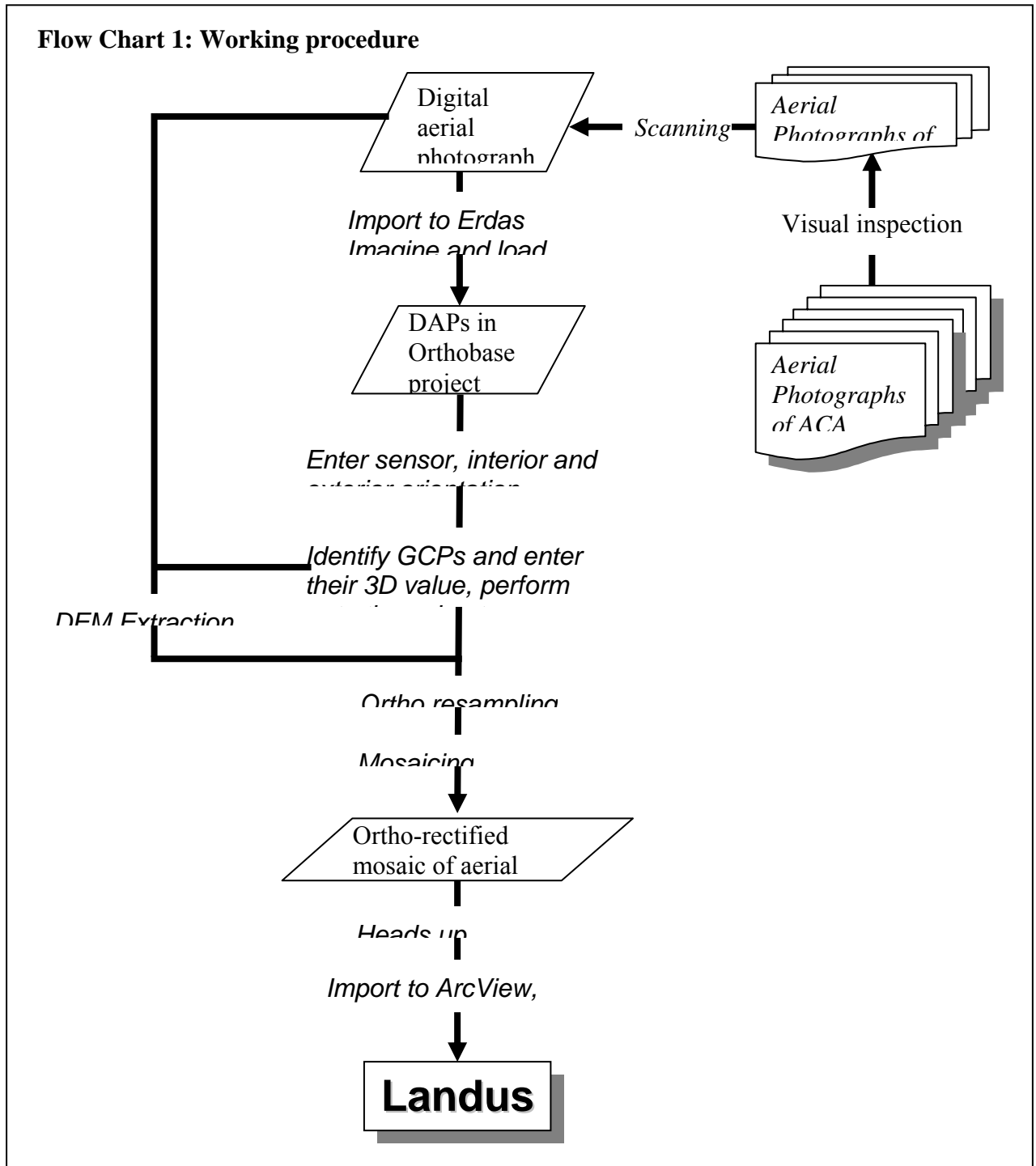
	<i>extraction from aerial photographs)</i>	
<i>April 10, 2003</i>	<i>Mosaic ortho rectified photographs, digitize and prepare landuse map</i>	<i>Independent working</i>
<i>April 11, 2003</i>	<i>Report preparation and data back up</i>	

Working Procedures and Outcome:

As outlined in the training schedule, the training was mainly divided into 2 parts. First week was planned for guided work whereas second week was for independent replication of the whole process and procedures to ortho-rectify and landuse map a next region. So, the working procedures for both the parts were the same as following in sequence (Please refer to Flowchart 1 for diagrammatic flow of the working procedure):

- 1. To start up working, 3 aerial photographs of the region were selected and scanned to digital form. The scanned aerial photographs were then imported into Erdas Imagine and loaded on OrthoBase.*
- 2. Sensor parameters (camera parameters – focal length, symmetry parameters, fiducial mark location and radial lens distortion parameters) were entered into the system. The locations of fiducial marks on the scanned images were also entered. As we did not have exterior parameters quantified, we set it to unknown.*
- 3. Eight Ground control points (GCPs) were selected for supplying the latitude, longitude and altitude parameters to ortho-rectify the aerial photographs and those information for each of points were entered into the system.*
- 4. In the next step, automatic tie process and automatic triangulation process were run to generate additional tie points and triangulate them for the purpose of ortho-rectification. Tie points, thus generated, were evaluated visually with reference to known features to ensure the software has calculated and placed them exactly where they should have been.*

5.



6. *As we did not have Digital Elevation Model (DEM) of the area, we extracted DEM using GCPs supplied for ortho-rectification and stereo-pair aerial photographs. Then, we resampled the aerial photographs (80% of active area and 10% overlap threshold) to get the ortho-rectified aerial photographs. Mosaic tool was used to create a mosaic three ortho-rectified aerial photographs for the purpose of heads up digitizing.*

Conclusion

The training programme has been useful. Six Nepalese protected area managers have been trained and their knowledge has been updated in various methods of biodiversity assessment and monitoring. It has also build up the confidence to carry out further research work in Nepal.

Appendix 4.

Report on the initial visit to Nepal 20th – 31st August 2002

Professor Peter Furley

This report consists of an itinerary (A), an outline of the principal outcomes of the visit (B) and a short list of material collected which may be of use to UK-based members of the Project (C). The visit was extremely well organised by Siddartha Bajracharya, who accompanied me throughout and was strongly supported by the King Mahendra Trust for Nature Conservation (KMTNC).

A. Itinerary

- August 20th Leave Edinburgh Flight BD 0061 to Heathrow
Heathrow to Doha Flight QR 0002
- August 21st Doha to Khatmandu Flight QR 0350
Hotel Himalaya (KMTNC rates)
Evening meeting with Siddartha Bajracharya to outline programme
- August 22nd Progress review of current research
Courtesy visit to the British Embassy – Andrew Mitchell, Chargé d’ Affairs; left copy of itinerary and programme
Visit to Pashupati area
Afternoon meeting with Dr Harka Gurung (ex Edinburgh PhD), formerly member and Vice-Chairman National Planning Commission and State Minister for Education, Ministry of Commerce, Tourism, Public Works and Transport. Now runs New ERA Consultants
Afternoon meeting with Dr Chandra Gurung, Country Representative WWF and with Dzori Lama (ex Edinburgh MSc in Resource Management, currently Programmes Development, Fund Raising and Public Relations, at WWF)
Evening visit to Swayambhu
- August 23rd Flight to Pokhara by Necon Air
Courtesy meeting with Annapurna Conservation Area project senior officials: Director of ACAP Gerendra Gurung
Meeting with Nav-Raj Chapagain, GIS specialist at APAC
Visited Institute of Forestry (Dean and Campus Chief absent)
Drive to Nayapul; walk into Birethanti for overnight stay
- August 24th Depart for Ghandruk (4-5 hour walk)

Preliminary meeting with ACAP staff, including staff who may come on training courses to the UK

Appraise research site

Overnight stop at Cottage Gurung

August 25th Detailed discussion of research achieved and proposed with visits to field sites of plantation forests, typical farming practices, micro-hydro plant, forest nursery (with Suresh Thapa, a forest Ranger who may come on the training courses)

Courtesy calls on local conservation leaders and briefly attended a village conservation meeting

Tour of village including the social and environmental features shaping ACAP policy

August 26th Leave Ghandruk for Birethanti and Nayapul

Drive to Pokhara

Meeting with the Head of the Natural Resources Programme at ACAP, Roshan Sherchan

Dinner with the Director of ACAP, the Head of the Programme for Conservation Education, Ramchandra Nepal and John Futcher (BESO), British IT Adviser

Overnight in Pokhara

August 27th Drive to Royal Chitwan National Park (KMTNC)

Meeting and briefing by the Director of the Biological Conservation Centre (BCC), Narayan Dhakal

Tour of the BCC facilities and programmes, including the community involvement programmes

Visit to the Park (by elephant) with Bishnu Lama (wildlife expert for 20 years)

Evening meeting with Narayan Dhakal and Bishnu Lama

Overnight stay at the BCC

August 28th Visit to the plantation forest of the Saurah village community and their tourist tower/lodge facilities

River trip to the elephant breeding station

Departed BCC for Khatmandu

Visited Khatmandu Durbar

16. Overnight at the Hotel Himalaya

August 29th Visit to the King Mahendra Trust for Nature Conservancy headquarters. Brief discussion with the Member & Secretary (i.e. the CEO), Arup Rajouria and the Executive Officer Ganga Thapa
Visited the associated KMTNC institution at the Central Zoo and met the Director R.K.Shrestha and UNDP Landscape project researcher T.P.Khatri
Afternoon discussion with Dr Pralad Yonzon, a highly respected and energetic wildlife biologist who runs the Resources Himalaya Consultancy
Visit to Patan Durbar
Dinner with Siddhartha's wife and family

August 30th Visit to DFID offices and discussion of project with Peter Neil, Rural Livelihoods Adviser
Visit to ICIMOD offices and discussion with Dr Binayak Bhadra, Director of Programs
Lunch discussion of research objectives in the light of meetings

Visit to Bhaktapur

August 31st Departure from Khatmandu
Flights QA 0351 to Doha and QA 0001 to Heathrow
Flight BD 0064 to Edinburgh

B. Principal outcomes of the visit

1. Establishing contacts with KMTNC

The Trust is the main Agency concerned with conservation in Nepal and, as an NGO, is supposedly outside the direct influence of government. The Trust has a strong and apparently genuine ethic towards community involvement and education. At their HQ in Kathmandu, I briefly met the ‘Member & Secretary of the Governing Board of Trustees’ or Chief Executive Officer (Arup Rajouria), and had a longer interview with the Executive Officer (Ganga Jang Thapa). These are the top officials at the Trust and they were strongly supportive of the project’s aims. Since Siddartha is regarded as a senior member of KMTNC, these interviews consolidated the project firmly within the main Nepalese agency.

2. **The Annapurna Conservation Area Project**

The main purpose of the visit was to visit ACAP, to establish contacts with the staff at the HQ in Pokhara, visit some of the constituent villages and assess the research so far undertaken and that which needs to be undertaken in the Darwin Project.

The contacts at the ACAP headquarters were extremely friendly and supportive. This is mainly a result of Siddartha’s 6-year spell as Director. ACAP is essentially a facilitating organisation, bringing advice and expertise to the communities who then control much of the development (conservation along with social benefits). There has been little previous research and members of ACAP seemed to be genuinely pleased that there was to be a research and training component to their work. The headquarters at Pokhara is a large and well-equipped facility, largely built with ODA aid. The current Officer in charge (i.e. Director) is Gehendra Gurung (agricultural background with a MSc from Wye College (now part of Imperial College). He was extremely helpful and the training element would be best taken here (as well as in the field). I was introduced to the Administration and Finance sector leaders as well as most of the Technical Officers or Programme Leaders, notably Natural Resources which will be a key component (Roshan Sherchan), Conservation Education (Ramchandra Nepal), Tourism, Gender Issues, Infrastructure and Alternative energy (mainly engineering) and GIS (NavRaj Chapagain). There is already a framework for the spatial database but the impressive demonstration of PC-based ARC INFO and ARC-VIEW was presented by only one Technical Officer. Since he also seemed to be engaged in collecting primary data, the system cannot possibly be at an advanced stage (no error checks and little research motivation). This is a sector, which could be strengthened by the Darwin Project.

Following the visit to the Headquarters, we visited Ghandruk Village, one of the best models for the work of ACAP. This involved a 5-hour trek from the nearest road end and an overnight stop at the entrance to ACAP at Birethanti as well as stopping at a lodge in Ghandruk. The strong community involvement was very evident at Ghandruk but there did seem to be strong factors in favour of the conservation-social benefits approach in this area, which may not exist elsewhere (i.e. outside ACAP or outside the mountain communities). There was already a strong sense of community, with a nearly homogenous ethnic group and little

caste difference. There was a remarkable input from ex-Ghurkas (Indian as well as British armies) which enabled almost every village to have some more worldly-wise inhabitant who could use his experience in village organisation. Ghandruk also has a large ACAP office which is clearly a strong force in listening to and advising the community. There are 7 such offices scattered throughout ACAP and each one is responsible for a number of villages. Visits were made to most of the features of the ACAP structure in Ghandruk. These included the forest areas and the plantation forests (planted to replace fuelwood cutting in the forest and also for fodder – mostly *Alnus* and *Ficus* species respectively), the forest nursery, visits to the houses of village members, especially those concerned with the conservation and women's committees), the health centre, the nursery/primary/secondary schools, the Ghandruk Museum (built to conserve the traditional tools and culture of the community), one or two of the tourist lodge owners and the local micro-hydro plant producing 50kw. We also joined one of the village committees (the Conservation Committee) as it debated the activities of a local saw mill owner. It was an impressive demonstration of local concern for the environment and taking control of their lives. The Village Chairman however, had departed for Pokhara in view of the Maoist insurgency -, as had many other vulnerable officials in the mountain communities.

The field visit enabled us to have a more realistic discussion of the research underway and proposed. The environmental and ecological aspects were hampered by the rebel occupation of the eastern forests. Nevertheless a series of time transects had been surveyed examining a number of aspects of the natural cover and signs of disturbance. These include systematic species' inventory (with the help of the forest guards), canopy cover, ground cover, wildlife observations, evidence of grazing, logging etc. and these were later matched with village perceptions of wildlife damage. The social surveys have already uncovered much useful information with 16 villages/settlements contacted for PRA surveys, stratified into social divisions with participatory mapping and semi-structured interviews covering around 10% of households. Qualitative and semi-quantitative surveys also included key informant interviews of 'stakeholders' within ACAP and outside. These initial findings need to be extended in the Project, perhaps to include the more remote communities with differing environmental problems and to extend the forest surveys, which have been hampered by the rebel occupation of the area. Consideration needs to be given to appropriate RBA methods for plant and wildlife monitoring. The community and social survey methods appear robust and reliable. Satellite and air photograph coverage would strengthen the time series approach to monitoring and survey.

3. Other KMTNC links

In addition, visits were made to the Royal Chitwan National Park where the Biological Conservation Centre's work specialises on landscape scale conservation of the riverine/flooded Terai forest, notably for endangered rhinoceros and tiger populations. Furthermore they have a similar scheme to that of Annapurna, replicating ideas of community involvement. This has proved much more difficult than in ACAP for a variety of reasons which include varied indigenous and incoming population groups with disparate cultures and backgrounds, more dispersed settlement patterns and fewer staff involved in forging the community links. The BCC was funded initially by US AID and with technical help from the Smithsonian Institution, and consists of a small administration block, several small but well equipped guesthouses and an trained

elephant area. It lies adjacent to the protected area of the park and wild animals pass through the compound at night. The staff at BCC was extremely helpful (Project Director Narayan Pd.Dhakal) and there are numerous possibilities for further joint research activities, both on the biological and social aspects.

A further visit was made to the Kathmandu National Zoo, an associated institute of KMTNC. The Director ((R.K.Shrestha) spent a morning explaining the educational projects of the zoo by means of a film comparing the situation before the present educational campaign and the current project design. This was later illustrated by a tour of the 6 ha zoo facilities, which demonstrated the popularity and educational awareness and conservation effort of staff and visitors.

4. Other conservation and environmental organisations

WWF- Nepal

This is an energetic and seemingly well-run organisation with many links to KMTNC. We met the Country Representative (Dr Chandra Gurung), who had at one time been Director of ACAP and who had been partly responsible for initiating many of the innovative community programmes. Currently WWF Nepal are more concerned with the Terai corridor project – linking up the various protected areas along the Indian border and into India. Dr Gurung thought that the Darwin Project was timely and appropriate and seemed supportive. We clearly need to keep them informed and involved.

Resources Himalaya

This is an NGO with a considerable reputation for independent thought and good ideas. We met the Team Leader (Dr Pralad Yonzon), who was very interested in the biological ideas within the Darwin Project and who would be a useful source of information and suggestions. He would also be a person with whom the Project should keep in touch.

New ERA Consultants

This is another NGO with wide experience and good contacts in Nepal. We met the Chairman of the Board of Directors (Dr Harka Gurung), whom I can remember as a young postgraduate at Edinburgh in the early 1960s. Since then he has been on Government Planning Committees and served as a Minister with a range of portfolios. He would be a good contact for impartial advice particularly if policy and planning became an issue.

5. Other relevant organisations

ICIMOD

The International Centre for Integrated Mountain Development is well known internationally and has concerns throughout the Himalayan region. It has a large

office in Khatmandu. We met the Director of Programs (Dr Binayak Bhadra) who was supportive and interested in the Darwin Project. This is a more research - oriented organisation and has (by report) good facilities for satellite imagery and GIS. It could be a useful source of information and materials.

DFID (Nepal)

The structure and facilities at DFID were impressive. The building is fairly new (1998) and very well equipped. We met the Rural Livelihoods Adviser (Peter Neil), who had been a forester by training before moving over to a more socially-slanted line. DFID are very much concerned with similar sorts of exercise to those of ACAP. DFID's interests and the Darwin Project have much in common and we assured them that we would keep in touch and also with an informal Biodiversity group network that has just been established (via Steve Parr, RSPB, The Lodge, Sandy, Bedfordshire)

C. Materials which may be of interest to UK members of the Project

Annapurna Conservation area Trekking Map

Sarasi - Newsletter of the BCC (December 2001 and July 2002)

Protected Areas of Nepal – photocopy of presentation by the Project Director BCC

King Mahendra Trust for Nature Conservation) Annual Report 2000 and Profile of a National NGO

WWF _ Integrating Conservation : a community approach to conservation in Royal Bardia National Park

Resources Himalaya - Habitat Himalaya (fact-files)

- Protected areas of Nepal (summary in 76 pages)