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## **International Knowledge Transfer Scheme**

17<sup>th</sup> March – 10<sup>th</sup> April 2010

Institute of Agriculture and Animal Science (IAAS),  
Tribhuvan University, Rampur, Nepal

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A collaboration between:

The University of Southampton

The Glacier Trust

Institute of Agriculture and Animal Science

Practical Action Nepal

## **Outcomes and Recommendations Report**

**Dr Eloise M Biggs and Gary R Watmough**

Produced by the Southampton University for the Glacier Trust

## Overview

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The purpose of this knowledge-transfer programme was to commence collaborations between the University of Southampton (UK) and the Institute of Agriculture and Animal Sciences (IAAS; Nepal). The Glacier Trust funded two MSc students at IAAS for a 2-year course and the trust has long-standing links with the School of Geography, University of Southampton. The aim was to provide MSc students with expertise in geospatial analysis. The Glacier Trust has an interest in research projects relating climate change to water resources in rural mountain communities. Two academics from the University of Southampton visited Nepal to provide expertise on these research topics and methods of geographical data collection and analysis. In return, the MSc students provided invaluable local-level knowledge of research sites and access to remote mountain locations where little academic research has previously been conducted. The exchange was a success and this report details the programme with a list of outcomes, problems encountered and recommendations for ensuring successful future exchange opportunities.

### **Participants:**

Dr Ellie Biggs – Academic Lecturer, University of Southampton

Gary Watmough – PhD Student, University of Southampton

Mohan Khatiwada – MSc Student, IAAS

Parbati Joshi – MSc Student, IAAS

### **Programme Coordinator:**

Robin Garton – Charity Director, The Glacier Trust

### **Contributors:**

Dr Craig Hutton – Research Scientist, University of Southampton

Gehendra Gurung – Practical Action Nepal

Dr Dharma Dangol – Deputy Director, IAAS

Surbir Sthapit – Team Leader, HICODEF

Dolraj Gaire – Field guide, HICODEF

## 1. Aims

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The following aims were defined for the knowledge-exchange programme.

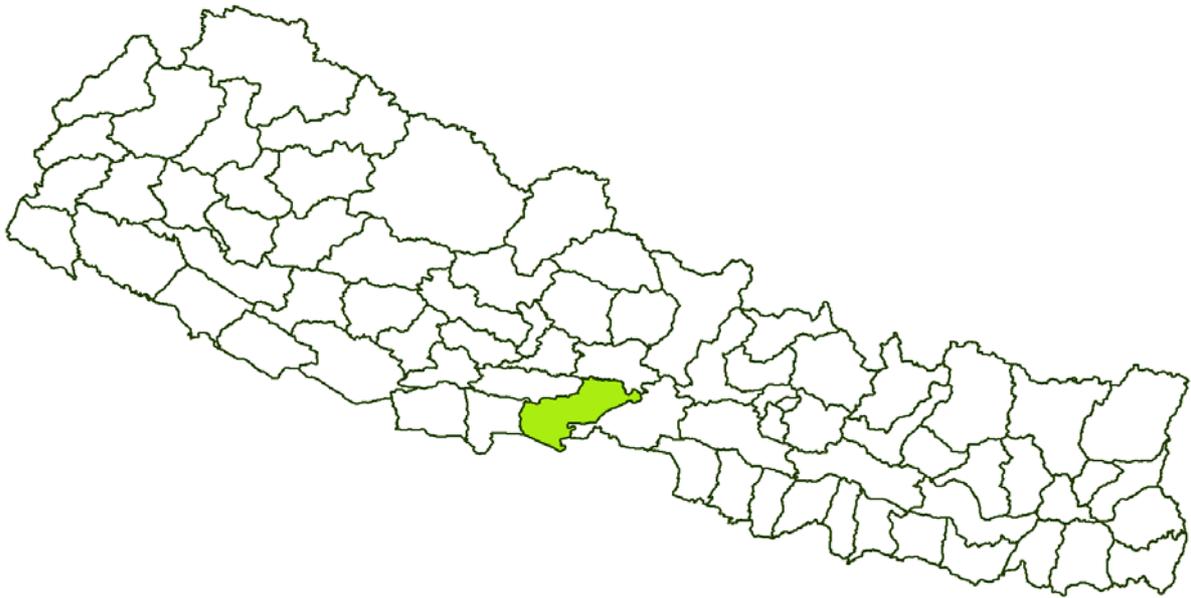
- Support for research method design and implementation for MSc students
- Knowledge-transfer of new field data collection methods (for both Southampton and Nepal students)
- Complete academic field data collection for establishing new research base in Nepal
- Collaboration with universities
- Understanding the research ethos of UK and Nepal academia
- Establishing links between NGOs, influential scientific organisations and the academic institutions

## 2. Background

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The programme was conducted between researchers from the University of Southampton and IAAS. Southampton students stayed at the guesthouse on IAAS campus in Rampur, Chitwan District, and field-based research was conducted in the Nawalparasi district, with accommodation provided free-of-charge by host families in the communities visited. The main field location that was studied was Bhandare (as this is where the Glacier Trust has research interests).

### 2.1 Location



Nepal indicating the location of the Nawalparasi District



Bhandare village

## 2.2 Participants

Brief information on the researchers involved in the knowledge-transfer programme.

### *Dr Ellie Biggs*

Lecturer in GIS and environmental applications with a key interest in hydroclimatology. Ellie's research background is in the spatiotemporal analysis of climate change data with a focus on hydrological extremes and rural catchment modelling.

### *Gary Watmough*

PhD student investigating the spatial relationships between socioeconomic variables and satellite remotely sensed environmental factors in Assam, India. Gary also has a MSc degree in remote sensing and spatial analysis.

### *Mohan Khatiwada*

MSc student studying the production and productivity of rapeseed by investigating the optimum sowing date of crops under changing climatic conditions, and to increase rapeseed growers' income accordingly.

### *Parbati Joshi*

MSc student studying the change in agricultural production and farming systems and climatic change, in the Magar communities in the Nawalparasi district, through farmers' perceptions, crop productivity and time-series analysis of climate data.

### **3. Knowledge Transfer**

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The following details the methods and ideas that were exchanged during the time in Nepal.

#### **3.1 Field Study Methods**

- A new social survey method called the Dephi technique was introduced to the MSc students
- The principles of GPS and how to collect data were described and demonstrated to the MSc students in the field; they then used their knowledge to collect their own data independently
- Local level knowledge and understanding was provided by MSc students to Southampton students
- Questionnaire design feedback was provided to MSc students
- Development and understanding of new research ideas and future research topics were discussed between all students
- MSc were encouraged to observe and understand the wider implications of their research findings
- Ensured research aims of the Glacier Trust were met

#### **3.2 Data Processing**

- Google Earth was used as a GIS tool for the MSc to learn to use, to display their data and produce map outputs
- Spatial mapping and spatial relationships between variables as concepts were explained to MSc students
- GIS principles and use with ArcGIS software were provided
- Directions for further spatial data analysis was provided to the MSc students so they could complete additional spatial analysis once research has been databased
- Examples of data analysis using relevant case studies (from Southampton student's previous/current research) were provided to explain ideas and concepts
- Southampton students gained invaluable knowledge about relationships between desk-based data resources and field collated data

## 4. Successful Outcomes

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All of the aims of the programme were met and this is evident from the outcomes achieved.

- A detailed knowledge of a new social survey technique was provided to the MSc students as a way to focus research and allow local opinion to be understood and translated as a group consensus
- Maps were produced for each study site location to provide both a general overview and detailed mapping of household data. This was in relation to useful secondary data such as water resources and the infrastructure network.
- Literature from other sources (Southampton students, ICIMOD etc.) was provided to contextualise MSc research findings and relate to the wider significance
- The comparative nature of spatial analysis was explained; the comparison of different villages and the relevance to location
- Southampton students developed an in-depth understanding of local knowledge from both community inhabitants and MSc students
- Successful exploration of watershed area to understand preconceptions of relationships
- Comparison made between Nepal and own research (e.g. Assam, India) to extend the wider significance of our research and determine how methods could be applied in Nepal and what alternative solutions to similar/different problems could be formulated
- Climate change was identified as an extremely significant issue in Nawalparasi and needs further study; there is not a lot of academic research here
- IAAS gained status as independent institution and is likely to receive more funding in the future, with a growing international reputation. It is essential for Southampton to maintain collaborations to help IAAS and continue developing international links

## 5. Issues encountered

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There were some problems encountered during the exchange programme in Nepal. Although most of these were overcome they are listed for future consideration should future students from Southampton visit Nepal. The issues are reflected upon in the recommendations section.

- Electricity is only available on campus 12 hours per day (with random block allocations)
- Internet resources are only available free in the faculty (other option is cyber cafe on campus but have to pay and cannot connect laptops) and this is with a very slow internet connection. Therefore, it was impossible to download remote sensing and GIS data from the internet and streaming imagery was a very slow process
- The faculty can only be accessed 10am-5pm each day which limits internet time
- There are insufficient computing facilities on campus to undertake spatial analysis, especially using GIS (no software due to expensive licence and no hardware capable of running the software)
- Organisation of activities was difficult without an IAAS academic permanently there to assist with planning
- When conducting field research it would have been useful to have a translator with very competent English as well as the MSc students present – some discussions were lost in translation
- Forward planning, commitment of time to the project and the logistics of the programme were stated prior to arrival but due to cultural differences these were not adhered to and this hindered effective time management

## 6. Recommendations

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These recommendations are provided as a guideline to improve the smooth running of the knowledge-exchange programme in future years and to provide suggestions to make it more successful for all institutions involved.

- Continue to direct funding to the students through Practical Action but implement research through HICODEF, who can act as a local contact and knowledge-rich resources in the Nawalparasi district
- Either (i) base Southampton students with MSc students at Practical Action HQ (in Kathmandu) for data analysis so computing/internet facilities are sufficient or (ii) implement a 2-year exchange programme whereby Southampton students visit Nepal at the beginning of the MSc programme to assist with research collection design/collect any of their own data, and then IAAS students visit the UK once they have completed all data collection so they can perform sufficient and detailed spatial data analysis. The latter recommendation also allows for both institutions to see how the other operates and experience the difference cultures and research customs
- Needs detailed planning of program aims and logistics pre-departure to ensure effective time management
- We recommend a 3-week program will be sufficient in future years
- MSc students needs to be very competent in English and this should be a prerequisite for selection
- Need access to a translator with very good English and ideally a scientific background to support MSc students (perhaps HICODEF can provide this in the future)
- Suggested future funding costs for this programme are £1000 per Southampton student sent to Nepal (see Appendix for detailed breakdown of expenses) which will cover a trip during the Easter vacation. This requires flights to be booked at least 4-months in advance, and will cover all transportation, accommodation and food costs at a basic living level. If the 2-year programme was implemented then using resources in the UK for 1-week would probably be sufficient and similar costs per students should be sufficient for this time period (a full costing would need to be done to confirm this)
- Collaboration with IAAS should continue, but the programme needs to be organised through Practical Action to ensure better coordination and access to resources
- Ideally, a PhD student from Southampton who needs to undertake research in Nepal as part of their doctoral research would be the best candidate. It might be worth involved the Biology department somehow to provide academic expertise in topics of crop genetics and food security which link well with IAAS research areas
- It is essential for Southampton students to take laptops to work on in Nepal
- With the exchange becoming more importance from university independence, it is essential that if not external funding is found fund this exchange the Glacier Trust should put the money up, as maintaining the collaboration will be an invaluable investment for the future
- Developing a website to advertise the exchange would help attract potential investors

- For future locations to conduct the research so that the Glacier Trust achieve their aims there should be discussions with HICODEF as they are the local NGO experts
- It would be better for students to be based at IAAS (or in Narayangargh at a hotel with a generator for a more constant electric supply) for the duration of the fieldwork and then in Kathmandu (or following the two-year exchange programme suggestion, Southampton) for data analysis

## 7. Summary

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Overall, the knowledge-exchange programme was a tremendous success and the Southampton researchers thoroughly recommend, and encourage, that the collaborations are maintained for the future with the opportunity to provide an exchange to students next year in 2011. IAAS MSc students do some very advanced field studies and there are a lot of resources available at the university to implement this research. However, resources for technical data analysis using computers are inadequate for demonstrating and utilising remote sensing and GIS techniques. This may improve with the independence of the university and possible increased government funding, yet this is likely to take time. We feel that there is real value in providing an exchange both ways. By visiting Nepal to collect primary data a lot of knowledge was gained about local-level problems, how academia is structured and how the process of investment is operated within Nepal. It is our belief that there needs to be ongoing (and strengthened) collaboration between academic institutions and NGOs, as academics are doing a great deal of important and relevant research, yet the NGOs are the institutions with the power and capital to invest in change for the communities. If research remains within the Nawalparasi District, involving HICODEF at a more integrated level would certainly be advantageous for them as a small NGO, IAAS and all international partners.

## 8. Appendices

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### 8.1 Photos



Parbati conducting questionnaires in Jahlybas



Ellie teaching Mohan, Deepak (BSc data collection helper) and Parbati how to use a GPS



Mohan conducting a Delhi survey in Girubari



Conducting a Dephi survey in Bhandare



Gary discussing the spatial analysis of data with Parbati and Mohan in the faculty building