

Darwin Initiative Annual Report

Darwin Project Information

Project Ref Number	162/13/033
Project Title	Combating alien invasive plants threatening the East Usambara mountains in Tanzania
Country(ies)	Tanzania
UK Contract Holder Institution	Centre for Ecology & Hydrology & Tropical Biology Association
UK Partner Institution(s)	Centre for Ecology & Hydrology & Tropical Biology Association
Host country Partner Institution(s)	Amani Nature Reserve & Sokoine University of Agriculture
Darwin Grant Value	£153,120
Start/End dates of Project	01/04/05 to 31/03/08
Reporting period (1 Apr 200x to 31 Mar 200y) and annual report number (1,2,3..)	01/04/06 to 31/03/07 Annual Report 2
Project Leader Name	Philip Hulme
Project website	http://www.usambara.ac.uk
Author(s), date	Philip Hulme & Rosie Trevelyan

1. Project Background

The East Usambara Mountains are one of the most important areas within the Eastern Arc Mountain Forests of Tanzania, a global biodiversity hotspot internationally recognised as a conservation priority due to the exceptional concentrations of endemic species. While the pressures from deforestation have receded following the establishment of the Amani Nature Reserve in 1997, biodiversity continues to be endangered by the rapid spread of invasive alien plants (IAP). Many of the tropic's most pernicious IAP including herbs (e.g. *Clidemia hirta*), shrubs (e.g. *Lantana camara*), palms (e.g. *Elaeis guineensis*) and trees (e.g. *Psidium cattleianum*), have been introduced to the Amani Botanic Garden over the last century. Subsequently, many have spread widely in the East Usambaras where they have replaced native species and altered ecosystem processes. At present the extent of the invasions and their environmental consequences remain unquantified but experience from other tropical forest ecosystems indicates the potential for substantial impacts. The dynamic nature of these invasions implies that action must be undertaken now if cost effective management strategies are to stand any hope of safeguarding biodiversity

2. Project Partnerships

Project partnerships: The second year has the project build on partnerships considerably. Training of two MSc students Mr Ezekiel Edward and Mr John Richard has led to the involvement of two Professors from Sokoine University of Agriculture Prof Munishi and Prof. Madoffe. Detailed discussion have been held to outline and finalise the topics for research and timetable of activities. The training of two researchers in plant invasion ecology comprises a significant contribution in the capacity building within this area of expertise in SUA. The MSc students have presented their work to academic staff and other students, raising both the profile of the Darwin project as well as highlighting this particular ecological concern. Both of the University Professors and the two MSc students participated in our Training workshop on mapping invasive species. The training course was a key instrument in building capacity within the Amani Nature Reserve as several staff also took part in the training. The success of the training course and built stronger links between the UK partners and the Amani Nature Reserve and as a result greater awareness in sampling invasive species, methods of mapping, monitoring and survey have been disseminated. These skills can be applied to a wide range of biodiversity issues in the Amani Nature Reserve. The Training Course provided the opportunity of bringing together several organisations e.g. TAFORI, TAWIRI, ANR, SUA etc. and helped identify synergies and the potential for new partnerships among these national bodies. The project has also built links with international organisations working in the Easter Arc forests e.g. WWF and the Criticla Ecosystem Partnership Fund.

3. Project progress

3.1 Progress in carrying out project activities

Progress to date has closely followed the agreed baseline timetable and included: running a workshop on invasive species mapping and monitoring, launching two MSc research projects, completing the first phase of PhD data collection and establishing a detailed project website. The “Invasive plants in tropical forest ecosystems: An introduction to mapping and monitoring biological invasions” workshop was organised in Amani Nature Reserve between 12th -16th June 2006. The aim of the workshop is to instruct Tanzanian conservation biologists up to date techniques in the understanding and management of invasive alien plant species. Specifically, the workshop:

- taught practical skills in surveys & monitoring,
- provided guidance in the use of GPS and mapping techniques,
- instructed attendees in the use of software for analysis of distribution data,
- boosted attendees’ understanding of invasive species ecology and management
- built institutional capacity as new skills are transferred after the workshop
- catalysed links between forest biologists nationally and internationally

Prior to the workshop the UK partners spent considerable time preparing course materials, advertising the course, selecting candidates and planning the logistics. The course was led by the UK partners in association with Mr Corodius Sawe, Conservator of Amani Nature Reserve; Prof Seif Madoffe and Dr P. Munishi, Sokoine University of Agriculture; and Mr Ahmed Mndolwa, Tanzania Forest Research Institute. The workshop comprised a series of lectures, seminars, group discussions and field exercises. Fifteen participants were selected for the course from a total list of over 30 applicants. All trainees were young, professional researchers working in conservation issues in Tanzania. The organisations represented included: Sokoine University of Agriculture, College of African Wildlife Management-Mweka, Tanzania Forest Research Institute, Wildlife Conservation Society of Tanzania, Tanzania Wildlife Research Institute, Forest and Beekeeping Division, Tanzania Forest Conservation Group, and the University of Dar es Salaam. The course covered such diverse topics as using GPS, reading and creating maps, field survey techniques, GIS, and invasive plant ecology. The course was particularly well received and has established a network of likeminded researchers keen to progress future work on invasive plants in Tanzania. Funds were made available for workshop participants to produce posters outlining the impact and risk of invasive species in Tanzania.

Two MSc research projects were initiated this autumn. Mr John Richard will be addressing “Status of the Panama rubber (*Castilla elastica*) in Amani Nature Reserve: Spread and Management options” while Mr Ezekiel Edward will conduct a study of “Population status and spread of *Cordia alliodora* in Amani Nature Reserve, Tanzania”. These projects were discussed in the field with both research students and their Tanzanian supervisors, draft research proposals were prepared, assessed by Sokoine University and have now been approved. The UK PhD student, Mr Wayne Dawson, successfully completed his second field season in Amani and presented early findings at the British Ecological Society conference in early September 2006. Details of all three of these projects as well as more general information on the East Usambaras, Amani Botanical Garden, plant invasions (including species descriptions) and the Darwin Initiative project can be found at the newly established project webpage: www.usambara.ceh.ac.uk.

3.2 Progress towards Project Outputs

The project is progressing well towards its outputs. We had hoped to organise two training workshops in 2006 but this proved difficult with regard to staff and location availability. The next workshop on risk assessment is scheduled in May 2007. Drafts of the MSc dissertations have been seen and the PhD student is making good progress, having submitted his first peer reviewed paper. The difficulties in transferring funds between years may mean that a third training workshop may be difficult to fund in 2007. This situation is out of our direct control and the Darwin Initiative were forewarned that this would be a consequence of not permitting a transfer of funds into the final year of the project.

3.3 Standard Output Measures

Table 1 Project Standard Output Measures

Code No.	Description	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	TOTAL
Established codes						
8	Visit to Tanzania by 2 UK project staff (number of weeks)	6	3			
7	Website providing guidance on problems of invasive plants	1	-			
4C	Tanzanians trained on TBA Tropical Ecology course	3	2			
4D	Four weeks training for two Tanzanians on TBA course	4	4			
6A	Two Tanzanians initiate MSc studies	2				
6B	Six months training to two MSc students	2	2			
8	Three week visit to Tanzania by 2 UK project staff	-				
10	'Exotic Plant Species in East Usambaras' identification guide	-	1			
10	Mapping/Monitoring in Biological Invasions' workbook and guide	-	1			
4C	Ten Tanzanians trained in "Mapping in Biological Invasions' course	-	10			
4D	One weeks training for ten Tanzanians in Mapping/Monitoring	-	1			
14B	Paper presented at BES Annual Meeting	-	1			
11B	One paper submitted to peer reviewed journals	-	1			

Table 2 Publications

Type *	Detail	Publishers	Available from	Cost £
(eg journals, manual, CDs)	(title, author, year)	(name, city)	(eg contact address, website)	
Journal	Dawson W, Mndolwa AS, Burslem DFRP & Hulme PE Assessing the risks of plant invasions arising from collections in tropical botanical gardens.	Biodiversity & Conservation	submitted	

manual	Species description		www.usambara.ceh.ac .uk	

3.4 Progress towards the project purpose and outcomes

The purpose level assumptions hold true in that awareness of invasive species issues has been significantly heightened by this project and the indicators adequate towards measuring outcomes.

3.5 Progress towards impact on biodiversity, sustainable use or equitable sharing of biodiversity benefits

Only two years into the project and the long time scales involved in managing invasions makes this question less pertinent. It is fairly certain that within the lifetime of this project no discernible positive impact on biodiversity will be seen but the capacity to address invasive aliens pests in this region will have been improved.

4. Monitoring, evaluation and lessons

Progress is monitored through discussions with stakeholder, assessing changes in perceptions and awareness among workshop participants, in the progress made by MSc students towards their MSc degrees.

5. Actions taken in response to previous reviews (if applicable)

No issues raised

6. Other comments on progress not covered elsewhere

None

7. Sustainability

The third year should see the fruition of our current investment in training and progress towards a sustainable invasive plant management strategy for the Amani Nature Reserve

8. Dissemination

There was widespread advertising of the training workshop through the major institutions in Tanzania.

Annex 1 Report of progress and achievements against Logical Framework for Financial Year: 2006/07

Project summary	Measurable Indicators	Progress and Achievements April 2006 - March 2007	Actions required/planned for next period
<p>Goal: To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but constrained in resources to achieve</p> <p>The conservation of biological diversity,</p> <p>The sustainable use of its components, and</p> <p>The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources</p>		<p>Increased appreciation of the risks and impacts of invasive plant species on forest biodiversity</p>	<p>(do not fill not applicable)</p>
<p>Purpose To empower researchers in the Tanzanian Forestry Research Institute, East Usambara Conservation & Management Program and Sokoine & Dar Es Salaam Universities to map, monitor & manage invasive alien plants in the Eastern Arc Mountains so as to safeguard globally important biodiversity and satisfy Tanzania's CBD obligations</p>	<p><i>Distribution maps of IAP species abundance in the main forest areas of the East Usambaras used to direct IAP control programme.</i></p> <p><i>Invasion models for priority problem species developed.</i></p> <p><i>Evidence of invasive plant species eradication and/or control.</i></p>		<p><i>Detailed mapping being undertaken in 2007</i></p> <p>Prioritisation training in 2007 workshop</p> <p>Not feasible due to resistance from ANR against chemical control</p>
<p>Output1 Four partner institutions able to monitor and manage the long term eradication of IAP in the East Usambaras</p>	<p><i>A minimum of 10 staff from 4 partner institutions trained in invasion ecology and IAP management</i></p>	<p>Achieved</p>	
<p>Activity 1.1 Yrs1-3: Invasion ecology training workshop: Invasive Species in East Africa workshop</p>			<p><i>First workshop completed, second workshop due soon, plans being made for final workshop</i></p>
<p>Output 2. Output 2 IAP identification guides produced</p>	<p><i>Guidelines published, 100+ copies produced/distributed as hardcopies</i></p>	<p>Achieved</p>	

	<i>and on web</i>	
Activity 2.1. Guidelines published, 100+ copies produced/distributed as hardcopies and on web		Material available on web
Output 3. etc, IAP management strategy in place	Strategy developed in collaboration with UK and Tanzanian staff	Politically sensitive, recommendation will be made to ANR but no formal management plan requested
Activity 3.1. etc Initial awareness through species prioritisation		Plans for this to be developed in 2007
Output 4 Publications	2+ newspaper articles, 4+ journal papers, workshop proceedings published	In progress
Activity 4.1. etc Scientific publications drafted		Paper submitted to the journal Biodiversity and Conservation

Annex 2 *Project's full current logframe*

<i>Figure 1 Project summary</i>	<i>Figure 2 Measurable indicators</i>	<i>Figure 3 Means of verification</i>	<i>Figure 4 Important assumptions</i>
<p><i>Figure 5 Goal:</i></p> <p>To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but poor in resources to achieve the conservation of biological diversity, the sustainable use of its components, and</p>			
<p><i>Figure 6 Purpose</i></p> <p>To empower researchers in the Tanzanian Forestry Research Institute, East Usambara Conservation & Management Program and Sokoine & Dar Es Salaam Universities to map, monitor & manage invasive alien plants in the Eastern Arc Mountains so as to safeguard globally important biodiversity and satisfy Tanzania's</p>	<p>Distribution maps of IAP species abundance in the main forest areas of the East Usambaras used to direct IAP control programme.</p> <p>Invasion models for priority problem species developed.</p> <p>Evidence of invasive plant species eradication and/or control.</p>	<p>IAP identification guides in use</p> <p>Invasion models for priority problem species tested.</p> <p>Management strategies put in practice in the field</p> <p>Results published in peer reviewed journals and on website</p>	<p>Researchers integrate new knowledge into future management of IAP in East Usambara forests</p> <p>Project resource at least match scale of IAP problem in order to assess scope for control.</p> <p>Partners attract additional support to continue control strategies following project completion.</p>
<p><i>Figure 7 Outputs</i></p> <p>Four partner institutions able to monitor and manage the long term eradication of IAP in the East Usambaras</p> <p>IAP identification guides produced</p> <p>IAP management strategy in place</p> <p>Publications</p>	<p>A minimum of 10 staff from 4 partner institutions trained in invasion ecology and IAP management</p> <p>Guidelines published, 100+ copies produced/distributed as hardcopies and on web</p> <p>Strategy developed in collaboration with UK and Tanzanian staff</p> <p>2+ newspaper articles, 4+</p>	<p>IAP distribution database</p> <p>Participant attendance and assessment records</p> <p>2 copies sent to Darwin Initiative</p> <p>IAP management strategy endorsed by local NGOs and published</p> <p>Copies of all publications sent to Darwin Initiative</p>	<p>A high % of participants complete training, pass assessments and continue present employment.</p> <p>Publisher and distribution method identified</p> <p>Cooperation among partner organisations & availability of resources</p> <p>Sufficient media interest</p>
<p><i>Figure 8 Activities</i></p> <p>Workshops</p> <p>Field Research Programme</p>	<p>Activity Milestones (Summary of Project Implementation Timetable)</p> <p>Yrs1-3: Annual project workshops (1wk July); Yr1: Start-up workshop with project team to establish priorities, methodologies and procedures for data collation and to develop the tailor-made training programmes (1wk Aug 03); Invasion ecology training workshop (2 wks Oct 03); Yr 2: Statistics workshop (1wk Aug 04); Yr 3: Invasive Species in East Africa workshop (1wk Mar 06) proceedings of which produced 6wks afterwards</p> <p>Collate details of IAP plantation, existing vegetation survey data and EUCAMP GIS database (Sept 03); Protocols for field surveys and target species produced and agreed (Oct 03). Field surveys completed (Aug 04); Impact studies completed (July 05); Control studies completed (Mar 06)</p>		

Manual Development	Collation of information on surveys, impact studies and control trials. Draft management manual produced (Dec 05). Publication (Mar 06)
Publicity Material	Newspaper and radio coverage (yrs 1-3), project information in local NGO publications (various dates), IAP identification guides published (yr 2); 2 scientific publications drafted (in each of yrs 2& 3), workshop proceedings published (May 06)

