

# Darwin Initiative Annual Report

## Darwin Project Information

Project Ref Number	15-010
Project Title	Buffer Zone Restoration and Development in Knuckles Forest Reserve
Country(ies)	Sri Lanka
UK Contract Holder Institution	University of Aberdeen
UK Partner Institution(s)	Centre for Ecology and Hydrology, Banchory (CEH)
Host country Partner Institution(s)	University of Peradeniya (UP)
Darwin Grant Value	£225,068
Start/End dates of Project	1 July 2006 / 30 June 2009
Reporting period and annual report number	1 April 2007 to 31 March 2008 Annual Report Number 2
Project Leader Name	Michelle A Pinard
Project website	<a href="http://www.abdn.ac.uk/knuckles">www.abdn.ac.uk/knuckles</a>
Author(s), date	Pinard, 15 May 2008

## 1. Project Background

The Knuckles Forest Reserve (KFR), located in the central uplands of Sri Lanka (Appendix Location Map), is one of South Asia's premier sites for conservation of montane tropical forest habitats. It lies within the biodiversity hotspot that extends from the Western Ghats of India into Southwest Sri Lanka and has been proposed for MAB Reserve and World Heritage Site status. The core zone of KFR contains 6000 ha of natural montane forest within an altitudinal range of 200 -1900 m. The buffer zone (20,000 ha) is a mosaic of anthropogenically derived vegetation types that vary in habitat quality, including degraded grasslands maintained by anthropogenic fire and livestock grazing, plantations of tea and *Pinus caribaea*, and natural forest fragments which have, in many cases, been under-planted with Cardamom. The threats to the sensitive ecosystems in the core zone of the KFR are derived from human-induced changes occurring within the buffer zone, such as encroachment of fire, invasion of *P. caribaea* and other plant species, illegal cardamom cultivation, hunting and firewood collection, and forest clearance for agriculture. Understanding and reversing these drivers of landscape change is an essential prerequisite for conservation of the core zone of the KFR.

The aim of the project is to enhance the sustainable conservation of biological diversity and ecosystem services in the Knuckles Forest Reserve (KFR), Sri Lanka, by addressing the main threats to environmental protection through the development of options for buffer zone management that improve the livelihoods of local communities and the restoration of ecosystem functions.

This is the second annual report and it follows a mid-term review that took place at the end of 2007.

## 2. Project Partnerships

UA and UP are working in partnership as the main implementing agencies of the project. A Research Assistant from the UA, Mr Balram Dhakal, is based at UP and supports Pinard and Gunatilleke with project administration and coordination. Over the past year the partnership has been positive and productive. While the first year involved planning and establishing activities, structuring a management system and providing training, the second year has focused on moving forward with activities, reviewing our progress, evaluating opportunities to develop the project further while maintaining training and progress with activities. Our achievements are outlined in the various sections of the reports below. Our partnership with CEH, Banchory, has principally been through one of the research components of the project, and the provision of training and supervision of a Sri Lankan MPhil student working on invasive pines in the buffer zone. The functional partnership is with Phil Hulme, who relocated to New Zealand at the beginning of 2007. This move has not been detrimental to the work in that Hulme continues to provide support, in terms of scientific advice, to the team members working on pine invasion.

We are working with a number of other organizations within Sri Lanka in various capacities. The Forest Department is an important stakeholder in Knuckles as it holds responsibility for the management of the reserve. During this year we have had several formal meetings and several informal meetings with individuals at various levels in the FD, for strategic planning purposes and for more specific planning of activities. Representatives from the FD participated in the mid-term review. We have also held planning

meetings and discussions with IUCN, both with individuals in the national office and working in the Knuckles area. Gunatileke attends meetings of the steering committee for the Forest Governance Project in Knuckles.

This year we have developed working partnerships with several organizations that implement rural development in the Knuckles Region. In our community interventions we have been working alongside the national programme of *Jathika Sawiya* which is a NGO that supports sustainable agriculture. Representatives from that organization have worked alongside our team in community development, in terms of identifying training needs for farmers and in implementing training (e.g., composting and home garden improvements). Wickramasinghe (UP team member) joined their Board of Governors this year.

We are also working with an organization that supports small-scale farmers to move into organic production (Bio Foods (Pvt) Ltd). We are collaborating on an assessment of farming practice and farmer motivation in the villages of Kalugala, Udailaka and Kosdanda, to determine whether or not it is feasible to promote organic farming in those areas. Several members of the team met with the Director of BioFoods in March 2008 to discuss shared interests and to identify potential avenues for collaboration. We are working with the Plantation Human Development Trust (PHDT), a state-funded social development programme targeting estate workers, in a participatory appraisal of sustainable development priorities in two estates. The team attended a formal meeting with PHDT in December 2007 where we introduced ourselves and our project to their staff, and were introduced to the trust and their priorities. Subsequent to that meeting, Wickramasinghe has entered discussions to finalize a plan to collaborate on the replication of our community empowerment programme.

We are working cooperatively with private enterprise. Midland State Plantation and Finlays provided sites for research and some infrastructural support. Individuals from Midlands and Finlays participated in the Mid-term Review. Amongst the private estates that we are working with, priorities for degraded lands differ. For some, the priority for the non-tea lands is fuelwood plantations to power their factories; native species are unlikely to provide the same output as exotics for this use. For others, there is interest in utilising some of these lands for community development projects for the estate workers. The discussions with the PHDT mentioned above are exploring the possibilities with two estates.

One recommendation that came from the Mid-term review was that the project needed more regular communication between the project and interested, relevant stakeholders. We have subsequently initiated an e-newsletter that will be distributed quarterly (see Appendix NEWSLETTER)

#### **Other Collaboration:**

A member of the UP staff, Professor Pushpa Wijekoon (Statistics and Computer Science), was nominated and participated in training course in the use of R, a powerful statistical software package that is very relevant to our work. The training course was offered by a Darwin Initiative Project in Malaysia, Biodiversity and ecosystem functioning: Building research capacity in SE Asia (PIs, Glen Reynolds and Andy Hector). The course was held at the Danum Valley Field Centre, Sabah, Malaysia. Professor Wijekoon found the course to be very relevant to her teaching at UP and she has revised her courses to undergraduates to include both Minitab and R. She is hoping to conduct similar courses for graduate students and academic staff members involved in DI and other projects in biology. She has held the first of a series of short training courses for staff in the Faculty of Science on the use of R.

### **3. Project progress**

#### **3.1 Progress in carrying out project activities**

During and subsequent to the project review, we revised our logframe and the associated milestones that were relevant to tracking progress towards outputs (Appendix LOGFRAME, Appendix MILESTONES).

#### **Rehabilitation Options**

Work on the research activities to inform the development of restoration and rehabilitation options has progressed smoothly, as planned during the year and as presented in the revised milestones. The installation of the experiments in the degraded grasslands was completed and monitoring is ongoing at the three sites. The objective of the new experiments is to examine the role of root competition and soil nutrient limitation in the inhibition of tree development in degraded grasslands. Additionally, plots from an experiment established in 2002 in Riverston were also maintained to provide longer-term data. The results from this work indicate that seed availability is a constraint for tree establishment in the grasslands, high winds are probably responsible for restricting seed fall in the open areas. Forest fragments, however, are beneficial in that the edges are associated with higher levels of seed deposition. It may be that the forest serves to slow wind speeds, allowing seed to drop at the edges. Additionally, birds may be perching at the edges of fragments, bringing in seed with their droppings. The manipulation experiment with scarification of soil near the forest edge was effective at increasing tree establishment rates. During the next 6 months we will be developing dissemination materials to publicize

the results of the study. Preliminary results from the new experiments will be presented in a report form to the thesis committee in June 2008 by Mr Danuska Warnapura Wickramarathna.

Fieldwork for the pinus invasion study was completed during the year and dissemination and outreach activities were initiated. The specific activities completed were as follows: data collection of pine spread into adjoining habitats was completed; study plantations were mapped and a GIS developed; pine densities in each habitat type was calculated; seed germination tests were conducted to compare viability in plantation and natural grown pine trees; cross-sections were taken from pine stumps in order to detect fire frequencies. One objective for the research during this year was to examine the interactions between pine invasiveness and fire history. Information on fires was collected through oral histories and cores were taken from tree stems in an attempt to corroborate the oral histories. However, coring proved ineffective for consistently sampling fire scars. Some time was spent exploring the potential of using stem cross-sections and dendrochronology, however this also was not particularly successful. The research results related to adjacent habitat types was more successful and indicated that grasses differ in terms of their vulnerability to invasion by pine, with open turf grasses more vulnerable than the dense grasses. Mr Anuradha Madawattae has been supported by Dr Kushan Tennakkoon and Dr Phil Hulme (formerly, CEH Banchory).

In order to determine the effects of cardamom underplanted in natural forest on the composition and structure of the forest, an extensive survey of vegetation was conducted in three sites in forest with and without cardamom. A total of 60 plots (20 x 20 m) were installed. During the year, the data from this survey have been analysed and the preliminary results presented at a regional conference of the Association for Tropical Biology and Conservation in Kuching in April 2008. An objective for the next six months is to prepare a manuscript and relevant dissemination materials. Mr Balram Dhakal has been supported by Prof Gunatilleke and Drs Pinard and Burslem.

An experiment to examine the effectiveness of treatments to eradicate cardamom and restore forests was installed in Riverston, on the Midland State Plantation. Pre-treatment measurements were made in Dec 2007, the three treatments were imposed in March 2008 and the first measurements initiated thereafter.

Agroforestry and conservation farming innovations were initiated the mosaic associated with three villages, Udailluka, Kosdanda and Kalugala. A series of participatory appraisal and planning meetings with members of the communities were held to identify relevant development activities that could contribute to conservation. Three innovations were initiated, a riparian conservation, homegarden development and a highland farming development. The innovations involve a small number of farmers that were identified by the community to develop models. The intention is that once the models are in place, farmers will support each other in replicating and adapting the models to other sites within the mosaic. Miss Anusha Prasangani Indra Kumari Abeyaardana is working with Prof Anoja Wickramasinghe.

The riparian conservation activity was started in Sept 2007 with technical assistance from a local agricultural officer. Our project provided plant material to the project, suitable for stabilizing the soil along the stream, as well as providing the landowner with a useful crop (i.e., pepper, arecanut, garcinia, yellow bamboo, mee and nutmeg). The farmers involved have cultivated kitul, cardamom, green bamboo and arecanut. During Dec 07 and Jan 08, additional cardamom hedges were planted to try to reduce soil erosion.

The homegarden development site is intended as a model for using improved forest and fruit-producing species in the homegarden, while developing hedges along contour lines to improve soil conservation. The project contributed a number of pepper vines, coffee plants and other species, while the farmer contributed a number of plants that were obtained from the village areas.

The highland development is intended as a mixed cropping model, that includes forest timber species as well as high value crop species. The project contributed 200 plants and is supporting the nursery activities for cultivating the additional plants of forest species required.

Three farmers, one in each village, have developed nurseries on their land to support the conservation farming innovations. The project has provided polythene sheets and bags and the farmers are supplying the labour and land. About 800 plants were provided by the project during the year for the three development sites, additionally, plants were distributed to all members of the communities during planning meetings.

### **Capacity building**

Four students (3 MPhil, 1 PhD) received hands on training in research methods and analysis during the year from their local and UK-based supervisors. Each is following their own personal development plan, as required by their institutions and reporting regularly to their supervisory team. Progress is monitored formally through thesis committee meetings (for MPhil students) and 6 monthly assessments (for the PhD student).

Five team members from UP were trained in the use of GIS by participating in six day residential courses conducted by the Post Graduate Institute of Science at U Peradeniya.

Technical training was provided to farmers in Kalugala, Udailluka and Kosdanda in the preparation of green manure and composting. As part of the specific innovations described above, a small group of farmers have received training in contour farming and hedge development in home gardens.

### **Empowering Communities**

Our work in Kosdanda, Kalugala and Udailluka has been participatory and empowering throughout. Our approach in working with the members of the community is as facilitators not implementers. The members of the community are implementing the projects themselves, with the support of local service delivery agencies. Our project has contributed by bringing representatives of these agencies into the village to discuss priorities with the farmers. Additionally, we have sometimes assisted in resolving conflicts, promoting teamwork and farmer-to-farmer sharing of experience.

This year our activities were focused on planning and supporting the implementation of models. Next year we will expand our activities by working in two new sites and by developing additional partnerships at these new sites. Another priority for the next year is to consolidate and document the approach taken and lessons learned in order to share experiences of community development with other organizations working in the Knuckles region.

### **Partnerships**

We made good progress in developing working partnerships with service provision agencies and other buffer zone development groups this year. In addition to our partnerships with the communities described above, we have been working alongside a local agricultural officer from the Sustainable Agricultural Research and Development Institute and local representatives of the Nation Building Society (*Jathika Sawiya*) in participatory planning and implementation of the conservation farming innovations.

In December 07, the project team had a formal meeting with the Plantation Human Development Trust, in order to familiarize each other with aims and objectives and to identify overlapping interests. In the next project year we agreed that we would pursue collaborative activities related to community development in the estates in Knuckles.

In December 07 we hosted a dinner for various enterprises involved in plantations in the Knuckles region. This meal was mainly for the group to share information about activities and plans for the upcoming year.

In addition, in March 08 we facilitated discussions between Bio Foods and village officers in Kalugala, Kosdanda and Udailluka. This meeting was motivated by a request by the communities to explore the potential to cultivate organic cinnamon in the villages. Bio Foods (Pvt) Ltd. is an export company that is devoted to organic and Fair Trade produce from Sri Lanka. They work through the farmers' group called SOFA (Small Organic Farmers Association) that produces organic spices and foods under a concept of fair trade. The initial meeting focused on explaining the requirements for organic certification and the procedures used to assess farms and farmers' associations. The local farmers were enthusiastic to proceed with the assessment thus the plan for early in the next project year is to contribute some funding to support the preliminary data collection activities (e.g., determining the number of farmers interested, their current land holding, the current use of chemical fertilizers or pesticides). The project team also meet with the CEO of Bio Foods at their head office in Kandy in March 08 to discuss the broader aims of the project and areas of overlapping interests.

In addition, we continue to work with the Forestry Department, IUCN, Midlands State Plantation, Finlays and Eco-Friends as described in the first section of the report.

### **Design and Dissemination Options**

An article was written and published in a local newspaper (Vedusara) explaining the problem of pine invasion in the Knuckles conservation area and the potential for enrichment of pine plantations for conversion to productive agroforestry systems (Appendix NEWSARTICLE). The team wrote and published an Ecotour booklet that provides university students that visit the Knuckles region on expeditions and field courses with information about the local ecological, conservation and sustainable development issues. Two members of the team submitted abstracts to the regional meeting of the Association for Tropical Biology and Conservation to be held in Kuching, Malaysia in April 2008 (Appendix ABSTRACTS). Both were successful in receiving partial funding to attend the conference and an associated training workshop on research methods.

A one day awareness programme about biodiversity was held in Kosgama Vidyalaya (Appendix KOSGAMA), at a school located in the Knuckles area. Prof. I.A.U.N Gunatilleke gave a special lecture to students on pine invasion and enrichment. Additionally, the students and project team members explored the local area, sketched a map of the village forest and digitized it using ArcGIS software.

The first edition of the project newsletter was written and distributed to project stakeholders (Appendix NEWSLETTER).

### 3.2 Progress towards Project Outputs

As a consequence of our Mid-term review our project outputs were revised, as were the indicators. The team is satisfied that our new outputs and indicators are more powerful and appropriate for our project goal than were the previous ones.

#### 1. Options for the rehabilitation of degraded areas developed that are relevant to communities in Knuckles

We have implemented three (riparian conservation, highland agroforestry, homegarden development) and made progress with two (organic cinnamon production, improved stoves) options that were identified and planned in a participatory process with a cluster of three communities. We are using previous experience with enrichment of pines to provide information and training to relevant stakeholders about this option (e.g., planters, forestry college, communities). The experimental grassland and cardamom forest restoration sites will eventually be available for educational purposes and already serve as model sites for the estates.

#### 2. Improved capacity to implement and adapt options over time

We have invested in UP staff and students throughout the year, building capacity and experience. Also the training events and experiences with participatory planning in the communities has improved capacity to implement and adapt options.

#### 3. Communities in Knuckles empowered to articulate their own priorities for livelihood options and to influence decision-making processes in KFR buffer zone

We have made good progress in the cluster of Kalugala, Kosdanda and Udailuka both by facilitating their appraisal, planning and implementation activities but also by creating opportunities for the members of the community to work alongside other implementing agencies. This next year the work will be expanded to at least two other areas.

#### 4. Recommendations for management of buffer zone of KFR

We have gained experience with both specific interventions and also processes for identifying and implementing options. The work during this next year will consolidate our work with broader experience across the Knuckles so that a set of recommendations can be developed based on lessons learned from all the relevant stakeholders and activities in the region.

No significant changes have occurred that influence the assumptions.

### 3.3 Standard Measures

**Table 1 Project Standard Output Measures**

Code No.	Description	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	Total to date	Total planned from application
Established codes							
1	PhD qualification (Nepalese)				1	0	0
2	MPhil degrees (Sri Lankan)			2	1		3
3	GIS training (Sri Lankan, Nepalese)		5				12
4C	Training in research (Sri Lankan)	3	3			6	6
4D	Training in research (Sri Lankan)	4	4			8	8
6A	Community members in conservation farming (Sri Lankan)		80			80	8
6A	Community members in monitoring (Sri Lankan)		12	12		12	0
6B	Community members in conservation		3	4	1	3	8

	farming (Sri Lankan)						
6B	Community members in monitoring (Sri Lankan)		1	1		1	0
7	Training materials in enrichment planting, grassland restoration, community empowerment for buffer zone development			1	3	0	0
8	UK staff in Sri Lanka	12	12	10	2	24	36
9	Recommendations for KFR Buffer zone management plan					1	1
11B	Manuscripts submitted			1	2	2	4
14A	Dissemination workshops			1	1	0	2
14B	Conferences where work is presented		2	2	2	2	2
15B	Local press release		1	2	2	1	3
15A	National press release			2	1	0	3
15C	UK national press release				1	0	3
16A	Project newsletter		1	4	3	1	0
16B	Estimated circulation		25	30	40	25	0
17A	Networks established			1		0	0
17B	Network enhanced				1	0	0
19A	National radio features			1	1	0	1
20	Vehicle to be handed over, 2 computers				1	0	1
22	Model field sites developed	1	3	4	2	4	unspecified
23	Value raised from other sources	35,000	32,000	30,000	7,500	67,000	£103,000

In Table 2, provide full details of all publications and material produced over the last year that can be publicly accessed.

**Table 2 Publications**

Type *	Detail	Publishers	Available from	Cost £
To date there have been no publications				

### 3.4 Progress towards the project purpose and outcomes

The activities on the ground have contributed to the outputs but it is still early to see direct impacts on the project purpose. This year progress was made with the application for World heritage site classification for the Knuckles. The Forestry Department's interest in and awareness of our project has increased during the year but their overall approach to management has not changed substantially.

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

If we are effective in achieving our outputs, the impacts on biodiversity and sustainable development in the buffer zone should be evident within the decade. Currently the work on the ground is of a very small scale, replication and adaptation to local conditions will be required for a substantial impact at the regional level. By working in partnership with implementing agencies and by facilitating networking and sharing of good practice amongst groups working in Knuckles we look forward to our project having an impact at this level.

#### **4. Monitoring, evaluation and lessons**

We were fortunate to undergo a mid-term review in Dec 2007. This review process provided us with a structure for evaluating our progress and considering how we could better use project resources towards achieving the project purpose. We believe that our new set of indicators for the project purpose are appropriate and strong. We are monitoring farmer uptake of innovations within the communities in which we are working and will use the activities and outputs of the network to monitor adoption and empowerment on a larger scale in the Knuckles.

#### **5. Actions taken in response to previous reviews**

Log frame. In last year's annual report and again in the mid-term review we were asked to revise our logframe. We have done this and the reviewers have commented positively on the new logframe.

Project management. The mid-term review recommended greater integration amongst the components of the project and recognized the importance of the team working together effectively. We are holding monthly team meetings to exchange information and ideas. The revised activities and outputs reflect greater integration across the different rehabilitation models.

Building a strong base. The reviewers challenged us to develop more concrete plans for dissemination, which we have done and begun to implement. Further, we are extending our influence on the management of KFR through interactions with other organizations. For example, Prof Gunatilleke is on the steering committee for the IUCN forest governance project and Prof Wickramasinghe now is a board member for the Nation Building Society.

Linkages. The reviewers recommended that the project does not overlook local expertise when planning our activities. Our use of the locally provided GIS and statistics courses is one example of adoption of this recommendation. We have initiated a quarterly newsletter to facilitate information exchange and to strengthen linkages with other stakeholders.

The reviewers recognized the need for the project activities with communities to "upscale" in order to have a greater impact. We are doing this with the activities planned for two new development sites alongside the PHDT.

Information dissemination and communications. As explained under the heading dissemination, we have revised our strategy here. Also, we are taking action to increase the branding of our work. We have printed project t-shirts and caps and will soon distribute these to people working in and alongside the project.

#### **6. Other comments on progress not covered elsewhere**

There is nothing to add here at this point.

#### **7. Sustainability**

The project team has worked well together this year and we continue to look for additional opportunities to extend the work being undertaken in this project. By working closely with service providers like the Nation Building Society, the PHDT, SOFA and *Jathika Sawiya*, the potential for replication and continuation of activities increases. By facilitating a network of organizations working on community development and conservation in the Knuckles region, the impacts of the project should also gain more sustainability. Lessons learned will be compiled, shared and documented. Policy recommendations coming from the workshop in Jan 09 will be presented to policy-makers directly in June 09, again with the intention of creating momentum for their application.

#### **8. Dissemination**

Our dissemination activities have been both informal and formal. We have held meetings and discussions with prominent groups with an interest in the Knuckles (e.g., Planters, PHDT, Bio Foods, FD, IUCN). We have kept a presence in national forestry conferences and regional conservation conferences.

Our dissemination activities were much discussed during the mid-term review and we received helpful suggestions and inspiration from the reviewers. As a consequence of this we are now issuing quarterly newsletters to stakeholders to share information about the project and our partners' work. We are also planning to create a set of pamphlets for disseminating information about each of the different rehabilitation models that we are developing. Plans have been put into place to provide training in rehabilitation of pines to the staff at the forestry college and plantation estate staff.

We have also initiated an outreach programme in the local schools where the project has activities. The first event at Kosgama was successful and plans are in place to replicate in three other areas this next year.

We are more aware of the need to publish in local and national newspapers and are preparing plans for a radio discussion related to issues in the Knuckles region. It is too early to know how motivated the network of buffer zone development organizations may be to continue dissemination activities but it is one of our objectives to assist the network to develop this vision and capacity.

## 9. Project Expenditure

### Project expenditure during the reporting period (Defra Financial Year 01 April to 31 March)

Item	Budget	Expenditure	Balance
Rent, rates, heating, overheads etc			
Office costs			
Travel and subsistence			
Printing			
Conferences, seminars, etc			
Capital items			
Others			
Salaries (specify)			
TOTAL			

At the end of Yr 1, Darwin agreed a shift in expenditure, where 10,000 that was originally allocated to a GIS training course, was reallocated to support community development. This was approved by Darwin Secretariat. The expenditures for the year are very close to the total allocation but the division across categories is presented as different from the original allocation. This deviation is not so much because the spend was different from what was planned but rather that the allocation to categories by the finance office in UA is often different from the allocation used by the project team itself.

## 10. OPTIONAL: Outstanding achievements of your project during the reporting period (300-400 words maximum). This section may be used for publicity purposes

[I agree for ECTF and the Darwin Secretariat to publish the content of this section](#) (please leave this line in to indicate your agreement to use any material you provide here)

In this section you have the chance to let us know about outstanding achievements of your project over the year that you consider worth highlighting to ECTF and the Darwin Secretariat. This could relate to achievements already mentioned in this report, on which you would like to expand further, or achievements that were in addition to the ones planned and deserve particular attention eg in terms of best practice. We may use material from this section for various promotion and dissemination purposes, including e.g. publication in the Defra Annual Report, Darwin promotion material, or on the Darwin website. As we will not always be able to ask projects on an individual basis for their consent to publish the content of this section, please note the above agreement clause.



## Annex 1 Report of progress and achievements against Logical Framework for Financial Year: 2007/08

Project summary	Measurable Indicators	Progress and Achievements April 2007 - March 2008	Actions required/planned for next period
<p><i>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</i></p> <p><i>The conservation of biological diversity,</i></p> <p><i>The sustainable use of its components, and</i></p> <p><i>The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources</i></p>		<p><i>(report on any contribution towards positive impact on biodiversity or positive changes in the conditions of human communities associated with biodiversity eg steps towards sustainable use or equitable sharing of costs or benefits)</i></p>	<p><i>(do not fill not applicable)</i></p>
<p><b>Purpose</b> To enhance the sustainable conservation of biological diversity and ecosystem services in the Knuckles Forest Reserve (KFR), Sri Lanka, by addressing the main threats to environmental protection through the development of options for buffer zone management that improve the livelihoods of local communities.</p>	<ol style="list-style-type: none"> <li>1. Appropriate restoration and rehabilitation options adopted by Knuckles Communities</li> <li>2. Communities and local service providers empowered to enhance local livelihoods in a way that reduces dependence on exploitation of forest reserve</li> <li>3. Capacity developed at UP and among users of rehabilitation options to enhance sustainability of outcomes, including adaptive improvement over time</li> <li>4. Recommendations for buffer zone management integrated into revisions of management plan for KFR</li> </ol>	<p>Development of restoration options supported by experiments, participatory appraisals and trials.</p> <p>Social capital in communities and service providers enhanced through training, implementation of innovations in conservation farming, and sharing experiences. Partnerships supporting sustainable development functioning.</p> <p>UP staff and project team members trained in the use of GIS, communities offered technical training in implementation of interventions.</p>	<p>Rehabilitation options – research findings presented in form of reports, manuscripts and thesis; materials developed for dissemination.</p> <p>Exchange visits arranged for farmers from communities in Knuckles to visit other model sites. Preliminary meetings with groups working in KFR on community development to create network.</p> <p>Training in implementation of rehabilitation options offered to partner institutions; training materials prepared and disseminated; team members participate in regional conference.</p>
<p><b>Output 1.</b> Options for the rehabilitation of degraded areas developed that are relevant to communities in Knuckles</p>	<ol style="list-style-type: none"> <li>1.1 Research base established and conservation benefits of options documented</li> <li>1.2 Design and dissemination of options supported by network of groups working on conservation and development in the Knuckles area</li> <li>1.3 Incentives exist for the uptake of options (participatory approaches have informed development of options; model sites are in place to motivate</li> </ol>	<p>In general, we have made good progress towards this output and believe that the indicators given are appropriate.</p> <p>The research required to develop the strategies for degraded grasslands and cardamom forest was established during the year and preliminary results have been analysed. The field work to quantify the risk of invasion by pine was completed and data analysis is underway. A needs assessment and analysis of agroforestry systems used in traditional villages in the buffer zone has been conducted.</p> <p>Work with collaborators is underway to design and disseminate rehabilitation options. Participatory approaches have been taken and have informed the</p>	

	and disseminate; market demand for products examined)	development of innovations in the communities where we are working. Some model sites are available and we are working towards making more available.
Activity 1.1 Project Planning Workshop		Completed
Activity 1.2 Conduct research to establish basis for rehabilitation options		On track.
Activity 1.3 Design and disseminate options		Initiated.
Output 2. Improved capacity to implement and adapt options over time	2.1 Three MPhil students trained to conduct research and apply results to management problems 2.2 At least 3 UP staff trained in GIS 2.3 At least 50 representatives from a range of communities and service providing institutions in Knuckles trained in the implementation and monitoring of rehabilitation options	Good progress to date on all three indicators. Indicators remain relevant and appropriate.
Activity 2.1. Three MPhil students at UP complete programmes (Yr 1, Yr 2, Yr 3) and one PhD student at UA initiates and continues fieldwork (Yr2, Yr3).		Three MPhil students are making good progress with their programmes, as is the UA PhD student.
Activity 2.2. etc At least 5 members of UP project team participate in GIS training (Yr 2)		Completed.
Activity 2.3 Project team and partner institutions conduct participatory appraisals and project planning workshops with traditional communities and estate communities (Yr 1, Yr 2)		Completed in three traditional communities and planning is underway for two estate communities.
Activity 2.4 Project team and partner institutions offer technical training in implementation of rehabilitation interventions (Yr 2, Yr 3)		Completed training in conservation farming innovations in three communities. Work will continue in Yr 3 in relation to other interventions.
Activity 2.5 Project team and partner institutions develop training materials for dissemination (Yr 3)		This work will begin in Yr 3.
Output 3. Communities in Knuckles empowered to articulate their own priorities for livelihood options and to influence decision-making processes in KFR buffer zone	3.1 Social capital strengthened in at least 5 communities, with representation from both traditional villages and estates 3.2 Innovations being shared within communities (e.g., from farmer to farmer) 3.3 Technical capacity of community members enhanced (by participation in training activities listed above, as well as through on the ground support from partner implementing organisations)	We have made good progress in 3 communities, moving forward with the implementation of innovations that were identified by the community members themselves and implemented with the support of our project team and other implementing agencies. Several training events have also been held.  Planning for activities in two new communities began in April 2008, alongside the Plantation Human Development Trust.  The indicators remain relevant and appropriate.

	3.4 Participation of community groups at networking meetings (e.g., Dumbara Surrakino representatives)	
Activity 3.1 Participatory processes and technical training activities detailed above (Yr 1, Yr 2, Yr 3)		Participatory appraisals and planning for innovations have taken place, training events have been completed for 3 communities.
Activity 3.2 Develop partnerships with service provision agencies and other buffer zone development groups to share learning and disseminate good practice. (Yr 2, Yr 3)		Partnerships have been developed with the local agricultural officer (Sustainable Agricultural Research and Development Institute), local representatives of the Nation Building Society (Jathika Sawiya), the farmer organization SOFA (Small Organic Farmers Association), BioFoods, Inc., Human Plantation Development Trust. In addition, we continue to work with the Forestry Department, IUCN, Midlands State Plantation, Finlays and Eco-Friends.
Output 4. Recommendations for management of buffer zone of KFR	4.1 Recommendations articulated and informed by contributions by diversity of stakeholders 4.2 Development of timetable for management plan revision	Models being developed will contribute to this output. The specific activities related to this output are scheduled for years 3 and 4.  The indicators remain relevant and appropriate.

## Annex 2 Project's full current logframe

### LOGICAL FRAMEWORK

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p><b>Goal:</b> 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 the fair and equitable sharing of benefits arising out of the utilisation of genetic resources</p>			
<p><b>Purpose</b> To enhance the sustainable conservation of biological diversity and ecosystem services in the Knuckles Forest Reserve (KFR), Sri Lanka, by addressing the main threats to environmental protection through the development of options for buffer zone management that improve the livelihoods of local communities.</p>	<ol style="list-style-type: none"> <li>1. Appropriate restoration and rehabilitation options adopted by Knuckles Communities</li> <li>2. Communities and local service providers empowered to enhance local livelihoods in a way that reduces dependence on exploitation of forest reserve</li> <li>3. Capacity developed at UP and among users of rehabilitation options to enhance sustainability of outcomes, including adaptive improvement over time</li> <li>4. Recommendations for buffer zone management integrated into revisions of management plan for KFR</li> </ol>	<p>Posters, newsletters, published documents</p> <p>Revised management plan</p> <p>World Heritage Status Application</p> <p>Policy Brief outlining response to findings of project</p>	<p>Government policy remains supportive of conservation of KFR;</p> <p>Forest Department remains committed to the adoption of participatory approaches to management of the reserve and buffer zone;</p> <p>Other stakeholders (e.g., private plantation companies, private landowners, other government agencies, NGOs and CBOs) support and implement options for buffer zone management</p>
<p><b>Outputs</b></p> <ol style="list-style-type: none"> <li>1. Options for the rehabilitation of degraded areas developed that are relevant to communities in Knuckles</li> <li>2. Improved capacity to implement and adapt options over time</li> <li>3. Communities in Knuckles empowered to articulate their own priorities for livelihood options and to influence decision-making processes in KFR buffer zone</li> <li>4. Recommendations for management of buffer zone of KFR</li> </ol>	<ol style="list-style-type: none"> <li>1.1 Research base established and conservation benefits of options documented</li> <li>1.2 Design and dissemination of options supported by network of groups working on conservation and development in the Knuckles area</li> <li>1.3 Incentives exist for the uptake of options (participatory approaches have informed development of options; model sites are in place to motivate and disseminate; market demand for products examined)</li> <li>2.1 Three MPhil students trained to conduct research and apply results to management problems</li> <li>2.2 At least 3 UP staff trained in GIS</li> <li>2.3 At least 50 representatives from a range of communities and service providing institutions in Knuckles trained in the implementation and monitoring of rehabilitation options</li> <li>3.1 Social capital strengthened in at least 5</li> </ol>	<ol style="list-style-type: none"> <li>1.1 Project reports and publications</li> <li>1.2 Meeting reports, newsletters, and reports by project, project partners and other groups working in Knuckles area</li> <li>1.3 Reports and attendance records of Participatory Appraisals with target groups</li> <li>2.1 Student reports to UP; project reports;</li> <li>2.2 Project reports; workshop attendance records;</li> <li>2.3.1 Training and monitoring workshop records;</li> <li>2.3.1 Training and monitoring</li> </ol>	<ol style="list-style-type: none"> <li>1.1 External market influences do not provide disincentives to adopt options</li> <li>1.2 Diverse groups working on conservation and development in Knuckles are willing to engage with project partners and participate in activities</li> <li>2. Trained staff remain in institutions and in positions where they can use the skills provided and train others in the skills</li> <li>Information sharing will continue within and between communities.</li> <li>Communities are receptive to adopting new innovations.</li> <li>4. Management plan remains open for revision.</li> </ol>

	<p>communities, with representation from both traditional villages and estates</p> <p>3.2 Innovations being shared within communities (e.g., from farmer to farmer)</p> <p>3.3 Technical capacity of community members enhanced (by participation in training activities listed above, as well as through on the ground support from partner implementing organisations)</p> <p>3.4 Participation of community groups at networking meetings (e.g., Dumbara Surrakino representatives)</p> <p>4.1 Recommendations articulated and informed by contributions by diversity of stakeholders</p> <p>4.2 Development of timetable for management plan revision</p>	<p>methods materials produced</p> <p>3.1.1 Community organisations emerged or strengthened, documented by membership lists and registration with Department of Environment</p> <p>3.1.2 Community groups participating in innovations, training and PRAs (project reports)</p> <p>3.2 Project reports</p> <p>3.3 Reports from partner institutions and service provision organisations</p> <p>4. Documented correspondence with Forest Department</p>	
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## Activities

### Rehabilitation Options

Project planning workshop (Yr 1: Stakeholder workshop with project team to agree workplan, define tasks and priorities)

Conduct research to establish basis for rehabilitation options

Degraded grasslands (Yr 1: maintain research sites at Riverston, establish new experiments at three sites; Yr 2: monitor experiments, analyse data, disseminate findings from Riverston; Yr 3: complete thesis, continue to monitor and evaluate research, revise recommendations)

Pine plantations (Yr 1: determine invasiveness and differences in vulnerability to invasion of adjoining habitats; Yr 2: examine interactions between invasiveness and anthropogenic fires; Y2: elaborate recommendations regarding invasiveness and disseminate findings, complete thesis and revise recommendations;

Cardamom forest (Yr 1: investigate negative impacts of cardamom understories on forest structure and composition; identify potential sites for eradication experiment; Yr 2: implement experiment to examine effectiveness of treatments to rehabilitate cardamom forest; disseminate findings from Yr 1 work; Yr 3: stakeholder survey to determine attitudes towards cardamom forest, negative impacts and priorities for eradication)

Agroforestry innovations (Yr 1: document existing agroforestry systems used in 3 traditional villages and gather traditional knowledge and practices related to these systems; Y2: conduct needs analysis for innovations to address local problem; Y3: assess impacts of participatory interventions, complete thesis;

### Design and disseminate options

Implement demonstration plots for options and interventions (Yr 2: riparian development, homegarden development, highland .....; Y3: pinus conversion, shrubland conversion)

Develop dissemination material for various options and interventions (Y2: pine conversion, pine invasion, grassland restoration; Yr3: homegarden development, highland development, riparian development).

Buffer zone development workshop (Yr 3: workshop for sharing learning and best practice amongst groups working in Knuckles)

Develop partnerships with plantation owners, FD and others to identify opportunities for implementation of trials for pine conversion, restoration of degraded grasslands, or other innovations aimed at enhancing conservation value of land within the buffer zone and /or reducing dependency on exploitation of forest reserve;

### Capacity Building

Three MPhil students at UP complete programmes (Yr 1, Yr 2, Yr 3) and one PhD student at UA initiates and continues fieldwork (Yr2, Yr3).

At least 5 members of UP project team participate in GIS training (Yr 2)

Project team and partner institutions conduct participatory appraisals and project planning workshops with traditional communities and estate communities (Yr 1, Yr 2)

Project team and partner institutions offer technical training in implementation of rehabilitation interventions (Yr 2, Yr 3)

Project team and partner institutions develop training materials for dissemination (Yr 3)

### Empowered Communities

Participatory processes and technical training activities detailed above

Develop partnerships with service provision agencies and other buffer zone development groups to share learning and disseminate good practice. (Yr 2, Yr 3)

### Recommendations for management of buffer zone of KFR

Profiles of organizations and projects working on sustainable management in the buffer zone prepared and compiled (Yr 3)

Workshop held (see 1.3.3.3 above) and recommendations articulated (Yr 3).

Discussion meeting with policy-makers to review recommendations and identify ways forward (Yr 4).

## Annex 3 Milestones Revised

We have revised the implementation timetable to take into account the changes in the logframe and outputs. Below is the original table with milestones, followed by the revised table.

Project implementation timetable		
Date	Financial year	Key milestones
July 2006	06/07	Appoint project staff and recruit Sri Lankan M.Phil. students
Aug 2006	06/07	Stakeholder workshop with project team to agree workplan, define tasks and priorities, establish experimental and sampling designs
Dec 2006	06/07	PRA conducted in a minimum of 3 villages
Mar 2007	06/07	Completion of collation of historical data on <i>Pinus</i> plantation planting records and fire frequency and mapping new regeneration of <i>Pinus</i> outside plantations
Apr 2007	07/08	Workshop on GIS techniques for staff of Forest Department, IUCN and UP
Dec 2007	07/08	Community-based training on monitoring and participatory research completed
Apr 2008	08/09	Dendrochronological analysis of <i>Pinus</i> invasions in relation to fire frequency completed; <i>Pinus</i> enrichment, forest fragment and grassland restoration trials established
Dec 2008	08/09	Participatory research on production of cash crops within restoration sites in buffer zone established and assessed
Feb 2009	08/09	Community based meetings for dissemination and discussion of buffer zone management conducted
April 2009	08/09	Classification of vegetation within the buffer zone based on ecological attributes, livelihood options and management requirements (preliminary draft)
	08/09	<i>Pinus</i> enrichment, forest fragment and grassland restoration trials recensused
	08/09	Final workshop, for dissemination and work on publications

Revised Table

Date	Fin Y	Key Milestones
<b>Jul 2006</b>	06/07	Appoint project staff and recruit Sri Lankan M.Phil. students
Aug 2006	06/07	Stakeholder workshop with project team to agree workplan, define tasks and priorities, establish experimental and sampling designs
Dec 2006	06/07	PRA conducted in a minimum of 3 villages
Mar 2007	06/07	Completion of collation of historical data on <i>Pinus</i> plantation planting records and fire frequency and mapping new regeneration of <i>Pinus</i> outside plantations
<b>March 08</b>	07/08	Rehabilitation options Grassland restoration experiments established at three sites and monitoring underway. Research sites for grassland restoration at Riverston maintained. Interaction between invasiveness of pines and factors such as adjacent habitat types and fire history examined Cardamom forest and non-cardamom forest compared in terms of forest structure and composition; Experiment to examine effectiveness of treatments to rehabilitate cardamom forest established. Agroforestry systems in the mosaic covering a cluster of 3 villages documented and a needs analysis for innovations to address local problems conducted. Capacity building Five team members trained in the use of GIS Technical training in the implementation of rehabilitation and conservation interventions offered to communities Partnerships Partnerships developed with service provision agencies and other buffer zone

		<p>development groups and joint activities planned. (Planters Dinner, PHDT meeting, BioFoods and SOFA, Sustainable Agric Group, ...)</p> <p>Dissemination</p> <p>First edition of project newsletter distributed to stakeholders</p> <p>Ecotour report</p> <p>Newspaper article about intervention (invasive pines and potential for pine conversion)</p>
<b>Oct 08</b>		<p>Rehabilitation Options</p> <p>Grassland restoration – update on research findings presented in form of report to thesis committee</p> <p>Invasive pines – thesis submitted</p> <p>Cardamom forest – Stakeholder surveys to determine attitudes towards cardamom forest and priorities for interventions for eradication</p> <p>Agroforestry innovations – data analysed, preliminary report drafted.</p> <p>Capacity building</p> <p>Technical training in the implementation of rehabilitation interventions offered to partner institutions (Forestry College, April – July)</p> <p>Training materials on the implementation of rehabilitation interventions prepared and disseminated (for Forestry College)</p> <p>Exchange visits for farmers from communities in Knuckles to share ideas and visit model sites</p> <p>Two team members participate in a regional conference</p> <p>Dissemination</p> <p>Materials developed for rehabilitation interventions (pamphlets created for each: grassland restoration, pinus conversion, cardamom forest and invasiveness of pine;</p> <p>Newspaper briefs created for at least two components, pine invasiveness and community development)</p> <p>Outreach</p> <p>Conservation programmes in local schools – materials created and sessions held in three schools</p> <p>School visit to Hantana</p> <p>Partnerships</p> <p>Preliminary meetings and discussions held with groups working in Knuckles in community development</p> <p>Document prepared with a collation of group profiles and summary of activities;</p> <p>Workshop planned and scheduled for Jan 2009</p>
<b>March 09</b>	08/09	<p>Rehabilitation Options</p> <p>Analysis of priorities for buffer zone interventions for stakeholders conducted and report drafted</p> <p>Capacity Building</p> <p>Visit to UA or NZ for team member from UP</p> <p>Bibliography of published work related to the Knuckles Region drafted and distributed to partners for amendments</p> <p>Students participate and present papers at the Annual Forestry Conference in Colombo (USJ)</p> <p>Partnerships</p> <p>Stakeholder workshop for sharing experiences among groups working in Knuckles on buffer zone conservation and community development</p> <p>Dissemination</p> <p>Discussion document on the implications of experience with buffer zone development for the management plan, with draft of recommendations</p> <p>Newsbrief of workshop</p> <p>Media discussion of buffer zone management and intervention options</p> <p>Do we want to try for a radio debate related to the workshop?</p> <p>Manuscripts describing various interventions for rehabilitation and community development drafted and submitted to the Ceylon Forester</p>
<b>July 09</b>	09/10	<p>Rehabilitation options</p> <p>Rehabilitation options initiated at at least two additional sites in Knuckles</p> <p>Classification of vegetation within the buffer zone based on ecological attributes, livelihood options and management requirements (preliminary draft) with presentation to management plan working group</p> <p>Capacity building</p>



		Technical training in the implementation of rehabilitation interventions offered to partner institutions Exchange visits for farmers from communities in Knuckles to share ideas and visit model sites Dissemination A minimum of four publications drafted Recommendations for the management plan distributed Bibliography published and distributed
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## Annex 4 onwards – supplementary material (optional)

### APPENDIX – OUTREACH AT KOSGAMA VIDAYALAYA

We conduct one day awareness program about bio diversity in Kosgama Vidyalaya (Figure 1), school which situated in the Knuckles area. Prof. I.A.U.N Gunatilleke gave a lecture to students on pine invasion and enrichment. In the meantime we explored (Figure 2, 3) and sketched a map (Figure 4) by using Arc GIS software of Kosgama forest patch which located in the Kosgama village. There we found few *Dipterocarpus* spp not recorded before from the Knuckles conservation area.



Figure 1. Kosgama school



Figure 2. The entrance view of the school



Figure 3. Exploring the forest

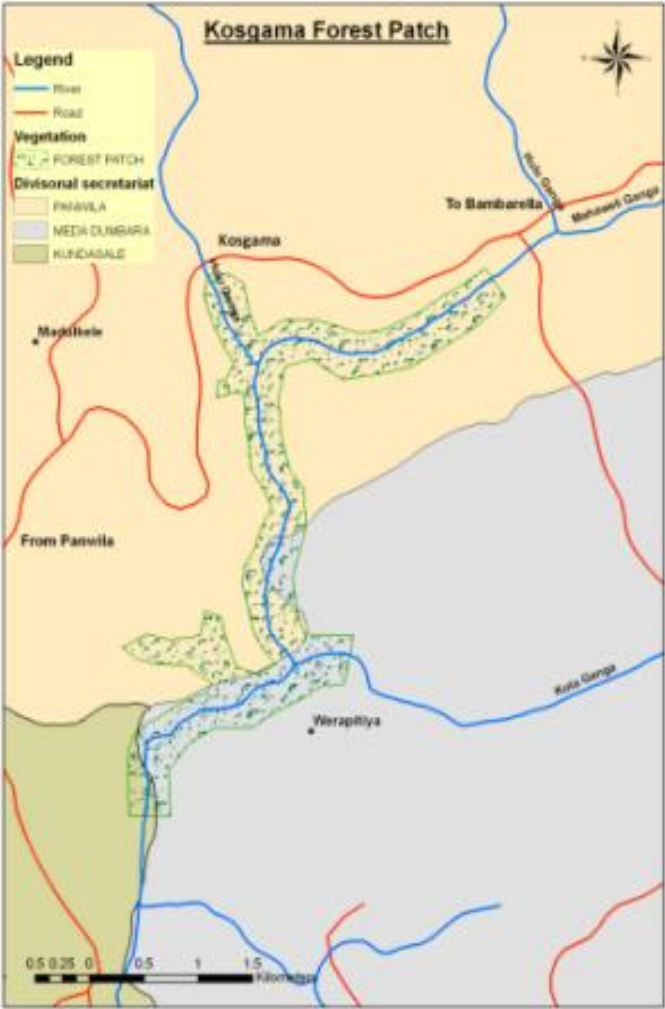


Figure 4. Map of Kosgama forest patch



**Is Caribbean pine (*Pinus caribaea* Morelet) invasive in the  
Knuckles Conservation Area, Sri Lanka?**

W. W. M. A. B. Medawatte<sup>1</sup>, K. U. Tennakoon<sup>1</sup>, Philip E Hulmes<sup>2</sup> and I. A. U. N. Gunatilleke<sup>1</sup>

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Lincoln University, Canterbury, New Zealand

The Forest Department of Sri Lanka established 26,000 ha of pine plantations after the 1960s to reforest denuded areas (degraded grasslands, abandoned tea lands etc.) and to meet the long fiber requirement for the paper industry. Since introduction of this exotic its natural spread was not reported in the island; but recently seedlings and even saplings were noted in grasslands abutting pine plantations in the Knuckles (Dumbara) Conservation Area (KCA). This led us to investigate the extent of the vulnerability of different habitats near pine plantations to pine regeneration in the KCA.

Though the KCA represents < 0.5 % of Sri Lankas land area, it has a high biodiversity (almost a third of the islands angiosperm flora), some unique to Sri Lanka. There are 1033 flowering plants, of which 160 (15%) are endemic to the island, and about 3% are nationally threatened. With respect to the fauna, 70 species are endemic and 72 are nationally threatened.

In our study twelve pine plantations, in three agro ecological zones, with an annual rain fall of > 900 mm (intermediate mid country 3), > 1400 mm (intermediate mid country 1) and > 1250 mm (wet mid country 3), around the KCA were selected randomly for the study. Different habitats around these plantations were recorded and the extent of naturally regenerating pines in them was quantified by systematic random sampling. The data gathered were processed by Arc GIS software and statistically analyzed by Minitab software.

All pine plantations studied showed spread of pines into adjacent habitats. Grasslands and rock outcrops appear to be highly vulnerable to pine regeneration than scrublands and forests. Habitats in the intermediate mid country agro-ecological zone subject to a long dry spell (May to September) and high wind velocity was the most affected. In this zone pines in the plantations were shorter with asymmetric crowns indicating the presence of strong wind; seedlings, saplings and mature trees of pine were recorded in grasslands 100 m away from the parent plantation. These pines may have arisen from seeds produced in the plantation and dispersed by wind. To be an invasive, a species needs to produce reproductive offspring 100 m away from the sites of introduction for taxa spreading by seeds. The results of the present study provide strong evidence that *Pinus caribaea* is invading grasslands in the KCA.

This study confirms that the perimeter of the reserve includes degraded habitats susceptible to pine invasion, which would be detrimental to natural regeneration of native species in these habitats. Therefore, the spread of pines need to be monitored in the long term and management of pine

plantations in the KCA needs to be addressed immediately at this very early stage rather than waiting until it becomes more aggravated.

Key words: pine invasion, *Pinus caribaea*, Knuckles Conservation Area.

### **Ecological consequences of cardamom management in forest understorey in Knuckles Conservation Area, Sri Lanka**

Balram Dhakal<sup>1</sup>, Michelle A Pinard<sup>2</sup>, David Burslem<sup>2</sup>, I A U N Gunatilleke<sup>3</sup>

#### **Abstract**

A large proportion of the Knuckles Forest Reserve of Sri Lanka was underplanted and managed for cardamom in 1960s but with the conservation designation, the cardamom was abandoned, with no further maintenance since more than two decades. Underplanted cardamom is assumed detrimental to the conservation value of the reserve, however there is a lack of evidence to support this assumption. In this paper, in addition to the potential ecological consequences of the cultivation, maintenance and abandonment of cardamom in the forest drawn from the literature, the current research approach adopted for assessing these consequences and restoring the forest ecosystem functions and services in Knuckles are explored.

Key words: Knuckles, cardamom, people, ecological consequences, conservation

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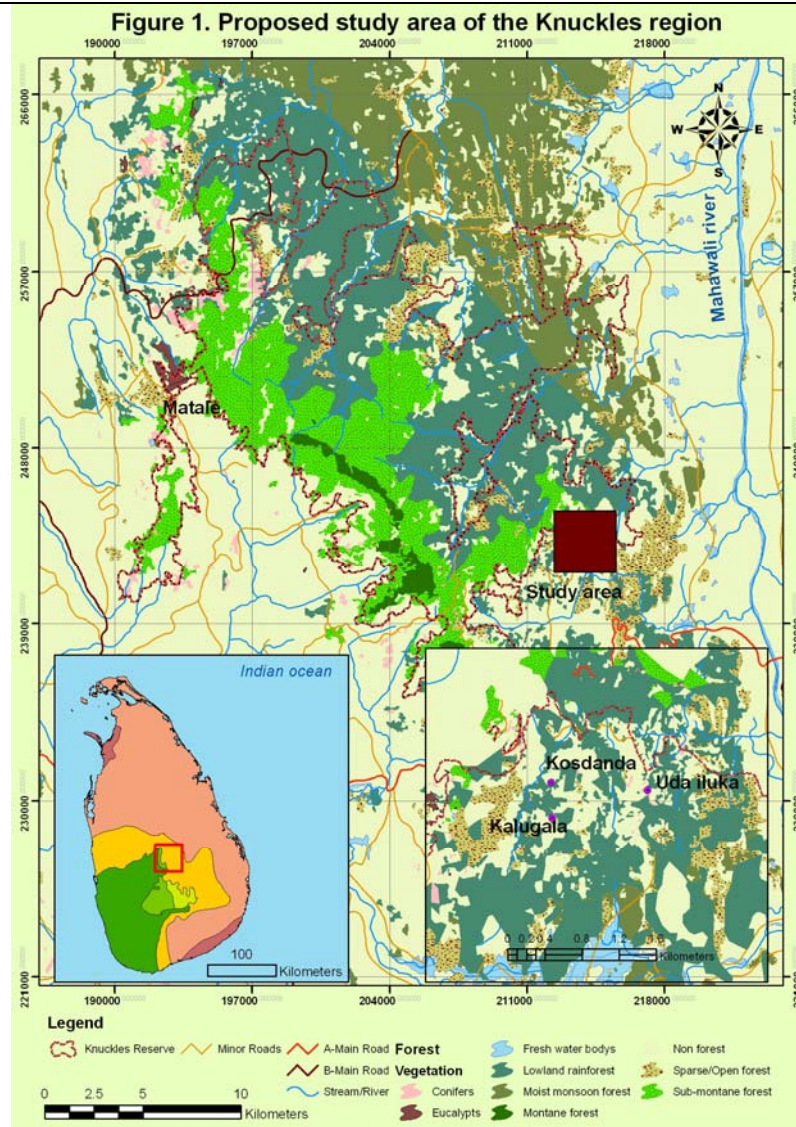
<sup>1</sup> University of Aberdeen, UK / Darwin Initiative Project, PGIS, University of Peradeniya, Sri Lanka

<sup>2</sup> University of Aberdeen, UK

<sup>3</sup> University of Peradeniya, Sri Lanka

### ***Checklist for submission***

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Have you completed the Project Expenditure table?	
Do not include claim forms or communications for Defra with this report.	







## Darwin Initiative Project - Buffer Zone Restoration and Development in Knuckles, Sri Lanka

No 1

Newsletter

April 2008

### Darwin Initiative Project...

This project - Buffer zone restoration and development in Knuckles Forest Reserve, Sri Lanka is funded by the Darwin Initiative (Ref. 15 - 010) of the government of UK and implemented jointly by the University of Aberdeen, UK and the University of Peradeniya, Sri Lanka, for three years from July 2006 to June 2009. The project is at the beginning of the third year of its implementation.

This project aims to enhance the sustainable conservation of biological diversity and ecosystem services in the KFR, Sri Lanka, by addressing the main threats to environmental protection through the development of options for buffer zone management that improve the livelihoods of local communities.

Dear Readers,

Welcome to the Darwin Project News!!!

This is the first issue of our project newsletter. We aim to share brief news items about the Darwin Project and other partners working in Knuckles with you all. From now onwards, we will be releasing this newsletter every three months. If you have any information on research and any other practical applications in Knuckles that you would like to share with others, please let us know.

Since this is our first issue and we are at the initial stage of its development, your suggestions and comments for the improvement of the quality of the newsletter at this stage would be very helpful.

With thanks and best wishes,

The Editorial Team

### Project mid-term review

Our project had been selected by Darwin Initiative for a midterm review in 2007. The review team consisting of two members Dr Paddy Abbot and Mrs Lesley Brown visited the project in the period 8 – 14 December, 2007 for this review mission.

As a part of the review process, the review team was engaged in a number of meetings and consultations with the project team, its members and other relevant stakeholders. Also, the review team made the visits to the project sites during their visit to Sri Lanka.

We thank the review team for providing the opportunity to exercise this review process and also for their valuable feedback and recommendations to the project. The review team acknowledged the project progress we have made so far and highlighted the need of integration of project activities, dissemination of the findings and strengthening the partnership to maximise the sustainability and impact of the project. We are also thankful to all of our members of the team, partners and other stakeholders for their active and effective participation and cooperation during this review process.



## Progress in the field

### Experimental set up of cardamom experiment

The experimental set up of cardamom experiment is now completed. Altogether 48 plots (8 blocks consisting of 6 experimental plots together) in cardamom forest and 8 plots in natural forest have been established to monitor tree seedling regeneration, survival and growth in these two types of forest under different treatments.



We have completed the first measurement in the plots after the assignment of treatments.

Dr Michelle A Pinard, the PI of the project made her supervisory visit in March 2008 to the project.

### Progress in restoration component

In the Grassland Restoration component, altogether 18 plots (6 in each site) have been established in Deanstone, Riverstone and Madulkelle. At the moment, the research team is monitoring the survival and performance of *Macaranga* and *Symplocos* seedlings under different treatments. The preliminary results seem to be very interesting. Currently Dhanushka is analyzing his results and planning to present them at his next research committee meeting which is scheduled to be held in end of June, 2008.



### Progress in *Pinus* invasion component

In *Pinus* invasion component, twelve *Pinus* plantations in three mid-country agro-ecological zones around the Knuckles were investigated to assess whether *Pinus caribaea* is spreading naturally at the adjacent habitats. The preliminary results show that *Pinus caribaea* is invading the adjacent grasslands in Knuckles. Anuradha Meadawatte is further analysing the data to investigate the pattern of this invasiveness.

### Progress in livelihood development of buffer zone communities

Various development activities are being implemented in three different sites i.e. riparian belt, home garden and highland in the three selected buffer zone villages, through active participation of the local communities. The project team has been successful in developing partnerships and networking with other development agencies working in this area Viz. agricultural based 'Jathika Sawiya' National program and the BioFood Company.

Prof. Anoja Wickramsinghae and her team who are implementing these livelihood development activities are now in the process of replicating these activities in other two villages of Knuckles. The discussion with the Plantation Development Human Development Trust, one of the potential collaborators of the project, is in progress to finalise the plan.

## Outreach activities

### PIs visit to the project

Dr Michelle A Pinard, the PI of the project visited the project on 03-08 Dec 2007 and also in 25 -29 March 2008. Dr David Burslem, PI of the project also visited project on 06-15 Jan 2008. Follow up of the field activities, planning of new project activities and necessary budgetary allocation were the part of these visits.

### School visit – conservation awareness program

Our *Pinus* invasion research team have conducted one day conservation awareness program at Kosgama School of the Kosgama village located at the buffer zone of Knuckles. A special session was organised by Prof. Nimal Gunatilleke to help them understand the potential threats of *Pinus* invasion and its consequences along with possibilities of *Pinus* plantation enrichment with high value native broad-leaf species. The team have found the students very interested in taking part in such type of programmes and also the programme as an effective approach to create awareness among the students about such conservation issues. We are planning to replicate this type of conservation awareness programme in other villages of the Knuckles, including other issues of conservation such as restoration of cardamom forests and grasslands.

### Participation in ATBC meeting

The Project Coordinator Mr Balram Dhakal and one of our MPhil students Mr Anuradha Medawatte have participated the Association of Tropical Biology and Conservation – Asia Pacific meeting (23 – 28 April, 2008) in Kuching, Malaysia, followed by a statistical analysis and scientific writing workshop (29 April – 5 May). Mr Dhakal presented his work on ecological consequences of cardamom cultivation in Knuckles Conservation Area, Sri Lanka. Mr Medawatte presented a poster on his work on assessment of the risk of *pinus* invasion in Knuckles.

## Working with our partners

### Meeting with Biofoods Pvt Ltd

A meeting was held with Biofoods Pvt Ltd. on 27 March 2008 in their own office at Anniwattae, Kandy to explore the partnership and networking opportunities to work together in the field of biodiversity conservation in Knuckles. Prof. Dr Nimal Gunatilleke, Dr Michelle Pinard, Prof. Dr Anoja Wickramasinghae and Mr Balram Dhakal participated the meeting. The meeting has been helpful to take initiatives to explore the opportunities for working together in the field.

## Upcoming events

### Next project team meeting

Our project team meets up once in every month, at the first half of the month. Recently we had our regular project meeting on 09 May 2008. We discussed about the project progress, issues and the ways forward. Our next project meeting is scheduled to be held on 06 June 2008.

### Related links

Darwin Initiative, UK  
<http://darwin.defra.gov.uk/>

Department of Botany, University of Peradeniya, Sri Lanka  
<http://www.pdn.ac.lk/sci/botany/>

Department of Plant and Soil Science, University of Aberdeen  
<http://www.abdn.ac.uk/biologicalsci/>

IUCN Sri Lanka  
<http://www.iucn.org/places/srilanka/iucnnew/index.htm/>

Plantation Human Development Trust, Sri Lanka  
<http://www.phdt.org/home/>

Biofoods Pvt Ltd, Sri Lanka  
<http://www.biofoodslk.com/>

## About our E News ...

Information about our project can be obtained online at [www.abdn.ac.uk/knuckles](http://www.abdn.ac.uk/knuckles). Thank you for visiting our website.

If you have any queries and questions about our project and its activities, please write to our Project Team Leaders Dr. Michelle A Pinard at [m.a.pinard@abdn.ac.uk](mailto:m.a.pinard@abdn.ac.uk) or Prof. Dr. I A U N Gunatilleke at [savnim@slt.lk](mailto:savnim@slt.lk).

If you have any relevant and interesting news from Knuckles that you would like to share with our readers, please email to the Project Coordinator Mr. Balram Dhakal at [b.r.dhakal@abdn.ac.uk](mailto:b.r.dhakal@abdn.ac.uk).

We encourage you all to forward this news to others who might be interested. If you would like to get the electronic copy of this newsletter, please visit our project website. Alternatively, you could email to Mr. Dhakal.

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