

5.6 Project Idea for Technology 5: Ex-situ conservation for highly threatened species and possible reintroduction.

Project Idea:

'Studies to identify and prioritize species for ex-situ conservation, and climate change modeling to identify species vulnerable to climate change'

5.6.1 Introduction/Background

This project – 'Studies to identify and prioritize species for ex-situ conservation, and climate change modeling to identify species vulnerable to climate change' – is a proposed action under 'Technology 5: Ex-situ conservation for highly threatened species and possible reintroduction'.

Threats to biodiversity often affect the habitats of species. In instances where such threats are unrelenting, the effectiveness of *in-situ* conservation efforts - interventions based within the natural range of a species - is limited. As a result, it is necessary to supplement *in-situ* conservation actions with *ex-situ* interventions. *Ex-situ* interventions are based outside the natural habitat of a species, and often involve housing floral and fauna species in a secure and controlled environment, such as botanical or zoological gardens, where fluctuations in environmental conditions and threats are removed or minimized. *Ex-situ* conservation activities can also involve the preservation of genetic material and germ-plasm in genetic banks.

Ex-situ conservation efforts are often costly in terms of resources (financial as well as spatial) and manpower, and as such, it is not possible to use this form of intervention in every case. Therefore, it is necessary to focus *ex-situ* conservation efforts on selected priority species that require *ex-situ* interventions urgently. Given that there is no such list of species in Sri Lanka at present, the compilation of a priority list will be immensely useful in the efficient and objective allocation of resources and conservation efforts.

In the future, it is likely that certain habitats, such as montane and coastal ecosystems, will be altered, damaged or lost disproportionately due to climate change. Species that are supported by these habitats, particularly point endemic species which are restricted to a single locality, will be affected adversely as a result. Given that *in-situ* conservation efforts are likely to be insufficient, or ineffective, for these species in such instances, *ex-situ* conservation efforts will be crucial to their survival. However, *ex-situ* conservation efforts are most successful when planned and carried out in a timely fashion. As such, the identification of species that are vulnerable to climate change, and as such, likely to become priority species for *ex-situ* conservation in the future, is crucial. Once these species are identified, their populations can be monitored *in-situ* so as to gain insight into the ways in which they are affected by climate change, while the chances of their survival can be enhanced by establishing *ex-situ* populations.

The information generated through this project can be used to maximize the use of resources allocated for conservation activities, and to ensure the survival of species that require *ex-situ* conservation urgently, or will require such interventions in the future with changing climatic conditions.

5.6.2 Objectives

- To identify and prioritize species for ex-situ conservation.
- To identify species vulnerable to climate change through climate change modeling.

5.6.3 Outputs of the Proposed Project

- A comprehensive study of species requiring *ex-situ* conservation and species that
- A list of priority species for *ex-situ* conservation in light of climate change vulnerability.
- Capacity building and development of expertise on climate change modeling.
- Modeling data and maps predicting the habitats that are vulnerable to climate change in future.

5.6.4 Relationship to the country's sustainable development priorities

The project involves the identification of priority species for *ex-situ* conservation. The importance of *ex-situ* conservation is recognized in both National Biodiversity Strategy and Action Plan - 'Biodiversity Conservation in Sri Lanka: A Framework for Action' (1999) and its Addendum (2007). The importance of considering and researching the impact of climate change on biodiversity is also given priority in this Addendum. The project will also involve research development and technology transfer, as well as capacity building, which are addressed in this document. As such, the project is in line with national interests and priorities.

Sri Lanka is signatory to the Convention of Biological Diversity (CBD). The conservation of biodiversity and adaptation to climate change are included in the Convention on Biological Diversity (CBD) and the Aichi Biodiversity Targets for 2011-2020. As such, the project also contributes to national efforts to meet these targets and fulfill obligations arising from Sri Lanka's involvement in the CBD.

5.6.5 Project Deliverables

- A detailed report on the study on priority species for ex-situ conservation by Year 3.
- A list of priority species for *ex-situ* conservation (with 50 flora and 50 fauna species) by the end of Year 1.
- A detailed report on the study on species that are vulnerable to climate change, including maps and data from climate change modeling by Year 3.
- A list of species that are vulnerable to climate change by Year 3.

5.6.6 Project Scope and Possible Implementation

The priority list of species for ex-situ conservation can be used by the National Zoological Gardens and National Botanical Gardens. Here, resources and efforts can be focused on the proper care and breeding of these species, so as to aid their conservation. This list will enable efficient and objective decision making where resources are limited and only a few species can be given priority over others.

The list of species vulnerable to climate change can be used to inform future ex-situ conservation efforts. Special attention can be focused on these species so that their populations and habitats are monitored adequately, and to facilitate the investment of conservation resources and efforts on these species.

Both lists of species can be updated over time, as new studies are carried out.

5.6.7 Project activities

(i) Studies to identify and prioritize species for ex-situ conservation

Species belonging to the Critically Endangered and Endangered categories of the most recently published IUCN Red List will be used to form a shortlist of species for consideration. A priority list of species will be formed by selecting species for which ex-situ conservation is critical. This selection process will be carried out objectively, using a set of key criteria and a points-based system.

This set of criteria should include consideration of the following factors:

- (1) Conservation status of the species (the extent to which it is threatened): species that are Critically Endangered will be assigned a high score.
- (2) Distribution of the species: species with a restricted range (particularly point endemic species) will be assigned a high score.
- (3) The nature of the threats (can they be mitigated): threats that can be mitigated or minimized realistically will be assigned a higher score.
- (4) Potential for success in ex-situ conditions: species that can be kept in in-situ facilities and will survive well under these conditions will be assigned a higher score.
- (5) Potential for reintroduction in the future: species that can be re-introduced into their natural habitat successfully in the future will be assigned a higher score.
- (6) Presence outside protected areas: species that are found outside protected areas will be assigned a high score.
- (7) Impact of the loss of the species on its ecosystem and the ecosystem services it provides: species for which the impact of its loss will be high, will be assigned a higher score.
- (8) Potential impact of climate change on the habitat of the species: species that occupy a habitat that is likely to be impacted significantly due to climate change (eg. montane species) will be assigned a higher score.

Fifty flora species and fifty fauna species will be included in the priority list and will be ranked according to their score.

(ii) Climate change modeling to also identify species vulnerable to climate change

The necessary training required to carry out the climate change modeling study will be provided. Capacity building to improve the technical knowledge base and expertise on this subject will also be carried out.

Climate change modeling will be used to predict the way in which species will be affected by changing climatic conditions. This can be done through computer based simulations of conditions that are likely to arise as a result of climate change. Through this, habitats and ecosystems that are especially vulnerable to climate change can be identified (eg. montane and coastal habitats). Species that are Critically Endangered or Endangered, and have a restricted range within the habitats identified as vulnerable to climate change (particularly point endemic species), can then selected to form a list of species vulnerable to climate change.

All outputs produced from the studies carried out during the project will be reviewed by the coordinating committee as well as biodiversity and climate change experts.

List of project activities

1. Compilation of the priority list of species for *ex-situ* conservation
2. Training of personnel in climate change modeling and capacity building
3. Climate change modeling and identification of vulnerable habitats
4. Identification of species vulnerable to climate change
5. Review of outputs by biodiversity and climate change experts
6. Dissemination of information gathered during the studies with relevant stakeholders and policy makers

5.6.8 Timelines for the Proposed Activities

Table 5.10: Proposed Timelines for Implementation of the Activities of Project 5

Activity	Year 1				Year 1				Year 1			
	Quarter											
	1	2	3	4	1	2	3	4	1	2	3	4
1. Compilation of the priority list of species for <i>ex-situ</i> conservation												
2. Training of personnel in climate change modeling and capacity building												
3. Climate change modeling and identification of vulnerable habitats												
4. Identification of species vulnerable to climate change												

5.6.11 Possible Complications/Challenges

- Priority species that are in urgent need of *ex-situ* conservation may be missed during the prioritization process.
- There may be inaccuracies in the predictions made through climate change modeling.

5.6.12 Responsibilities and Coordination

The project will be coordinated by a committee consisting of representatives of the Department of Wildlife Conservation, the Forest Department, the Climate Change Secretariat of the Ministry of Environment, leading universities in Sri Lanka and relevant environmental organizations. The lead in implementing the project will be taken by the Department of National Zoological Garden, Department of National Botanical Gardens and Plant Genetic Resources Centre of the Department of Agriculture. The studies will be carried out by suitable universities and environmental organizations, as agreed upon by the committee.

Key implementing agencies include Department of National Zoological Garden, Department of National Botanical Gardens and Plant Genetic Resources Centre of the Department of Agriculture. Biodiversity Secretariat of the Ministry of Environment will be the Project Execution Agency.

5.6.13 List of References

1. Biodiversity Conservation in Sri Lanka: A Framework for Action (1999)
<http://www.cbd.int/doc/world/lk/lk-nbsap-01-en.pdf> (Last accessed: 16/10/2012)
2. Biodiversity Conservation in Sri Lanka: A Framework for Action: Addendum (2007)
<http://www.cbd.int/doc/world/lk/lk-nbsap-oth-en.pdf> (Last accessed: 16/10/2012)
3. The Strategic Plan for Biodiversity 2011- 2020 and the Aichi Targets
<http://www.cbd.int/doc/strategic-plan/2011-2020/Aichi-Targets-en.pdf> (Last accessed: 16/10/2012)