

Technology Fact Sheet for Adaptation

Focusing on conservation of resources and carrying out special management for restricted range, highly threatened species and ecosystems ⁱ

1. SECTOR: <i>To be written by sector expert</i>	Biodiversity
TECHNOLOGY CHARACTERISTICS	
2.1 Technology name:	Focusing conservation resources and carrying out special management for restricted range, highly threatened species and ecosystems
2.2 Introduction: <i>Low/high, Brief introduction to the technology</i>	This technology involves investing resources in the maintenance and continued survival of species that are likely to become extinct as a result of global climate change¹. Thus it would target species that need special attention, with high vulnerability to climatic changes. Recent studies have shown the ecological changes in the phenology and distribution of plants and animals are already occurring, and have been linked to local and regional climate change. Range-restricted species, particularly polar and mountaintop species, show severe range contractions, and certain such species have gone extinct. Tropical coral reefs and amphibians have been most negatively affected². The Sri Lanka Red List³ identifies threatened species, and their locations. Thus this can be used to identify and target specific species that may require additional conservation intervention. Globally the IUCN Red List is already being used to identify species at risk with climate change⁴. In some cases, translocation of certain highly vulnerable species may be required. Translocation involves moving animals, plants, and other organisms from sites that are becoming unsuitable due to global climate

¹Mawdsley, J.R., O'Malley, R., Ojima, D.S., 2009. A review of climate-change adaptation strategies for wildlife management and biodiversity conservation. *Conservation Biology* 23, 1080–1089.

²Parmesan, C. 2006. Ecological and evolutionary responses to recent climate change. *Annual Review of Ecology, Evolution and Systematics* 37:637–669.

³ IUCN Sri Lanka and the Ministry of Environment and Natural Resources (2007) *The 2007 Red List of Threatened Fauna and Flora of Sri Lanka*, Colombo, Sri Lanka. xiii+148pp.

⁴ IUCN. 2009. Climate change and species.

http://www.iucn.org/about/work/Programs/species/our_work/climate_change_and_species/

	change to other sites where conditions are thought to be more favorable for their continued existence⁵. It must be noted that translocation has not been successful with certain species and caution should be exercised on such an activity and used as a last resort for immobile species. It should not be carried out for species that translocation has been unsuccessful previously. <i>Reference in existing policies, strategies and action plans:</i> The Biodiversity Conservation - Framework for Action, in the section on in-situ conservation recommends to 'prepare and implement recovery plans for threatened species that need special conservation actions (both for in-situ and ex-situ in addition to habitat conservation).⁶ According the National Action Plan for Haritha Lanka Strategy 2.3 states to 'Prepare and implement recovery plans for threatened species that need special conservation actions'⁷.
2.3 Technology characteristics/highlights: <i>Few bullet points, ie. Low/high cost, advance technology; low technology</i>	It could be considered a medium level technology. The cost can vary from medium to high depending on the species and the type of intervention required. This is not an entirely new mechanism, as general conservation tools can be used for this purpose (eg: declaring a core conservation zone where there are threatened species). Additionally there could be species and ecosystems that are currently not threatened, but may have restricted ranges or other threats (eg: edge effects) – and may require targeted protection. It will need to be supported by modeling of biodiversity and climate change, while continuous monitoring will be necessary to identify those vulnerable to climate change. It would be useful to identify researcher focusing on certain taxa, create a database of people and research – and focus on improving research.

⁵Mawdsley et al. 2009. Op. Cit.

⁶Ministry of Environment and Natural Resources. 2007. Biodiversity Conservation in Sri Lanka: A Framework for Action – Addendum.

⁷ National Council for Sustainable Development . 2009. National Action Plan for Haritha Lanka Programme

	Climate change related impacts will require conservation for plant and animal species in both terrestrial and aquatic areas.
2.4 Institutional and organizational requirements: <i>How much additional capacity building and knowledge transfer is required for the adaptation option to be implemented.</i>	There will be some additional capacity building necessary to conserve certain species that are currently not targeted specifically for conservation. Information/technology transfer maybe required from other countries on how to identify and conserve species that are vulnerable to climate change, especially from countries that already have specific action plans and conservation strategies for such species.
3. OPERATIONS AND MAINTENANCE	
3.1 Endorsement by experts:	For details of endorsement by local experts and relevant agencies see section on '<i>Reference in existing policies, strategies and action plans</i>' in Section 2.1. Focusing conservation efforts on highly threatened and vulnerable species is recommended as a climate change strategy globally, and is suggested in peer-reviewed journals^{8,9}.
3.2 Adequacy for current climate: <i>Are there negative consequences of the adaptation option in the current climate? Some adaptation may be targeted at the future climate but may have costs and consequences under the current climate.</i>	There will be no perceived negative consequences of this technology in the current climate. The Sri Lanka Red List¹⁰ has already identified threatened species that would need some intervention for their survival. Additional could be identified based on predictions and vulnerability, while in other cases they may need to be identified in the future, depending on how climate affects certain species or ecosystems.
3.3 Size of beneficiaries group: <i>Technology that provides small benefits to large number of people will be favored over those that provide larger benefits, but to fewer people.</i>	This mechanism will ensure that biodiversity is conserved in a sustainable manner, preventing any extinction. It will ensure that ecosystem services are maintained – which will benefits a large group of people. There could be direct benefits from conservation related income.

⁸Mawdsley et al. 2009. Op. Cit.

⁹ Heller, N.E. & Zavaleta, E.S. (2009) Biodiversity management in the face of climate change: a review of 22 years of recommendations. *Biological Conservation*, 142, 14.

¹⁰ IUCN Sri Lanka and the Ministry of Environment and Natural Resources (2007) The 2007 Red List of Threatened Fauna and Flora of Sri Lanka, Colombo, Sri Lanka. xiii+148pp.

4. COSTS	
4.1 Cost to implement adaptation options: <i>Cost measures</i>	The cost could be medium to high, and will depend on the time of intervention and its scale. There will be some cost for monitoring and conservation activities. It is estimated that this activity will cost Rs. 100 million annually. This is based on the assumption that a budget increase of 5% of current conservation budgets will be necessary for this activity (based on total Forest Department and Wildlife Department annual budgets). It is estimated that 25% of this will be borne by the public sector. This activity will need to be carried out continuously and will have to be an annual budget. Cost will be for identification of most threatened species/ecosystems, (with use of models and available information), prioritization, identifying conservation measures, revising management plans/creating species or ecosystem-based management plans, implementing conservation activities and monitoring.
4.2 Additional costs to implement adaptation option, compared to “business as usual”	There will be additional cost for this adaptation option, as there will be costs associated with special conservation strategies targeted at threatened species.
5. DEVELOPMENT IMPACTS, INDIRECT BENEFITS	
5.1 Economic benefits: Employment - <i>Jobs</i> Investment - <i>Capital requirements</i>	Employment: • Job opportunities for implementation of the targeted Programs for species. • Ecotourism-related opportunities. Investment: • There could be medium to high capital requirements if special facilities or conservation areas need to be established.
5.2 Social benefits: Income – <i>Income generation and distribution</i> Education – <i>Time available for education</i> Health – <i>Number of people with</i>	Income: • Income generation from ecotourism and visitation to conservation facilities/areas where there are targeted programs for threatened species. For ecosystems, this will also have benefits to local communities and other stakeholders who may become involved in

<i>different diseases</i>	ecotourism activities. • There could be benefits from payments for ecosystem services, community conservation and from conservation-related jobs. Education: • Students will get an opportunity to study threatened species and understand its importance. • Ability to study how such species can be protected from threats such as climate change. Health: • Threatened species will contribute to ecosystem services such as provision of water, micro-climate regulation etc that will benefit the well-being and health of communities.
5.3 Environmental benefits: <i>Reductions in GHG emissions, local pollutants, ecosystem degradation etc.</i>	Such a mechanism will facilitate long-term conservation and viability of species and ecosystems. It will ensure that ecosystem services continue unhindered.
6. LOCAL CONTEXT	
6.1 Opportunities and barriers: <i>Barriers to implementation and issues such as the need to adjust other policies</i>	Opportunities: • Biodiversity Conservation - Framework for Action identifies the importance of protecting threatened species. • Threatened species have been identified in the Red List, along with some locations, which will ease the difficulty in predicting which species will require special intervention. • There will be opportunities from ecotourism, REDD, payments for ecosystem services, REDD and ecotourism. Barriers: • Lack of funding and other resources to target and facilitate specific conservation programs. • Difficulty in predicting how species will be affected by climate change.
6.2 Status: <i>Status of technology in the country</i>	Threatened species under current environmental conditions have been identified, and some programs are targeted at these species.

	The technology will vary from species to species, and will need to consider the changing climate and may need support from other countries.
6.3 Timeframe: <i>Specify timeframe for implementation</i>	The time frame to identify species initially would vary from a few months to a few years, but the process will be continuous, as identification of vulnerable species may need to be done from time to time. Conservation and monitoring activities will need to be continuous.
6.4 Acceptability to local stakeholders: <i>Whether the technology will be attractive to stakeholders</i>	Opportunity for local stakeholders to protect high profile and threatened species. There could be income related benefits, which may also increase acceptability.

ⁱ This fact sheet has been extracted from TNA Report – Technology Needs Assessment Reports For Climate Change Adaptation – Sri Lanka. You can access the complete report from the TNA project website <http://tech-action.org/>