

5.5 Action Plan for Technology 4: - Focus conservation resources and carryout special management for restricted range, highly threatened species and ecosystems

5.5.1 Description of the Technology

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 change⁶⁸. Thus it would target species with high vulnerability to climatic changes that need special attention.

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, show severe range contractions, and some of such species have already become extinct. Tropical coral reefs and amphibians have been most negatively affected⁶⁹. The Sri Lanka Red List⁷⁰ identifies threatened species, and their locations. Thus this can be used as a resource 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 change⁷¹.

Some of its benefits are highlighted below:

- Environment - This will facilitate long-term conservation and viability of species and ecosystems while ensuring that ecosystem services will continue unhindered.
- Employment - Employment opportunities through the implementation of the program and also from ecotourism related ventures.
- Investment - There could be medium to high capital investment requirements in the event of any need for providing special facilities or conservation areas established.
- Income - Income generation from ecotourism and visitation to conservation facilities/areas where technology related programs are implemented. The local communities and other stakeholders will

⁶⁸ Mawdsley, et al. 2009. Op. Cit.

⁶⁹ Parmesan, C. 2006. Ecological and evolutionary responses to recent climate change. *Annual Review of Ecology, Evolution and Systematics* 37:637–669.

⁷⁰ 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.

⁷¹ IUCN. 2009. *Climate change and species*.

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

also be benefited by getting involved in ecotourism activities. There also 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 – Management interventions of this nature will contribute to ecosystem services such as provision of water, micro-climate regulation etc that will benefit the well-being and health of communities.

5.5.2 Target for technology transfer and diffusion

- Develop and implement at least 15 species/habitat action plans based on priority.
- Allocation at least 2-5% of annual budgets to implement above action plans.
- At least one comprehensive climate modeling to study climate change impact on species and ecosystems.
- Legal protection of 2-5 sites where point endemics are found.
- Incentive scheme introduced for protection in areas outside protected areas.
- At least 5 effective partnerships between Ministry/Departments and universities, NGOs, species specialists etc for species conservation.
- Awareness and capacity building programs targeting at least 25% of staff in Forest and Wildlife Departments.
- Implement at least five research studies on critical species.

5.5.3 Barriers to the technology's diffusion

Ten key barriers comprised of one (01) economic & financial, four (04) information & awareness, two (02) technical, one (01) each of policy, legal & regulatory, network failure, and institutional & organizational capacity have been identified.

The list of key barriers and hierarchy classification is given in table 5.14.

Table 5.14: List of key barriers and hierarchy classification for the technology 4

Technology Name:			
No.	Key Barriers Identified	Priority Rank	Category of Barriers
1.	Minimal funding allocated for protecting highly threatened species/habitats.	1	Economic and financial
2.	Lack of national biodiversity action plans for highly threatened species/habitats	3	Technical barriers
3.	Lack of focused research on habitats for species migration.	5	Technical barriers
4.	Lack of information (including modeling) on potential climate change impacts on species/ecosystems.	2	Information, awareness
5.	Inadequate information on threatened species (distribution data, ecological information including population size and genetics - (in-situ research)	7	Information, awareness
6.	Poor awareness by general public and policy-makers on point endemics and other threatened species. Lack of recognition to reinforce voluntary (suasive) conservation action	9	Information, awareness
7.	Insufficient knowledge within the relevant authorities on species management strategies	4	Information, awareness
8.	Not all sites that harbor threatened point endemic species are protected.	10	Policy, legal and regulatory
9.	Insufficient partnerships for species conservation.	8	Network failure
10.	Delay in obtaining permission for conducting research by individuals and non-state sector institutions.	6	Institutional and organizational capacity

5.5.4 Proposed Action Plans for Technology 4:

The Proposed Action Plan for Technology 4 is provided in table 5.15.

BIODIVERSITY SECTOR

Action Plan for Technology 4

Table 5.15: Proposed Action Plan for the technology 4: Focus conservation resources and carryout special management for restricted range, highly threatened species and ecosystems

Measure/Action 1: Allocate sufficient funds from annual budgets to implement action plans based on priority.*					
Justification for the action: There is a low financial allocation for implementation of this technology (nationally). Currently the main departments dealing with environment and biodiversity in the country do not have financial provisions for this activity in their nationally allocated budgets and it is considered a major constraint for conserving restricted and threatened species which is a high priority for biodiversity adaptation to climate change.					
Action /Sub Action	Priority Rank	Responsibility for Implementation	Time frame	Cost & Funding Source	Indicators
(i). Apportion part of the annual budgets of Forest and Wildlife Departments for this technology based on the action plans (ii). Seek external funds*	V. High	Forest/Wildlife Dept, M/Environment	Year 3 Annually	Domestic No additional funding involved (5%, approx. US\$ 750,000 annually)	- At least 2-5% of budget allocated for the technology after 1 year.
Measure/Action 2: Develop and implement species/habitat action plans based on priority.					
Justification for the action: There is a dearth of conservation action plans for highly threatened species/habitats. The main reason is being the insufficient funds and other resources being made available for preparation and implementation of such plans. Even though certain landscapes and ecosystems are protected, it appears to be insufficient to conserve certain highly threatened species/habitats. These species may be highly threatened due to a range of reasons. Therefore a comprehensive study is necessary to understand the existing and potential future threats, and prepare an action plan accordingly. It is of vital importance to take actions to implement the action					

plans once prepared. The level of threat to species/habitats as highlighted in the IUCN Red List can be utilized for planning purposes.

Action /Sub Action	Priority Rank	Responsibility for Implementation	Time frame	Cost & Funding Source	Indicators
(i). Develop and implement species/habitat action plans based on priority.	V. High	Forest/Wildlife Dept, M/Environment M/Fisheries and Aquatic Resources Dev, NARA and CCD, Disaster Management Center	2-5 years	Domestic and international 1,750,000	- Completed comprehensive species/habitat action plans within 2 years. - 10% increase in species population/habitat area/quality in 5 years.
(ii) Mechanism to incorporate disaster response for biodiversity (including rescue/relocation strategies and contingent fund)					- At least one strategy for disaster response prepared in one year.

Measure/Action 3: Generation of necessary **information** and **climate modeling** for determining potential climate change impacts on species and ecosystems.*

Justification for the action: There is a lack of information (including modeling) on potential climate change impacts on species/ecosystems. A preliminary GIS mapping exercise carried out based on available species data and broad climate predictions has only drawn broad conclusions. Detailed and localized information at a fine scale is required to get accurate predictions on how species will be impacted by climate change. This information would be useful for modeling to enable developing climate change adaptation strategies for the specific species and ecosystems.

Action /Sub Action	Priority Rank	Responsibility for Implementation	Time frame	Cost & Funding Source	Indicators
(i). Generation of necessary information and climate modeling for determining potential climate change impacts on species and ecosystems.*	V. High	Forest/Wildlife Dept, M/Environment NARA and CCD	1 – 3 years	Domestic and international US\$ 500,000	- Comprehensive study completed in 3 years. - Set of modeling data, maps etc within 3 years.

		Universities Environmental organizations			
--	--	--	--	--	--

Measure/Action 4: Legalizing the protection of sites where point endemics are found; **incentives** and alternatives for protection in areas outside protected areas*; **inter-departmental coordination** for protection of point endemics and make recommendation to incorporate climate change and species related considerations into legislation and publicize amendments.

Justification for the action: - Not all sites of point endemic species are protected. Currently there are certain point endemic species that do not fall within the protected area system. Even though the species are protected, some ecosystems/sites are not protected and therefore non conservation related activities in such sites cause high threat to these point endemics. If the sites of these species are not protected, they will disappear permanently, and climate change will only compound the threats. Therefore protecting such sites will increase their adaptability to climate change.

Action /Sub Action	Priority Rank	Responsibility for Implementation	Time frame	Cost & Funding Source	Indicators
(i). Enabling legislations to protect the sites where point endemics are found.	Medium	Forest/Wildlife Dept M/Environment M/Fisheries and Aquatic Resources Dev, CCD	1-4 years	Domestic and international US\$ 760,000	- Document with gaps and priorities identified within 6 months. - At least 1 area successfully legalized (and implemented) annually.
(ii). Integrate climate change and species related considerations into legislation – make recommendations and publicize amendments.					
(iii). Incentives and alternatives for protecting sites outside protected areas*	High	Forest Dept, Wildlife Dept M/Environment M/Fisheries and Aquatic Resources	1-4 years	Domestic and international US\$ 1,500,000	- 2-5 alternative livelihoods introduced and carried out annually. - At least 500 beneficiaries annually.

		Dev, CCD			
(iv). Inter-departmental coordination for protection of point endemics.	High	Forest Dept, Wildlife Dept CCD	3-10 years -	Domestic and international US \$ 600,000	- Internal policy/strategy promoting partnership formulated in 6 months. - 5-10 meetings between departments annually.
(v). Make recommendations on climate change and species related considerations	High	Individual experts, Conservation oriented NGOs M/Environment	Year 3	Domestic US\$ 5,000	
Measure/Action 5: Create effective partnerships between Ministry/Departments and universities, NGOs, species specialists etc for species conservation.					
Justification for the action: The Department of Wildlife Conservation being the legally mandated organization to conserve species has established limited partnerships for species conservation. Currently there are numerous researchers and institutions working on biodiversity conservation, and species focused research. Forming formal partnerships with these specialists will facilitate carrying out appropriate species-specific conservation. Their assistance can also be sought for carrying out specialist research and preparation of action plans & strategies for conserving such species etc.					
Action /Sub Action	Priority Rank	Responsibility for Implementation	Time frame	Cost & Funding Source	Indicators
(i). Establish effective partnerships between Ministry/Departments and universities, NGOs, species specialists etc for species conservation.	High	Forest/Wildlife Dept, M/Environment M/Fisheries and Aquatic Resources Dev, NARA and CCD Environmental	3 years & Continuous	Domestic and international US\$ 115,000	- At least 10 partnerships formed in 2-5 years. - At least 5 partnerships have lasted more than 1 or 2 years.

		organizations Species specialists			
Measure/Action 6: Carry out extensive surveys/research ; obtain expertise on the subject/ capacity building *					
Justification for the action: There is inadequate information on threatened species in terms of distribution, population size and genetics. This information is vital when preparing management plans and strategies for their long-term conservation. It is proposed undertake such research in-situ in view of the vulnerability of these species. This information will also be essential for climate change modeling as it will give an idea of possible migration/dispersal and other changes. Therefore, availability of this information is a prerequisite for climate adaptive strategies for biodiversity conservation.					
Action /Sub Action	Priority Rank	Responsibility for Implementation	Time frame	Cost & Funding Source	Indicators
(i). Carry out extensive surveys/research; obtain expertise on the subject/capacity building*	Medium	Universities Environmental org Species specialists Forest/Wildlife Dept, NARA and CCD	Year 2	Domestic and international US\$ 800,000	- 2-5 of studies/research successfully completed (incl. reports) annually - 2-5 Capacity building – workshops annually with 25-50 stakeholders participating.
Measure/Action 7: Awareness programs on point endemics and critically endangered species, and the importance of their conservation; awareness and mechanisms for voluntary conservation action					
Justification for the action: Currently there is poor awareness by both the general public and policy-makers regarding the importance of point endemics and other threatened species. Many do not have any awareness on the importance, the role-played in terms of ecosystem services and the threats to their survival. It is often the lack of awareness on its importance that leads to threats and destruction of such species. Awareness creation should be carried out in a manner that is easily understood and captivates the interest of those whose priorities are often not conservation.					
Action /Sub Action	Priority Rank	Responsibility for Implementation	Timeframe	Cost & Funding Source	Indicators
(i) Awareness programs on point	Medium	Forest/Wildlife	Annual from	Domestic and	-2-5 awareness workshops annually with 25-50

endemics and critically endangered species, and the importance of their conservation.		Dept, , NARA and CCD Universities Environmental org	year 3	international US \$250,000	stakeholders
(ii). Awareness (in an innovative manner) with the support of the government sector for policy makers, school children etc.*	High	Forest/Wildlife Dept, , NARA and CCD Universities Environmental org	Annual from year 4	Domestic and international US\$250,000	- 2-5 awareness workshops annually with 25-50 stakeholders.
(iii) Introduce relevant mechanisms to reinforce voluntary conservation action*	Medium	Environmental org Local communities Forest Dept, Wildlife Dept CCD Private sector	Year 2	Domestic and international US\$300,000	- Incentive mechanism set in place/legalized in 1 year.

Measure/Action 8: Expedite the current administrative process available for obtaining **permission** for research work by individuals and non-state institutions*

Justification for the action: There are experiences of undue delays in obtaining permission for conducting research by individuals and non-state sector institutions. The current existing administrative procedure to obtain such permission is unjustifiably long and discouraging. In some instances delays mean there is a lack of time for researches to carry out the research at the correct season or time period making research ineffective. Expediting the procedure is essential to encourage research activities, while ensuring that the essential administrative requirements are complied with.

Action /Sub Action	Priority Rank	Responsibility for Implementation	Time frame	Cost & Funding Source	Indicators
(i). Expedite process for obtaining permission for research by individuals and non-state institutions* (ii) Create awareness on process	High	Forest/Wildlife Dept, NARA and CCD	Year 1	Domestic and international US\$ 25,000	- Mechanisms introduced to expedite selection. - 25% reduction in time to grant permission for research activities within a year.
Measure/Action 9: Research on habitats for species migration and identification/conservation of such habitats*					
Justification for the action: There is a lack of focused research on habitats for species migration. With the effects of climate change is felt, the species will tend to migrate into more favorable ecosystems and sites, while there will also be altitudinal migration. Often research is carried out in the present habitats of species. However with climate change, potential migration/dispersal sites of species also become important. Climate change modeling would enable identifying such potential sites. This information should be used as a guide and potential sites need to be researched to identify their suitability for species migration/dispersal.					
Action /Sub Action	Priority Rank	Responsibility for Implementation	Time frame	Cost & Funding Source	Indicators
(i). Research on habitats for species migration and identification/conservation of such habitats*	V. High	Universities Environmental org. Forest/Wildlife Dept, NARA and CCD	Year 4	Domestic and international US\$500,000	- List of research priorities identified in 3 months. - 2-5 successful studies completed and activities implemented annually.
Measure/Action 10: Build capacity and equip staff within departments for conservation and monitoring of threatened species/ecosystems (specialized knowledge).*					
Justification for the action: There is insufficient knowledge on species management strategies within the relevant authorities. Sri Lanka has a high diversity of species and it is not feasible for one department to be equipped with all the expertise on the country's biodiversity. Yet insufficient knowledge is a major hindrance for appreciating the need for species conservation. For species focused conservation, it is vital that ecological and other information relevant to the threatened or endemic species is known.					

Capacity building, and knowledge acquired from researchers and external experts will be essential when planning and carrying out conservation of species.					
Action /Sub Action	Priority Rank	Responsibility for Implementation	Time frame	Cost & Funding Source	Indicators
(i). Build capacity and equip staff within departments to conserve and monitor threatened species/ecosystems (specialized knowledge).*	V. High	Forest/Wildlife Dept, NARA and CCD (Environmental org.)	Year 2	Domestic and international US\$275,000	- 2-5 Capacity building – workshops annually with 25-50 stakeholders participating.
Total cost for the Technology 4				#Approx. US\$ 7.5 million for 10 years	

V. High = Very High; NARA – National Aquatic Resources Research and Development Agency; CCD – Coast Conservation Department; NGOs – Non-governmental Organizations