

## 5.3 Action Plan for Technology 2: Increasing connectivity through corridors, landscape/matrix improvement and management

### 5.3.1 Description of the Technology

Increasing connectivity in the broader landscape is vital for conserving biodiversity during climate change<sup>59</sup>. It is an important mechanism to connect fragmented areas, as many protected areas are isolated from each other. With climate change, corridors become important as they will allow migration of species, whose range will change to the changing climate.<sup>60,61</sup>

This strategy involves the protection of areas and regions that would be essential for climate-induced wildlife movements<sup>62</sup>. Technologies that can be used include movement corridors for terrestrial species, while unblocked streams and rivers are important movement corridors for aquatic species<sup>63</sup>. In the case of forests, a system of corridors could be designed utilizing existing patches or augmenting with rehabilitation and restoration and other restoration mechanisms, creating an opportunity for short or long term migration. There are provisions for such corridors in wildlife legislation and are referred to as 'jungle corridors'<sup>64</sup>.

Several Policies, Action Plans and Strategies in Sri Lanka have identified this technology as an essential strategy for biodiversity conservation.

Some of its benefits are highlighted below:

- Environment - Environmental benefits include maintaining genetic diversity, allowing migration of species within large home ranges, seed dispersal, carbon sequestration and other ecosystem services. It will also allow ecosystems to be resilient to the changing climate as they are better conserved.

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<sup>59</sup> Mawdsley, et al. 2009. Op. Cit.

<sup>60</sup> Mawdsley, et al. 2009. Op. Cit.

<sup>61</sup> Hannah, L and Hansen, L. 2005. Chapter 20 – Designing Landscapes and Seascapes for Change. In: Lovejoy T, Hannah L, eds. 2005. In *Climate Change and Biodiversity*. New Haven, CT: Yale Univ. Press

<sup>62</sup> Allan, J. D., M. Palmer, and N. L. Poff. 2005. Climate change and fresh- water ecosystems. Pages 274–290 in T. E. Lovejoy and L. Hannah, editors. *Climate change and biodiversity*. Yale University Press, New Haven, Connecticut.

<sup>63</sup> Mawdsley et al., 2009. Op. Cit.

<sup>64</sup> The Fauna and Flora Protection Ordinance No. 2 of 1937 and Amendment Act No. 49 of 1993.

- Employment – Employment opportunities will be created locally through the implementation of rehabilitation, restoration, monitoring and conservation related activities. There also would be opportunities for ecotourism, community conservation and sustainable utilization of NTFP
- Investment - No major capital investments will be required. However, some investment will be required if rehabilitation and restoration or any construction (eg: fish ladders) related activities are found to be required. Investment will need to be made in order to secure land in the case of corridors. In some cases payment of compensation to legitimate owners would be required.
- Income - Income could be generated through activities associated with corridors and matrix management and ecotourism related activities. Possible benefits from community conservation, payments for ecosystems services, REDD, NTFPs etc.
- Education - Educational benefits will include the opportunities available for students to learn about the technology; University students can learn and contribute to this technology.
- Health - It will help sustain biodiversity and ecosystem services, contributing to good environmental quality, which in turn will improve well-being and health of people.

### **5.3.2 Target for technology transfer and diffusion**

- At least one incentive scheme introduced for private landowners to set aside or maintain areas necessary for connectivity.
- Allocation of at least 2-5% from the annual budgets of Department of Wildlife Conservation and Forest Department for improving management, increasing the extent under conservation.
- Integrate provisions into the policies to ensure that medium to large development projects set aside areas to maintain connectivity.
- Complete study for prioritization.
- One campaign for political awareness completed.
- Climate change modeling for at least two regions completed.
- Evidence of implementing policies/legislation documented.
- At least 4 critical areas included into protected area network.

### **5.3.3 Barriers to the technology's diffusion**

Eleven (11) key barriers which comprised of four (04) economic & financial, four (04) policy, legal & regulatory and three (03) information & awareness have been identified.

The list of key barriers and hierarchy classification for this technology is given in table 5.10.

**Table 5.10: List of key barriers and hierarchy classification for the technology 2**

<b>Technology Name: Increasing connectivity through corridors, landscape/matrix improvement and management</b>			
<b>No.</b>	<b>Key Barriers Identified</b>	<b>Priority Rank</b>	<b>Category of Barriers</b>
1.	Low funding allocation for connectivity.	1	Economic and financial
2.	No incentives for protecting isolated forest patches/ecosystems in private lands.	3	Economic and financial
3.	No provisions exist to ensure that large development projects set aside areas to allow connectivity.	5	Economic and financial
4.	Insufficient incentives and policies to involve private landowners in enhancing connectivity.	6	Economic and financial
5.	Critical areas for connectivity and priorities not identified at a national scale.	2	Information and awareness, technical
6.	High altitudinal (montane) areas are poorly protected due to non-enforcement of laws and management plans.	4	Policy, legal and regulatory
7.	Matrix/landscape level planning of conservation not carried out; lack of enabling policies and legislation to ensure matrix level planning/conservation.	8	Policy, legal and regulatory
8.	Lack of awareness on value and benefits of connectivity due to poor communication.	7	Information and awareness
9.	Ambiguity in government policies on 'taking over unutilized land' – as the term 'unutilized' is ill defined hence include patches of natural ecosystems vital for connectivity.	9	Policy, legal and regulatory
10.	Procedural delays in land acquisition.	10	Policy, legal and regulatory
11.	Lack of community awareness on cohabitation with biodiversity/critical species and lack of policy and legal framework for benefit sharing	11	Information and awareness, social, cultural and behavioral

### **5.3.4 Proposed Action Plans for the Technology**

The Proposed Action Plan for Technology 2 is provided in table 5.11.

## BIODIVERSITY SECTOR

### Action Plan for Technology 2

**Table 5.11: Proposed Action Plan for the Technology 2: Increasing connectivity through corridors, landscape/matrix improvement and management (includes altitudinal and other movement)**

<b>Measure/Action 1:</b> Apportion part of <b>annual budgets</b> of Forest and Wildlife Departments for connectivity based on an action plan. *					
<b>Justification for the action:</b> Currently the main departments dealing with environment and biodiversity in the country do not have sufficient allocation for this activity through their nationally allocated budgets. This is seen as a major barrier, as activities related to improving connectivity cannot be implemented without funds being made available. Improving connectivity being a high priority for biodiversity adaptation to climate change, not prioritizing improving connectivity and unavailability of funds is a major hindrance in this regard.					
Action /Sub Action	Priority Rank	Responsibility for Implementation	Time frame	Cost (US \$) & Funding Source	Indicators
(i) Allocate sufficient funds from annual budgets to implement the action plans based on priority* (ii) Seek external funds*	V. High	Forest/Wildlife Dept M/ Environment M/Fisheries and Aquatic Resources Dev, NARA and CCD	0.5 – 1 year and thereafter annually	Domestic No additional cost (4.5%, approx. US\$ 675,000 annually).	- At least 2-5% of budget allocated for this activity within 3 years
<b>Measure/Action 2:</b> <b>Incentives</b> for private landowners to set aside or maintain areas necessary for improving connectivity*					
<b>Justification for the action:</b> No incentives are available for protecting isolated forest patches/ecosystems in private lands (plantations/home gardens etc) and it is considered a major constraint for the success of this activity. The landscape/ecosystem approach to conservation places a major role in improving connectivity. There are					

considerable extents of private land/leased land situated adjacent to protected areas which could serve as corridor for ensuring connectivity. In the absence of any incentive scheme to promote conservation of such private forests and other ecosystems, these lands remain vulnerable to conversion into other land uses.

Action /Sub Action	Priority Rank	Responsibility for Implementation	Time frame	Cost (US \$) & Funding Source	Indicators
(i). Incentives for private landowners to set aside or maintain areas necessary for connectivity*	V. High	Forest/Wildlife Dept M/ Environment, CEA M/Fisheries and Aquatic Resources Dev, NARA and CCD	0.5 – 2 year on wards	Domestic & international US\$ 1,020,000	- A minimum of 500 beneficiaries a year - At least US\$ 100,000 worth of incentives disbursed annually.

**Measure/Action 3:** Make enable legal and policy environment to ensure that medium to large development projects set aside areas that allow for connectivity.

**Justification for the action:** Currently there are no provisions available to ensure that large development projects set aside areas that allow for connectivity. The landscape/ecosystem approach to conservation places a major importance on connectivity including areas outside protected areas. There is a considerable amount of private land/state land adjacent to protected areas which are likely to be used for state sponsored and private sector development activities. Hence, this is considered a major barrier for improving connectivity.

Action /Sub Action	Priority Rank	Responsibility for Implementation	Time frame	Cost (US \$) & Funding Source	Indicators
(i). Make provisions (legal/policy) to ensure that medium to large development projects set aside areas that allow for connectivity.	High	Forest/Wildlife Dept, M/Environment M/Fisheries and Aquatic Resources Dev, NARA and CCD	0 – 2 years thereafter continuous	Domestic & international US\$ 20,000	- New provisions incorporated in 6-12 months.

**Measure/Action 4:** Political **awareness**; site specific environmental valuations for areas prioritized for rehabilitation and restoration (over development)\*

**Justification for the action:** In order to provide incentives to involve private landowners in connectivity related activities, an enabling policy environment need to be created

with political patronage through awareness. Additionally site-specific evaluation and prioritization is essential to ensure that the most important sites are connected first, and it would also help when prioritizing conservation *vis a vis* development.

Action /Sub Action	Priority Rank	Responsibility for Implementation	Time frame	Cost (US \$) & Funding Source	Indicators
(i). Political awareness; site specific evaluation for areas prioritized for rehabilitation and restoration (over development)* [Awareness to all levels of decision makers]	High	Forest/Wildlife Dept, M/Environment M/Fisheries and Aquatic Resources Dev, NARA and CCD	0 – 2 years annual	Domestic & international US\$ 275,000	- At least 50 decision makers participate in annual events. - At least 10 decision makers advocate for environmental issues in 2 years.

**Measure/Action 5: Identify critical areas** to be connected and prioritize required corridors. **Climate change modeling** to identify critical areas\*

**Justification for the action:** Identification and prioritization of critical areas for connectivity has not taken place at national scale. A lack of prioritization of sites to be conserved for connectivity remains a major barrier for biodiversity adaptation. Connectivity is vitally important for climate change adaptation as it facilitates migration and dispersal of species. Although, some attempts exists towards conservation, rehabilitation and restoration of small patches of forests, these actions often takes place happens haphazardly and not based on priorities. Therefore critical areas for connectivity and its prioritization still remain to be carried out through a national level study. Additionally, climate change modeling should accompany the study to make it accurate and select the most vital areas for connectivity.

Action /Sub Action	Priority Rank	Responsibility for Implementation	Time frame	Cost (US \$) & Funding Source	Indicators
(i). Identify critical areas to be connected and prioritize required corridors. Climate change modeling to identify critical areas*	V. High	Forest/Wildlife Dept, Climate Change Secretariat of M/E) M/Fisheries and Aquatic Resources Dev, NARA and CCD	1 – 3 years Implementation continuous	Domestic & international US \$ 1,850,000	- One comprehensive study completed in 3 years. - At least 4 critical areas included into protected area network.

**Measure/Action 6:** Enforcement and management of protected areas; increasing protection level and effectiveness of conservation/ management\*; Include critical areas into protected area network

**Justification for the action:** High altitudinal areas are considered critically important for migration and dispersal of biodiversity during climatic changes. Currently there are adequate policies and laws that provide protection to critical areas including montane areas. However the lack of enforcement has led to degradation due to through conversion into other land uses and encroachment. Inclusion of the critical montane areas within the national protected area system and upgrading the protected area category to ensure high degree of legal protection and more effective management will be vital for the conservation of these montane areas.

Action /Sub Action	Priority Rank	Responsibility for Implementation	Time frame	Cost (US \$) & Funding Source	Indicators
(i). Enforcement and management of protected areas, increasing its protection level and effectiveness of conservation/ management*	V. High	Forest/Wildlife Dept, M/Environment M/Fisheries and Aquatic Resources Dev, NARA and CCD	1 – 10 years	Domestic & international US\$ 1.5 million	- One Strategy prepared within 6 months - At least 10-20 issues addressed annually.

**Measure/Action 7:** Integrate the concept of Landscape level **planning for conservation** and special management into Forest and Wildlife Department management plans

**Justification for the action:** Matrix/landscape level planning of conservation is not properly carried out while the focus is only on isolated areas; Enabling policies and legislation for mandatory matrix level planning/conservation is lacking. Therefore landscape level planning for conservation, special management and implementation should be integrated into Forest and Wildlife Department management planning process. It is also vital to integrate Forest and Wildlife Department management plans, and these institutions need to work closely together. Such a mechanism needs to be formalized by two institutions.

Action /Sub Action	Priority Rank	Responsibility for Implementation	Time frame	Cost (US \$) & Funding Source	Indicators
(i). integrate landscape level planning for conservation and special management into Forest and Wildlife Department management plans.	Medium	Forest/Wildlife Dept, CEA, M/Fisheries and Aquatic Resources Dev, NARA and CCD	1 – 10 years	Domestic & international US\$ 250,000	- One Strategy prepared within 3 months - At least 2-5 instances where landscape planning has been used and implemented every year.
(ii). Include elements of climate change consideration in the EIA process and draft the the TOR accordingly					
<b>Measure/Action 8:</b> Carry out environmental valuation and identify <b>benefits of connectivity</b> , publicize results including awareness creation and communication.					
<b>Justification for the action:</b> Value and benefits of connectivity is generally unknown while there is a lack of communication and awareness as well. Effective and innovative communication and awareness programs must be launched to enable the decision makers to recognize the true value and benefits of connectivity. Where information on values are not available, research and studies need to be carried out. However the most important aspect is dissemination and the information reaching the most important stakeholders in a convincing manner.					
Action /Sub Action	Priority Rank	Responsibility for Implementation	Time frame	Cost (US \$) &Funding Source	Indicators
(i). Carry out valuation and identify benefits of connectivity, publicize results including awareness creation and communication.	Medium	Forest/Wildlife Dept, M/Environment M/Fisheries and Aquatic Resources Dev, NARA and CCD	2 – 5 years	Domestic & international US\$ 500,000	- At least 10 studies carried out successfully within 3 years - At least 1000 documents of published results disseminated by year 4.



<b>Measure/Action 9: Policy harmonization</b>					
<b>Justification for the action:</b> There is ambiguity in the definition of the term “Unutilized” when ‘taking over unutilized land’ for government purposes. At present the legal definition of the term ‘Unutilized’ includes patches of natural ecosystems vital for connectivity. In order to address this ambiguity, land – policy harmonization has to be carried out to address any misconceptions. Additionally, an amendment to the policy will be necessary to ensure that the definition of “unutilized” shall not include valuable ecosystems requiring strict protection.					
<b>Action /Sub Action</b>	<b>Priority Rank</b>	<b>Responsibility for Implementation</b>	<b>Time frame</b>	<b>Cost (US \$) &amp; Funding Source</b>	<b>Indicators</b>
(i). Policy harmonization (eg: definition of ‘unutilized’ should not include areas vital for biodiversity).	Medium	Forest/Wildlife Dept, M/Environment M/Fisheries and Aquatic Resources Dev, NARA and CCD Environmental organizations	0 – 1 year	Domestic & international US\$ 20,000	- One document analyzing policy gaps produced within 6 months. - At least 2-5 instances where harmonized policy is used annually.
<b>Measure/Action 10: Amend procedures to expedite land acquisition process.</b>					
<b>Justification for the action:</b> Currently there are procedural delays in land acquisition. In order to address this issue, the current procedures that cause delay should be amended. It should include a comprehensive analysis of the existing procedure and identify where delays occur and introduce amendments in order to expedite the procedure. Such amendments would be beneficial as delays in acquisition can result in further degradation of the areas requiring urgent attention.					
<b>Action /Sub Action</b>	<b>Priority Rank</b>	<b>Responsibility for Implementation</b>	<b>Time frame</b>	<b>Cost &amp; Funding Source</b>	<b>Indicators</b>
(i). Amend procedures to expedite land acquisition process.	Medium	Forest/Wildlife Dept, M/Environment M/Fisheries and	1 – 10 years	Domestic US\$ 30,000	- Amend the relevant legislation in 2 years.

		Aquatic Resources Dev, NARA and CCD			
<b>Measure/Action 11:</b> Create <b>awareness and build capacity</b> to promote coexistence with biodiversity. (eg: Kandyian home gardens; native plants seeds, materials etc)*					
<b>Justification for the action:</b> Often communities lack awareness on sharing habitats with biodiversity/critical species and a policy and legal framework is not available for benefit sharing in such instances. In order to address this barrier, awareness creation on coexistence with biodiversity should be carried out in areas where people inhabit adjacent to high value ecosystems and protected areas. In many areas communities have conflicts with certain species of biodiversity such as elephants, wild boar etc. Sometimes such incidents contribute to negative attitudes towards conservation.					
Action /Sub Action	Priority Rank	Responsibility for Implementation	Time frame	Cost & Funding Source	Indicators
(i). Create awareness, build capacity and provide material to promote coexisting with biodiversity.	Medium	Forest/Wildlife Dept, M/Environment M/Fisheries and Aquatic Resources Dev, NARA and CCD	2 – 10 years	Domestic & international US \$ 275,000	- Ten awareness/capacity building programmes annually, each attended by at least 50 participants - At least 2-5 successful case studies a year.
<b>Total Cost for Technology 2</b>				<b>#Approx. US \$ 6.75 million for 10 years</b>	

V. High = Very High; NARA – National Aquatic Resources Research and Development Agency; CCD – Coast Conservation Department; CEA – Central Environmental Authority