# [Mains Article] Eco-bridges

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## Introduction:

Within many of India's wildlife protection area, roads, railway lines and transmission lines cut across the landscape, fragment wild habitats and often result in mortality of animals, thus endangering many of the species.

Some of the prominent examples of these negative effects include the National Highway (NH) 72 and 74 crossing **Rajaji National Park**; NH 67 and 212 passing through **Bandipur National Park** etc.

Thus, there is a pressing need for conservation and development to go hand in hand, complementing each other. One of the solution of maintaining balance between the two is through **creation of Eco-bridges or wildlife corridors.**

## What is an Eco-bridge?

- Eco-ducts or eco-bridges are **areas of a habitat** that aim **to enhance wildlife connectivity** that can be **disrupted because of human activities** or structures including highways or logging.
- They are generally **made up from native vegetation** which joins two or more larger areas of similar wildlife habitat.
- **Ex:** Recently, the first **90-foot eco-bridge** for reptiles and smaller mammals has been built in **Ramnagar** Forest Division, **Nainital** district, **Uttarakhand.**
- These include-
    - **Canopy bridges** (usually for **monkeys, squirrels** and other arboreal species).
    - **Concrete underpasses** or **overpass tunnels** or **viaducts** (usually for **larger animals**).
    - **Amphibian tunnels** or **fish ladders** (for **aquatic** animals).
    - **Green roofs** (for **butterflies** and **birds**).
    - **Culverts** (for **small mammals** such as otters, hedgehogs and badgers).
- It is a way **to preserve the ecosystem**.
- Usually, these bridges are overlaid with planting from the area to give it a **contiguous look with the landscape.**

## Criteria to build an Eco-bridge:

- There are **two important aspects** of building eco-bridges – **size and location**.
- It also depends on the **animal habitats** in the area, **topography**, **disturbance types**, **road length** and its **curvature**.
- The **span and distribution of eco-bridges** should depend on **animal movement patterns**.
    - Example: **Barking deer** prefer closed habitats need **smaller bridges.**

## Why Eco-bridges are needed?

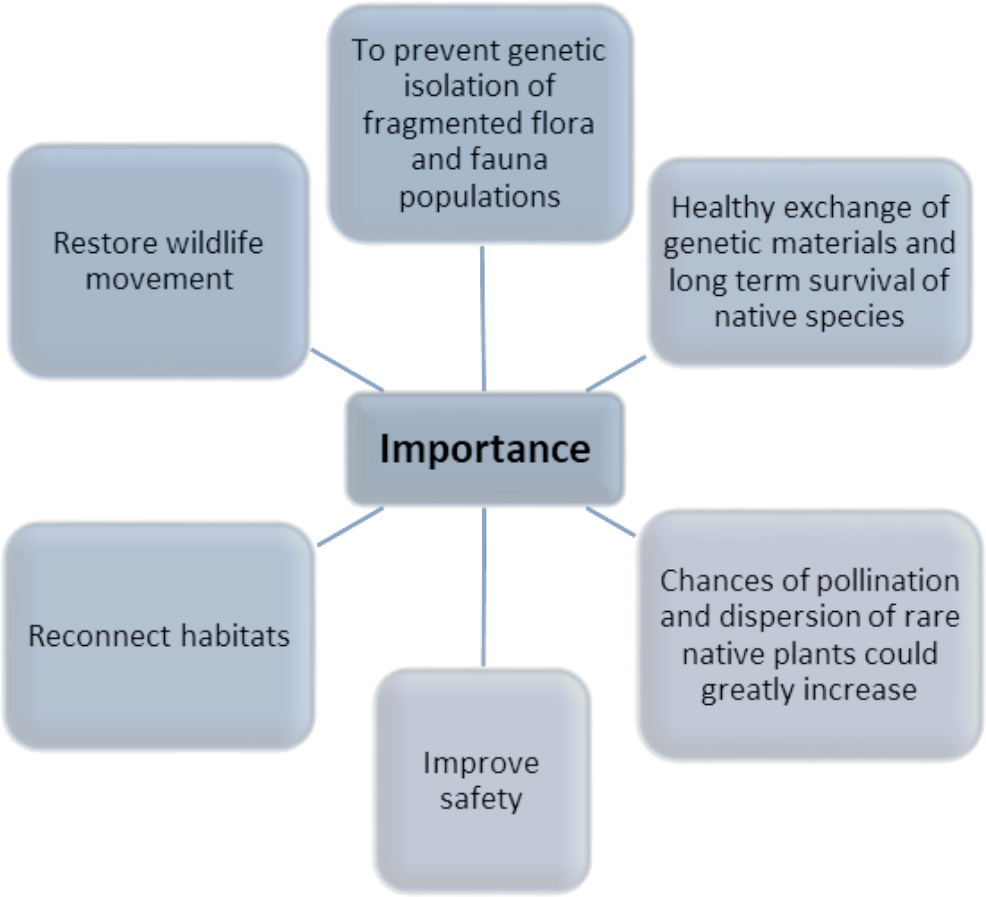
- As per a 2020 study by the **Wildlife Institute of India**- nearly 50,000 km of road projects have been identified for construction in India over the next five to six years, while many **highways are being upgraded to four lanes.**
- **Human activity and intervention** in natural environment leave **fragmented patches** of land intact, putting the **ecosystem at risk**.
- It results in the **breakdown of various ecological processes** such as species migration, recycling of nutrients, pollination of plants and other natural functions required for ecosystem health.
- As a result, there will be-
    - Severe **biodiversity decline.**
    - Local **extinction of sensitive species**.
    - **Lack of access** to the particular habitats to animals.
    - An **increased mortality rate** of animals.
    - **Noise induced change** in behaviour of species.
    - Increased **human-wildlife conflict.**
- In such circumstances, eco-bridges can **help halt biodiversity loss** and **redress some of the**

**impacts** of the degradation and isolation of the **ecosystem.**

## Advantages of Eco-bridges:

- **Increased immigration** which could:
  - Increase or maintain species richness and diversity
  - Increase the population sizes of particular species
  - Decrease probability of extinction
  - Permit species re-establishment
  - Prevent inbreeding depression / maintain genetic diversity.
- **Increased foraging area** for wide-ranging species.
- **Provide escape cover** for movement between patches.
- **Increase accessibility** to a mix of habitats.
- Provide **alternative refuge** from large disturbances.




## Potential disadvantages of Eco-bridges:

- Increased immigration, which could:
  - **Facilitate the spread of diseases**, pests, invasive and alien species.
  - **Decrease the level of genetic variation** between populations due to outbreeding

depression.

- **Facilitate spread of fire** and other contagious catastrophes.
- **Increase exposure to hunters**, poachers and predators.
- May **not function for species** not specifically studied.
- **Cost and possible conflicts** with other conservation efforts for threatened species (increase size of habitat patches, improve matrix quality, species translocation).

## Challenges Involved with Eco Bridges:

- **Lack of funds** results in **lack of research into the actual benefits** of these corridors.
- Wildlife corridors often need to be built towards a specific animal population which can **decrease their efficiency** in the grand scheme of conservation.
- As many wildlife corridors intersect busy roads or places where a lot of humans are, **many species shy away from the area.**
- Corridors also **need to be built very wide to maintain the wilderness effect**, but this land is very hard to get approved for usage as a wildlife corridor in some cases.
- They also **must maintain the same habitat** or crossing will **seem unnatural** to the animals.
- These corridors **often allow for the safe passage of invasive species** of flora and fauna which can drastically change the ecosystem of a nearby area that was once inaccessible.
- **More study needs to be conducted on specific animal migratory patterns** as well as the overall benefits of these corridors in order to know if they are truly worth the cost of building and maintaining.


## Way Forward:

- Aim to ensure that **ecological processes and corridor functions co-exist.**
- **Maintain and increase vegetation cover and habitat quality** to maximise the connection between larger remnants of vegetation.
- Give due consideration to **specific habitat resources** and ecological needs particularly for **threatened species.**
- **Maximise corridor width and function** by re-vegetation and control of weeds and feral animals.
- **Maximise the protection/linkage of landforms** (i.e. valley floors, floodplains, gullies, mid-slopes and ridges etc.)

## Conclusion:

- It is important to bear in mind that **connectivity is not the only solution to fragmentation and degradation of natural habitats**.
- Biodiversity preservation must also be analyzed in **terms of quantity and quality of natural habitats.**

- Hence, **eco-bridges coupled with other conservation methods** can be a **beneficial tool for wildlife conservation.**