

**Green Road to Montreal** Planning Environmentally Sustainable Infrastructure WORKSHOPS SERIES 2022 28 April / 19 May / 23 June / 26 October



### Addressing Biodiversity and Ecosystem Services in Road Projects financed by ADB in Nepal

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#### Date: 26 October 2022

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### **NEPAL'S BIODIVERSITY**





Asiatic elephant

### Bengal Tiger





Nepal has 49th position in the world biodiversity.

There are over 22,000 species reported from Nepal i.e., 1.3% of the global biodiversity.

In richness of flowering pla nt species, the country holds 27<sup>th</sup> position in the world and 10th in Asia.

Ref: NBRCC

One horn Rhino

Red Panda

# Policies on Biodiversity and Wildlife Conservation

- The Constitution of Nepal 2015
- National Parks and Wildlife Conservation Act (1973)
- Soil Conservation and Watershed Management Act (1982)
- Forest Act (1993)
- Environmental Protection Act (1995)
- National Parks and Wildlife Conservation Regulation (1974)
- Wildlife Reserve Regulation (1978)
- Environmental Protection Regulation (1995)
- 15<sup>th</sup> National Development Plan (2019/20 t0 2023/24)
- Wild life Friendly Infrastructure Construction Directives 2022







### Wildlife Friendly Infrastructure Construction Directives 2022

#### Working Policies









Corridors will be defined for infrastructure passing through forests Coordination and collaboration will be ensured for the development of conservationfriendly infrastructure. Human-wildlife conflict will be minimized through awareness programmes

Bioengineering will be an integral part of development works

# Wildlife Friendly Infrastructure Construction Directives 2022

#### Important Provisions







-Outside Sensitive area

-Detail Technical Study

#### <u>Construction of WL</u> <u>friendly Structures</u>

-mitigation measures as rec. by EIA/IEE. Some eg. overpass and underpass, guiding fence, noise resistant structures





<u>Wild fauna and</u> <u>flora species listed</u> <u>in the protected list</u> <u>according to the</u> <u>existing law to be</u> <u>protected</u> Determination of national infrastructure corridor

-by a committee of 5 secretary + 1 JS, led by secretary of MOFE

# Baseline Biodiversity Assessment (BBA) : Initiatives from Narayanghat Butwal Road

On the Basis of field visit and Camera Trap Survey Report, Construction Supervision Consultant's (CSC) Wildlife Expert, **Environment Expert** (PD/ADB) and Mr. Norris Dodd (Ecologist) finalized the Biodiversity **Baseline Assessment** Report on July 2020.



# Location of WL movement in NB Road as per Baseline Biodiversity Assessment (BBA) Report

The **35 locations** of the wildlife crossing were finalized in NB Road in which **12 numbers** of wildlife crossing required design modifications

43'0"

38'0"N

N.0

28'0'

23'0'N



83°28'0"E 83°32'0"E 83°36'0"E 83°40'0"E 83°44'0"E 83°48'0"E 83°52'0"E 83°56'0"E 84°0'0"E 84°4'0"E 84°8'0"E 84°12'0"E 84°16'0"E 84°20'0"E 84°24'0"E

# Approximate increased cost of cross drainage structures making for wild life

Cost of 12 cross drainage structures as per Contract (original design)= <u>NPR.</u> <u>132,174,790.00</u> (i.e, 1.11 million US\$)

- Cost of 12 cross drainage structures after modification in size (design) to suit for WL passing as recommended by BBA= <u>NPR.</u> <u>229,322,306.00</u> (i.e, 1.93 million US\$)
- Increase in amount = <u>NPR.</u> <u>97,147,516.00</u> (i.e, 0.82 million US\$), which is <u>0.65%</u> of Contract amount for the road project









Existing & Newly Constructed Structures @ NB Road

### Facts and Lesson Learnt

- There are 409 numbers of cross drainage structures in NB road out of them only 35 structures are being used by the wild life substantially : The route of animal shall be identified
- Most of the cross drainage structures allows wild life movement if they are of adequate size: Appropriate size : larger of size required for drainage discharge or size required for targeted wild animals
- Because of change in size of 12 cross drainage structures only NPR.
  97,147,516.00 (i.e, 0.82 million US\$) is increased value of the Contract which is 0.65% of the total contract price: If we consider the requirements of wildlife movement at the design phase of the structures the cost implication is not substantial
- Biodiversity Conservation plan is being implemented: Biodiversity plan should be adequately implemented and budget should be allocated

# Integration of Biodiversity and Ecoservices with linear infrastructure Development: SWOT Assessment

#### Strength:

-Good policy documents -WL friendly Infrastructure Construction guidelines is already in our hand

-There is a dedicated Departments (Forest, Nationalpark and Wildlife Conservation)

-Competent technical manpower in the infrastructure development sector

-Strong support from the development partners

#### **Weakness**

-Stakeholders are not fully aware about the policy of the government

- -Weak interagency coordination
- -No integrated planning
- -Budget scarcity for sophisticated design
- -No research/study about the outcome
- -Limited capacity of conducting BBA, CHA and Smart Green
- structure's benefit assessment

# Integration of Biodiversity and Ecoservices with linear infrastructure Development: SWOT Assessment

### **Opportunity:**

- -Develop WL friendly infrastructures
- -Develop typical design suitable for different situation
- -Innovation in design using local materials
- -Preservation of natural habitats
- -Capacity development & Technology transfer

#### <u>Threat</u>

- -Few experts are available in the relevant field
- -Priority of the people is quantity of the construction activities
- -Less priority among policy makers
- -Sometime too expensive and budget deficit (@ costly overpass/underpass)
- -No typical design
- -Still there is debate on optimal length of WL crossing structures and their spacing
- -No tradeoff culture \_ Ego culture -No clear decision supporting tool
- -Managing Intersection of broad transportation & ecological corridors

### **Recommendation and way forward**

### 1. Development of a decision support tool

• The benefit from the ecosystem preservation cannot be compared with money. However they shall be appropriately addressed in the decision tool with a simple formula.

### 2. Planning Mitigation: Key factors

- Spacing of WL crossings (How far apart? What interval for spacing?)
  - There are different guidelines about the size of the structures for different habitat species and minimum recommended spacings.
  - But some times the experts have different opinion that even if the size and spacing are as per the most sophisticated guidelines they may not be sufficient to provide complete ecological solution.
- So, based on the best practice those guidelines should be explained appropriately

### **Recommendation and way forward**

3. Tradeoff between NPV and Socio-environment damage score while designing WL friendly infrastructures (optimal Design)



Percentage of the total socioenvironmental damage score

Continuous structures vs Limited structures

-Continuous Structures: May be too expensive (project could be economically infeasible)

-Limited Structures: The Natural habitats and ecological corridors might be endangered

-Combination of wildlife structures and fencing: This could be the best option to find optimal planning and design solution

-Capacity Buildings training to the Planner and decision maker based on adopted best practice

### **Recommendation and way forward**

- 4. The developing world needs to be given financial resources for conserving the planets natural capital
- Have policy, have commitment but cannot implement because of initial huge investment, although it might be not so costly in the long run.
- As Biodiversity and Eco system services in Infrastructure development is a global agenda, the gap in funding faced by those countries should be supported. For this purpose, a special fund should be created and procedure to select the Project for which gap in finance could be supported from the special fund, should be agreed.



### Thank You for your patience!