TRAINING ON

Planning and Design of Smart Infrastructure for Biodiversity Protection

25–27 April 2022

Rhino Lodge, Sauraha, Nepal

Cumulative impacts of infrastructure development, 27 April 2022

Patricia de la Cueva (ESSA)

Cumulative impacts of infrastructure development on wildlife and biodiversity conservation

I. Why consider cumulative impacts?

II. CIA: Approaches and practice

III. Example: CIA for NB and NHP roads

I. Why consider cumulative impacts?

Changes to the environment that are caused by an action in combination with other past, present and future actions (Hegmann et al. 1999).

Rhinos or roads? Nepal deals with a tricky balancing act

BY **ABHAYA RAJ JOSHI** 23 JANUARY 2019

KUMROJ, Nepal — In March 2016, a team of experts from the International Union for Conservation of Nature (IUCN) arrived in Nepal's Chitwan National Park. Dispatched at the request of...

'Sharing the air' proves a challenge for new Nepal airport in bird paradise

BY **ABHAYA RAJ JOSHI** 5 APRIL 2022

KATHMANDU — Nine lakes listed as Ramsar sites, perennial rivers that start from the Himalayas and beyond, and lush green fields in the foothills of the mountains: these features make...

Nepal burns more than 4,000 confiscated wildlife parts

BY **SHREYA DASGUPTA** 24 MAY 2017

On Monday, the Nepalese government set fire to more than 4,000 items of confiscated wildlife parts in an attempt to demonstrate zero tolerance for the illegal wildlife trade. The stockpile...

Casualty of peace? Study shows rise in deforestation after conflicts

BY **DILRUKSHI HANDUNNETTI** 2 JULY 2019

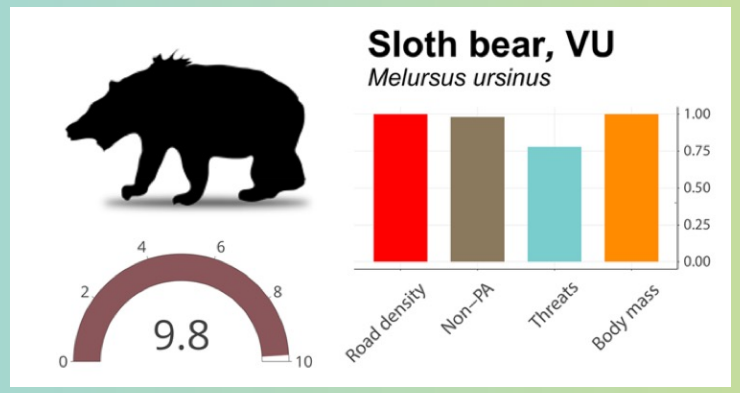
The advent of peace in four countries with long experiences of deadly armed conflict hasn't been kind to the environment, with a new study showing greater rates of deforestation during...

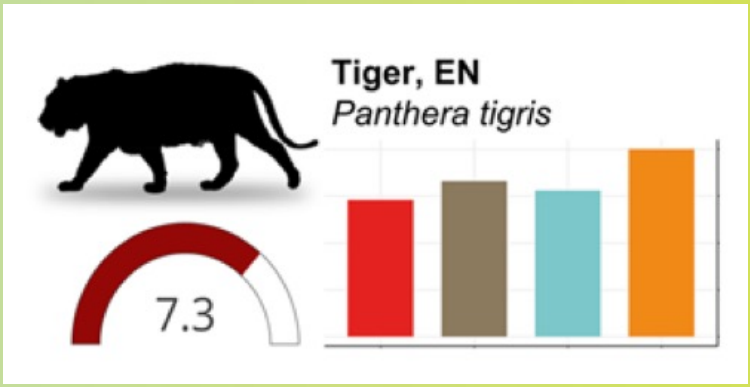
Proposed action's impact on wildlife + **Other past, present and future actions** = **Cumulative impacts on wildlife**

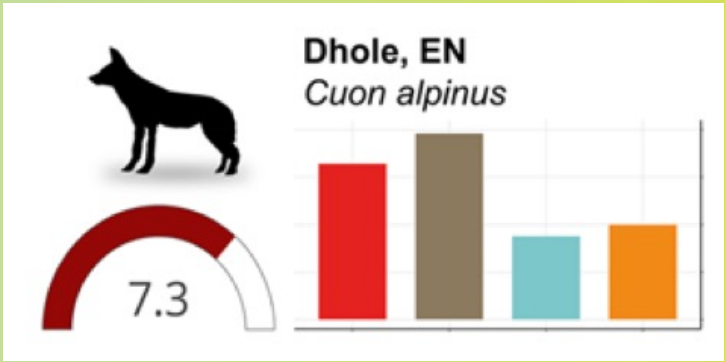
I. Why consider cumulative impacts?

Wildlife populations can be impacted over **large geographical areas** and **time scales**

- 8 of the 10 species with the highest cumulative road risk occur in Asia
- Planned Postal Highway will cause severe impacts on 7 apex predators in Nepal



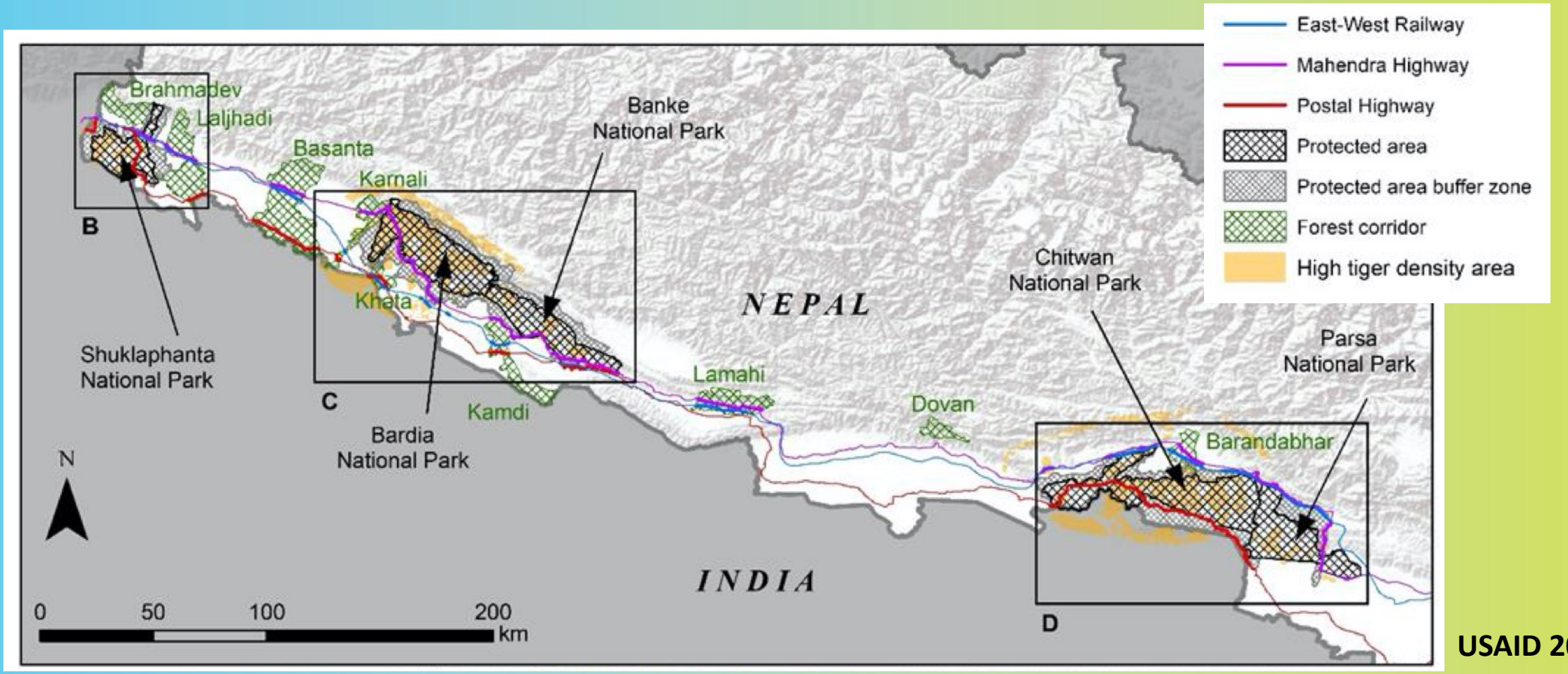




Quintana et al. 2022

I. Why consider cumulative impacts?

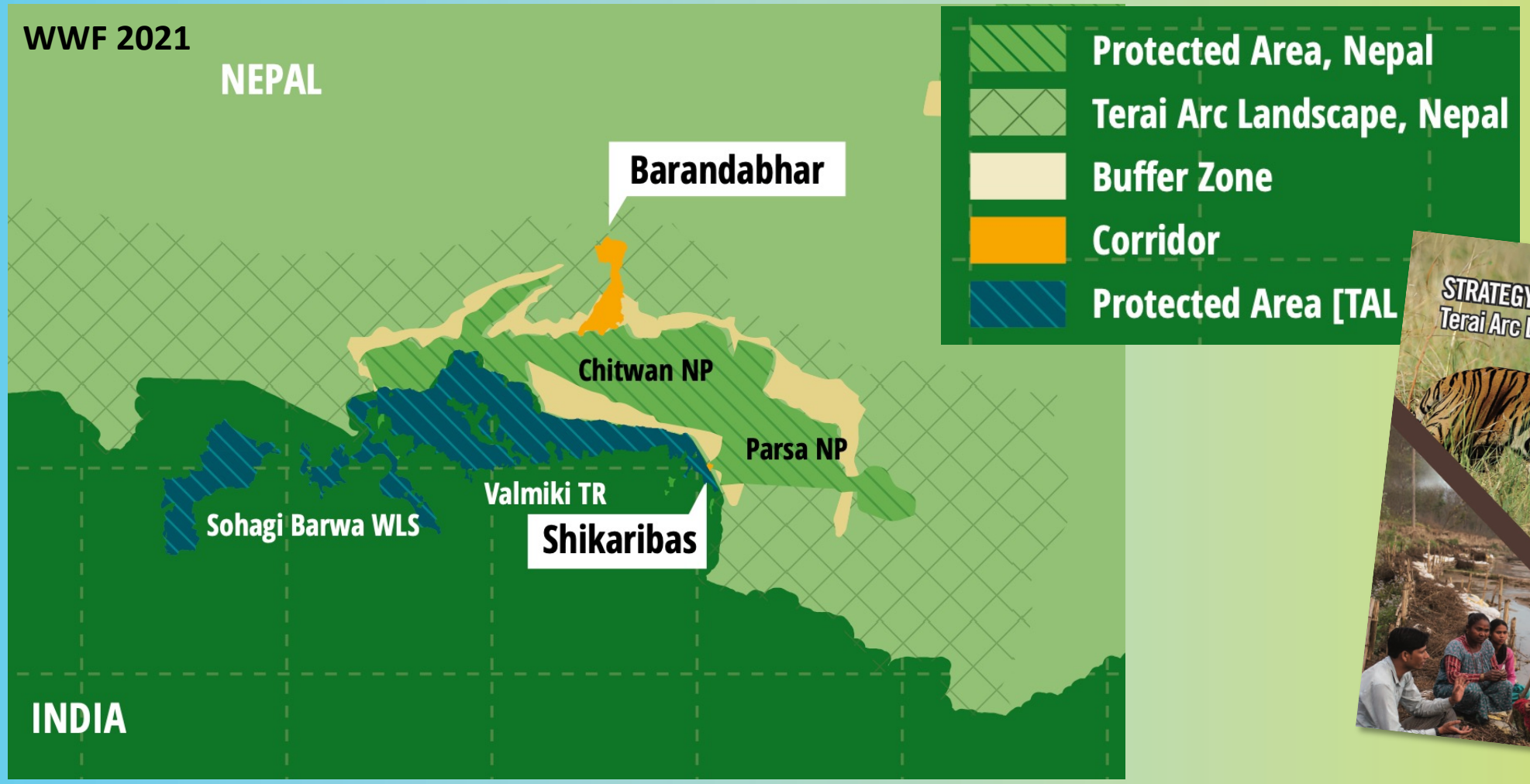
- Upgraded highway system act as a trigger for **induced development** and **land use change**

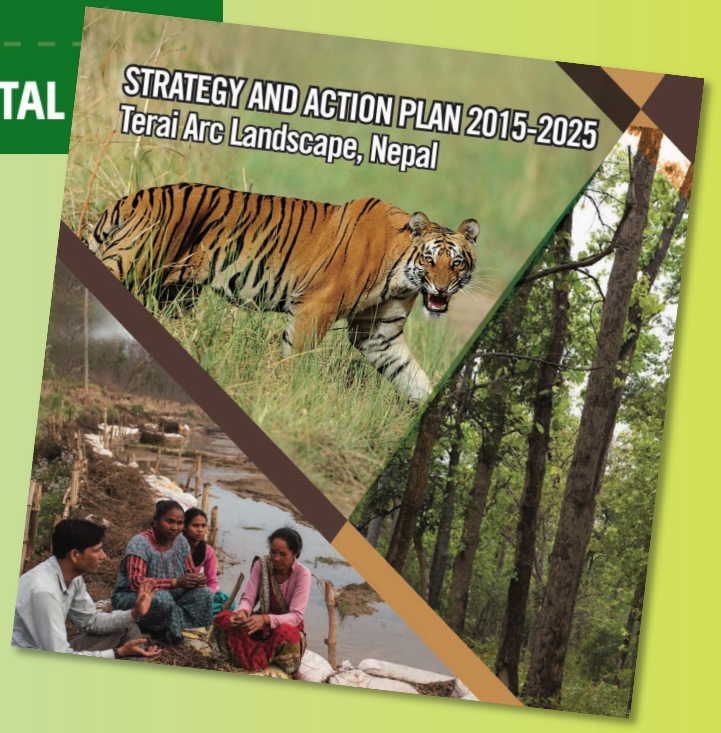


USAID 2021

I. Why consider cumulative impacts?

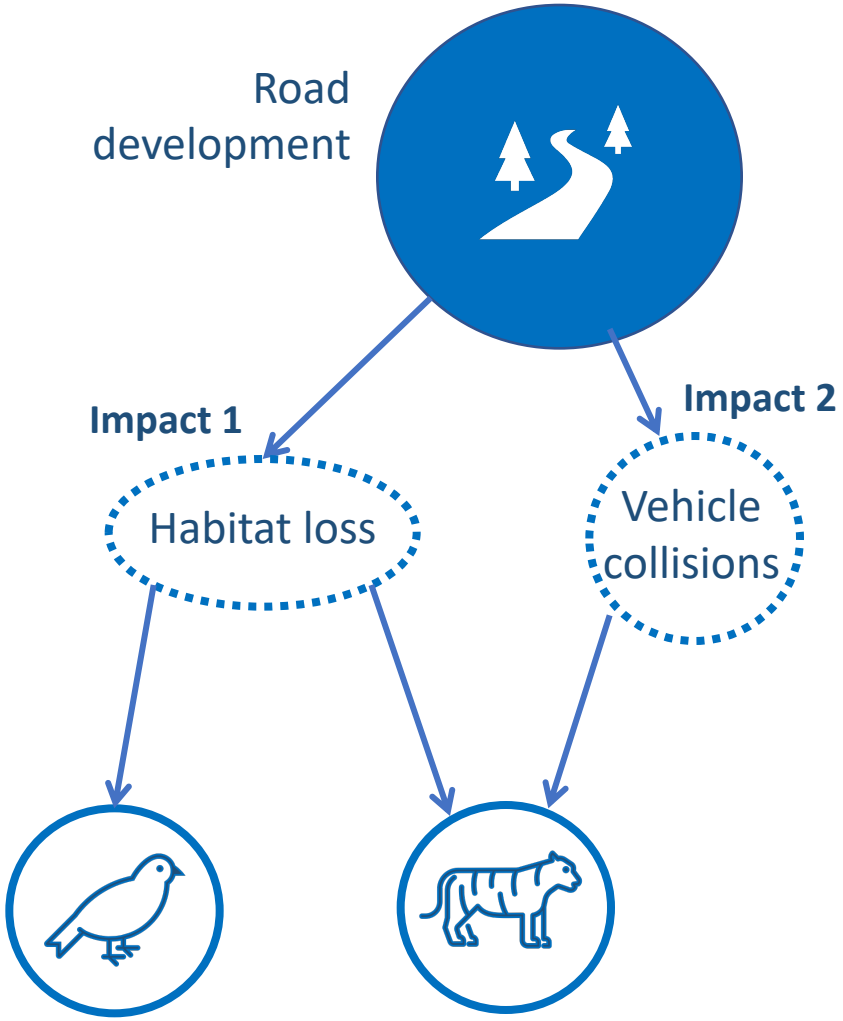
- Conservation efforts require a **landscape scale** approach



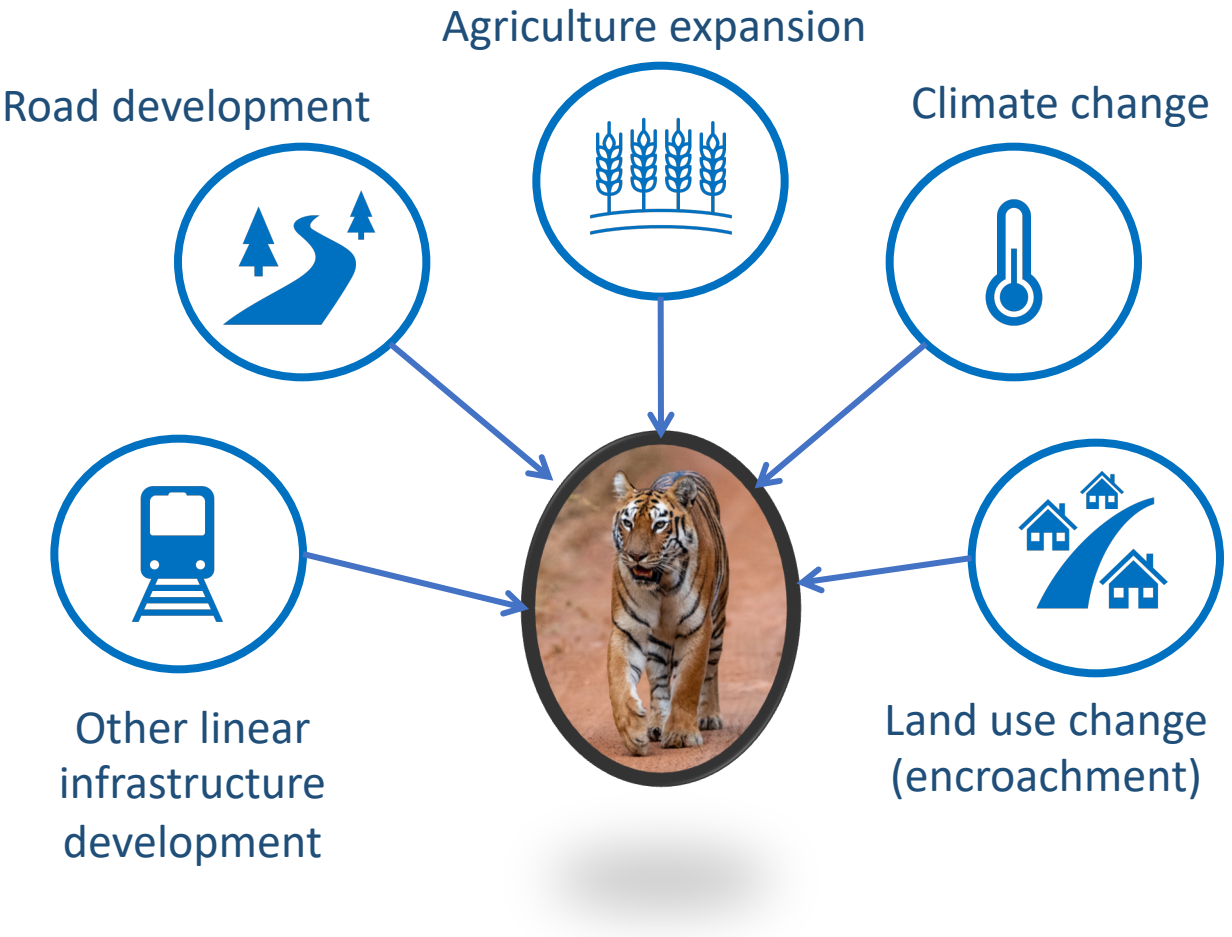


II. CIA: approaches and practice

Project-centered EIA



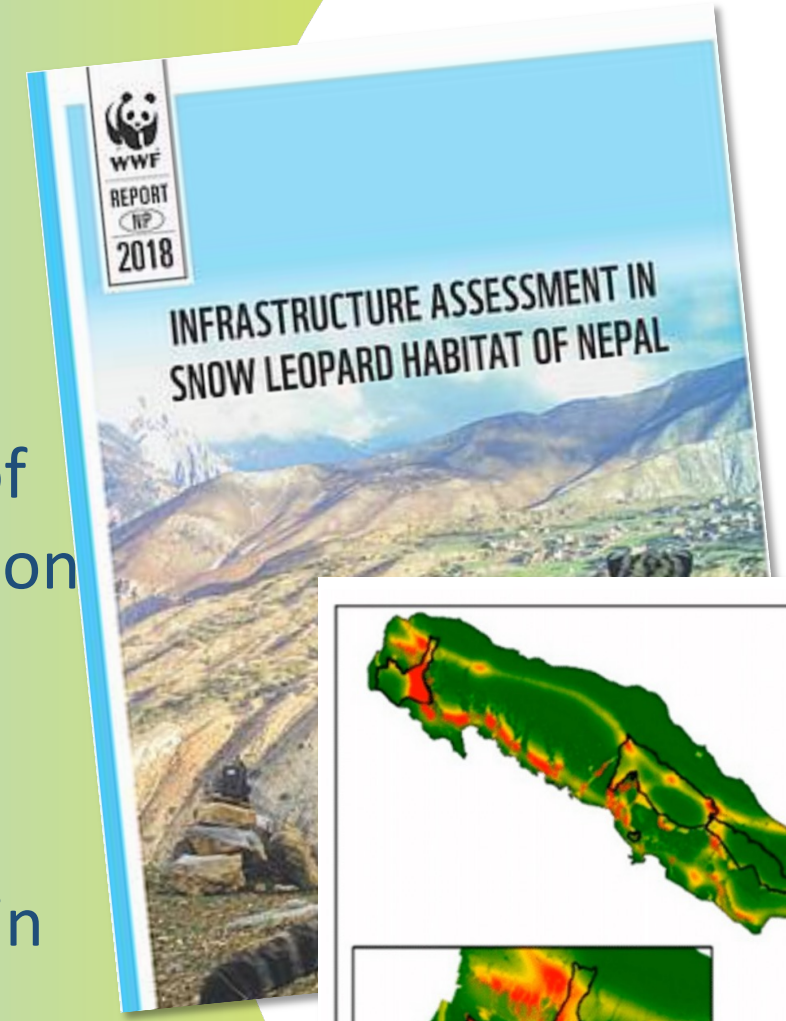
VEC-centered CIA



II. CIA: Approaches and practice

NEPAL

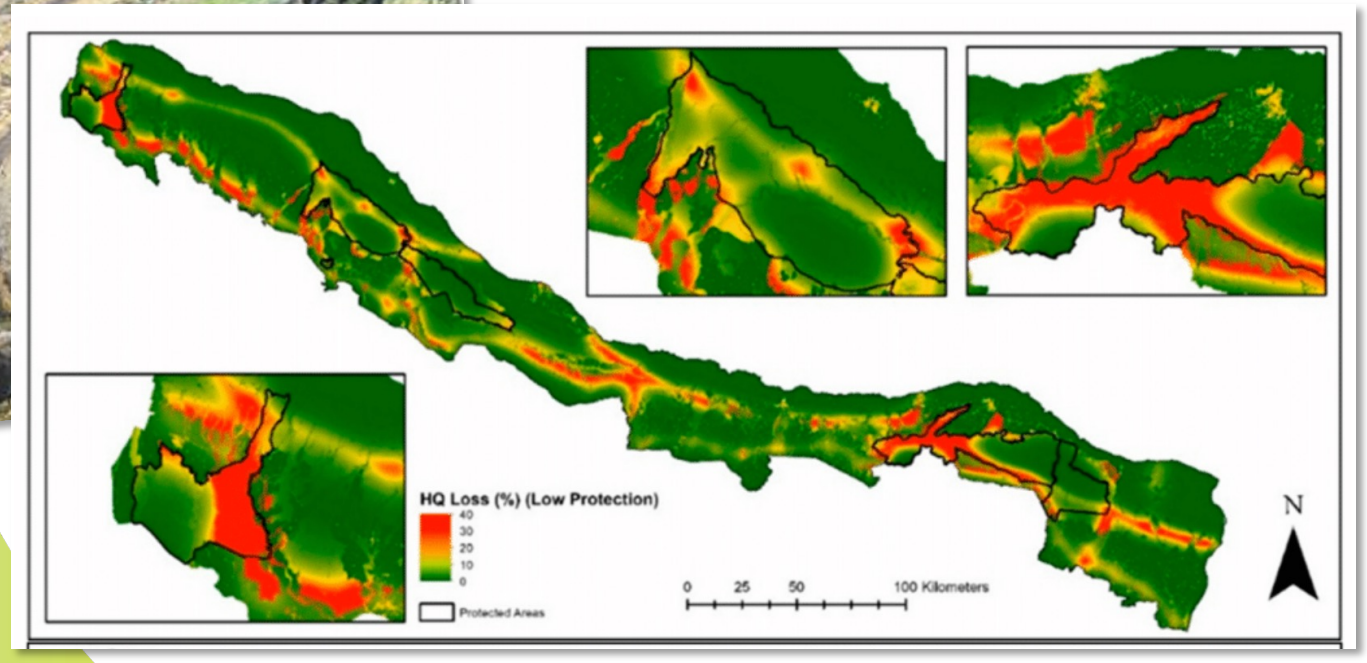
- No regulatory requirement for CIA
- WWF 2016 – Impacts of multiple infrastructure on snow leopard
- Recent studies of infrastructure impacts in TAL



Article

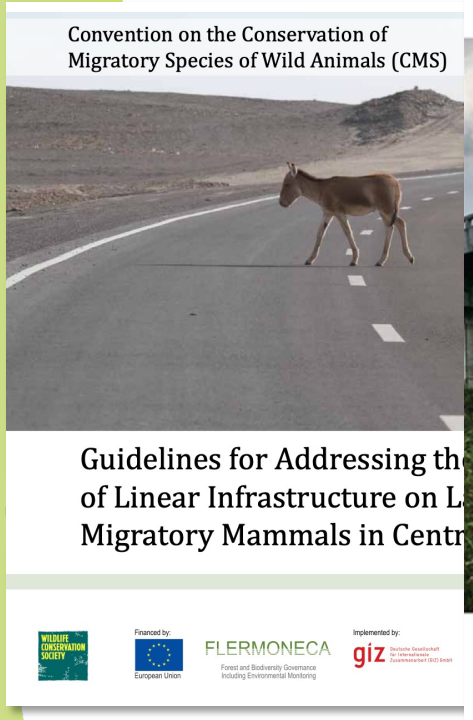
Spatial Assessment of the Potential Impact of Infrastructure Development on Biodiversity Conservation in Lowland Nepal

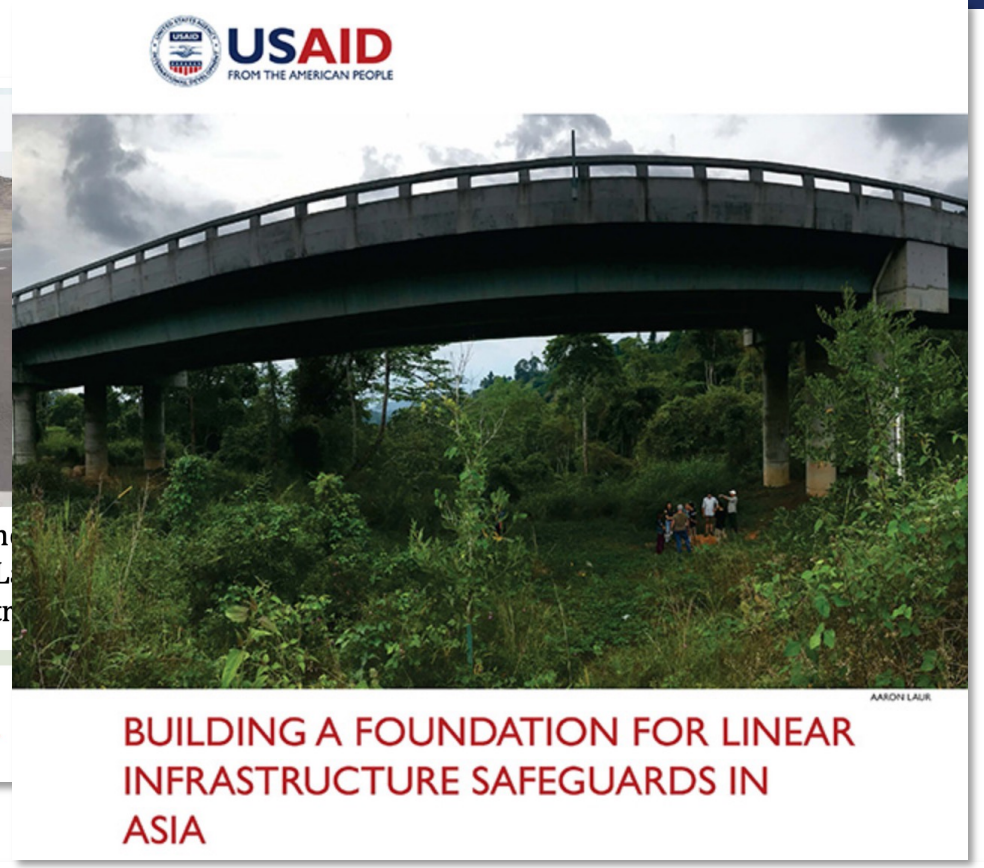
Roshan Sharma [1,*], Bhagawat Rimal [2], Nigel Stork [3], Himlal Baral [1] and Maheshwar Dhakal [4]



II. CIA: Approaches and practice

- **Limited guidance** and case studies
- Rapid infrastructure development in areas of high **biodiversity value**
- **Transnational** corridors





RESEARCH ARTICLE | APPLIED ECOLOGY

Road development in Asia: Assessing the range-wide risks to tigers

NEIL CARTER, ALEXANDER KILLION, TARA EASTER, JODI BRANDT, AND, ADAM FORD Authors Info & Affiliations

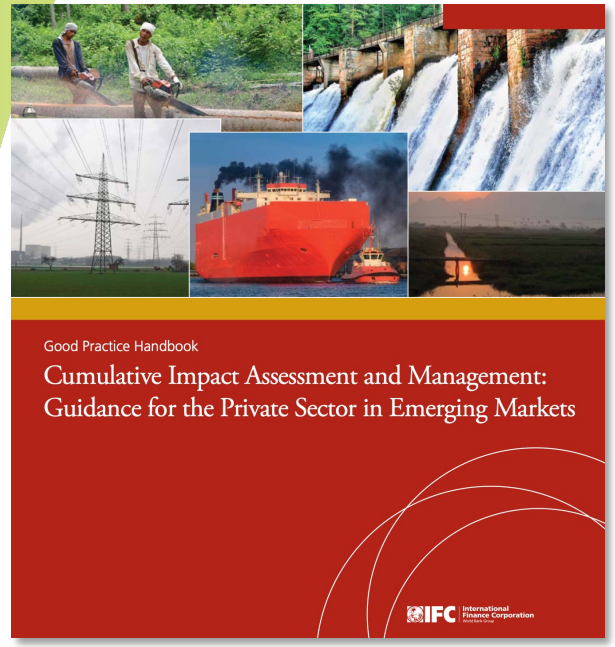
Review

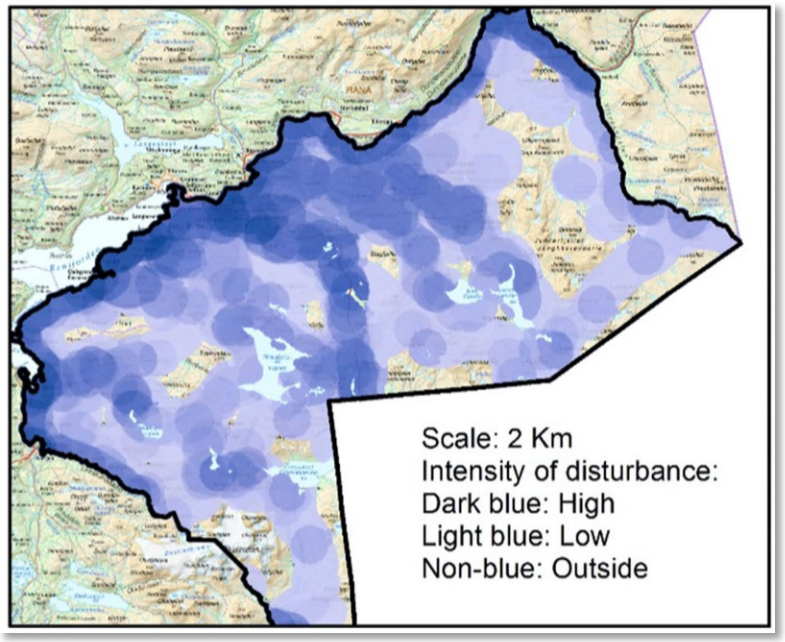
Environmental Impacts of Infrastructure Development under the Belt and Road Initiative

Hoong Chen Teo [1], Alex Mark Lechner [1,2,*], Grant W. Walton [3], Faith Ka Shun Chan [4], Ali Cheshmehzangi [5], May Tan-Mullins [6], Hing Kai Chan [7], Troy Sternberg [8] and Ahimsa Campos-Arceiz [1,2]

II. CIA: Approaches and practice

- CIA practice more established
- Most case studies from North America and Europe
- Indicator-based species-specific approaches

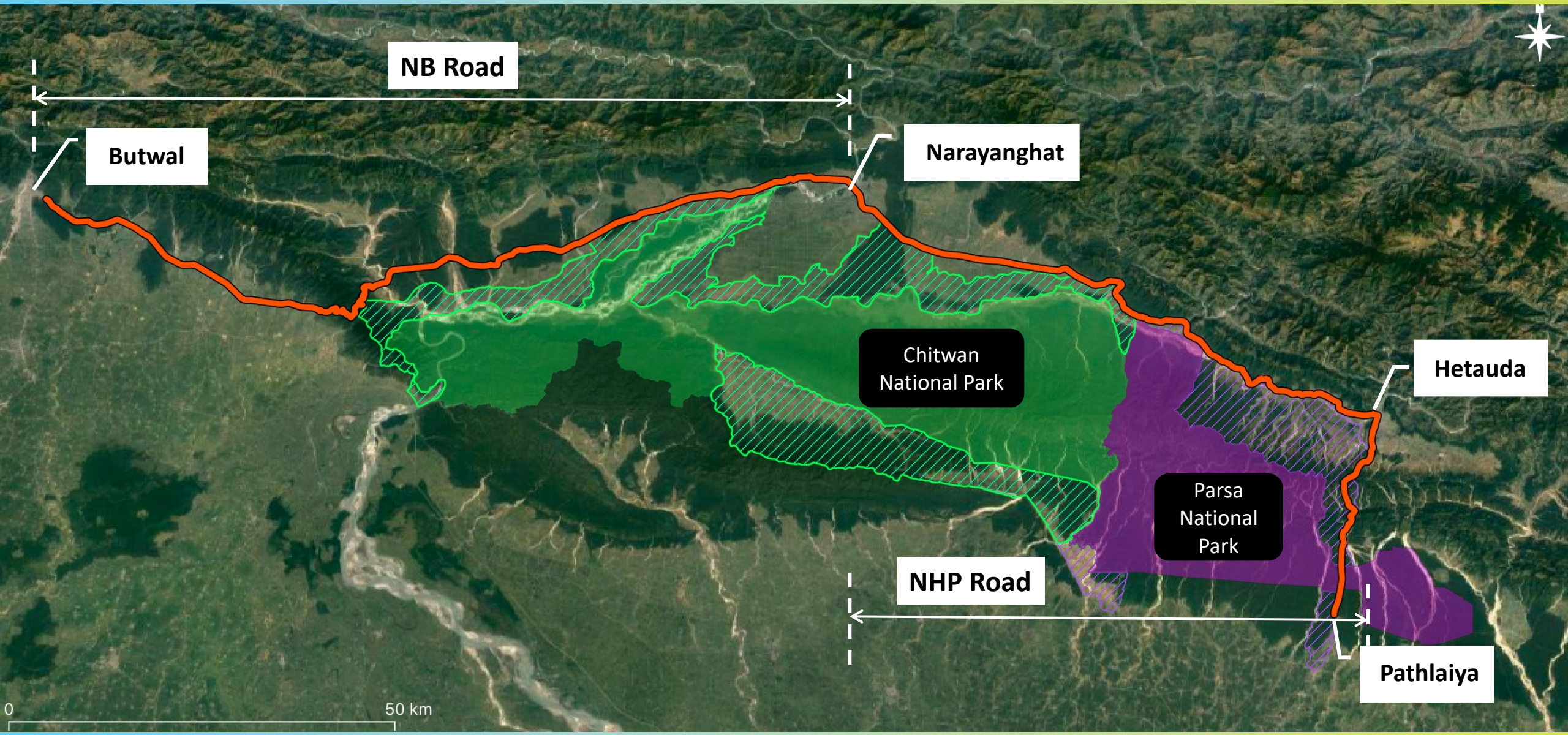




Mitigating the Impacts of Development Corridors on Biodiversity: A Global Review

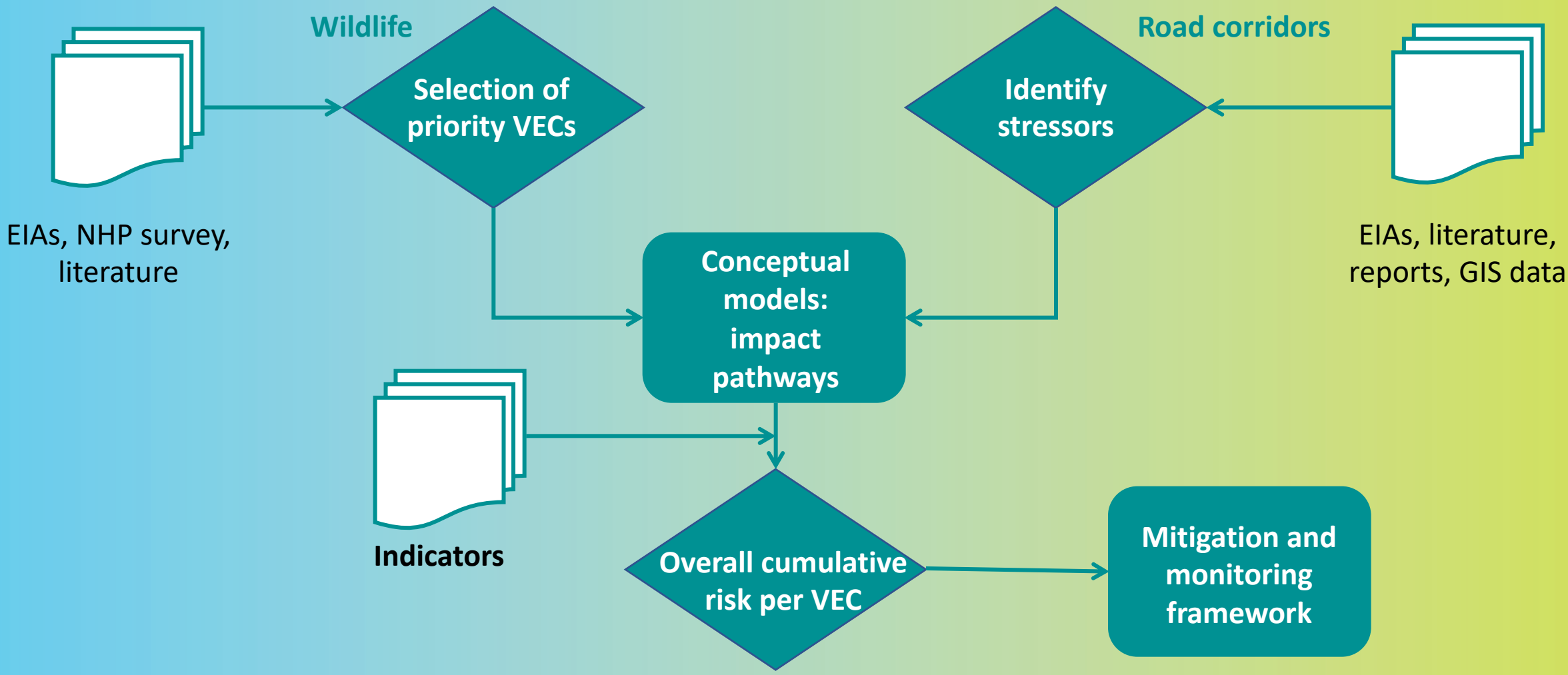
Diego Juffe-Bignoli[1,2], Neil D. Burgess[1], Jonathan Hobbs[3], Robert J. Smith[2], Christine Tam[4], Jessica P. R. Thorn[5,6] and Joseph W. Bull[2]*

III. CIA for NB and NHP roads



III. CIA for NB and NHP roads

Overall approach



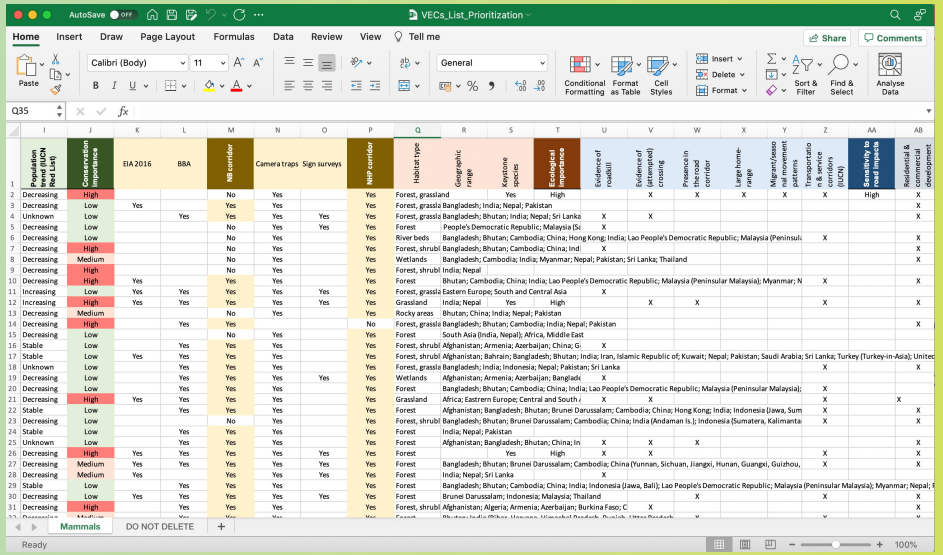
III. CIA for NB and NHP roads

Selection of **priority VECs** – functional groups

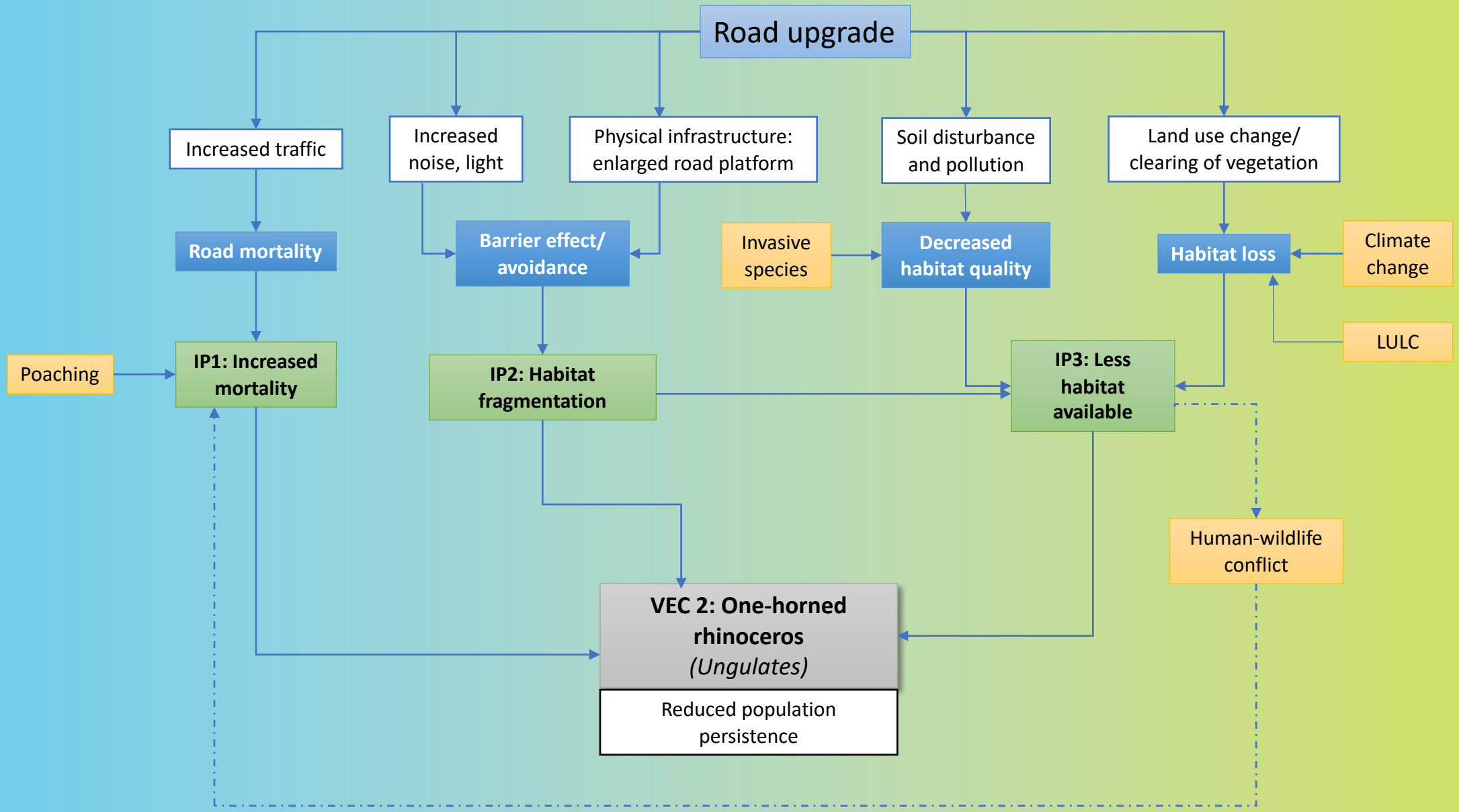
Wide-ranging carnivores VEC 1: Tiger	**Ungulates** VEC 2: Rhinoceros VEC 3: Asian elephant
Small and medium-size mammals VEC 4: Sloth bear VEC 5: Small mammals	**Birds** VEC 6: Vultures VEC 7: Migratory

Prioritizing criteria

- Conservation status
- Ecological importance and/or representativeness
- Vulnerability to road impacts



III. CIA for NB and NHP roads



III. CIA for NB and NHP roads

Key takeaways:

- Limited data/baseline information
- Species-specific threshold indicators
- Useful exercise for high level screening/planning
- Engagement with stakeholders is key (COVID-19)

THANK YOU

धन्यवाद

pcueva@essa.com