Review of: "Social and Environmental Drivers of Black-Necked Crane (BNC) Habitat Suitability in Bhutan: Insights From Maxent Modelling and Conservation Implications"

Filipe Guimarães Lima[1]

1 Universidade Federal de Goiás

Potential competing interests: No potential competing interests to declare.

Firstly, I want to congratulate the authors for not only the research but also for highlighting the importance of the local community as a key to achieving conservation goals. I recommend this paper for publication, and below you will find some suggestions to improve your manuscript.

- I suggest the authors declare the scientific name of the species either in the title or in the abstract because in a systematic review, it would be helpful to find the species by its scientific name.
- Here I suggest the authors insert references:

“This species stands out as one of the rarest cranes globally, bearing significant cultural and ecological importance within its native habitats (REFERENCE). Renowned for its resplendent aesthetics, graceful movements, and intricate mating rituals, the BNC epitomizes a species of remarkable ornithological significance (REFERENCE).”

- Is there any study or assessment that suggests this? If so, it needs a reference.

“Furthermore, climate change-induced alterations in the availability of suitable habitats and food sources present formidable challenges to the long-term viability of these plants.”

- Here I recommend a reference in which these variables were important for building a niche/habitat model.

"This multifaceted assessment involves meticulous consideration of various factors that collectively define the ecological landscape supportive of the life cycle activities of BNC, including climate, nesting sites, human activity disturbance, conservation efforts, habitat requirements, food, and water availability."

- It would be interesting to mention if there have been previous studies in Central Asia, or specifically in Bhutan, approaching niche/habitat modelling, and what is known about the BNC so far. The authors mention in the text that research support in Bhutan is scarce, but my suggestion is to make it clear in the text whether the species is well studied. By exploring this, it would highlight the relevance and novelty of your research.
- I believe in this part, “To discern suitable habitat features, an HIS model serves as a tool for evaluating habitat quality and identifying the spatial distribution of suitable habitat (Na et al., 2018; Van der Lee et al., 2006). ”, you mean HSI

(Habitat Suitability Index) instead of HIS.

- “Empirical SDMs have been developed to predict species distributions by correlating species occurrence with surrounding habitat features, providing a nuanced approach to assessing habitat suitability (REFERENCES).”
- In the part below, I do not see why you mention so many mammal species. I know they are remarkable, but it would be more relevant to mention species ecologically related to the BNC such as bird diversity, other migratory species, predators, competitors, facilitators, etc.

“The faunal diversity encompasses 129 mammalian species, including apex predators such as the tiger (Panthera tigris), common leopard (Panthera pardus), dhole (Cuon alpinus), snow leopard (*Scientific name*), and the endangered BNC (Thinley et al., 2017).”

- This following part does not belong in the methods; it should be in the introduction:

“Climate change poses a major threat to insect species survival, especially for habitat specialists, who are forced vulnerable populations into an evolutionary race to adapt to changing conditions or, if accessible corridors exist, to shift their geographical ranges by tracking the movements of suitable habitats—neither of which are guaranteed rescue strategies under rapid anthropogenic warming (Lu et al., 2020).”

- Where the authors describe the contribution rates in 3.3. *Influence of Environmental Factors on the Distribution of BNC*, the description of the values is followed by a table containing the same values; I recommend to keep the table only.
- As the authors say in the manuscript, about the “exceptional predictive capabilities of the model,” would that be caused by intrinsic characteristics of the species such as limited range and habitat specificity in such a way that errors estimating suitable areas would decrease?
- Finally, I suggest the authors make a bold and straightforward statement about their main result. As it shows, although plenty and large, the existing protected areas are not efficient in protecting viable populations of the BNC in the long term, once the most suitable areas for the species are outside them. In this way, the conservation efforts must functionally meet the BNC's needs, such as the restoration initiatives mentioned.