Project Update: December 2023

1. Ethnographic Interviews: Human-langur interactions

During the winter, local communities experience a decrease in agricultural activities, known as the lean season. Coinciding with this period, our team, comprised of a Principal Investigator (PI) and a field assistant, conducted social surveys to assess whether golden langurs are causing damage as primates. Within the administrative block, the field assistant engaged with community members to inquire about golden langur foraging habits on crops, the extent of annual crop losses attributed to them, and any measures implemented to mitigate this reliance on crops. In this quarter, our field assistant conducted interviews with 271 households. The project aims to interview over 500 local residents and identify hotspots of langur damage, which will inform the development of a comprehensive model later on. When asked about the most problematic primate species, respondents consistently identified the Assamese macaque as the primary issue across the study area. However, golden langurs were also reported to cause crop damage within their distribution range.

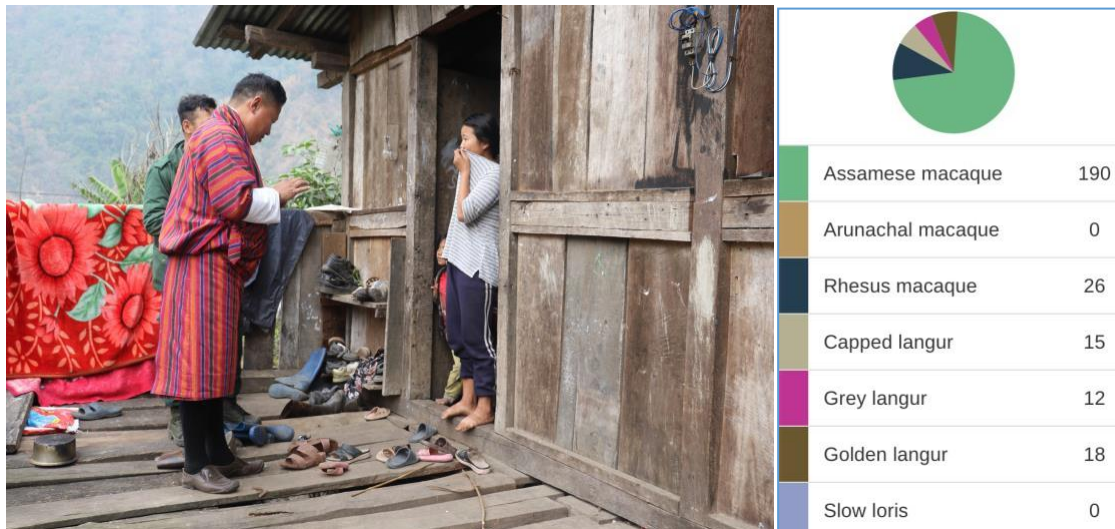|	Species	Count
	Assamese macaque	190
	Arunachal macaque	0
	Rhesus macaque	26
	Capped langur	15
	Grey langur	12
	Golden langur	18
	Slow loris	0

Figure 1. (A) Field Assistant in conversation with local residents pertaining to golden langur crop damage. (B) Graphic illustration on damage caused by different monkey species.

2. Predicting the present and future distribution of endangered Gee's golden langur under climate change scenarios

As a first step in building a model on spatial human-langur interaction, the occurrence data were cleaned, sorted, and managed in QGIS Version 3.4 to convert it into a shapefile. Locations with an accuracy level of more than 20 m were either removed or revalidated through communication with the field assistant. We utilised MaxEnt to model the distribution of the golden langur based on occurrence points collected through a citizen science approach. The resulting distribution map represented a surface of occurrence probability, modeled using the

principle of maximum entropy. For this preliminary analysis, we incorporated environmental variables such as elevation, land cover, distance from settlements, roads, and rivers, all of which are known to influence the distribution of golden langurs. These spatial layers were processed within a GIS environment using ArcGIS TM Version 10.5. They were converted into raster format with a standard cell size of 30 m x 30 m and a common projection and geographical extent (PCS_DRUKREF_03_TM for Bhutan).

Elevation data were extracted from the Digital Elevation Model for Bhutan, while the distance from settlements, roads, and rivers was derived from corresponding datasets for Bhutan and rasterised using the Euclidean distance tool. Land cover information was obtained from the land use map of Bhutan and rasterized using the features to raster tool in ArcGIS 10.5.
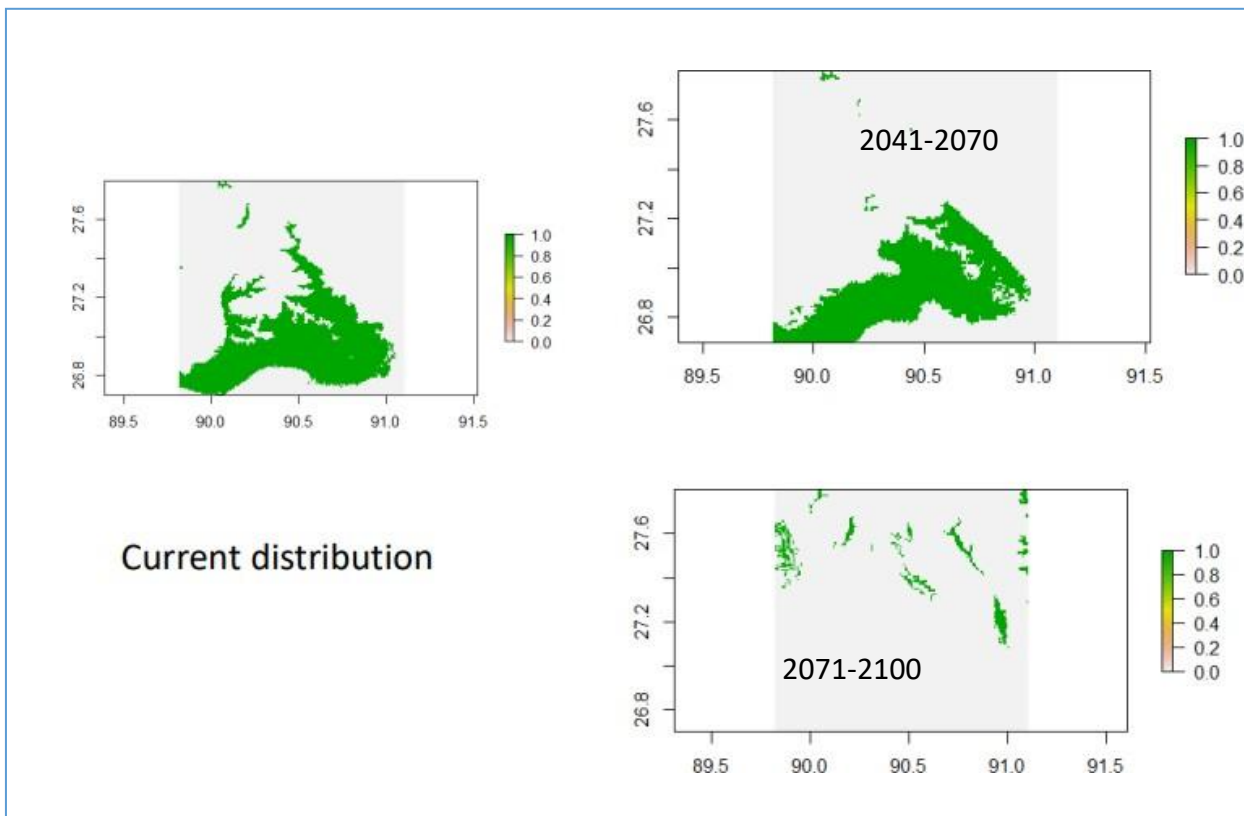

Figure 2. Preliminary current and future prediction of golden langur in Bhutan. Under technical assistance of Dr Mika.