

CLIMATE INNOVATION CHALLENGE

Monthly Progress Update

Reporting Period (Month)	March
Grantee Name	Geoneon
Project Title	Infrastructure Vulnerability to Slope Instabilities and Floods in Phuentsholing, Pasakha, and Gelephug (Bhutan)
<p>1. List the key activities in your workplan undertaken/completed during this month.</p> <ul style="list-style-type: none"> • Sourcing information and data from stakeholders. • Sourcing publicly available information and data. • Training deep learning model to map all buildings. • Automated mapping of all buildings. • Mapping of roads, bridges, and power towers. • Define replacement value metrics. • Compute 30 x 30m infrastructure model. 	
<p>2. List additional activities (outside the workplan) undertaken during this month.</p> <ul style="list-style-type: none"> • Mapping of power towers, which is more relevant than trees for this project scale. • Tests have been completed to include socio-economic metrics; however, the data is provided by states, which are larger areas than the project areas and not sufficiently granular to add value. Therefore, a single project area would have the same metric value for the full area. 	
<p>3. List the key beneficiaries /stakeholders consulted during this month</p> <ul style="list-style-type: none"> • Department of Disaster Management, Bhutan. • ADPC 	
<p>4. Summarize key achievements and milestones of this month</p> <ul style="list-style-type: none"> • Used deep-learning model to segment all buildings on satellite data in the areas of interest, resulting in 4,063 (Phuentsholing) and 4,713 (Gelephu) buildings being mapped, compared to the 1,510 (Phuentsholing) and 1,763 (Gelephu) buildings in the DDM database. • Infrastructure models for both Phuentsholing and Gelephu are 90% complete and will be delivered on time. 	
<p>5. List key challenges to be resolved</p> <ul style="list-style-type: none"> • Waiting on flood discharge rates from DDM which is necessary for the flood model. 	
<p>6. Any additional challenges (observations/learning in terms of the applicability, scalability, and sustainability)</p> <ul style="list-style-type: none"> • Nothing to report. 	



Figure 1 Example of building mapping results in Gelephu. Left: database from DDM Bhutan (buildings in pink), Right: automated segmentation results using deep-learning model (buildings in yellow).



Figure 2 Example of infrastructure model in Gelephu at a 30m by 30m showing replacement value for the buildings, roads, and transmission towers.