Supplementary Material

Table SI.1. Initial set of variables used for predicting non-recovery, after removing highly-correlated variables. Those indicated with * are included in the final non-recovery model in Nepal.

Description	Units	Name	Source	Citation
*Remoteness to municipal headquarters	Hours	remoteMunic	World Bank Global Equity Practice	[27]
*Modeled population density in 2015	Number of people per 100m grid	popn2015_wp	Worldpop	[59]
*Tree cover in 30 minute radius	Average % tree cover in 30 minute walking distance from grid	trcvr_buff	Global Forest Watch	[57,69]
*Topographic Slope	Degrees	slopedeg	CGIAR	[60]
*Shaking intensity	Modified mercalli intensity	MMI_usgs	United States Geological Survey	[55,70]
*Rainfall-triggered landslide hazard	Relative landslide hazard triggered by extreme 24hr rainfall	lndsld_HZ_rf_mr	British Geological Survey	[56]
Earthquake-triggered landslide hazard	Relative landslide hazard triggered by earthquake with a 10% probability of exceedance in 50 years	lndsld_HZ_EQ_mr	British Geological Survey	[56]
Precipitation during monsoon season (for drought likelihood)	Standardized difference from precipitation levels from 1980-2014	msn_prcdiff_2015	CHIRPS: Rainfall Estimates from Rain Gauge and Satellite Observations	[71]
Precipitation during dry season (for drought likelihood)	Standardized difference from precipitation levels from 1980-2015	dry_prddiff_2015	CHIRPS: Rainfall Estimates from Rain Gauge and Satellite Observations	[71]
International wealth index	International wealth index	IWI_mn_2011	World Bank Global Equity Practice	[72]
*Food insecurity	Food poverty prevalence per local government unit	FII_P2	World Bank Global Equity Practice	[58]
Population size	Number of people per ward	n_tot	Central Bureau of Statistics, Nepal	[34]
Livelihood - wage employment	Percentage of population conducting wage work per ward	p_wagework	Central Bureau of Statistics, Nepal	[34]
Livelihood - agricultural employment	Percentage of population conducting agricultural work per ward	p_agwork	Central Bureau of Statistics, Nepal	[34]
Livelihood - female migrant work	Percentage of population who are females of migrant age per ward	p_femaleworker	Central Bureau of Statistics, Nepal	[34]
Livelihood - male migrant work	Percentage of population who are males of migrant age per ward	p_maleworker	Central Bureau of Statistics, Nepal	[34]

Roof type	Percentage of houses with thatch roof per ward	p_thatchroof	Central Bureau of Statistics, Nepal	[34]
Load-bearing structure type	Percentage of houses with mud brick load-bearing walls per ward	p_mudbrick	Central Bureau of Statistics, Nepal	[34]
Surveyed population density	Population per area per ward	pop_dens	Central Bureau of Statistics, Nepal	[34]
Age	Average age per ward	avg_age	Central Bureau of Statistics, Nepal	[34]
Female head of household	Percentage of female head of households per ward	p_fhh	Central Bureau of Statistics, Nepal	[34]
Gender	Male to female sex ratio per ward	sex_ratio	Central Bureau of Statistics, Nepal	[34]
Literacy	Percentage of population who are literate per ward	p_literate	Central Bureau of Statistics, Nepal	[34]
Electricity access	Percentage of households with electricity for lighting per ward	p_elect_light	Central Bureau of Statistics, Nepal	[34]
*Water infrastructure	Percentage of households with tap water per ward	p_tap	Central Bureau of Statistics, Nepal	[34]
Information access - phone	Percentage of population with mobile phones per ward	p_mobph	Central Bureau of Statistics, Nepal	[34]
Information access - radio	Percentage of population with radio per ward	p_radio	Central Bureau of Statistics, Nepal	[34]
Information access - television	Percentage of population with television per ward	p_tv	Central Bureau of Statistics, Nepal	[34]
Language	Percentage of population who speak mother tongue (Nepali) per ward	p_mothtongue	Central Bureau of Statistics, Nepal	[34]
Low, Dalit caste group (Kami, Damai/Dholi, Sarki, Badi, Gaine, Chamar/Harijan, Musahar, Dushad/Paswan, Tatma, Khatwe, Dhobi, Baantar, Chidimar, Dom, Halkhor)	Percentage of population in Dalit caste group per ward	p_Dalit	Central Bureau of Statistics, Nepal	[34]
Disability	Percentage of population who are not disabled	p_notdisabled	Central Bureau of Statistics, Nepal	[34]

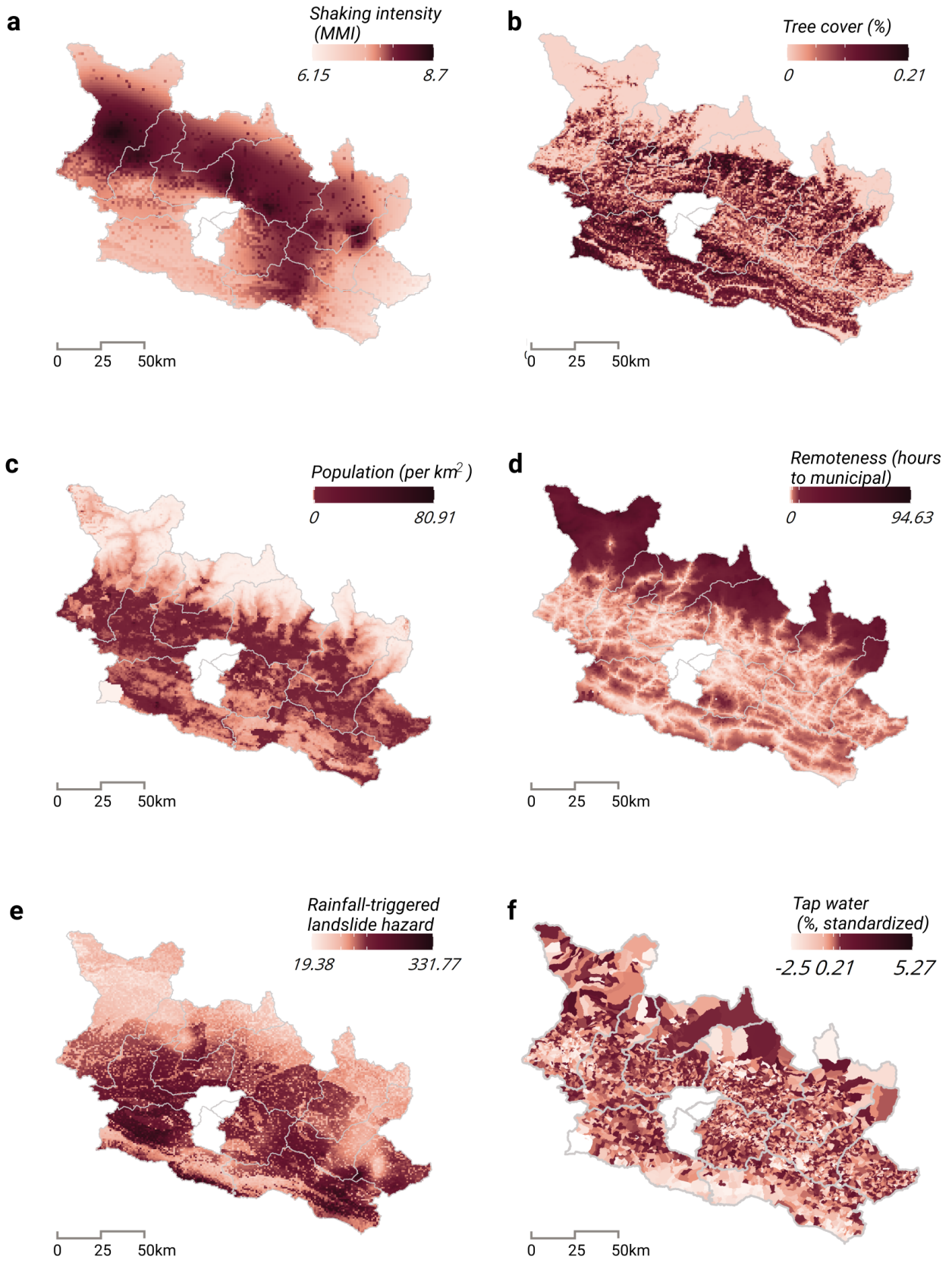


Figure SI.1. Maps of final predictors used to estimate the spatial distribution of non-recovery in Nepal. Maps are shown at original scale (also listed in Table SI.1) and colors represent the quantiles of the distribution to highlight spatial distribution of values. Maps are ordered in order of importance in the model.

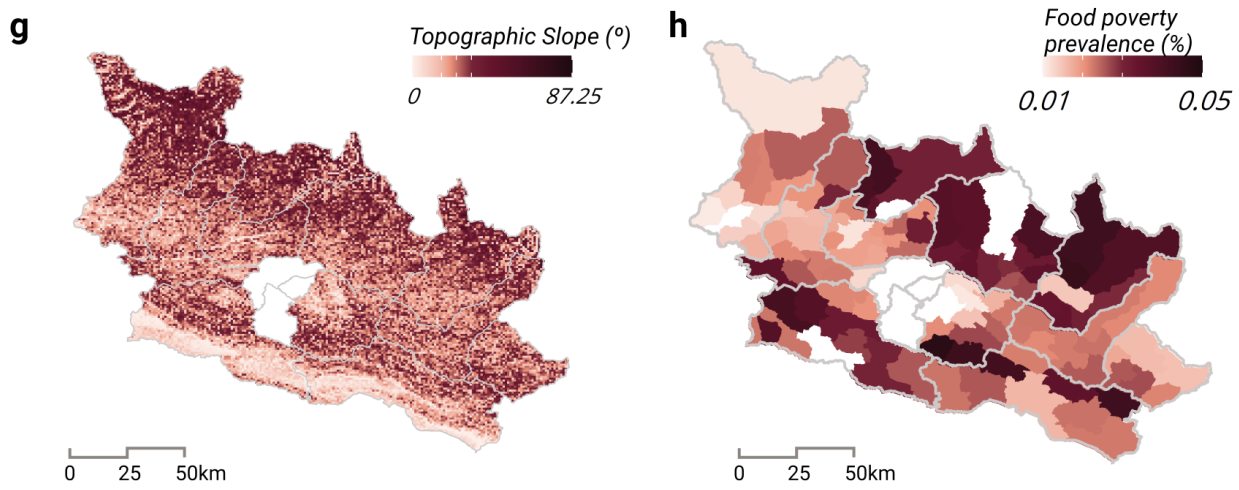


Figure SI.1. Maps of final predictors (continued). Maps are shown at original scale (also listed in Table SI.1) and colors represent the quantiles of the distribution to highlight spatial distribution of values. Maps are ordered in order of importance in the model.

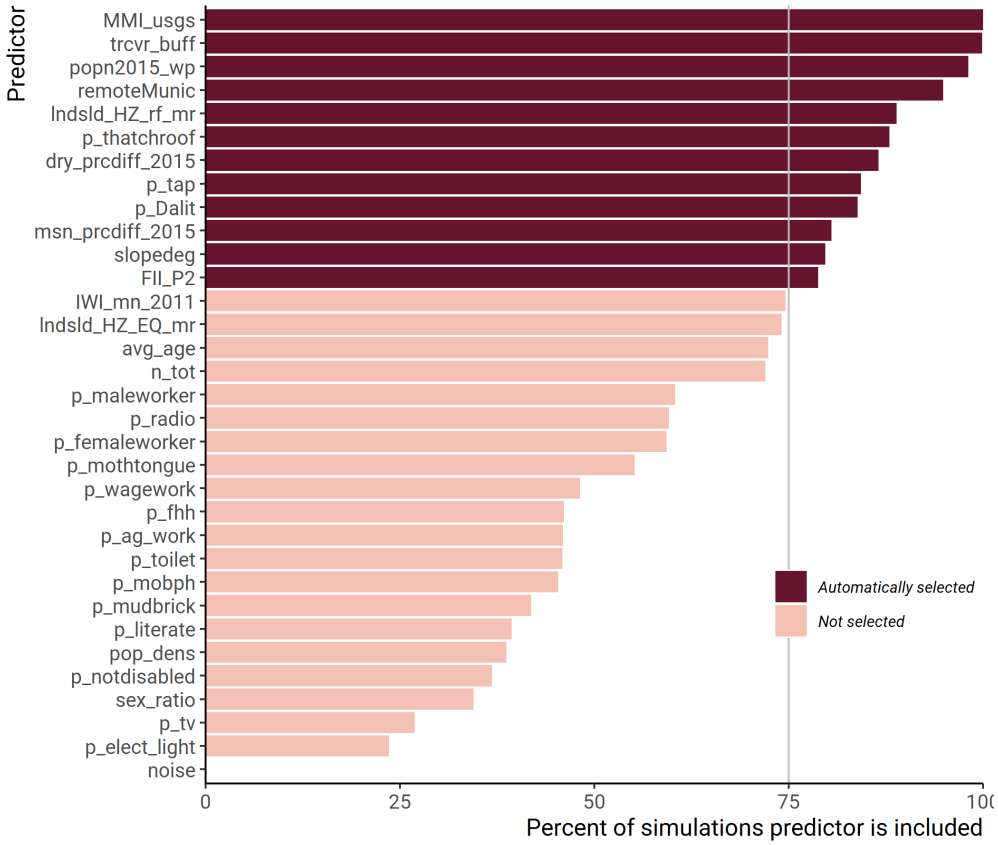
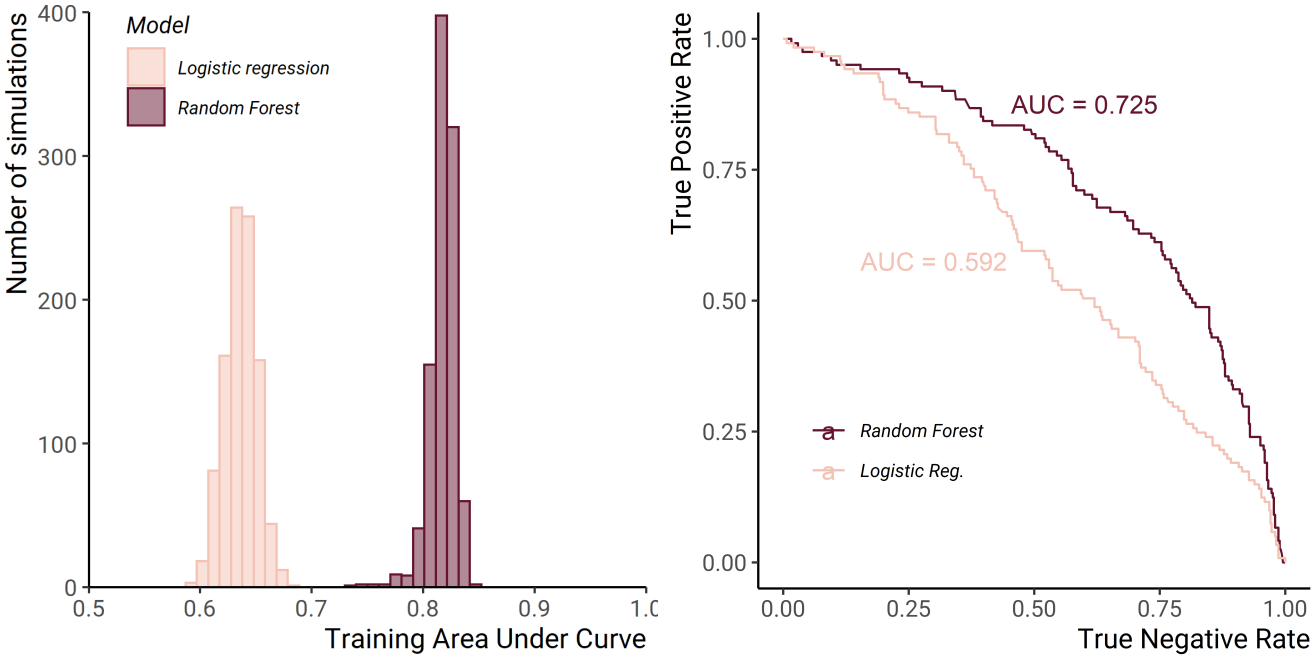


Figure SI.2. Percentage of 1000 simulations that each predictor was selected in random forest model. Each simulation used different bootstrapped samples as training data. Each simulation selects variables that are more predictive than a random noise variable. In the final model, we include only the variables that occurred for at least 75% of the simulations, then manually remove variables whose relationships were not supported in the literature.



(a) Training error

(b) Test error

Figure SI.3. Training and test errors for models to predict non-recovery. (a) Histogram of area under the curve for 1000 simulations using logistic regression and random forest models. Random forest was selected as the final model due to better performance, or higher area under the curve. (b) The final random forest model applied to the test data has an area under the curve of 0.725, which is slightly worse than the training error, as expected, but better than the logistic regression.