Conflicts of large mammals with local community in nature reserve of rainforest in Yunnan Province, China

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Background

Tropical rainforest

Diverse wildlife species & An increasing human population

Increasing need for land & food resources
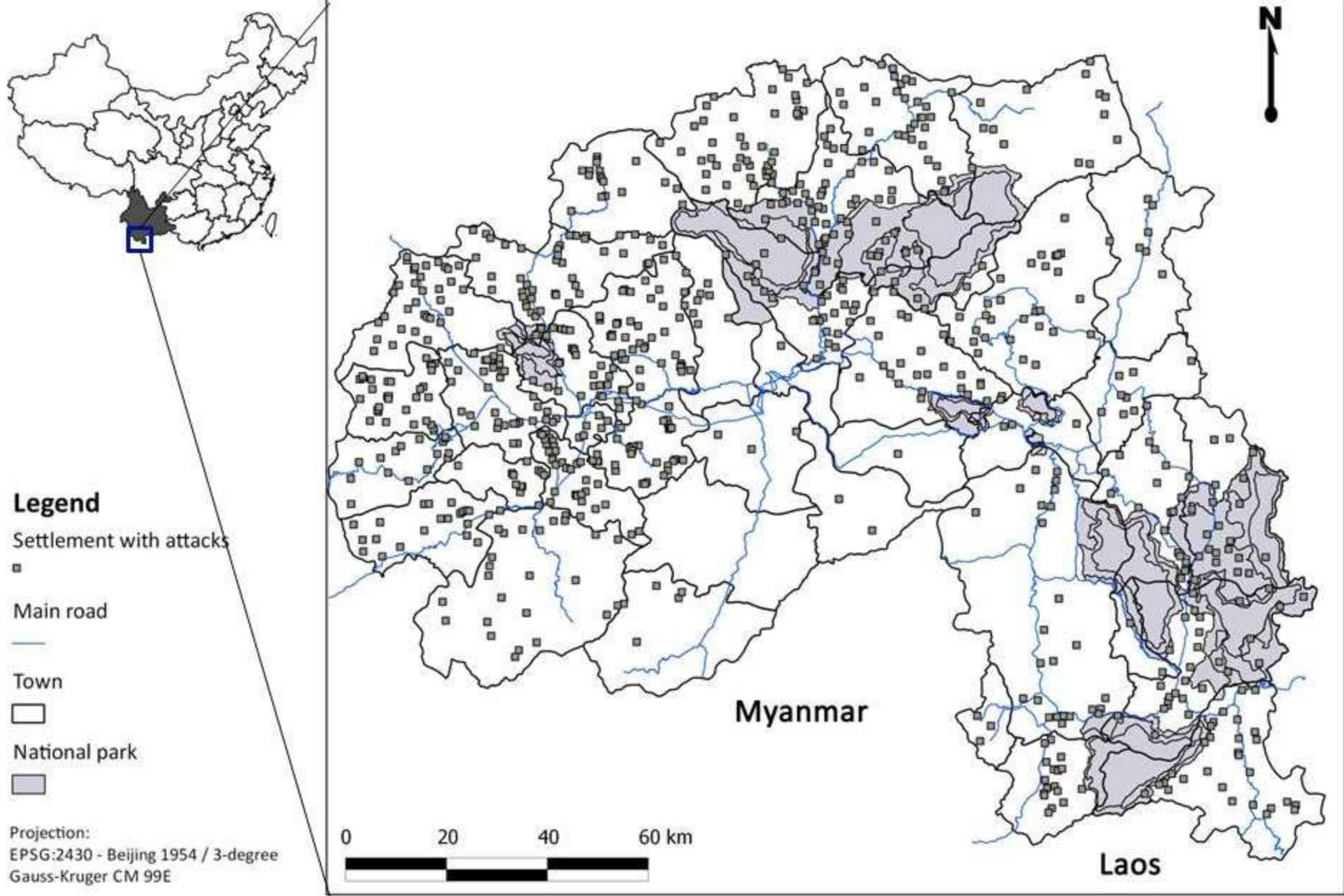
Increasing conflicts

Figure Map of study area – Xishuangbanna national nature reserve in southwest of China, bordering Laos and Myanmar

Methods

Data collection

XSBN national nature reserve

Local forest administration

Local community committees

China Pacific property insurance company

Data analysis

- Intensity of HWC was measured in five aspects, all together four predictors were chosen for modeling.

Response variables	Predictors
Total economic loss ($)	Settlements
Area of crop damage(ha)	Species
Number of rubber trees damaged	Year
Cost of livestock predation ($)	Season
Cost of human attacks ($)	

- Linear mixed-effects models, variations across years and seasons, how these patterns differed among diverse species causing the damage.
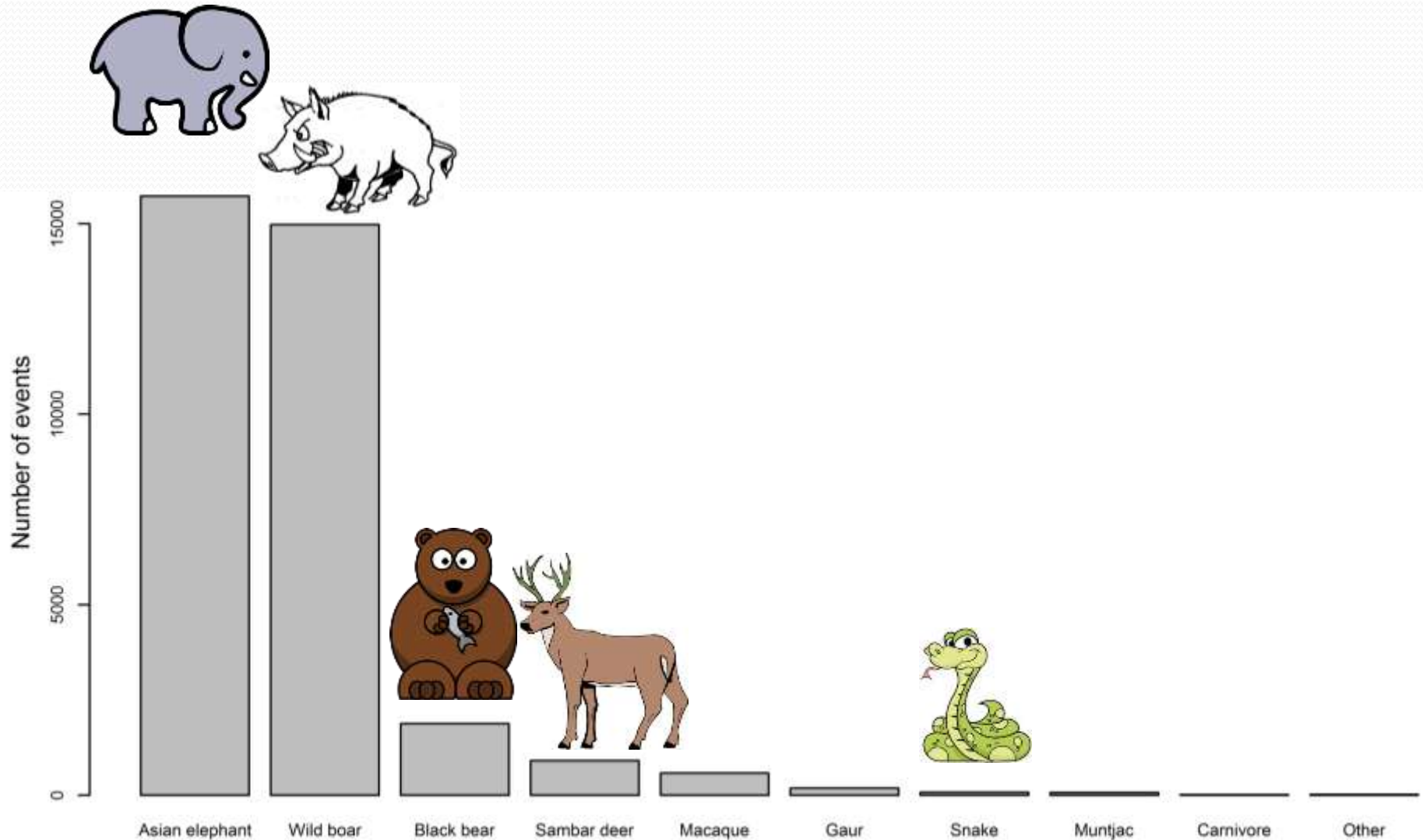
Results
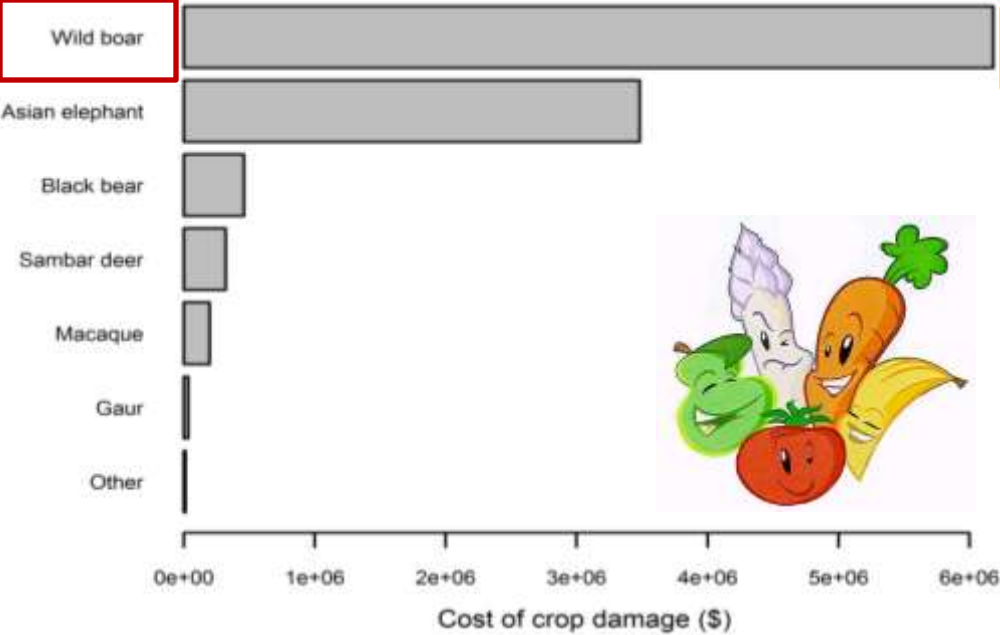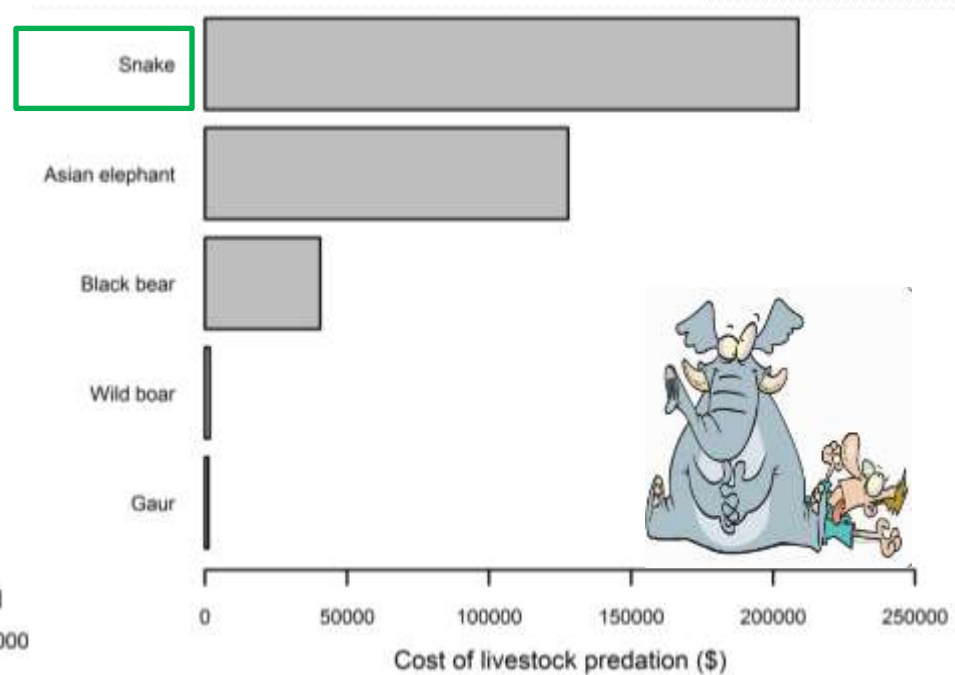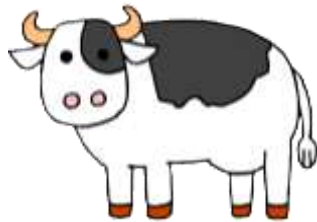

Figure 2 Total number of incidents caused by species
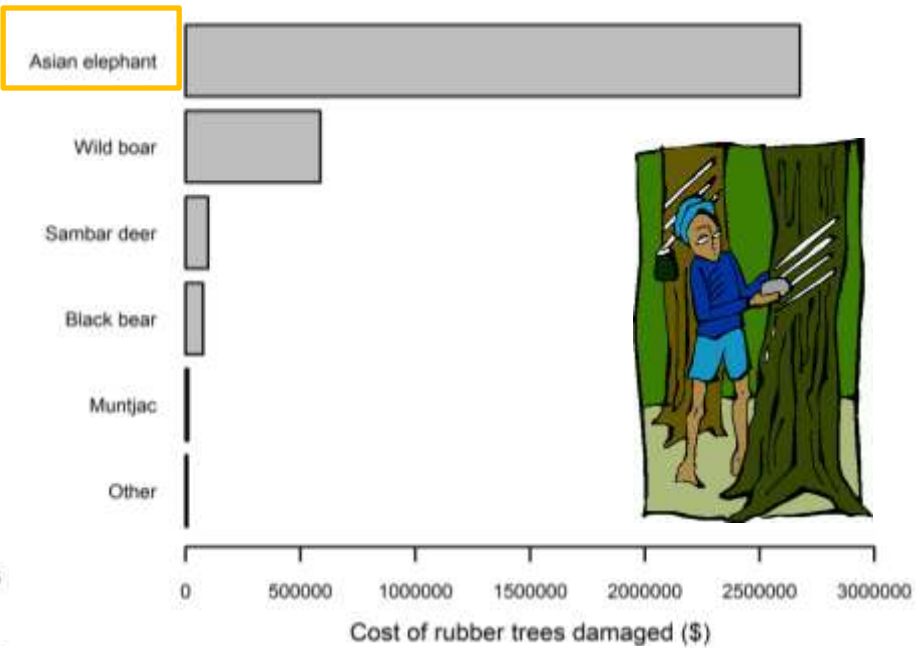
Figure Cost of four type conflicts during the study period by species
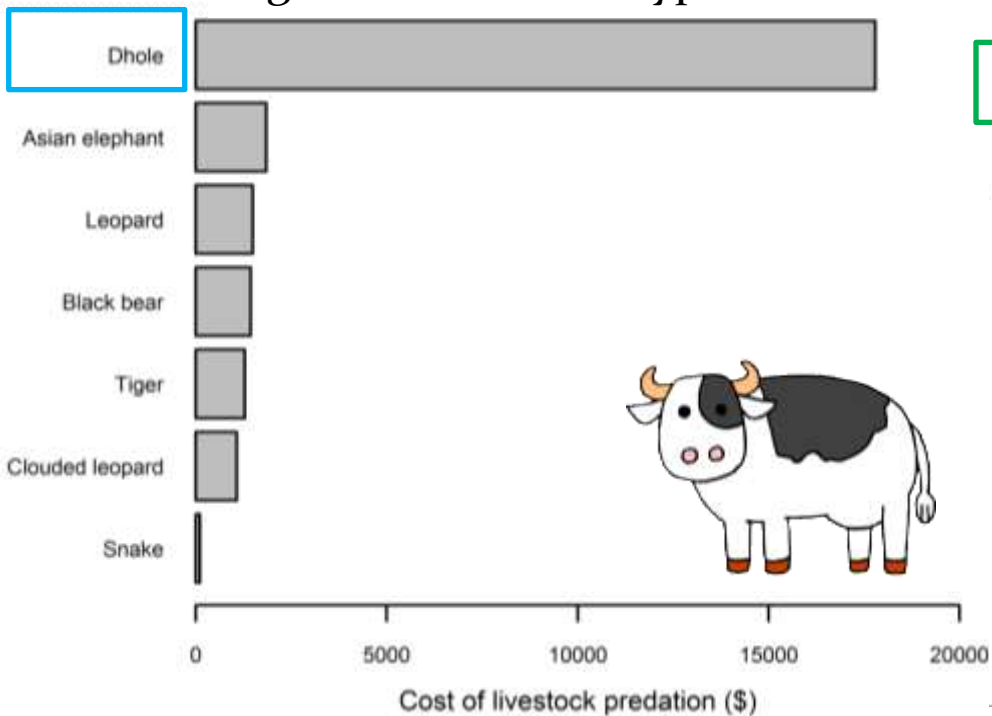
	Crop damage					Rubber trees damage	
	Paddy	Corn	Peanut	Soybean	Sugarcane	Seedling	Adult
Asian elephant	○	○	○	○	○	○	○
Wild boar	○	○	○		○	○	
Black bear	○	○	○			○	

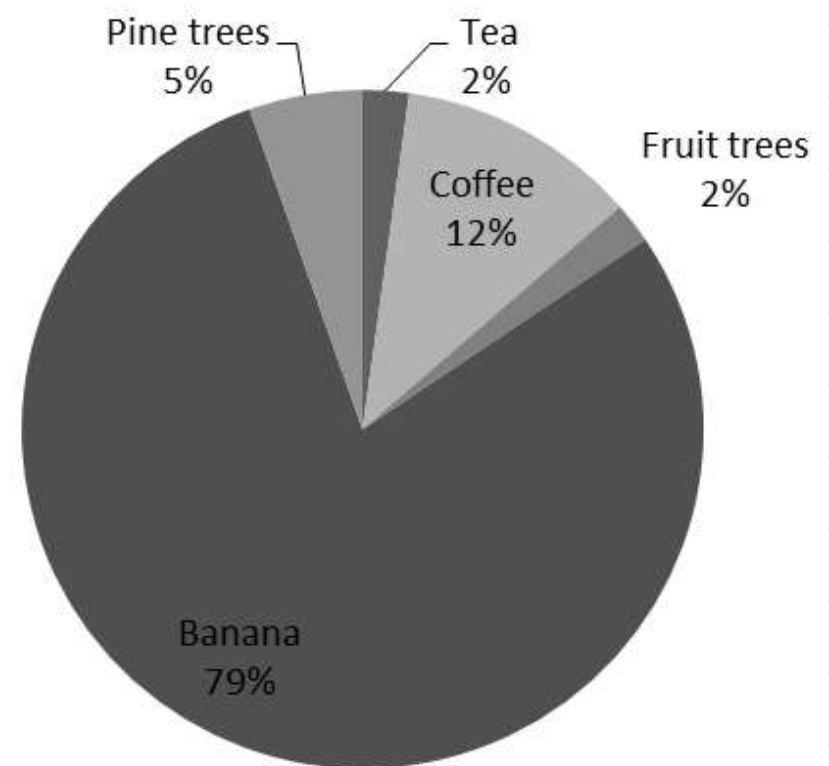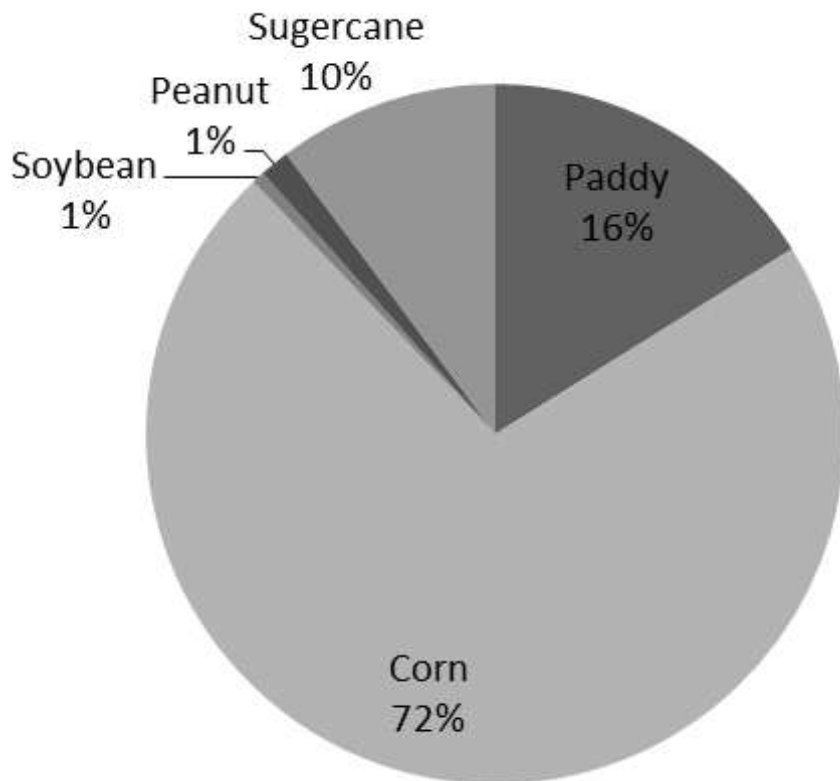|	Plantations loss (rubber trees excluded)					Property loss	Livestock predation	Human attacks	
	Coffee	Tea	Banana	Pine tree	Fruit trees	House & household facilities loss	Cattle, sheep, pig etc.	Human death	Human injury
Asian elephant	○	○	○	○	○	○	○	○	○
Wild boar		○			○				○
Black bear							○	○	○

Figure Proportion of crops and plantations damaged by Asian elephant in 2011 and 2012

Temporal patterns

Table 5 Significance level (p value) of predictors in overall cost models

Model type	Total economic loss (n= 30605)	Area of crop damage (n= 25450)	Rubber plantation damage (n=11021)	Livestock predation (n=24)	Human attacks (n= 109)
Year	<.0001	<.0001	< 0.0001	0.61	0.29
Season	<.0001	<.0001	< 0.0001	0.65	0.53
Species	<.0001	<.0001	0.0006	0.80	0.33

Temporal patterns
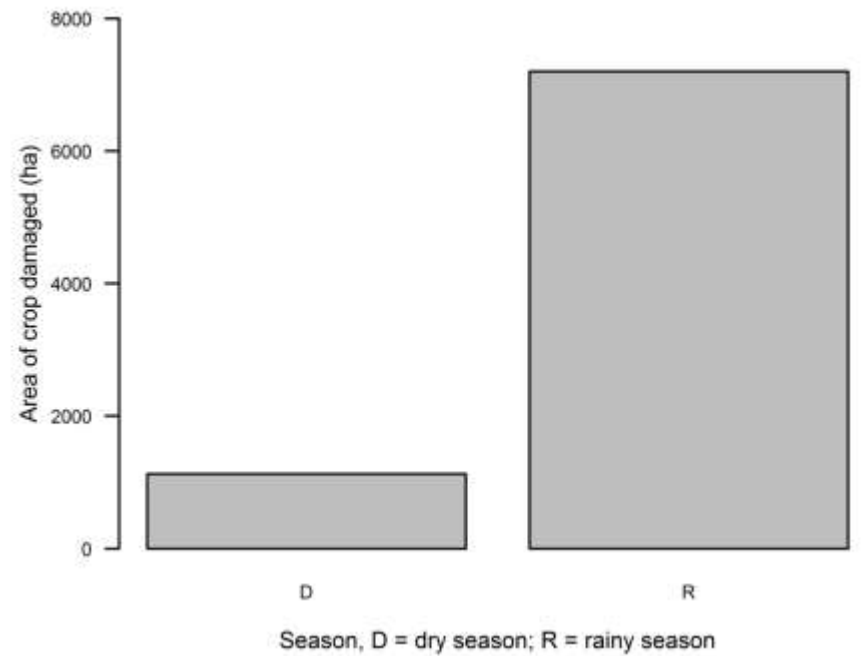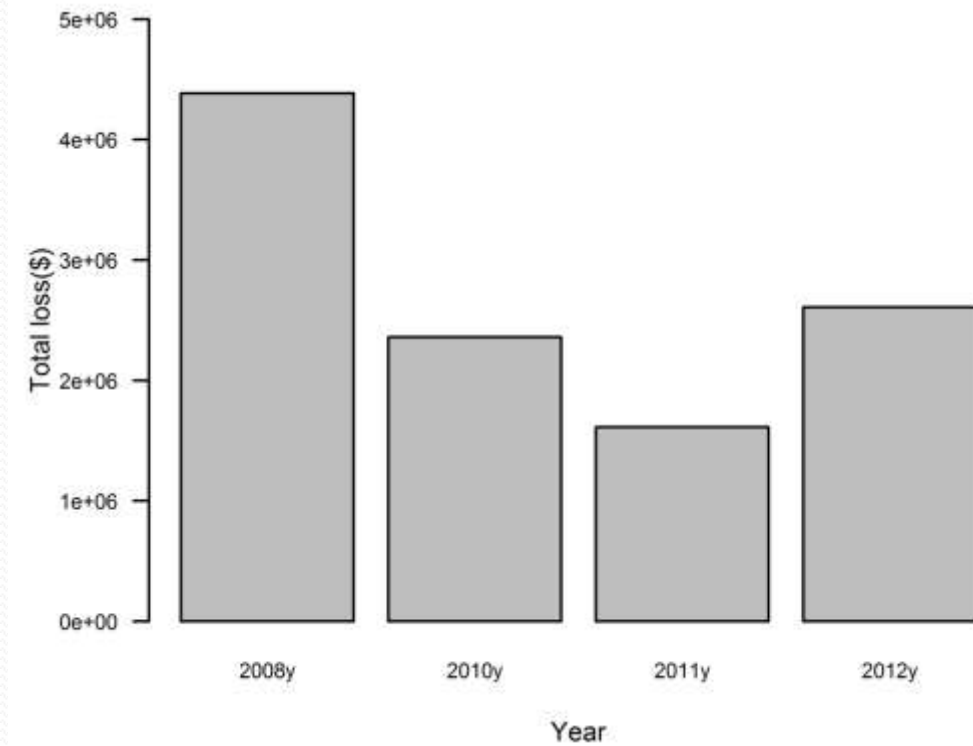
Temporal patterns variance among key species

- elephant and boar differed significantly across years and seasons, while that by bear showed no difference to neither year nor season

- elephant, boar and bear all varied across years and seasons.

- elephant indicated distinct year and seasonality effect, more frequent reported in rainy season, but neither boar nor bear showed distinct seasonal impact.

- black bear showed both year and seasonal difference, with a higher cost per event in dry season, while no trend identified in elephant attack human events.

Conclusion

- This study explored intensity, frequency, costs of HWC in XSBN and gained a comprehensive understanding of conflict temporal patterns.

- Land use structure, crop availability, population dynamic, distribution and habitat preference of main species involved explained the features and temporal pattern identified.

- XSBN is a region where many types of conflicts occur.

- The conflicts incidents are a dynamic changing process, showed certain patterns in temporal aspects.

Thank you!