

A photograph of a herd of elephants in a lush, green forest. The elephants are of various sizes, including several adults and a few young calves. They are standing on a grassy slope, surrounded by dense vegetation. The background shows a misty, forested hillside. The text is overlaid on a semi-transparent white box in the upper half of the image.

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

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# Background

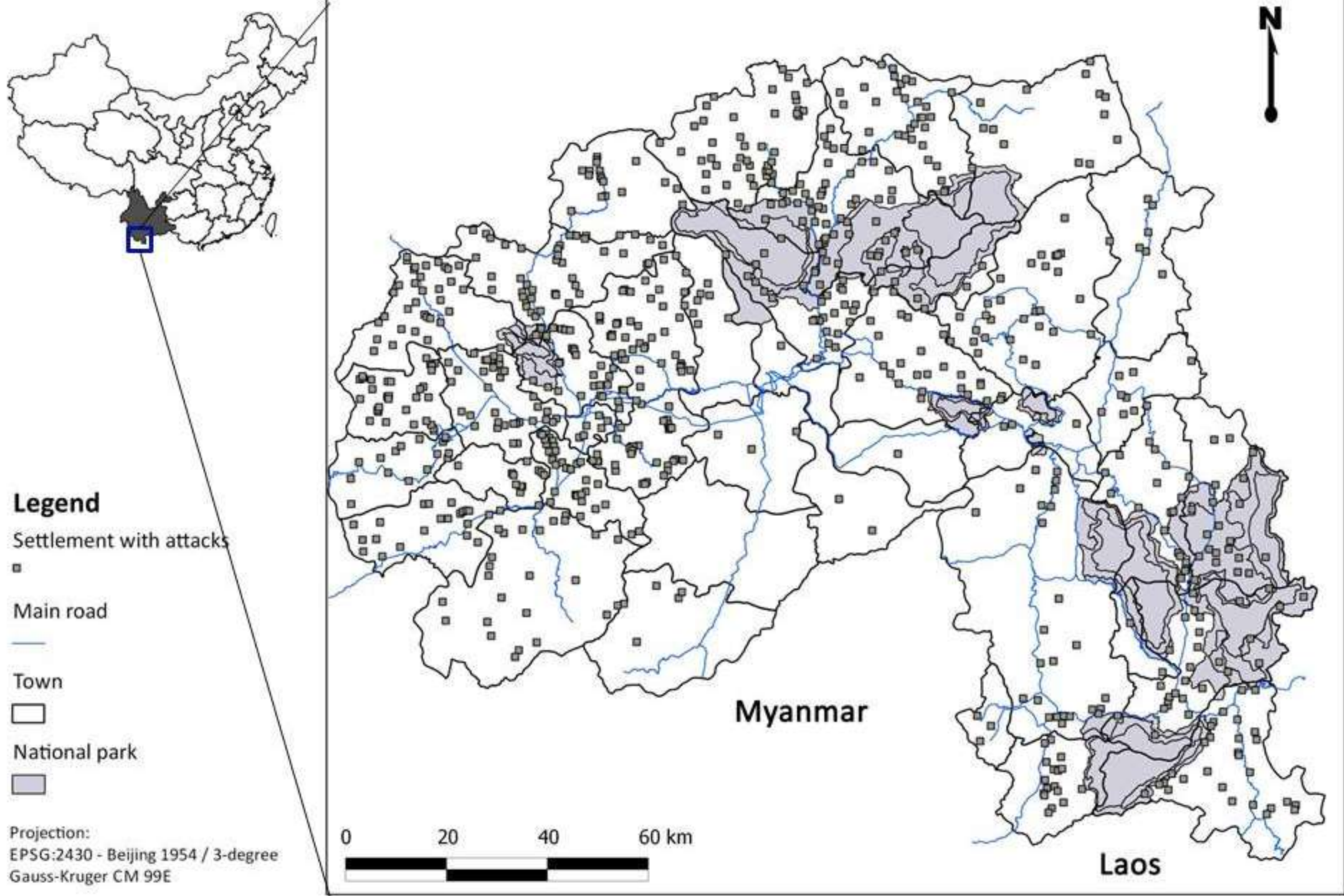


Tropical rainforest

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.

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## Response variables

## Predictors

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Total economic loss (\$)

Settlements

Area of crop damage(ha)

Species

Number of rubber trees damaged

Year

Cost of livestock predation (\$)

Season

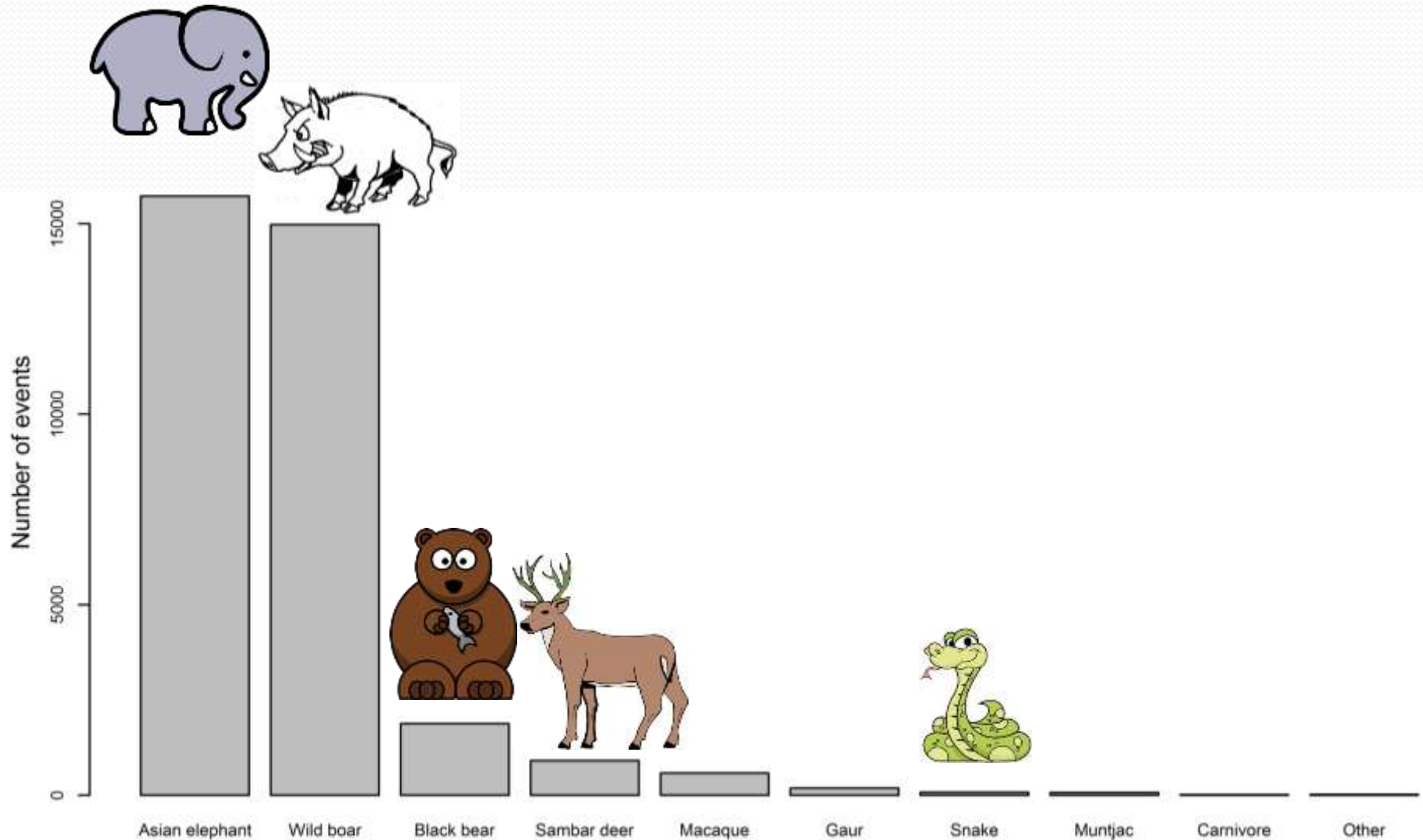
Cost of human attacks (\$)

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

“Data don't make any sense,  
we will have to resort to statistics.”

# Results



**Figure 2 Total number of incidents caused by species**

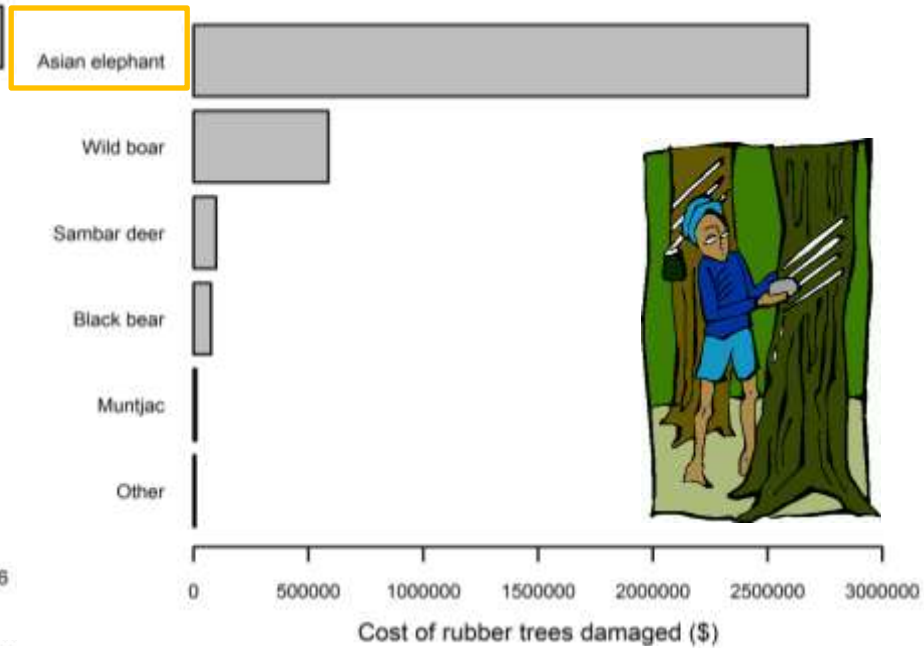
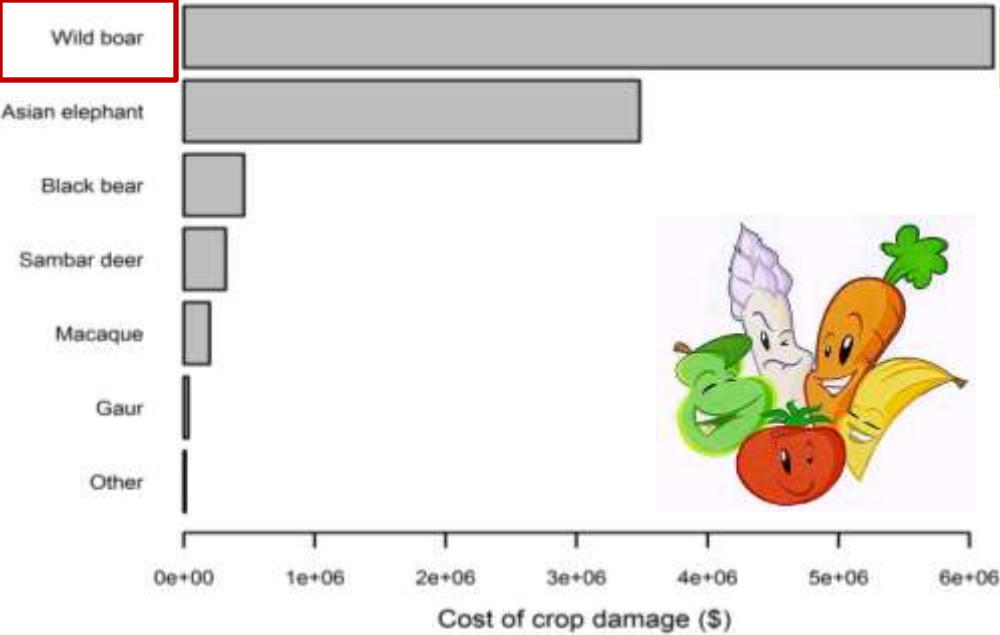
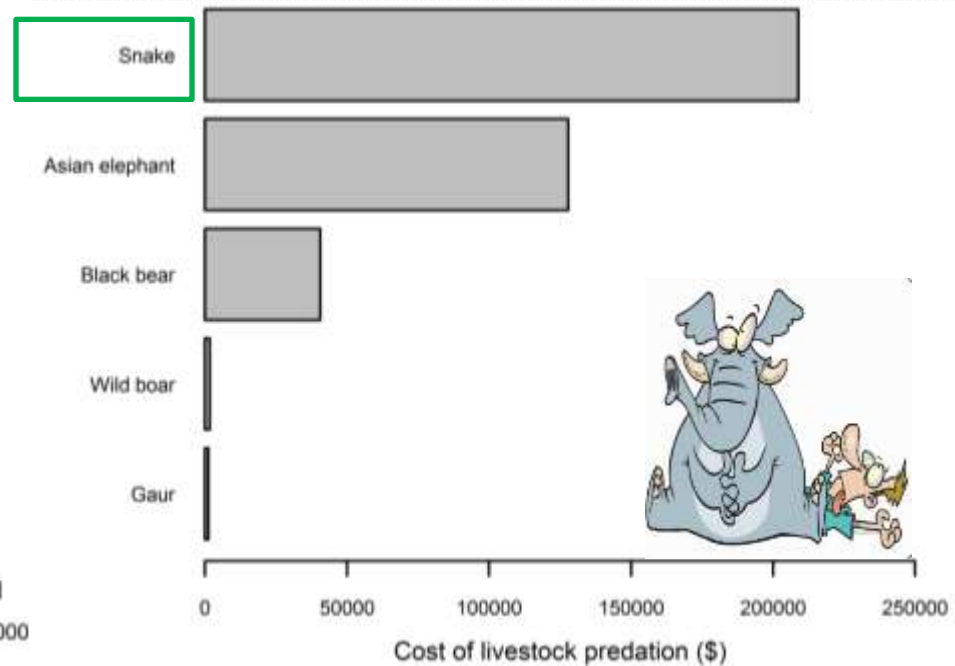
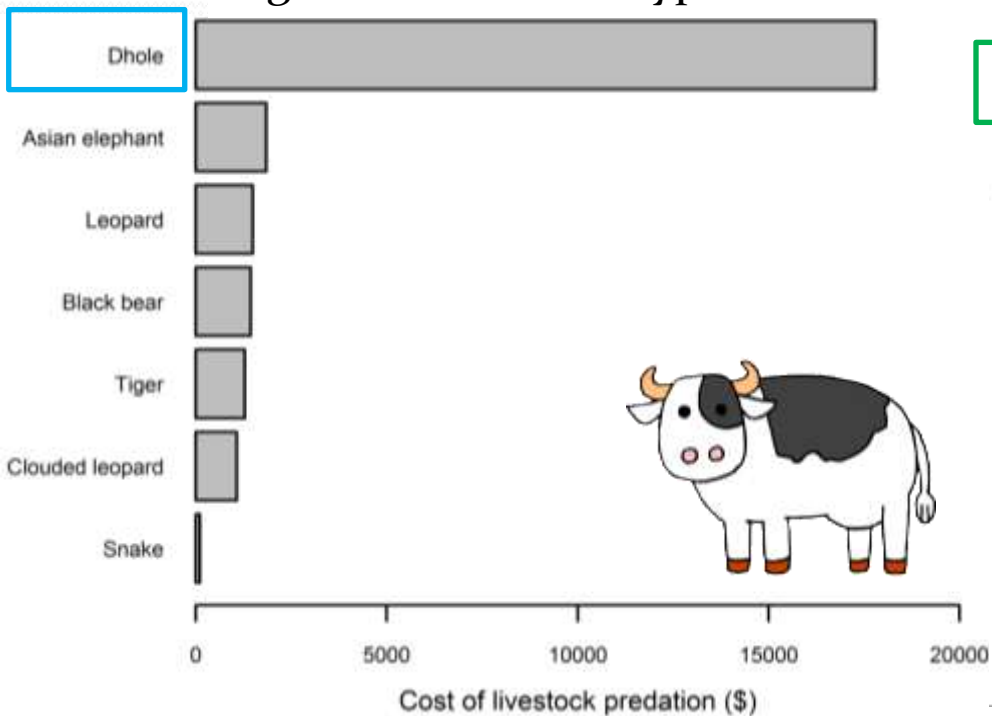


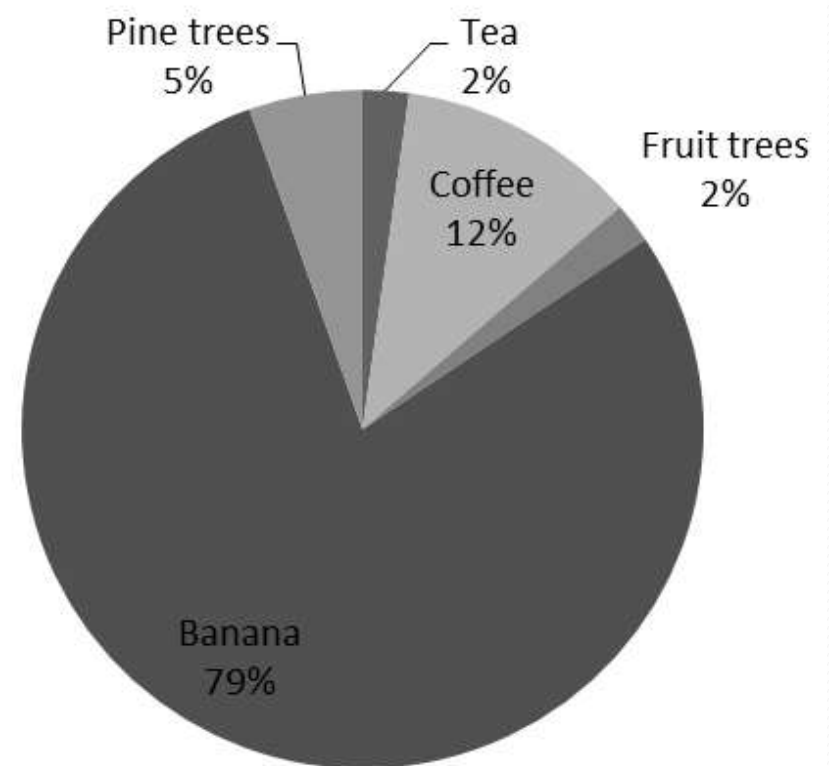
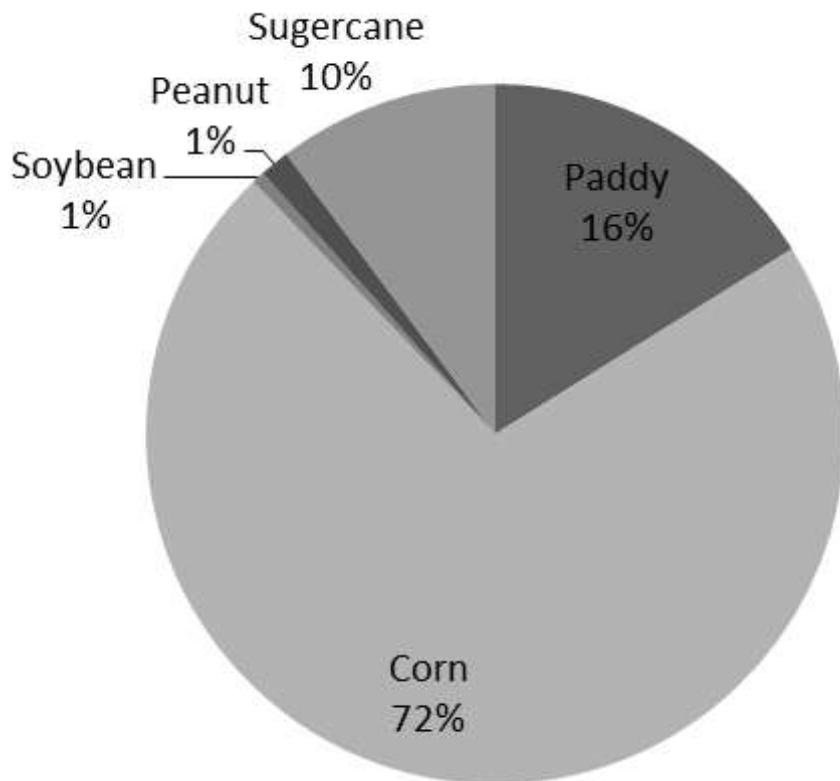
Figure Cost of four type conflicts during the study period by species



	Crop damage					Rubber trees damage	
	Paddy	Corn	Peanut	Soybean	Sugarcane	Seedling	Adult
Asian elephant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wild boar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	
Black bear	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			<input type="radio"/>	

	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	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wild boar		<input type="radio"/>			<input type="radio"/>				<input type="radio"/>
Black bear							<input type="radio"/>	<input type="radio"/>	<input type="radio"/>





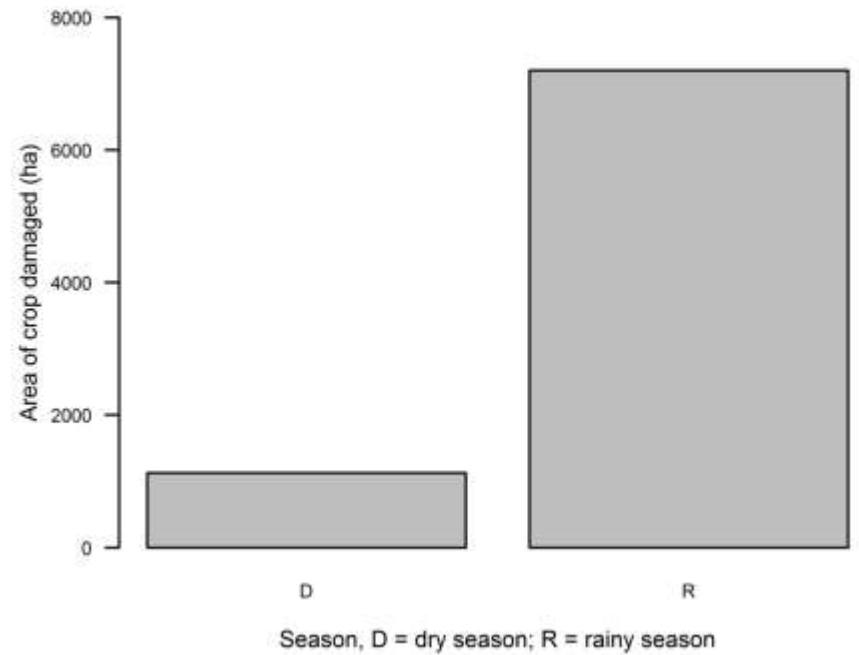
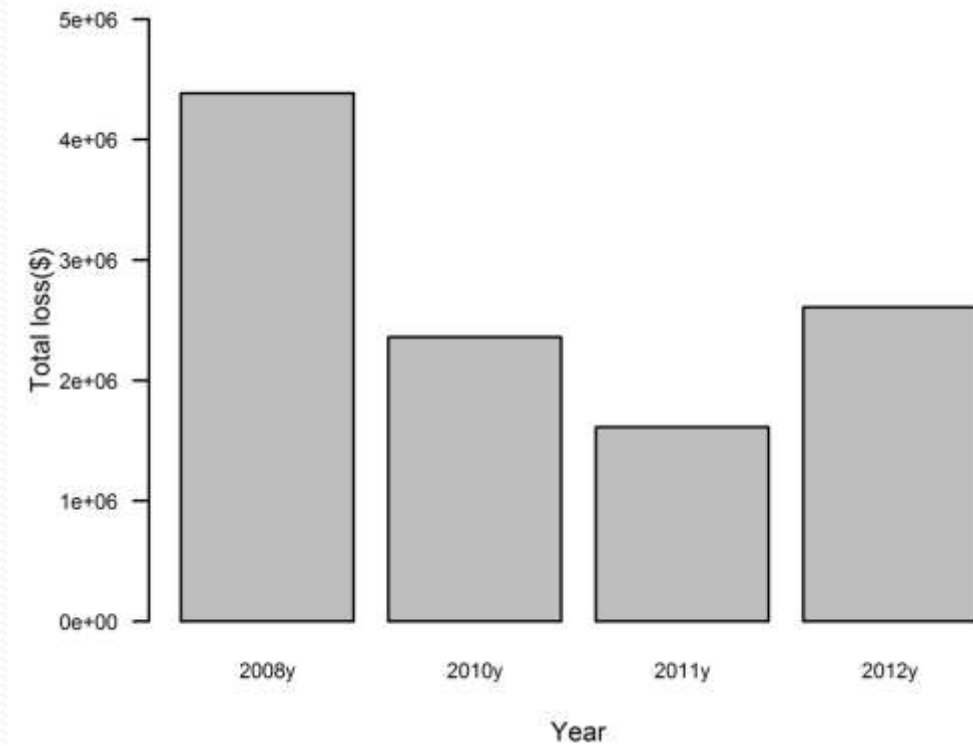
**Figure Proportion of crops and plantations damaged by Asian elephant in 2011 and 2012**

# 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!**

