Indian Farmers' Protest: a Spatial Analysis

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INTRODUCTION

In September 2020, the Indian government passed **3 new** agricultural laws (Navsharan, 2021):

- Farmers' Produce Trade and Commerce
- Farmers Agreement on Price Assurance
- the Contract Farming Act (+Amendement)

The newly introduced acts and amendments led to over **2 years of the worlds largest protest.**

Existing Literature

- Sentiment Analysis of Media: Studies have shows polarization in sentiment on social media towards the protests from different actors
- Union Involvement: There is discourse on whether the protests are led by farmers or traders and if political religious groups are involved
- Nature of the Protest: Protests are often confronted by a massive, intimidating police presence (or police violence) (Todhunter, 2021; Kronstadt,2021).

RESEARCH QUESTIONS

What is the distribution of violent Vs. non-violent protests across India? To what extent do they vary in their intensity?

Data

ACLED: The Armed Conflict Location & Event Data Project

- Over 6,000 unique protests reported between 2019-2021
- **4 out of 17** variables were used: event id , latitude, longitude, Population of 2020

Demographic Data: Census Predicted Population (2019-2021) Agricultural Census data (2015-2016) at **state level**
Shape File: A State Shape File from MIT GIS Library

Methods

Point Process Methodology: Nonhomogeneous Poisson Process with intensity function $\lambda(s) = \exp(z(s)'\beta)$ is the measure of **spatial intensity**
z(s): spatial variables (latitude and longitude, census population.

Poisson Process Model: Measures the **counts of protests over a given sq. area**, using lat and long information.

Intensity score: **Integral of the counts over the entire country.**

RESULTS

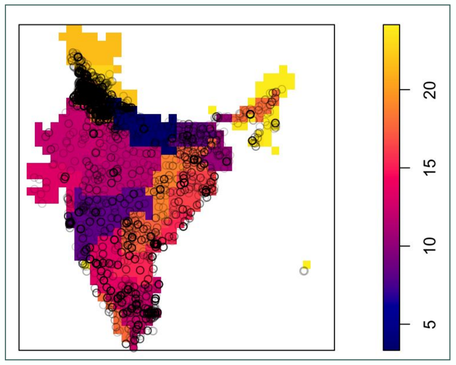

Fig1: Fitted PPM model for peaceful protests

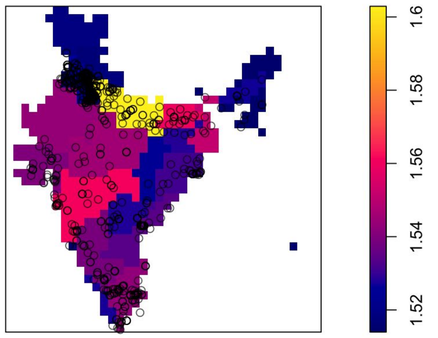

Fig2: Fitted PPM model for non-peaceful protests

	Peaceful	Not-Peaceful
Intercept	3.2	4.1
X (lat)	-0.05	-0.036
Y (Long)	0.05	0.005
intensity	**0.0008**	**0.00002**

Intensity score (λ) is comparable between peaceful vs non-peaceful
Intensity is a lot higher for peaceful protests vs non-peaceful protests.

CONCLUSION

This output tells us that the fitted intensity was comparatively higher for Peaceful protests vs. non-peaceful events. Conclusion is consistent with the IPP visuals. Therefore, per area covered by protests, whether a protest was peaceful or not has a significant effect on the intensity observed.

Limitations

The current model does not include other effective variables that would help us compare the intensities of peaceful vs non- peaceful and control for actors involved in the protests.

This model also does not use different demographic levels as a control and therefore the points may not accurately represent the spatial relations between the events
Lastly, the project is an ongoing effort where the authors are transition from using IPP models to Nimble. Which accounts for covariates more accurately

Data ethics.

The data collected for this project is from scraping news sources from different parts of South Asia. There is potential for biases in the dataset.