Memorandum

To: Chief Minister Uddhav Thackeray
From: Divyadarshan Punjabi
Subject: Revised Expenditure in tackling agricultural shocks will reduce crime rate in rural districts of Maharashtra.
Date: November 24, 2021

Executive Summary

There is substantial evidence for the existence of a bridge between weather shocks, agriculture and crime. Failure of periodic monsoon cycles and change in weather temperature is leading to failed crops, reduction in agriculture yield's, loss of livelihood (dire economic conditions for crop cultivators) and thereby, increased crime rate. Hence, setting up an emergency fund for farmers (around the poverty line) to help them sustain a weather shock (like a drought or famine); and a district-wise campaign to educate and offer subsidized irrigation supplies to poorer crop cultivators can reduce crime rate in Maharashtrian districts.

Key Findings

There is already enough literature in psychology documenting a link between physical discomfort and aggressive behavior – Anderson and Bushman.[1] Anderson; Auliciems and DiBartolo; Card and Dahl; Cohn and Rotton[2] specifically explain a correlation between temperature fluctuations and crime through psychological mechanism relating heat to aggression.

Hsiang, Burke, and Miguel[3] also give evidence that weather shocks increase civil conflict. Miguel; Mehlum, Miguel[4], and Sekhri and Storeygard[5]; Fetzer show weather–crime connections in developing countries due to rainfall fluctuations and invoked an income mechanism to explain their results.

From 1971 – 2000 in India, years in which precipitation was more than one standard deviation below the local long-term mean, crime rates increased by about 5 percent, while temperatures one standard deviation above the local mean are associated with a 3 percent increase in crime. The relationship between crime and weather has remained remarkably stable, even though average crime rates have declined despite the considerable economic development and structural change occurring across these years – Blakeslee and Fishman et al. 2017.

Blakeslee and Fishman also found that positive rainfall shocks (particularly regions getting rainfall from the south-west monsoon winds) are associated with an (imprecise) 2.8 percent decrease in production, 2.4 percent decrease in yields, 2.6 percent decrease in wages, and a 1.5 percent increase in crime. Positive temperature shocks are associated with an 8.4 percent decrease in production, a 4.8 percent decline in wages, and a 3.3 percent increase in crime.

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[1] Anderson, Michael L, "As the Wind Blows: The Effects of Long-Term Exposure to Air Pollution on Mortality," Technical Report 2019.

[2]Anderson, Craig A., Kathryn B. Anderson, Nancy Dorr, Kristina M. DeNeve, and Mindy Flanagan. 2000. "Temperature and Aggression." Advances in Experimental Social Psychology 32:63–133.

Auliciems, A., and L. DiBartolo. 1995. "Domestic Violence in a Subtropical Environment: Police Calls and Weather in Brisbane." International Journal of Biometeorology 39(1):34–9.

Card, David, and Gordon B. Dahl. 2011. "Family Violence and Football: The Effect of Unexpected Emotional Cues on Violent Behavior." The Quarterly Journal of Economics 126(1):103.

Cohn, Ellen G., and James Rotton. 1997. "Assault as a Function of Time and Temperature: A Moderator-Variable Time-Serie Analysis." Journal of Personality and Social Psychology 72(6):1322.

Their weather – crime regression led to the following statistics: Negative rainfall shocks led to riots increased by 7.0 percent, burglary by 6.7 percent, banditry by 7.3 percent, thefts by 3.5 percent, and robbery by 4.2 percent. Among non-property crimes, murder increases by 3.0 percent, kidnapping by 3.4 percent, and rape by a statistically insignificant 2.2 percent. Positive rainfall shocks only increase banditry in a statistically significant way (by 4.7 percent). Positive temperature shocks are associated with a 7.6 percent increase in banditry, a 5.8 percent increase in riots, and a 3.0 percent increase in murder.

These are compelling evidences suggesting a policy change for the rural districts of Maharashtra – where south-west monsoon winds are mainly responsible for rainfall. Crime rate in these districts account for 10-20 percent[7] of the crimes committed in the State.

Recommendation

I recommend Chief Minister Uddhav Thackeray to:

1. Set up an "Emergency Fund" of INR 1 Cr or (INR 10 million) in the budgets of each of the district corporations. This fund will be utilized to offset damages arising from weather shocks through:
    a. Voucher schemes to restore livelihood of citizens in case of loss of earnings due to crop failure.
    b. Cooling stations to reduce physical discomfort in case of high ambient temperatures.
    c. Availability and subsidies on plant seeds and irrigation supplies to tackle positive and negative rainfall shocks.
2. Set up a network of individuals to be tasked with educating farmers from lower socioeconomic backgrounds. This can involve but need not be limited to newer irrigation and cultivation techniques as well as upskilling seminars to keep up with sustainable agricultural practices.

Conclusion

Weather shocks associated with increases in crime are found to reduce agricultural incomes, plausibly suggesting a role for agricultural income shocks in mediating the observed relationship, consistent with a lengthy literature on the economic determinants of crime and group conflict. Therefore, finding ways to end these group conflicts and mitigating agricultural income shocks on farmers plays a crucial role in reducing overall crime rate.

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[3]Hsiang, Solomon M., Marshall Burke, and Edward Miguel. 2013. "Quantifying the Influence of Climate on Human Conflict." Science 341(6151):1235367

[4]Mehlum, Halvor, Edward Miguel, and Ragnar Torvik. 2006. "Poverty and Crime in 19th Century Germany." Journal of Urban Economics 59(3):370–88.
Miguel, Edward. 2005. "Poverty and Witch Killing." The Review of Economic Studies 72 (4):1153–72

[5]Sekhri, Sheetal, and Adam Storeygard. 2014. "Dowry Deaths: Response toWeather Variability in India." Journal of Development Economics 111:212–23.

[6]Blakeslee and Fishman. 2017. "Weather Shocks, Agriculture, and Crime: Evidence from India"

[7]Data on crime rates were obtained from India's National Crime Records Bureau (INCRB), housed under the Ministry of Home Affairs.