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WEATHERING THE STORM

Role of SHGs in mitigating the IMPACTS OF NATURAL DISASTERS

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This note is based on the paper *Safety Nets and Natural Disaster Mitigation: Evidence from Cyclone Phailin in Odisha* authored by P. Christian, E. Kandpal, N. Palaniswamy and V. Rao.¹

CONTEXT

Climate change is expected to increase the incidents of extreme weather patterns such as cyclonic storms. Large parts of the developing world including the Bay of Bengal region remain particularly vulnerable to adverse effects of such climate phenomenon. Odisha is located in one of the most disaster prone areas in the Bay of Bengal region with geographical features exacerbating strong winds into catastrophic storm surges. More than 80% of its 46 million population lives in rural areas, and it ranks amongst the most impoverished areas in the region with low levels of women's welfare. As of 2017, the Human Development Index (HDI) of Odisha is 0.599, well below the national average of 0.639 but an improvement over the 2004 value of 0.482.

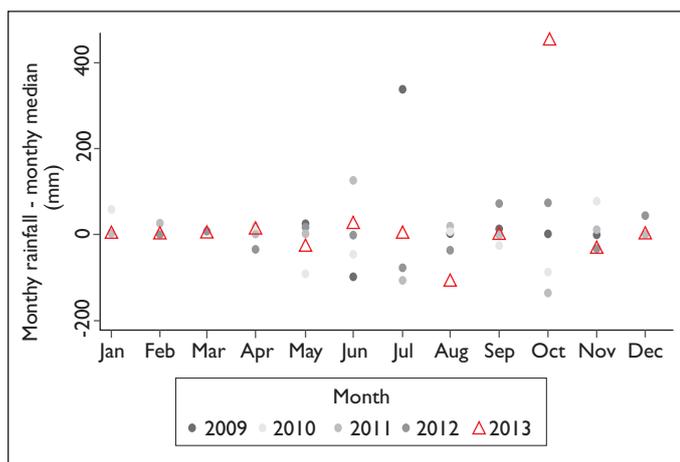
Cyclone Phailin made landfall in Odisha on October 11, 2013 with wind velocities of 205-220 kilometers per hour on landfall (higher than the 200 kmph velocity of Hurricane Katrina). The cyclone affected approximately 256,000 households and 1.3 million hectares of agricultural land. It also led to one of the largest emergency evacuations on record, with over a million people moved to shelters. Post disaster reconstruction and rehabilitation costs were estimated to be 1.45 billion USD.

HIGHLIGHTS

- Cyclone Phailin, one of the strongest tropical storms to hit India in the last two decades, made landfall in Odisha in October 2013 affecting 256,000 households.
- Phailin led to sizeable decreases in overall household consumption, while expenditure on women's goods showed the greatest reduction.
- Self Help Groups (SHGs) play a positive role in buffering the community from the effects of natural disasters.
- In the wake of the disaster, areas where the intervention (TRIPTI) was operating show a significant expansion in the number of loans, whereas non-program areas relied more on state-level aid programs.
- TRIPTI offset the decline in total non-food expenditures after Phailin but had no effect on food expenditure, perhaps because non-food items may be easier to finance through credit.
- There was a significant increase in women's mobility in TRIPTI areas, increased engagement with local government, and greater involvement and knowledge of village and state level politics.

1. The original paper is available at <http://documents.worldbank.org/curated/en/808311522070466796/Safety-nets-and-natural-disaster-mitigation-evidence-from-cyclone-Phailin-in-Odisha>.

Figure 1: Rainfall shock caused by Cyclone Phailin



While policy makers have long believed that SHGs can be used to effectively attenuate the effects of severe weather events, the overlap between the areas impacted by Cyclone Phailin and those participating in an impact evaluation assessment of SHGs in the state, presented a concrete opportunity to bear out this conviction and to study the gendered impact of climate disasters.

INTERVENTION

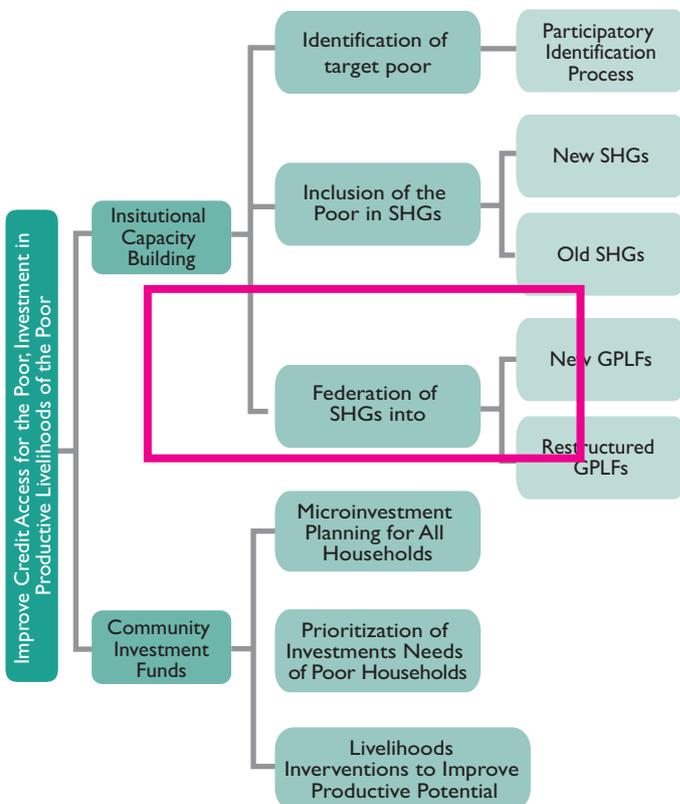
In 2006, the Government of Odisha (GoO) formed the Orissa Poverty Reduction Mission (OPRM; reconstituted as Odisha Livelihoods Mission – OLM) to target poverty reduction under the aegis of the Department of Panchayati Raj. In consonance with these objectives, the GoO had initiated an SHG program called Mission Sakthi in 2001. However, the program was plagued by various inefficiencies and the Targeted Rural Initiatives for Poverty Termination and Infrastructure TRIPTI was launched in 2009 with assistance from the World Bank, and implemented by the Orissa Rural Livelihoods Program (ORLP) to address the lacunae of inclusion, and limited productive potential.² TRIPTI aimed to address the high rates of rural poverty in Odisha, with a particular focus on increasing diversification of livelihoods and the reduction of debt, using SHGs as nodes of credit, and with a special focus on women’s empowerment, strengthening community ties and increasing community action.

The project was rolled out in a staggered manner amongst village councils, and by 2015 TRIPTI had been implemented in 38 sub districts in 10 coastal districts of Odisha. The administrative blocks receiving the intervention were identified through a participatory identification process, based on a situational analysis whereby an objective assignment score calculated as a weighted average of the total number of households, number of households belonging to lowest castes, number of SHGs deemed credit worthy and a Composite Development Index.³ In each district four blocks with the highest score were chosen to receive the intervention.

BOX 1: TRIPTI FOLLOWED THE PROGRAM OUTLINED BELOW

- **Build institutional capacity** of Community Based Organizations (CBOs), where SHGs at the village level were aggregated into federations at the Gram Panchayat (GPLF) and Block Level. The main thrust at this stage was the management of group-based lending and a need-based prioritization of resource allocation within the federation and linkages with services provided by the public and private sectors in order to improve productive potential.
- **Improve access to credit** through the provision of SHG grants called the Community Investment Funds (CIFs), with the intention that these would be used to meet the investment needs of the target poor, and that these needs would be identified through a facilitated process of micro-investment planning.
- **Link CIFs** with livelihoods interventions that focused on improving productivity.
- **Harness the collective bargaining potential** of these institutional platforms and enabling beneficiaries to negotiate with market actors for better economic gains, and with service providers (government, private sector, and civil society) for better service delivery.

Figure 2: Implementation of the OLM



2. Odisha was also the first state in the country to launch the National Rural Livelihoods Mission (NRLM) in 2011, in its bid to bring down rural poverty by promoting diversified and gainful self-employment to the rural poor.

3. Computed from census data, this index was based on the following variables: Density of population per Sq Km of area, percent of agriculture workers to total male workers, net area sown per agriculture worker, percent of net irrigated area to net area sown, percent of cropping intensity, percent literate, number of primary schools per one lakh population, percent of villages electrified, percent of problem villages provided with safe drinking water, number of medical institutions per lakh of population.

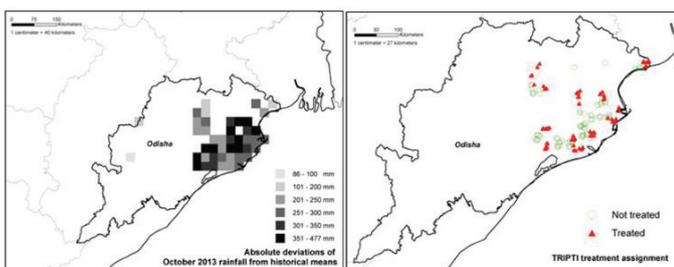
In 2016, at a project cost of 90.5 million USD, the Orissa Rural Livelihoods Project had 750,000 members (over twice the original target) who gained access to credit of about INR 10,000 each and were organized into 79,000 SHGs and over 1,000 federations, with a high level of membership among the poor and disadvantaged in the community based organizations.

EVALUATION DESIGN

The formalized rollout of TRIPTI was designed in conjunction with an impact evaluation, whereby a baseline survey for the impact evaluation of TRIPTI was conducted in 2011, two years before Cyclone Phailin made landfall in 2013, with data from 2875 households from 160 randomly selected villages. Thereafter, an endline survey was conducted in November 2014 and revisited the households from the baseline. The surveyed communities overlapped significantly with areas affected by the disaster.

Using spatial variation in the intensity of the rainfall shock and the staggered roll out of TRIPTI, researchers conducted a large-scale statistical examination of (1) the negative consumption impacts of Cyclone Phailin, and (2) whether the prior presence of TRIPTI SHGs mitigated covariate risk by improving access to credit and providing a platform for government response.⁴ The team conducted a regression analysis to measure the differential effects of Phailin across TRIPTI and non-TRIPTI areas, and econometric analysis to account for time in variant characteristics of the households and their location.

Figure 3: Overlap in areas affected by Cyclone Phailin and areas under TRIPTI implementation



The analysis models average impacts of both Phailin and TRIPTI and accounts for auto-correlation using a differences-in-differences approach to assess whether the difference in observations are constant over time for reasons other than exposure to the cyclone or TRIPTI. However, due to the fact that extreme weather events are not randomly assigned and the small possibility that differential trends in the variables observed arose from sources other than TRIPTI or Phailin, the study must be regarded as suggestive evidence on the impacts of both extreme weather and the safety nets designed to mitigate them.

KEY FINDINGS

Results showed that there were significant impact of the cyclone, yet there was substantial variation in the intensity with which the households were affected. Following spatial correlation strategies it was found that communities closer to the coast were affected more, which is in concordance with the fact that cyclones are strongest upon landfall.⁵

Households' expenditure per capita was significantly reduced in the wake of Phailin (by up-to a third in areas where the rainfall shock was the greatest), driven by lower per capita food expenditure (consumption shock). Households switched from purchased food to home grown food suggesting a coping strategy of drawing from stored food. It was observed that TRIPTI offset the decline in total non-food expenditures after Phailin but had no effect on food expenditure, perhaps because non-food items may be easier to finance through credit. Health and education expenditure, for instance, did not show much change after Phailin.

Interestingly, survey results observed a significant increase in expenditure on festivals whereby the worst affected areas spent more on *Raja*, a local festival that was celebrated eight months after Phailin's landfall. The increase in festival expenditure is balanced out in magnitude with a decrease in expenditure on women's goods, (including clothing, shoes, hygiene products, and toiletries purchased for women). It is worth noting that the decrease in expenditure on women's goods was primarily observed in areas where the TRIPTI program was not active, either suggesting that TRIPTI may have buffered women from the impact of Phailin, or that women in TRIPTI areas are more empowered, or both.

There was a significant increase in women's mobility in TRIPTI areas, which may be driven by their visits to SHGs meetings (17.8%) and to the bank (5.3%) alone. Women in TRIPTI areas were 5% more likely to use *gram panchayat* meetings to raise problems with domestic violence and alcoholism and to address issues with government welfare schemes. Their willingness to take collective and public action was 8% age points higher, and their willingness to pursue an institutional response to collective challenges was 12.8% points higher in TRIPTI areas.



4. The evaluation design incorporated a Geographic Information Systems (GIS)-coded dataset from the Indian Meteorological Department's (IMD) to measure the absolute deviation from the historical average of millimeters of rainfall at the nearest weather station together with data on household expenditures, consumption, credit-seeking, and political engagement from the TRIPTI surveys.

5. Households characteristics, vis a vis consumption, lending and political participation, were balanced according to cyclone intensity.

TRIPTI households in cyclone-affected areas took out a greater number of loans than in areas not affected. First time borrowing from SHGs as well as the loan amount increased in the wake of Phailin, highlighting the credit-expanding role of TRIPTI. This is particularly relevant since estimates also show that Phailin reduced the amount of borrowing in non-TRIPTI areas. The government extensively used TRIPTI infrastructure to distribute aid to cyclone-affected areas.

TRIPTI areas had increased awareness of the last village council meeting, as opposed to non-TRIPTI areas. TRIPTI areas also found it easier to facilitate community meetings in order to provide information about aid programs or leverage aid.

POLICY LESSONS

The rise of non-food expenditures in TRIPTI areas indicate that SHGs can help rebuild capital assets of households impacted by natural disasters and that easy access to credit can mitigate risks for communities exposed to them.

This study found empirical evidence to support two long held conjectures in the development community that (1) women are disproportionately vulnerable to climate change and that (2) they buffer their households in the wake of adverse economic shocks.

ABOUT THE IMPACT NOTE SERIES

This note is part of the South Asia Agriculture and Rural Growth Impact Note Series, that seeks to disseminate research and analysis focused on World Bank financed rural, agriculture and food systems programs in India. Series editors: Abhishek Gupta and Gayatri Acharya. Photographer: Rohit Jain.

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CONCLUSION

It was demonstrated that the TRIPTI areas affected by the cyclone showed greater community action and self-sufficiency, with SHGs increasingly used by governments to impart and leverage aid for maximum impact. The higher degree of awareness in TRIPTI areas of village council meetings and decision reflects a central role played by the SHGs in shoring up the community post disaster, promoting effective community action, and providing hope and dignity to their women members.

Further research needs to be done to fully understand the correlation between group based community lending and natural disaster relief. As climate change becomes a real threat to an increasing number of rural communities, there is urgent need to look into the effectiveness of community groups like SHGs to serve as social security nets in the wake of these disasters, as well as their cost-effectiveness when compared to other disaster response programs.