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Intersecting weather variability and chronic food poverty

Connie Bayudan-Dacuycuy and Lora Kryz C. Baje

Despite the government's various poverty reduction and social protection programs, poverty remains a social problem the country needs to hurdle. Moreover, most poverty studies in the country use cross-section data. As such, they only identify the poor at a given point in time and provide inadequate insights into the dynamics of poverty.

This *Policy Note* aims to contribute to poverty studies in the Philippines by analyzing chronic food poverty and how it is affected by weather variability.

The importance of weather variability

Weather is an integral part of our life and its shocks can have severe implications on income (Deschenes and Greenstone 2007) and household consumption. For example, Bayudan-Dacuycuy (2017) indicated that heat index fluctuation has effects on electricity consumption, and that the effects are highest on the consumption of balanced and female-majority households that are female headed and in rural areas.

Given their centrality to economic and social outcomes, climate change and the resulting changes in weather have received significant attention from local and international communities. In fact, several studies analyzed the effects of weather events on agricultural profit or output (Deschenes and Greenstone 2007), migration (Yang and Choi 2007), growth (Noy and Vu 2010), and health (Thai and Falaris 2014). Our study, on the other hand, analyzes the effects of weather events on chronic food poverty in the Philippines.

Food security is closely related to the discussion of weather variability and climate

change and food poverty. Based on the *2015 World Development Indicators* (WB 2015), around 29 percent (of total employment) is still employed in agriculture, a sector that is most vulnerable to weather fluctuations. Moreover, people in rural areas can easily slip in and out of poverty because their livelihood depends on stable environments such as stable temperature and steady supply of water.

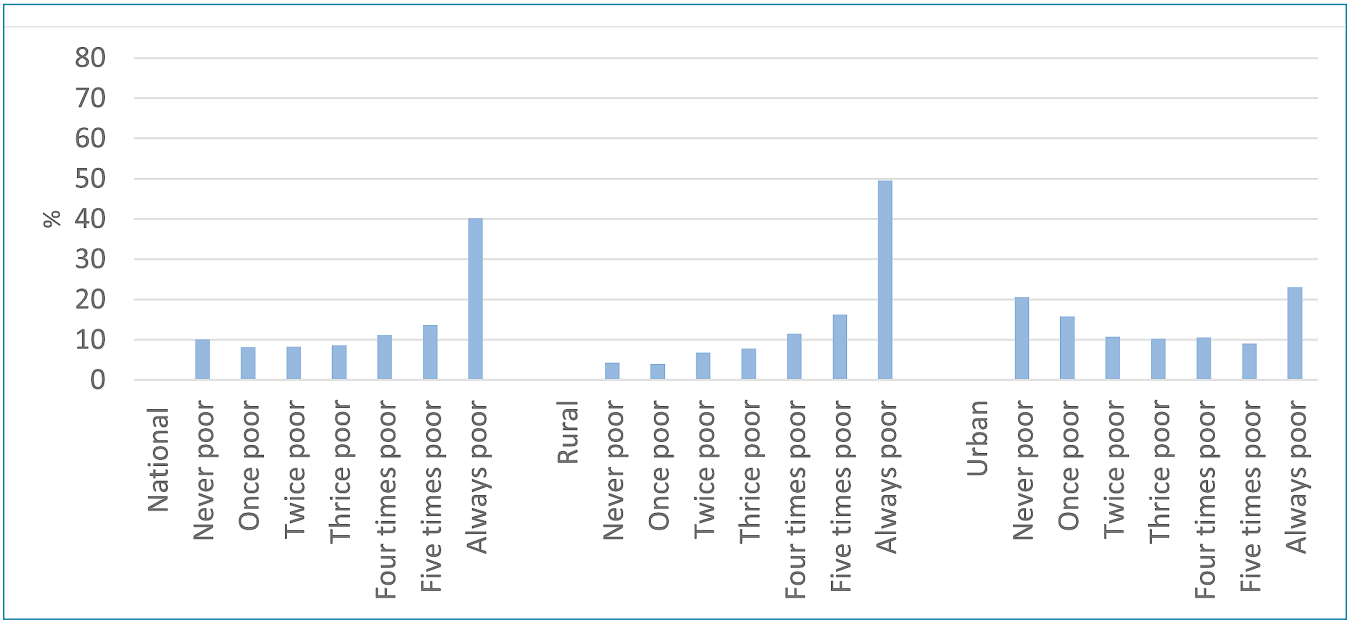
Analyzing the Philippine food poverty statistics

To analyze chronic food poverty, the 2004, 2007, and 2008 Annual Poverty Indicators Survey and 2003, 2006, and 2009 Family Income and Expenditure Survey collected by the Philippine Statistics Authority are merged. Based on these datasets, the number of times households fall below the poverty threshold is counted. Using this simple spells approach, this study found that a large percentage of the samples are always food poor at around 40 percent while the rest are either never poor or are moving in and out of poverty at the aggregate level (Figure 1).

Specifically, one in every two households in rural areas is always food poor while only 2 percent are never food poor. The rest of the rural households are moving in and out of poverty and a larger percentage experience high frequency of food poverty.

In the case of urban households, the percentage of never food poor and always food poor are relatively similar at 20 percent and 22 percent, respectively. Meanwhile, the remaining urban households are moving in

Figure 1. Food poverty, overall and by urbanity



Source: Authors' calculations based on the merged Annual Poverty Indicators Survey (APIS)-Family Income and Expenditure Survey (FIES) datasets

and out of food poverty. Particularly, those that are once food poor have the highest percentage at around 15 percent while the five times poor are around 10 percent.

This study also highlights the disparities of chronic food poverty across regions.

The National Capital Region has the highest percentage of never food-poor households, followed by CALABARZON (Cavite, Laguna, Batangas, Rizal, and Quezon), Central Luzon, and Cagayan Valley regions. Specifically, always food-poor households in Luzon are highest in MIMAROPA (Occidental Mindoro, Oriental Mindoro, Marinduque, Romblon, and Palawan) and Bicol regions that are beleaguered by the presence of the New People's Army.

Meanwhile, Mindanao has higher percentage of always food-poor households than Luzon and Visayas. Among its regions, Autonomous Region in Muslim Mindanao, where armed conflict often occurs, has the highest percentage of always food-poor households.

Some provinces, like Camarines Norte, Camarines Sur, Sorsogon, Masbate, and Albay in Bicol Region and Western and Northern Samar in Eastern Visayas, are prone to the occurrence of typhoons and are at risk to rainfall change as well.

Disparities, however, are likely results not only of armed conflict and natural disasters but also of uneven quality of local governance and infrastructure in the regions as well.

Impact of weather on food poverty in the Philippines

This paper analyzed the effect of weather event[1] on food poverty in the country. Weather events like increasing temperature and precipitation are likely results of climatic shift, as suggested by the projections of the Philippine Atmospheric, Geophysical and Astronomical Services Administration using mid-range emissions scenario. Slow-onset weather phenomenon, such as increasing precipitation and volatility in temperature, is equally damaging and can have severe consequences on social and economic outcomes.

Based on the estimates using multinomial logit regression,[2] this study predicts the probability of chronic food poverty, which is defined as being food poor all the time. To do this, we assume the following benchmark attributes: household headed by a person who is married, is not always employed, has less than college degree, and has a spouse who is not always employed. The benchmark household is also assumed to have two members who are less than one-year-old, one member who is between one- and six-year-old, with asset scores less than zero at times, and located in an area with armed conflict. The probability of chronic food poverty is then predicted for

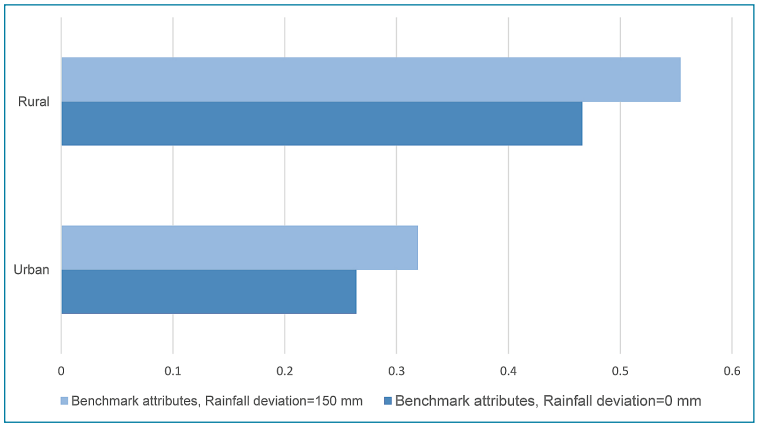
[1] This study uses the rainfall deviation defined as the difference between yearly rainfall and normal rainfall. Normal rainfall data, or the 30-year average rainfall (from 1971 to 2000), and yearly rainfall data (2003, 2004, 2006, 2007, 2008, and 2009) are obtained from the Philippine Atmospheric, Geophysical and Astronomical Services Administration.

[2] This is an estimator for unordered categorical variables.

1) benchmark characteristics and zero rainfall deviation and 2) benchmark characteristics and rainfall deviation of 150 millimeters.[3]

Results indicated that chronic food poverty in urban areas is around 6 percentage points and in rural areas around 8 percentage points higher for households that experience rainfall deviation than for similar households that do not (Figure 2).

Figure 2. Probability of always food poor in urban and rural areas



Source: Authors' calculations based on the merged APIS-FIES merged datasets

Policy recommendations

Invest in climate-smart agriculture

To address the adverse effect of sustained weather fluctuations, local government units (LGUs) should invest in the development of a climate-smart agriculture that fits the needs of the community. Given that community-based development of good agricultural and livelihood practices harnesses local skills and knowledge, it instills strong ownership in the community and climate change adaptation is likely to be successful.

Enhance technical assistance for LGUs

The *Philippine Development Plan 2017–2022* acknowledges that funding for climate change adaptation, especially in LGUs, competes with other development priorities. It is thus unfortunate to find that some adaptation funds remain untapped.

For instance, the People's Survival Fund (PSF) is an annual PHP 1 billion worth of fund for LGUs to implement climate change adaptation programs. However, while there are a number of proposals submitted to PSF, only two projects are approved (one in Surigao del Sur and one in Surigao del Norte) with total requested funding amounting to PHP 120 million. The PSF secretariat has indicated that most of the proposals submitted to the Climate Change Commission (CCC) lack the climate change adaptation component and are up for revision.

With this, CCC can enhance their technical assistance by providing LGUs an annual technical workshop on crafting proposals with strong climate change adaptation initiatives. It should also improve its information dissemination campaign not only to inform the public about their function but also to increase awareness on climate change adaptation and the various services CCC provides.

[3] Other values of rainfall deviation are also used. Patterns observed in the results presented hold.

Empower CCC to spearhead National Implementing Entity

Other than the PSF, another financing alternative is the Adaptation Fund (AF), established under the Kyoto Protocol of the United Nations Framework Convention on Climate Change. The said fund is a direct access to international financing mechanism that enables country institutions to participate in the design, implementation, and monitoring of the project. To avail of the fund, the country must designate a National Implementing Entity (NIE), which once accredited, will be fully responsible for program/project implementation and management.

This study recommends CCC as the most fitting national agency to spearhead NIE. As such, it should start looking into how the country can tap this additional adaptation funding source. Given that proposals need to be evaluated for AF grant, this highlights once again the need for strong CCC-led capacity building in LGUs so that they can come up with community-driven and well-defined adaptation projects and programs.

Consider the inclusion of environment protection to 4Ps' conditions

The government should also explore adaptive social protection (ASP) initiatives. These initiatives support propoor climate change adaptation and disaster risk reduction by strengthening the resilience of vulnerable populations to shocks (Davies et al. 2009). One ASP initiative that can be explored is to include environment protection as a condition to *Pantawid Pamilyang Pilipinong* Program (4Ps). 4Ps strengthens human capital and self-sufficiency but does not explicitly address risks associated with climate change. The program has to evolve with the needs resulting from climate change and changing weather patterns. ASP can take the form of including environmental protection such as planting X number of trees each year, beach reforestation, or the management of household solid wastes, as conditions to 4Ps.

Link ecotowns to 4Ps

The government can also explore linking ecotowns to 4Ps. The Local Climate Change Action Plan is packaged using the concept of ecologically stable and economically resilient towns or ecotowns (CCC 2012). Assistance to the poor in these ecotowns is granted on the condition of protecting ecosystems such as the protection of nearby forest from illegal tree cutting, the practice of appropriate farming techniques, or solid waste management. Linking these ecotowns to 4Ps can help rationalize funds and those that are freed up can finance other ASP initiatives.

Enhance involvement of external stakeholders to government social protection program

The government should also enhance the involvement of external stakeholders on the government's social protection program. For example, the Department of Social Welfare and Development can link Sustainable Livelihood Program through its Employment Facilitation (SLP-EF) track with social enterprises (SEs). SEs use local knowledge and resources to

The government should carefully consider the institutionalization of 4Ps. While the program has some weaknesses in monitoring health and that 4Ps can do better by imposing time-bound conditions on education, 4Ps has not only assisted the poor in sending their children to school but has also enhanced the community and bayanihan *spirit.*

address not only financial but also social and environmental issues within the community. The government can consider giving SEs incentives to put up enterprises for ecotowns or communities where SLP-EF is in place.

Institutionalize 4Ps

Lastly, the government should carefully consider the institutionalization of 4Ps. While the program has some weaknesses in monitoring health and that 4Ps can do better by imposing time-bound conditions on education, 4Ps has not only assisted the poor in sending their children to school but has also enhanced the community and *bayanihan* spirit. It has empowered members of poor families through the Family Development Sessions and has educated beneficiaries on bio-intensive gardening, communal gardening, and reforestation, among others.

For further information, please contact

The Research Information Department
Philippine Institute for Development Studies
18th Floor, Three Cyberpod Centris – North Tower
EDSA corner Quezon Avenue, Quezon City
Telephone Numbers: (63-2) 372-1291 to 92
E-mail: cdacuycuy@mail.pids.gov.ph; publications@mail.pids.gov.ph

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