

# Climate Variability and Inequality: Comparing the Experiences of Indonesia and Vietnam

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### MAIN MESSAGE

Households in Indonesia and Vietnam that are poor, rural, older, headed by women, and/or from ethnic minorities bear the biggest burden of variability in climatic conditions.

New research investigates whether climate variability in the two countries has regressive effects on income stability and inequality, hurting disadvantaged groups more than others.

The study finds that in Indonesia, climate variability reduces income, while it has an equalizing effect across the most vulnerable groups in society. In Vietnam, climate variability mostly affects the agricultural sector, and it raises inequality significantly.

### CONTEXT & MOTIVATION

Is climate variability regressive? In other words, does it causes more economic damage to poorer, most vulnerable, most exposed, and less able to cope parts of society?

Indonesia and Vietnam have experienced increased incidence of extreme climate hazards and uncertainties.

Past research suggests that the biggest losses will be faced by the agriculture sector, which is also the biggest income source for the most marginalized and vulnerable people in these two countries.

Studies of the direct impact of climate variability on inequalities are limited, as research mostly focuses on the direct effects on poverty while treating inequality as a secondary and consequential issue. But poverty and inequality are very distinct phenomena and often follow different patterns.

Indonesia and Vietnam are perfect examples. Despite their successful efforts in reducing overall poverty, these two countries are experiencing increasing inequality, as the divide between the richest and poorest widens through time.

The new study examines whether climate variability contributes to widen this gap and, if so, it identifies those groups who are most impacted by climate variability in Indonesia and Vietnam.<sup>1</sup>

### METHODS

The authors analyze the direct effects of annual and seasonal temperatures on income and income inequality over time. They explore this for each country's population as a whole and investigate how these impacts change for the most vulnerable and marginalized groups.

The authors use the local random deviation of household income and provincial level Gini coefficients to estimate the marginal response to changes in climate, controlling for unobserved heterogeneity among locations and households, spatial auto-correlation across locations, within-location auto-correlation, and non-linear climate trends.

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**Geography** Indonesia, Vietnam

**Key words** Resilience, Climate Variability, Vulnerability, Southeast Asia

**Themes** Economics; Inequality; Climate; Poverty

**Find out more about this project:** [www.afd.fr/en/carte-des-projets/climate-variability-indonesia-and-vietnam](http://www.afd.fr/en/carte-des-projets/climate-variability-indonesia-and-vietnam)

## RESULTS

The study finds that climate variability is regressive, reducing incomes (in Indonesia) and increasing inequalities (in Vietnam).

Farming activities are the most affected across both Indonesia and Vietnam, although there is evidence that non-farm and non-farm wage employment are also negatively impacted by climate variability for certain groups.

In Indonesia, the most affected groups are poor households living in rural areas. Some studies suggest that older people adapt more slowly and less efficiently to climate variations than other vulnerable groups. Others also suggest that households headed by women might have limited capacity to increase resilience to climate uncertainties.<sup>2</sup> This lower overall coping capacity of older households and those headed by women is confirmed in the results for Indonesia.

The authors also find that changes in climatic conditions might have an equalizing effect in Indonesia at the higher end of the income

Table 1: The impact of climate variability on income and income inequality in Vietnam and Indonesia: a summary

	Vietnam	Indonesia
Effect on income	Negative, when controlling for transfers	Negative
Most affected regions	Central Highlands	Sumatra, Kalimantan, and Sulawesi
Type of activity most affected	Farm	Farm
Groups most affected	Rural, poor, ethnic minorities, young	Rural, poor, and older households, and those headed by women
Effect on inequality	Positive	Negative (higher temperature); Positive (lower temperature)
Groups most affected	All	All
Most affected regions	Central Highlands, Southeast, Mekong Delta	Sumatra

distribution but an inequality-enhancing effect at the lower ends, especially in Sumatra at the highest temperatures.

In Vietnam, rural and ethnic minority households bear the biggest burden of climate variability, as their income reduces consistently with annual and seasonal climate variability. The most affected areas in Vietnam are the Central Highlands, Southeast and Mekong Delta

regions, which have historically been most vulnerable to El Niño.

The analysis also shows that Vietnamese households might adopt short term solutions to cope with climate impacts. Previous research suggests that the use of transfers and remittances as insurance by the most vulnerable groups during periods of higher climate variability can hide short term climate impacts. The new analysis confirms this claim.

## RECOMMENDATIONS

- It is essential to develop and monitor targeted measures that help rural and agricultural households to cope with both the annual and seasonal impacts of increasing climate instability, especially those that affect their farming activities.
- Specific attention should be paid to social protection policies targeting the wellbeing and livelihoods of rural and ethnic minority households in Vietnam.
- It is vital to strengthen the depth and breadth of social protection policies in Indonesia, focusing particularly on both older households and those headed by women, which bear the biggest burden of climate variability.

<sup>1</sup> Pacillo, G. et al. (2020). Who bears the burden of climate variability? A comparative analysis of the impact of weather conditions on inequality in Vietnam and Indonesia, [AFD Research Papers No.147](#), 2020.

<sup>2</sup> 1) Maguza-Tembo, F. et al. (2017). Determinants of adoption of multiple climate change adaptation strategies in Southern Malawi: An ordered probit analysis. *Journal of Development and Agricultural Economics*, 9(1), pp.1-7. 2) Perez, C. et al. (2014). How resilient are farming households, communities, men and women to a changing climate in Africa? CCAFS Working Paper no. 80. Copenhagen, Denmark: CGIAR-CCAFS.