

Development Aid, Drought and Coping Capacity

The United Nations Millennium Development Goals project set as its first ambitious goal to eradicate extreme poverty and hunger, including halving the proportion of people worldwide that suffer from hunger by 2015. Nearly all developing countries managed to accomplish the latter target, denoting a remarkable improvement in global food security. However, the global rate of undernourished has recently been on the rise. The leading cause of growth in hunger is escalating violence in war-torn countries, compounded by climate-related shocks, notably drought. This policy brief summarizes the first attempt to systematically assess the implications of development aid for recipient populations' environmental coping capacity following droughts across sub-Saharan Africa.

Brief Points

- We investigate the local effects of aid on children's health across 16 countries in Africa.
- We find that drought negatively impacts children's weight-for-height ratio, so-called wasting.
- However, children living close to aid project locations are better able to cope with a drought than those who do not live close to an aid project site.
- Finally, we find that it is the accumulative effect of *all types* of aid that is relevant, not only aid focusing specifically on food security, such as agricultural aid.

Elisabeth Lio Rosvold *Uppsala University*

Halvard Buhaug *PRIO & NTNU*

Siri Aas Rustad *Peace Research Institute Oslo (PRIO)*

Drivers of Child Malnutrition

A common way to measure a society’s environmental coping capacity – or resilience – is to assess local health indicators, such as infant mortality rates and child nutrition levels. There are different measures for undernutrition, depending on whether the undernutrition is a result of acute or long-term factors. As we are interested in the (immediate) effect of a drought on child nutrition, we rely on the weight-for-height ratio, so-called wasting, for children below the age of five. This is a measure of acute malnutrition where children’s weight for height is compared to a reference population provided by the US National Centre for Health Statistics and adopted by the World Health Organization (WHO).

High rates of malnutrition are closely related to armed conflict, and food crises are often especially acute when conflict overlaps with natural hazards. The FAO has concluded that the recent deterioration in global food security is due to the compound and interacting effects of escalating conflicts, climate-related shocks, and stagnating economies.¹ However, drought and other forms of extreme weather events can severely threaten food security also in the absence of political turmoil, especially where food provision and income are dependent on local agriculture, where food and trade markets are inefficient, and where infrastructure is poorly developed.

Existing research on child wasting finds that rainfall variability and drought impact levels of undernutrition. However, this finding derives from single-country studies, making it difficult to draw inferences beyond the specific countries that have been studied. In our study, we thus first have to establish that drought negatively impacts children’s nutritional status across our sample. An estimation of the average effect of drought severity on wasting in among 138,103 children, whose mothers took part in a Demographic and Health Survey (DHS), reveals that there is a statistically significant association between recent drought exposure and child wasting. More severe droughts are linked to lower weight-for-height scores, and we can conclude that a drought has negative health effects for affected populations.

Figure 1 shows the magnitude of the different determinants of children’s undernutrition that we include in our first model. The coefficients

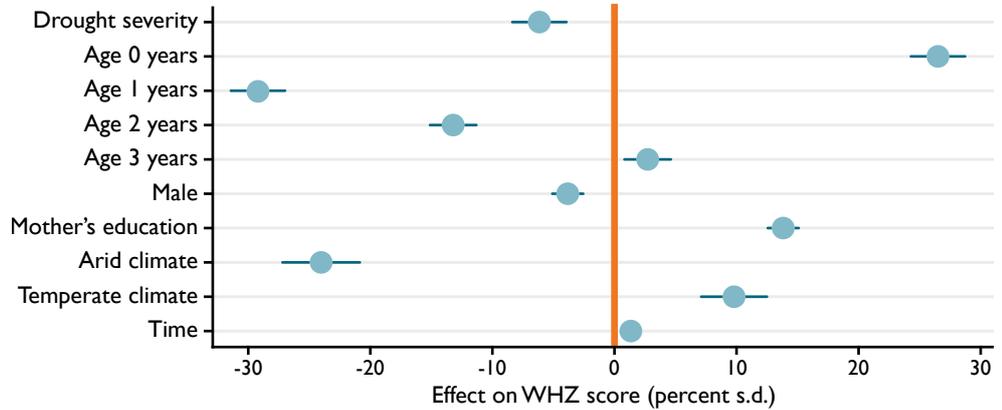


Figure 1: Determinants of under-5 wasting based on our models

show how much a one-step increase in each factor changes the expected wasting (WHZ score) level. Negative influences are found to the left of the orange line, and positive to the right. The drought coefficient is negative, meaning that children exposed to drought have a lower WHZ-score. This means that these children are more undernourished than those not exposed to drought. The magnitude of the effect is however modest compared to children’s age and the type of climate they reside in. The risk of wasting is highest among children living in arid areas, whereas temperate climate is associated with a lower prevalence of undernourishment compared to those living in tropical areas. We also see that child wasting risk peaks between the ages of 1 and 2 years old, while the youngest children, most of whom benefit from breastfeeding, are the least likely to be undernourished. Finally, the figure also confirms that mothers’ education levels matter: the more educated the mothers, the less wasted their children.

Health Benefits of Aid

Most of the literature on aid effectiveness investigates how (development) aid impacts overall development levels by assessing macroeconomic outputs such as GDP per capita. The verdict is often that aid fails to show up as increased country-level growth in recipient countries.

However, looking at specific aid projects, we see that they often target particular sectors in distinct parts of the recipient country. This means that country-aggregated statistics may be poorly suited to evaluate progress, and analyses that explore within-country variation in aid impacts provide more encouraging results. For health-specific aid, for instance, the results are generally positive, and health aid has been found to reduce infant mortality rates, improve child nutritional status, improve maternal health, and reduce HIV-prevalence.

Aid inflows both directly and indirectly

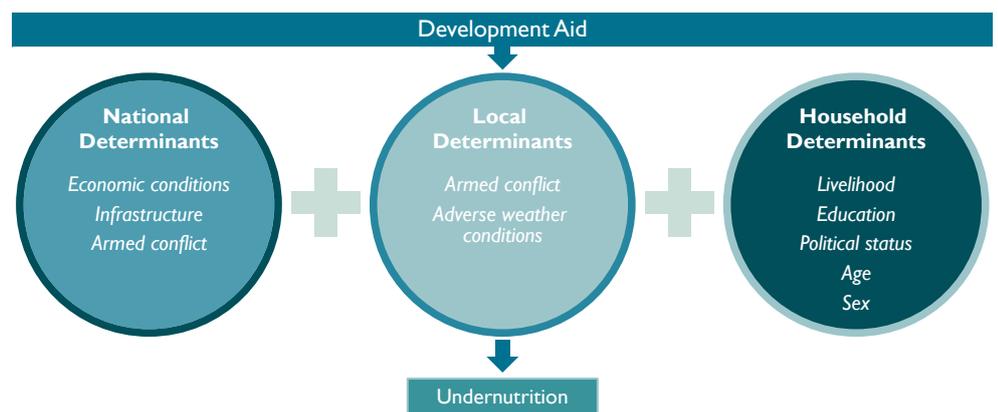


Figure 2: National, local and household determinants of undernutrition are all influenced by development aid

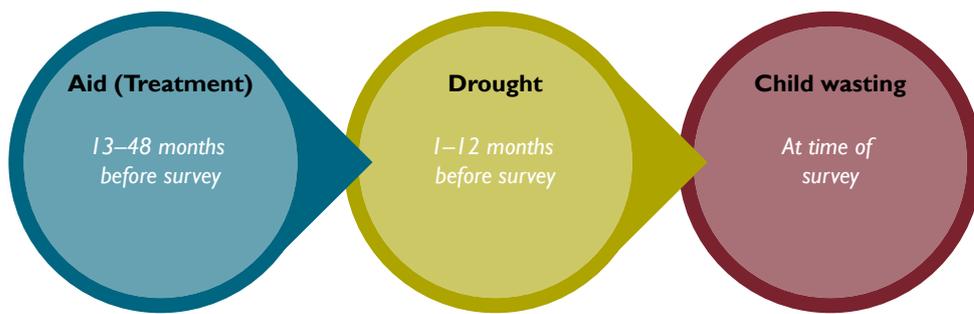


Figure 3: Sequencing of variables

influence recipient populations and ripple effects can consequently be expected across sectors. For instance, education aid can also have positive effects for health outcomes in the local community. Likewise, general aid can have positive *specific* outcomes. Positive effects of general aid have been found for local-level economic growth in Malawi and infant level mortality in Nigeria. As food security is closely linked to development, there is reason to anticipate that aid projects that facilitate local economic growth also reduce the rates of undernutrition in a recipient population, even if the macrolevel effectiveness of development aid may be questioned.

Does Aid Offset the Negative Effects of Drought?

Having established that drought negatively affects children’s nutrition, the main question is whether development aid projects could mitigate the effect of subsequent drought on local

child wasting. Figure 3 illustrates the sequencing of the events.

To assess the effect of official development assistance on recipient populations’ vulnerability to climatic extremes, we construct a comprehensive georeferenced dataset of individual respondents across sub-Saharan Africa. Our dataset contains information on 138,103 rural children from 32 georeferenced DHS household surveys in 16 sub-Saharan African countries, surveyed between 2001 and 2016. Knowing the locations of the DHS-respondents, we combine this with information on precipitation – more specifically, the absence of it – to identify the respondents who had been exposed to a drought somewhere in the 12 months prior to the survey. Then, we identify which of these respondents lived within 50 km of a location where an aid project had started up to three years prior to the drought. Importantly, all aid projects have to have begun before the drought in order to rule out that it is the drought that attracted the specific aid

project. Figure 4 maps the distribution of aid projects, drought exposure and child undernutrition across the countries in our sample.

Aid is not distributed at random, meaning that some areas are more likely to receive aid than others. This means that assessing aid outcomes based on a direct comparison between those that receive aid and those who do not would result in distorted estimates. We therefore use a method called coarsened-exact matching (CEM), which ensures that we only compare outcomes (child wasting) between children living in areas that have a similar likelihood of receiving aid in the first place.

Using this method, we do not find past aid to have an effect on nutritional status among children under normal weather conditions (i.e. when there is no drought). However, we do find a positive effect of aid projects among children who are exposed to drought. Figure 5 illustrates this difference. The coefficient indicating that there was a drought is on the right side of the vertical line, meaning that the children living close to aid project locations are better able to cope with a drought than those who do not live close to an aid project site but who also experience drought. The coefficient for “normal conditions” is on the other hand close to zero, and its confidence band (the horizontal line) crosses the vertical line. This means that there is no discernible effect of aid on children’s undernutrition in the absence of a drought.

We also find that the youngest children – who normally suffer least from undernutrition because they are breastfed – no longer perform “better” than the older children in the face of

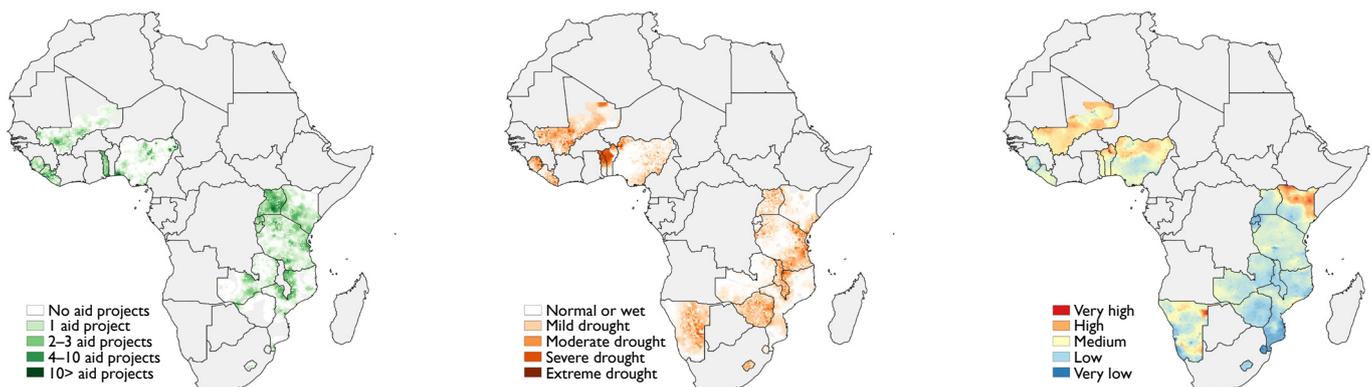


Figure 4: Maps showing the prevalence of (A) aid projects, (B) droughts and (C) child wasting across the countries included in our sample

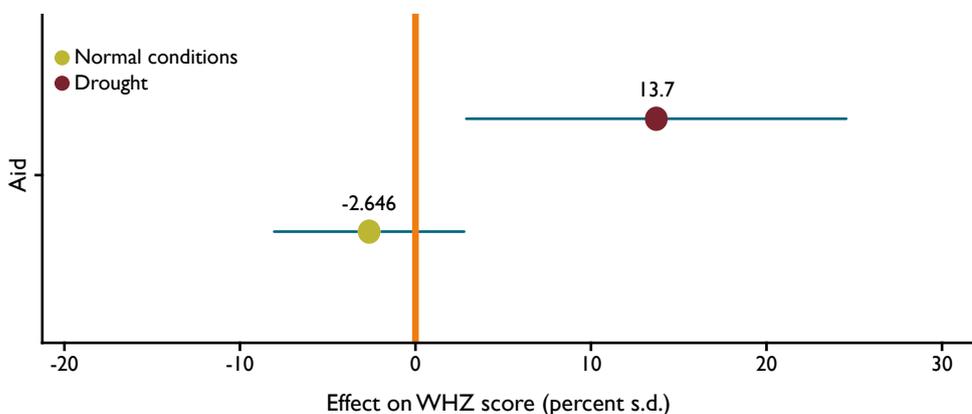


Figure 5: Effect of aid on under-5 wasting for matched respondents

drought. This indicates that the adverse effect of drought exists not only for children, but also for their mothers.

Since malnutrition, in this case wasting, is tightly linked with low or highly variable food availability at the local level, aid projects that specifically target the agricultural sector should improve food and livelihood security. This link may be especially important in rural sub-Saharan Africa, where rain-fed agriculture constitutes the dominant sector in terms of employment and income. With this in mind, we also investigate the performance of aid projects to the agricultural sector specifically. Contrary to our expectations, however, we do not find that the agricultural aid projects are able to offset the negative impact of drought on children's wasting. Although surprising, this suggests that important aid-sensitive drivers of malnutrition are also found outside food production and provision systems.

Increasing Local Coping Capacities

Even if the 2015 Paris Agreement on climate change mitigation ensures a transition to sustainable, carbon-neutral energy consumption that will limit future global warming, reducing

the human security challenges of increasingly devastating extreme weather events will largely depend on sustained local adaptation efforts and future development pathways. Development assistance is one of the most important tools available to aid such efforts.

Using DHS survey data over 16 years, in combination with geocoded World Bank development aid project locations and local weather data, we find limited evidence that development aid generates measurable child health gains for recipient populations in general. However, when focusing on the subsample of respondents exposed to recent drought, we find robust statistical results consistent with the notion that prior aid allocation reduces the extent of child undernutrition. Contrary to expectations, development assistance earmarked specifically for the local agricultural sector appears to perform less well.

Our results clearly indicate that development aid strengthens recipient populations' coping capacities, improving their ability to subsist in the face of future weather anomalies. The finding that agricultural aid does not significantly reduce the adverse effects of receiving

populations' exposure to drought does not however mean that funders should not prioritize these projects. Rather, we believe this particular finding speaks to the importance of cumulative and integrated efforts across aid sectors in order to strengthen local coping capacities.

Finally, from the literature on aid distribution, we know that aid often fails to reach the most vulnerable populations.² Taken together with the results of our study, this means that while inflow of aid does appear to strengthen local coping capacities to deal with future environmental adversities, aid distribution could potentially reinforce inequalities in the recipient country. Therefore, making sure that aid projects reach the most marginalized in the population – even though this might not always be the most effective strategy in terms of value for money – appears to be pivotal for avoiding the systematic augmentation of existing inequalities. ■

Note

This PRIO Policy Brief is based on the following article: Siri Aas Rustad, Elisabeth Lio Rosvold & Halvard Buhaug (2019) 'Development Aid, Drought, and Coping Capacity', *The Journal of Development Studies* 56(8): 1578–1593.

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THE AUTHORS

Elisabeth Lio Rosvold is a Researcher at the Department of Peace and Conflict Research, Uppsala University. Halvard Buhaug is a Research Professor at PRIO and Professor II of political science at NTNU. Siri Aas Rustad is a Senior Researcher at PRIO.

THE PROJECT

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PRIO

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