Young Lives

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Weathering the Storm: Climate Shocks Threaten Children's Skills and Learning But Social Protection Can Mitigate Impact

With only seven years to go to deliver the 2030 Sustainable Development Goals and critical climate goals set out in the Paris Agreement, COP28[1] provides an important moment for countries around the world to take stock of progress and drive urgent climate action.

But with many of these global goals significantly off-track, children living in poverty in low- and middle-income countries are bearing the brunt of worsening climate change and its impacts, affecting many areas of their lives related to health and nutrition, education, water and sanitation, and housing, among others. Children from poor households are particularly vulnerable because they are more likely to live in areas experiencing extreme weather events, while their families have less capacity to respond and adapt when hardships hit (Global Coalition to End Child Poverty 2023).

Key Findings

- Early exposure to climate shocks has profound long-term consequences for children's skills and learning, including intergenerational effects.
- Children living in the poorest households are most affected and when climate shocks intersect with gender inequality, adolescent girls are particularly disadvantaged.
- The impacts of climate shocks on children's development, skills and learning are not irreversible or inevitable.
- Social protection (including school feeding programmes) offers significant potential to support children's development and improve skills and learning in the face of climate shocks.

1 The 2023 United Nations Climate Change Conference, more commonly referred to as COP28, will be held from 30 November until 12 December 2023 in Dubai. See https://www.cop28.com.

This policy brief focuses on the long-term impact of climate shocks on children's basic skills and learning, highlighting the pivotal role that social protection can play in mitigating negative effects, particularly for those living in the poorest households. Young Lives' unique longitudinal evidence shows that early exposure to climate shocks, such as droughts and floods, has a profound impact on children's nutrition and physical growth, with long-term consequences for their skills development, ability to learn and progress in school. Worryingly, the adverse effects of climate shocks on nutrition and growth can transmit from mothers to their children, with **significant long-term intergenerational impacts** on children's skills development. And when climate shocks intersect with poverty and gender inequality, **adolescent girls are disproportionately affected**.

Importantly, however, Young Lives research shows that these effects are not irreversible or inevitable. Early growth stunting due to malnutrition can be reversed over a much longer period than previously thought – well beyond the first 1,000 days, even into adolescence; school feeding programmes can provide important nutritional support to children affected by climate shocks, enabling significant growth catch-up; and physical recovery is associated with (at least partial) catch-up in cognitive tests and school progression.

Our ground-breaking new research shows that providing vulnerable households with critical safety nets through social protection – including cash transfers and direct food provisions – not only improves children's growth and nutrition, but can also reduce climate-induced inequalities in skills development, learning and access to education. While there is a wealth of research demonstrating the potential of social protection to improve children's health, nutrition and access to education (ILO and UNICEF 2023), this is the **first evidence of its potential impact on improving children's foundational cognitive skills in low- and middle-income countries**.

Without targeted action, the climate crisis is likely to further exacerbate educational inequalities, leaving many children from disadvantaged backgrounds behind, just as we have seen during the COVID-19 pandemic. While investing in teachers and schools to improve the quality of education is pivotal, **ensuring all children can reach their potential requires a broad cross-sectoral approach** and policies outside the education system can make a big difference (Porter 2023). Adapting and expanding social protection programmes to better protect children from the negative effects of climate shocks and poverty, at critical points in their development, offers significant potential to improve children's skills development.

The Young Lives study

Young Lives has been following the lives of 12,000 young people in Ethiopia, India (in the states of Andhra Pradesh and Telangana), Peru and Vietnam, from infancy into early adulthood, since 2001.

Over the last two decades, the study has built a unique body of longitudinal data enabling researchers to investigate the impact of climate shocks, poverty and food insecurity on early childhood development and later life outcomes.

Young Lives is one of the few studies in low- and middle-income countries that collects detailed data on a broad range of skills. These include: (1) cognitive skills, such as numeracy and literacy; (2) foundational cognitive skills, such as long-term memory, working memory, inhibitory control and implicit learning; and (3) social and emotional skills, such as self-efficacy, self-esteem and agency.

Young Lives findings

Early exposure to climate shocks has profound long-term consequences for children's development, including skills and learning

When extreme weather events destroy crops, harm livestock or lead to higher food prices, vulnerable households struggle to maintain nutritious diets, with severe long-term consequences for children's physical growth and skills development.

In Ethiopia, Young Lives evidence shows that children exposed to severe drought in early childhood are likely to be shorter in height than their peers (physically stunted), and suffer more infections (such as diarrhoea) up until the age of 5, which might also negatively affect nutrient absorption and later growth (Bahru et al. 2019). We have also shown that children who experience early childhood stunting (at age 1 and age 5) perform significantly worse in basic vocabulary and maths tests in later childhood at age 8, compared to their peers (Woldehanna, Behrman and Araya 2017).

Climate shocks can have intergenerational impacts on children's growth and skills development

Worryingly, the adverse effects of climate shocks on nutrition and growth can transmit from mothers to their children, with significant long-term intergenerational impacts on children's skills development and ability to learn. In Ethiopia, Young Lives study children born to mothers exposed to the famine of 1983–5 were, on average, shorter and had less schooling than their peers (similar to their mother's experience) (Tafere 2016).

In India, analysis of Young Lives data matched with historical rainfall data shows that droughts, flooding or cyclones experienced by a **mother while she is pregnant** can negatively affect her future child's vocabulary skills by age 5. Longer-term effects on basic maths and social and emotional skills (such as self-esteem and self-efficacy) manifest even into adolescence up to the age of 15 (Chang, Favara and Novella 2022).

Climate shocks also negatively affect children's foundational cognitive skills

Our latest research shows that early exposure to climate shocks can also negatively affect children's **foundational cognitive skills**. Foundational cognitive skills are a strong predictor of educational outcomes and refer to basic cognitive processes – the building blocks – critical for complex thought and effective learning, including long-term memory, working memory, implicit learning and inhibitory control skills.[2]

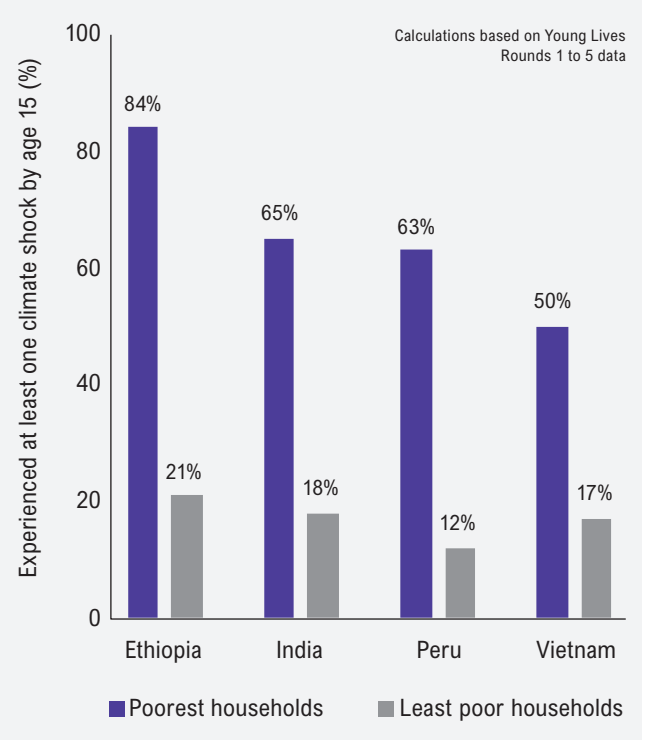
In Peru, rainfall shocks (droughts and floods) experienced during the first 1,000 days of life – particularly during the gestation period – have long-lasting negative effects on children's working memory and their ability to concentrate on a specific task (inhibitory control), and, to a lesser extent, on their long-term memory skills, measured at the age of 12. This is most likely due to related nutritional deficiencies (Pazos et al. 2023).

Children living in the poorest households are most affected, and when climate shocks intersect with gender inequality, adolescent girls are particularly disadvantaged

Children living in the poorest households are significantly more affected by the consequences of extreme weather events. In Ethiopia, 84 per cent of Young Lives children living in the poorest households had experienced at least one extreme weather event that affected the household economy by the age of 15, compared to only 21 per cent in the least poor households. Similar trends are seen in India (65 per cent versus 18 per cent), Peru (63 per cent versus 12 per cent) and Vietnam (50 per cent versus 17 per cent) – see Figure 1 (Porter and Ford 2022).

Poorer households are less resilient to financial hardships when climate shocks hit, which can increase the risk of interrupted education. Families without access to affordable credit are likely to spend less money on their children's education (e.g. on school fees, learning materials or transportation) and are more likely to withdraw children from school (with the increased risk of children engaging in both paid and unpaid work). In Vietnam, our evidence shows that lower household income due to crop failures directly reduces the amount of time children spend in school at ages 8 and 15, particularly those from poorer households (Nguyen 2013).

Figure 1. *Percentage of Young Lives children who had experienced at least one drought or flood that affected the household economy by age 15*

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"My body weight has greatly declined due to lack of sufficient food [after last year's drought] … we used to go to school without eating anything. We could not follow lessons properly due to hunger, and this contributed to the dropout of my sister and myself."

Shashitu, 15-year-old girl in rural Ethiopia (Chuta 2014)[3]

2 For more detail, see related Young Lives Policy Brief 59 (Ford, von Russdorf and Ahlborn 2023).

3 We protect the anonymity of the children and their families in Young Lives study. Shashitu is a pseudonym and the photos used are not of the Young Lives study children but are of children living in similar circumstances and communities.

When climate shocks lead to additional household work (e.g. walking further to collect clean water in times of drought or flooding) **or extra childcare responsibilities** (due to closed nurseries or schools), **the burden invariably falls on adolescent girls and young women**. These additional unpaid duties further reduce available time to study, and increase the risk of adolescent girls dropping out of school altogether, just as we have seen during the COVID-19 pandemic (Favara et al. 2022).

The impacts of climate shocks and poverty on children's growth and skills development are not irreversible or inevitable

Young Lives research shows that children suffering from chronic undernutrition, as measured by growth stunting, can recovery over a much longer period than previously thought – well beyond the first 1,000 days, even into adolescence up to age 15, indicating significant 'growth plasticity' throughout childhood (Georgiadis and Penny 2017).

Physical growth recovery is also associated with better performance (at least a partial catch-up) in cognitive tests and progression through school, by ages 8 and 12 (Georgiadis et al. 2017). For example, across all four study countries, children who were physically stunted at age 1, but had recovered by age 8, performed significantly better in maths, vocabulary and reading tests, compared to children who were still stunted at age 8 (although their scores were still lower than children who were never stunted) (Crookston et al. 2013).

While recognising the critical importance of investing in children's development and nutrition in the first 1,000 days, Young Lives evidence shows that **sustained investment throughout childhood is also crucial,** especially for those from the most vulnerable households.

School feeding programmes can provide important nutritional support to children affected by climate shocks. Young Lives evidence on the impact of India's Midday Meal Scheme (targeting primary schools) shows that recipient children who suffered undernutrition due to severe droughts in infancy demonstrate significant catch-up in physical growth by age 6. Growth catch-up is shown in both weight-for-age *and* height-for-age measurements, suggesting that school meals can have substantial impact on children's long-term development (Singh, Park and Dercon 2014).

Social protection offers significant potential to support children's development and improve skills and learning in the face of climate shocks

Social protection provides a critical safety net to help the world's most disadvantaged children fulfil their potential. This includes a wide variety of programmes implemented around the world to reduce and prevent poverty, including through cash transfers, food aid, welfare programmes and social insurance schemes**.**

Our ground-breaking new evidence shows that social protection can reduce inequalities in children's foundational cognitive skills (measured at the age of 12). This is achieved when social protection mitigates some of the negative effects of climate shocks and poverty, primarily through enabling better diets, reducing pressure on children to work, increasing time for learning and improving access to early education.[4]

In Ethiopia, children benefiting from the Productive Safety Net Programme (PSNP) have significantly better long-term memory. The children who benefited most were those who had experienced early undernutrition (leading to physical stunting), including those who had experienced rainfall shocks during their first year of life, and during the gestation period while their mother was pregnant (Freund et al. 2023).

Children benefitting from the PSNP also have better implicit learning skills (or 'muscle memory'). This is most likely due to increased household resources changing how children and other family members spend their time. The children who benefited were those who engaged in unpaid labour – working on the family farm or business – and those who spent no time studying *before* their household received support (Freund et al. 2023).


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"[Children from PSNP households] get food and have better capacity to understand the lessons [at school]. But those from non-PSNP go to school without food and do not follow their lessons properly."

Kassaye, 14-year-old boy in rural Ethiopia

4 For more detail, see related Young Lives Policy Brief 59 (Ford, von Russdorf and Ahlborn 2023).

In Peru, children benefitting from the JUNTOS conditional cash transfer programme from an earlier age (around 6 years old) performed significantly better in inhibitory control tests – measuring their ability to control an impulse response – than their older counterparts. This is most likely due to children starting school at the right age, a condition of the JUNTOS programme (Scott et al. 2022). Inhibitory control is important for concentrating in the classroom and improving the ability to learn.

Importantly, our new research shows that children who received JUNTOS support after early exposure to rainfall shocks also performed significantly better in inhibitory control tests – most likely due to bolstering depleted household incomes following shocks and, consequently, increasing (or restoring) the ability of families to invest in their children's nutrition and educational activities (Pazos et al. 2023).

Policy implications

The UK government's new White Paper on international development highlights that accelerating progress towards universal social protection will reduce extreme poverty and hunger, and increase resilience to climate and other shocks (FCDO 2023). Our evidence shows that adapting and expanding social protection programmes, as part of a broad cross-sectoral approach to supporting children's development, also offers significant potential to improve skills development and address inequalities in learning and education in the face of the climate crisis. This includes:

- **Adapting and expanding social protection programmes to be more 'shock-responsive'** to support the most disadvantaged households in disaster-prone regions, including sustained support in response to acute nutritional deficits caused by climate shocks. Linking social protection programmes to climate risk monitoring and early warning systems can also ensure vulnerable households are supported *before* extreme weather events occur.
- **Delivering 'child-sensitive' social protection** to create a protective environment for all children, from infancy to adolescence, especially those most vulnerable to the impacts of climate shocks. Prioritising sustained support to children who are undernourished or physically stunted (including beyond the first 1,000 days), those who are excluded from preschool and early education, and those who spend excessive time on paid or unpaid work, household duties or childcare responsibilities, is likely to yield the greatest benefits for improving children's skills and learning.
- **Prioritising safety nets for adolescent girls and young women,** particularly for pregnant teenagers and young mothers vulnerable to climate shocks and nutritional deficits. This is crucial not only to safeguard their own health and well-being, but also for their children's long-term development, **breaking intergenerational cycles of poverty and inequality**.
- **Designing social protection programmes and related impact evaluations to realise (and measure) both the direct and indirect benefits for children.** By doing so, these programmes can deliver more comprehensive and sustainable impacts, including improving long-term skills development and learning under threat from climate shocks. Demonstrating the long-term role that social protection can play in supporting children vulnerable to climate change should be considered in cost-effectiveness analysis, and could also help unlock additional investment through climate finance.
- **Extending and improving school feeding programmes, including for children in pre-primary, primary *and* secondary education.** In addition to social protection, school feeding programmes can help sustain early gains and support children's later development (and provide incentives for school attendance), particularly in areas vulnerable to food insecurity. Our research shows that children's skills are malleable from infancy through to adolescence, supporting the call to extend school feeding programmes beyond primary schools to include both pre-primary and secondary schools.
- **Building the evidence base on how climate-related shocks, nutrition, skills development and learning interconnect** and what can be done to better support coordinated cross-sectoral adaptation and mitigation strategies. Further longitudinal research is critical to understand changing trends over time and the impacts of specific climate shocks in different countries and social contexts.

Continuing to follow Young Lives

Young Lives has returned to the field in 2023 to conduct our next in-person quantitative survey (Round 7) across our study countries. Our survey will collect comprehensive new data on many aspects of young people's lives as they transition into adulthood and navigate multiple global crises (COVID-19, climate change and conflict), including in relation to their physical and mental health, education and skills, work and family formation. This will enable us to generate important new insights into the long-term impact of early-life climate shocks and poverty, including further analysis of the potential for social protection and other public policies to improve life outcomes.

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