Institute of Development Studies

CLIMATE AND ENVIRONMENTAL CHANGE: VIEWS FROM LIFE IN A TIME OF FOOD PRICE VOLATILITY

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Climate and Environmental Change: Views from Life in a Time of Food Price Volatility

Alexandra Wanjiku Kelbert

Summary

How are rapid recent food price changes linked to climate and environmental change? How do people who are vulnerable to these changes view these links? This note explores the views of people living on low and precarious incomes on these connections, based on research designed to explore experiences of food price volatility in 2012, through qualitative research in 23 research sites in 10 countries. The research was not specifically designed to study perceptions of climate and environmental change; these views are collected here because they offer interesting, relatively unmediated insights into how people perceive the causal connections between their food security and environment across varied social and ecological settings.

It should be emphasised that high and volatile food prices was an important topic of discussion in all the communities, as were the causes and effects of this situation. This note suggests that the public discourse about food price changes in these low-income communities treats them as causally connected to climate change. This was particularly noticeable in Bangladesh, Ethiopia, Kenya and Pakistan, where cyclones, droughts and floods had all been recent shocks to local farming and other livelihoods in several of the community research sites. Food price rises and volatility were also seen to be caused by longer-term processes of environmental degradation, particularly declining water and land availability and pollution, most noticeable in Viet Nam and Indonesia. Short-term responses and longer-term livelihood adaptations also sometimes influenced food price changes. Overall, it seemed that for many people, the links between climate and environmental change and food insecurity were robust and clear.

Keywords: Food prices; climate change; food insecurity; adaptation.

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Introduction

How are rapid recent food price changes linked to climate and environmental change? How do people who are vulnerable to these changes view these links? This note explores the views of people living on low and precarious incomes on these connections, based on research designed to explore experiences of food price volatility in 2012, through qualitative research in 23 research sites in 10 countries (see Figure 1). The research was not specifically designed to study perceptions of climate and environmental change; these views are collected here because they offer interesting, relatively unmediated insights into how people perceive the causal connections between their food security and environment across varied social and ecological settings (see Tables 1 and 2 for a summary of the links between food production and the environment in the research sites).

Figure 1. Community research sites

The views presented in this note are organised around:

i) climate-related events or shocks, and the crisis-coping responses they have engendered and

ii) longer-term changes in the environment directly shaping food security, particularly in local patterns of agriculture and livelihoods, and the associated adaptations people notice or identify as necessary, in their ways of life.

They are derived from research undertaken in 2012 as part of a project called *Life in a Time of Food Price Volatility*, a four-year (2012-15) mixed method sociological study of the impacts of and responses to high and volatile food prices (see Box 1).[1]

[1] For the full findings from the *Life in a Time of Food Price Volatility* project, see Hossain, King and Kelbert (2013) and King, Kelbert, Chisholm and Hossain (2014).

Box 1. Life in a Time of Food Price Volatility

Changes in food prices are significant events in people's lives, so with funding from UK Aid and Irish Aid, in 2012 we started a four-year project to track the impacts on everyday life. Many social costs of managing change when food prices rise or are volatile - more time and effort to feed and look after people; non-monetary effects on family, social, or gender relations; mental health costs such as stress; lower quality of life; feeling forced to eat 'foreign' or 'bad' food – are invisible to policymakers, but matter a great deal to those affected. *Life in a Time of Food Price Volatility* studies how price changes affect everyday lives of people on low or precarious incomes over the period 2012-15. We look at paid work, unpaid care work, relationships, and the resources people have to cope. The collective of researchers works in 10 urban/peri-urban and 13 rural locations across 10 low- to middle-income countries, revisiting the same roughly 1500 people. The approach is sociological, capturing local experiences and effects of global processes, through qualitative case studies and nationally representative data analysis. In 2012 we studied attitudes to farming and in 2013 we studied accountability for local food security. For more information, visit www.ids.ac.uk/lifeinatime.

The views presented here must be treated with caution: the research was not specifically designed to explore how people perceived the connections between food price volatility and climate and environmental change, so these findings should not be taken to represent the views of selected communities or groups in any rigorous sense. However, references to climate and environmental change were sufficiently prominent in the public discourse in the 23 research sites to warrant further exploration. The strategy was to code qualitative interview and focus group transcripts using qualitative analysis software under the following headings: 'built environment', 'climate events and natural disasters', 'crop failures' 'ecology and natural environment' and 'seasonal patterns'. This paper synthesises views on climate change and the environment in relation to food price changes, and where possible, contextual or other analysis is provided, to enable some insight into gender and other social differences in relation to the perceptions of the environment-food security links.

The paper draws on the qualitative community case studies that provide the backbone for the longitudinal research. The main sources of data for the community case studies are illustrated in Figure 2 (right). Some information about the agro-food economy and recent climate events in the research sites is provided in Tables 1 and 2.

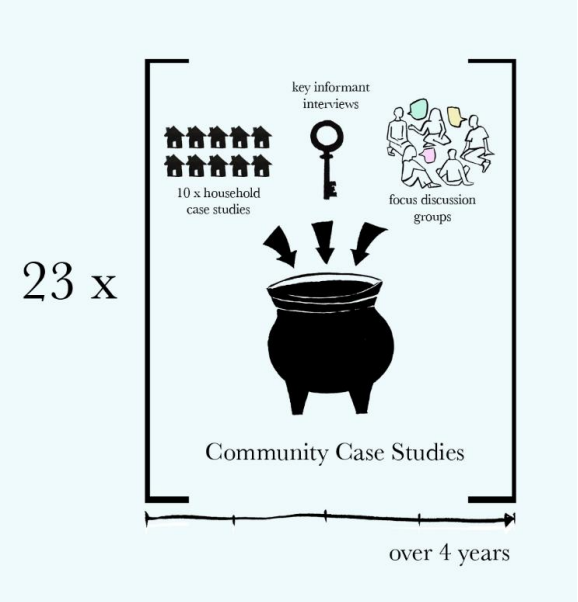

Figure 2. Elements of the qualitative research

Illustration by Tessa Lewin

Table 1. Rural research sites

Site location	Food production and climate-related events
Chikwanda, Northern Province, Zambia	Agriculture is the main activity, predominantly small-scale, subsistence-oriented, and access to fertilizer without subsidies is unaffordable for local smallholder farmers
Nessemtenga, Burkina Faso	Agriculture is the main activity, small-scale subsistence-based, but hit by several droughts /seasons of poor rainfall in the past few years.
Lango Baya, Kenya	Drought-prone region in the past reliant on small-scale, subsistence agriculture. In past couple of years, irrigation-fed production for own consumption and of vegetables for sale have shifted attitudes to farming. But success depends on access to land near the river
Eastern Oromia, Ethiopia	Dry region customarily dependent on small-scale, subsistence agriculture, but with rapidly growing interest in irrigation-fed agriculture production and 'model' farming
Chugüexá Primero, Guatemala	Mountainous region in the west, customarily dependent on corn and bean production for own consumption. Fewer households rely on agriculture than in the past, as output does not meet HH needs
Dhamuirhat, Bangladesh	Agriculture is the main source of livelihood, but land ownership is concentrated and it is mainly agricultural labour through which people earn a living. Non-agricultural sectors are growing fast
Dadu district, Pakistan	Greatly affected when the Indus river flooded in 2010 and many people fled
Koyra, Bangladesh	Until hit by cyclone Aila in 2009, predominantly rice producing region. Now more forest-based livelihoods and shrimp cultivation for export
An Giang, Viet Nam	The research site is in the major rice producing region, and agriculture dominates the local economy. Local farmers suffer when food prices drop, particularly if they own little land
Nghe An, Viet Nam	Similar to An Giang, a major rice producing region
Cianjur, Indonesia	The vast majority of the population live from agriculture, mainly rice production, but land ownership is skewed and most agricultural labour is wage work
Pirhuas, Bolivia	Poor rural community which has featured a lot of reverse migration in recent years. Food farming for own consumption has always been important but dairy farming has been successful recently.
Banjar, Indonesia	Mainly rubber-producing area of transmigrants from Java, highly integrated into and vulnerable to the global commodities markets

Source: Leavy and Hossain 2014

Table 2. Urban research sites

Site location	Connections with agriculture & food production
Dhaka, Bangladesh	Most people here are migrants, or climate refugees who lost agricultural land due to river erosion. Most people retain some links to rural districts, including family and property but for many these are emotional rather than material.
Kami, Bolivia	Some people still have connections with agriculture and see it is potentially attractive with higher prices, but many people in the town have sold any land they once owned.
Kaya, Burkina Faso	A small town, in which most people are involved in agriculture and livestock breeding.
Kolfe sub-city, Addis Ababa, Ethiopia	Most people here are artisans and wage workers with little evidence of enduring ties to rural communities. Many people rely on international migrant remittances here.
Chichicastenango, Guatemala	This is a market town in a small-scale/ subsistence agriculture region, whose market is famous for its agricultural produce.
Bekasi, Indonesia	Peri-urban industrial area, where most of the workers are migrants with rural agricultural backgrounds elsewhere in Java, who remit funds to and sometimes receive food and funds from their farm homes.
Mukuru, Kenya	Most of the residents are long-term city-dwellers, but some are involved in urban gardening and others retain connections with rural homes of origin.
Karachi, Pakistan	A diverse area with sections of the local community who are recent migrants after the devastating 2010 floods. Some connections to rural life and homes remain, but people see agricultural inputs as increasingly costly and agriculture as uncertain if potentially profitable.
Ha Noi Viet Nam	Rural parts of the Ha Noi community are involved in rice production, and farming is thought of with respect, although in practice urban people do not see agriculture as an alternative livelihood option.
Kabwata, Zambia	People are long-term city residents, but many are connected to agricultural production through their work as petty traders and food vendors.

Source: Leavy and Hossain 2014

1. Livelihoods and Climate-Related Events

In several communities, people's livelihoods and well-being, as well as food prices and capacities to cope with food price volatility (FPV), had been visibly affected by climate events and natural disasters. For the sake of clarity this section is divided according to regional location.

In the aftermath of Cyclone *Aila* in Bangladesh in 2009, people in Khulna in the south of the country, saw their fields flooded with seawater from the tidal wave. The floods had a dramatic impact on people's livelihoods, preventing food grain and notably rice to be grown for three consecutive years. The intrusion of salt water in the region with the cyclone means that all palatable water has become salty and land is now uncultivable, therefore shutting down the main occupation in the region and raising the price of available food grain. At present there are relatively few income-generating opportunities available in the area. Some men have sought new livelihoods, fishing and gathering forest resources in the Sundarbans rainforest, but this is a dangerous location both from wild animals and from armed bandits and the current trend is for out-migration.

In villages in Dadu District in Sindh Province in Pakistan, the 2010 floods forced people out of their homes. Climate migrants were among the most marginalized people as they were unable to afford to rent new homes. Destitution was forcing some Pakistani women displaced by the floods into 'dirty work' as sweepers, scavengers, or rubbish recyclers[2].

> *There are some people poorer than us here; there is a village named Morda village near the Super Highway, from where Baloch and Sindhi women come and sweep filth from our area and scavenge the trash for re-saleable items in order to earn a living. All of them are migrants of the 2010 floods; people who cannot even afford to live in rented houses. It is these circumstances which have forced the women to do such dirty work, otherwise the Baloch and Sindhi communities in villages do not let their women leave the house.*
>
> (Mr J. 45 year old climate migrant, now cloth-shop owner in Karachi, Pakistan)

Women engage in such 'dirty' work because they have less access to paid work than men, pointing to the ways in which social factors and existing inequalities can often exacerbate climate-induced destitution.

Older histories of floods were factors in rural-urban migration in other sites: Notun Bazaar in Dhaka in Bangladesh is an informal settlement of 'people from the broken river' – people who had lost their agricultural lands to river erosion in the past 20 or more years. Small rice farmers in Nghe An province in Vietnam also noted episodes of drought and flood had cut their yields in both of the previous two years. In Vietnam rice price volatility has been a major concern for farmers, who saw sudden dips in the price for their crops when harvests recovered in 2012. For small Vietnamese rice farmers, the uncertainty around what they will earn from their crop is exacerbated by the uncertainties of the weather, even though irrigation means many of them are less dependent on rain than their counterparts in Sub-Saharan Africa. Larger farmers appear better able to 'smooth' their incomes across years, so that drought and flood were less important concerns.

In the rural sites in Burkina Faso, Ethiopia, and Kenya, the small-scale farmers remain dependent on rain-fed farming, and droughts and changing rainfall patterns there have led to

[2] For more analysis on the gendered impact of food price volatility, see Kelbert and Hossain (2014).

severe crop failures in the past few years. In the community of Nessemtenga, in north-central Burkina Faso, poor rainfall had led to repeated episodes of acute food shortages. In Lango Baya, in the drought-ridden coastal region of Kenya people reported the lack of a proper rainfall in the last six years, greatly affecting maize and other harvests. In the words of Mrs P, a 55-year-old household head in Lango Baya:

> *We have so many changes that affect our well-being but the most critical of all is the drought. We have never experienced this kind of drought. I think this drought was sent to come and kill us.*

Several other respondents spoke in similarly dramatic terms about the ongoing drought, connecting it to the hardship they were facing as the costs of purchasing food continued to rise. In both the Ethiopian community in western Oromia, and in Lango Baya in Kenya, farmers complained about rain being 'too little, too late' and sometimes 'too heavy', making rain-fed farming riskier than ever:

> *Rain-fed farming is not a sustainable way of life. You can get good harvest during the year of good rain. But you may lose everything during drought and shortage of rain. So, we cannot trust this kind of farming though most of the people are dependent on this kind of farming.*
>
> (Mr S, 60- year-old farmer in western Oromia, Ethiopia)

In the rural mountainous research site in western Guatemala, Chugüexá Primero, the indigenous people spoke of how their capacities to cope with repeated blows caused by natural disasters had been exhausted by their frequency, with drought being a particularly prominent problem. Drought, unseasonal frost and unpredictable rains were also cited by farmers in the rural community of Pirhuas in the Cochabamba Valley in Bolivia. 'Farming is not what it used to be' said Mr A, a 52-year-old schoolteacher from rural Pirhuas:

> *Before, the rains were soft, calm, they made the ground wet and produce well, now strong storms fall that destroy production and wash the nutrients from the ground; now we only produce Cuban maize, we are buying wheat, here wheat was given before*.

Right: Mrs K., 36-year-old, pointing to the field owned by a self-help group, Lango Baya (Kenya); Left: Mr S, 65-year-old, helping with his daughter-in-law's vegetable garden, Khulna (Bangladesh)

In the nearby town of Kami, urban people detected climate change at work. One respondent said that in the past farmers from the rural areas 'would bring good produce, large potatoes, and fresh vegetables. Now, they do not grow them because they have been affected by droughts, frosts and so many other things that have changed climatically.' Pollution caused by new agrochemical and brick industries in Pirhuas were also said to help explain changing weather patterns.

2. Environmental Impacts on Food Scarcity and Price Volatility

Beyond the immediate destruction of infrastructure and livelihoods, climate events also have short and medium-term impacts on prices, and most importantly on food prices. As well as destroying arable land and infrastructure such as fishing fences and roads, by destroying rice cultivation as the main source of livelihood, *Aila* has led to dramatic changes in socio-economic activities. Following the disaster, the price of rice was reduced as the government provided subsidies for imported rice. Nonetheless, for many former rice-farmers, having to pay for even subsidized rice was costly and a blow to their sense of self-reliance.

Drought was a key explanation of price hikes in Burkina Faso, Ethiopia and Kenya. In several sites, people linked recent natural disasters to climate change, suggesting that this was being discussed locally. According to Mr R, a 25-year-old casual labourer in Mukuru, Nairobi:

> *The other contributing factor is global warming and the rising prices of agricultural inputs. Global warming has caused changes in the seasons such that the seasons that were usually for receiving rains have now changed and they are much shorter than previously. As a result drought sets in and all the crops that were planted now will dry up. There has also been a steady increase in the agricultural inputs like fertilizers and seed. Farmers then transfer this cost to us, the consumers, through their products like maize and greens. We pay heavily for it.*

This was echoed by Mr A, a 60-year-old farmer in western Oromia, rural Ethiopia:

> *The weather change is the main factor for this. The rain does not come in time. It starts very late. It becomes very heavy when it starts. It stops early. We are not happy with the weather condition. It comes after the farming time is passed. For example, this year it started in June. It should have started in April and May. As you see, the crops are very young and we do not hope that we will get a good crop this year. The shortage of rain and its variability is the main factor creating food shortages in the community. You know the soil is fertile but the rain is a major problem. Shortage of rain leads to shortage of food crops. Shortage of food crops in turn leads to increase in the price of food crops.*

A similar trend was observed in other regions where changes or volatility in climate and thus harvest has meant that the price of most food items has risen against the price received for selling other crops and staple foods.

Such changes need to be understood in a context of both poverty and seasonality. In Ethiopia for instance, as the most vulnerable farmers need cash in order to buy other items, middlemen and traders are confident that farmers will sell their crops for very little in the harvesting season in winter and buy it for high price in summer. Indeed, in times of crisis it

appears that the most affected are those with little collateral or insurance. As such, a similar pattern exists in Vietnam and Bangladesh whereby farmers report the impossibility of selling when prices are high and buying when prices are low, due to pressures to pay the wages of labourers. Here it should be noted that if in principle, producers benefit from higher prices, in practice, small producers who are still net consumers of basic food commodities are at a loss. Recent harvest failures connected to climate change have reinforced power relations and the ability of small farmers to bargain. This in turn leads to a widening gap between the net buyers and sellers of staple crops.

3. Future Farmers?

Variable climate conditions coupled with the volatilities of input and product prices were highlighted as particular risks for farmers across the rural sites. As part of our effort to understand how FPV was affecting different groups, the research explored whether agriculture was an attractive option for young people. The findings confirm what other research has already shown: that a reasonably widespread withdrawal from work on the land is an emerging norm, and that young people see farming as a last resort (Leavy and Hossain 2014). Among the factors people cited as significant deterrents to choosing farming were the unreliability of the real returns to farming. This was connected to climate and environmental factors and the perceived rise in unpredictability of harvests. But it was also connected to recent commodity price volatility, including uncertainties around earnings, rising costs of agricultural inputs such as fertilizer, irrigation, and pesticides, and the rising cost of living more generally. The idea that farming had become a 'risky business' was mentioned in several contexts:

> *Agriculture is a gamble, you can face losses one year and you can even get a bumper production and a get good price for your production in the very next year if you are fortunate enough.*
>
> (Participant in a focus group discussion in Dhaka, Bangladesh)

Unsurprisingly then, older generations of farmers pointed to changing aspirations amongst the youth. For instance, older men in Nessemtenga in Burkina Faso, noted that after several years of drought and food scarcity, it was not surprising that younger men preferred to try their luck in the dangerous gold mines to the increasingly uncertain returns of subsistence farming. In Nessemtenga, young men were said to be leaving for the gold mines in large numbers.

Volatility in agricultural inputs such as fertilizer and cattle medicine is often a key deterrent to farming. Left: citric acid used to make a fertilizing solution on salad farms in Pirhuas (Bolivia). Right: TIXFIX widely used for tick management in Lango Baya (Kenya).

4. Adapting to Drought

Irrigation was the single most important adaptation mentioned. Several respondents in Pirhuas in Bolivia explained that irrigation systems had improved following the construction of several wells. In the past two to three years, irrigation-fed cultivation had produced good vegetable and maize crops in the dry Lango Baya site in Kenya, and vegetables in Oromia in Ethiopia. In Oromia, farmers were buying assets and providing a model for other farmers, and employing agricultural wage labour. In both the Kenyan and Ethiopian site, many people were optimistic about irrigated agriculture.

Yet reliance on costly inputs to manage water shortages often means reliance on powerful groups that control important water resources. In rural Dadu, in Sindh in Pakistan, the problem of water scarcity in farming did not affect all members of a community equally, as many landlords – including politically powerful individuals - were able to pump and store water for irrigation, and to deny access to others. Similar views were expressed by smaller young farmers in Oromia in Ethiopia, who associated capital-intensive irrigated agriculture with inequality and abuse. Local lake water was used for irrigation, but the irrigation network was reserved for a few better-off farmers. Some small farmers had started leasing their plots to better-off farmers.

> *Those who left the irrigation farm association are those who do not have capital. Production of vegetable with the help of irrigation … is capital intensive and most residents of the local community cannot afford this amount of money to farm vegetable … Inputs such as fertilizer, improved seeds, pesticides, petroleum, labour costs etc. have increased tremendously. So, vegetable production using irrigation is the business of those who have good life.*
>
> (Young farmer, Western Oromia, Ethiopia)

Irrigation workshop and demonstrations in Lango Baya (Kenya), October 2013

In Cianjur in West Java in Indonesia, people noted that the irrigation channels they had previously relied on for rice cultivation had dried up or been degraded due to pollution. There, people noted that previous practices of cooperating to clear blocked channels or create other public goods had declined, so that they now had insufficient water to irrigate the fields in their region, and some people in the area were even stealing water system. Local farmers were trying to re-establish the old system of group labour on public infrastructure, known as *gotong royong*, setting timetables for participation in clearing rubbish from irrigation channels.

5. Changing Work Patterns

In Bangladesh, in the aftermath of Cyclone *Aila*, agricultural livelihoods became markedly more precarious, with rice fields turned into enclosures for shrimp cultivation as a response to the flooding of saline water. In addition to risks to the environment and future food production, this has meant less wage labour on rice fields, as lands next to shrimp farms become saline. This has increased local conflict and meant that forest-based livelihoods, including fishing, have increased. As well as potentially damaging to the fragile Sunderbans eco-system, forest foragers and fisherfolk are now vulnerable to attacks by tigers and pirates.

Water shortages in Pakistan have led farmers in rural areas to adapt their crops explaining that:

> *We water the land ourselves when we cultivate chilies. Currently wheat is being grown. When there is enough water available, rice is cultivated otherwise wheat is grown on the land. Wheat needs less water you need to water the crop fortnightly. But rice needs water every alternate day. Cotton also needs water urgently on 15 days but for wheat if there is no water available for a month, it doesn't matter.*
>
> (Man, rural Pakistan)

Another phenomenon was seen in Pakistan and Zambia, where mechanisms have been developed in order to face uncertainty in farming and changing prices. In Pakistan, people reported not cultivating their land in the eventuality of another flood ruining the crops. Similarly, in Zambia, many have pointed to the need to reduce the surface to grow maize due to lack of income to buy fertilizer and seeds.

> *When fertilizer price increases, some farmers reduce on the hectarage planted. It does not make sense to plant the same area as previously when you can't afford fertilizer.*
>
> (FGD Food producers, rural Zambia)

Finally, for many across the research sites, as in Pirhuas, rural Bolivia, respondents reported that some farmers were abandoning agriculture, and were instead getting jobs in the cities, guaranteeing daily earnings, as opposed to 'months without knowing what they will harvest'. Unsurprisingly, the ability to migrate is often very gendered, with Mrs M, a 22-year-old woman in Naogaon, Bangladesh explaining:

> *When the working opportunities have reduced in this area my brother migrated to Dhaka city for pulling rickshaw and earn a handsome amount of money. But because I am a woman I couldn't migrate to another place leaving my child alone even if I want so. Moreover, I couldn't work as rickshaw puller. I don't have any other option and my income is limited.*

6. Implications

With the caution that this research was not intended to uncover perceptions of climate and environmental change, this paper presents a synthesis of some of the links people in the research communities were drawing between changes in their environments, the climate and food security. Four points stand out as worthy of further attention:

- Climate and environmental change are being discussed, widely, by people facing the greatest hardship and livelihood impacts; this suggests both an appetite for action and the potential for people to be mobilized around and better informed about these issues.
- The connections between uncertain harvests, food markets, and food insecurities appear to be clearly mapped out in people's minds.
- Water emerges repeatedly as a core concern connecting climate, environment and food.
- Climate change and environmental degradation, and responses and adaptations to both, appear to exacerbate inequalities of power and wealth, most notably in relation to control over water and ability to hedge uncertainties.

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Further Resources

Oxfam (2013) Growing Disruption: Climate change, food, and the fight against hunger. Oxfam Issue Briefing, September 2013 http://www.oxfam.org/sites/www.oxfam.org/files/ib-growing-disruption-climate-change-230913-en.pdf

For further *Life in a Time of Food Price Volatility* findings visit http://policy-practice.oxfam.org.uk/our-work/food-livelihoods/food-price-volatility-research

For resources and research on Climate Change from the Institute of Development Studies see http://www.ids.ac.uk/idsresearch/climate-change

GROW Campaign website: http://www.oxfam.org.uk/get-involved/campaign-with-us/our-campaigns/grow