IMPACT EVALUATION OF SHOCK-RESPONSIVE CASH TRANSFERS FOR DROUGHTS

in the Sahel Adaptive Social Protection Program

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EXECUTIVE SUMMARY

There is an urgent need to improve how poor and vulnerable households are supported when they are affected by climate-related shocks. Large covariate shocks such as drought and floods are becoming increasingly intense and frequent with climate change, with well-documented long-lasting implications for welfare and poverty reduction. Ex-post responses to such shocks in the form of cash or in-kind support are far from covering all affected poor and vulnerable households and often reach them late. For instance, temporary cash transfers are often provided at the peak of food insecurity shocks, such as during the agricultural lean season. Recently, new approaches have emerged to help households prepare for shocks, cope with their effects, and adapt to reduce their exposure to future shocks. Specifically, shock-responsive cash transfers (CT) that support households before, during, and sometimes after the peak of the shock are increasingly used by governments and humanitarian actors to support households affected by shocks. Yet while the role of regular CT programs to help households cope with shocks is well documented, evidence on the impact of shock responsive CTs is still very limited. Evidence on the value of early intervention compared to traditional lean season response is also thin.

This concept note describes a coordinated multi-country impact evaluation (randomized control trial, RCT) to evaluate the relative effectiveness of early responses to drought (providing temporary cash transfers after the weather shock but before the peak of the impact of the shock on household food security and welfare) versus traditional responses to drought (providing temporary cash transfers at the peak of food insecurity during the agricultural lean season) in the Sahel. Does responding early help reduce the effect of drought shocks on household economic outcomes and welfare? The impact evaluation will be implemented in different countries in the Sahel. The impact evaluation for the Niger pilot is already underway, and endline data collection should be complete by July 2023. The evaluations in Mauritania and Senegal are in preparation, and the pilots should launch in November or December 2022, with a scope that will depend on trigger activation.

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1. Problem Statement

Large covariate shocks are becoming more frequent and intense with climate change, with important consequences for poverty reduction efforts. Those shocks disproportionately impact poorer households, which tend to be particularly exposed to shocks and more vulnerable to their impacts (Hallegatte, et al., 2016; Dercon, 2002). Poor households have limited resources to draw upon to manage the impact of a shock, such as savings, access to finance, and access to formal insurance or safety nets (Hallegatte, et al., 2016). As they struggle to cope with the impact of the shock, those households tend to resort to negative coping strategies by foregoing consumption, taking children out of school, selling productive assets, acquiring high-interest loans, or migrating (del Ninno, Coll-Black, & Fallavier, 2016; Hallegatte, et al., 2016; Skoufias, 2005). Those short-term coping mechanisms often have negative long-term consequences on welfare. For instance, temporary child undernutrition has been shown to have long-lasting consequences on education, income, and health outcomes (Chen & Zhou, 2007; Maccini & Yang, 2009; Dercon & Porter, 2014; Dinkelman, 2017; Victora, et al., 2021). In addition, households that are not poor but remain vulnerable also struggle to cope with shocks, and their shock-induced reduction in consumption puts them at risk of falling into poverty.

There is an urgent need to improve how poor and vulnerable households are supported in the face of climate-related shocks (e.g., drought, flood, extreme cold or heatwaves, cyclones, etc.). Governments, development partners, and humanitarian actors are responding by 1) trying to reduce exposure by investing in infrastructure and promoting livelihoods that are less exposed to risks (i.e., supporting adaptation to climate change, irrigation,...); 2) smoothing consumption and income by expanding coverage of multi-year cash transfer programs (including cash+ and economic inclusion packages); 3) providing ex-post recovery support to households through a mix of cash transfers and in-kind support. Despite the widespread recognition that safety nets have a crucial role to play and have made considerable progress in their expansion in recent years, the coverage of traditional safety nets is far from reaching all chronically poor and households vulnerable to shocks. The issue is particularly salient in low-income countries in the Sahel, where there are high poverty rates but limited fiscal space. When shocks occur, only a small share of affected households receive assistance.

Shock-responsive cash transfers (CT), i.e., temporary cash transfers provided to households affected or at risk of being affected by a shock, are increasingly used by governments and humanitarian actors. Traditional forms of shock-responsive assistance (in cash or kind) are provided during a short period around the peak of the food security shock to help households smooth consumption and avoid using negative coping strategies. They tend to be further delayed because of logistical and procurement issues and often reach households after they have started to engage in negative coping strategies. More recently, the importance of early action has been highlighted, and several countries are piloting early shock-responsive cash transfers, which start a few months before the peak of the shock and continue until the end of the shock. Based on early triggers using remote-sensing data, geographical areas, or populations at risk of being affected by a weather-related shock can be targeted weeks or even months prior to the worst impacts on food insecurity. Cash transfers received before the worst impacts of the weather shock can help households mitigate the impacts on their terms, such as by increasing their assets and savings, thus increasing the resources available to them to navigate the impact of the shock. It can also help them adjust assets and livelihoods to reduce their exposure to weather shock. During the peak of the shock impact, cash transfers can further help smooth consumption or food insecurity by compensating for reduced incomes. As a result, households are less likely to rely on negative coping strategies. Yet, evidence about what works best to support households affected by shocks remains very limited (Hill, Peredo, & Tarazona, 2021; Jeong & Trako, 2022).

On the one hand, the role of regular multi-annual CT programs in helping households cope with shocks is well documented (Asfaw et al., 2017; Jensen, Ikegami, & Mude, 2017; Premand & Stoeffler,

2022; Macours, Premand, & Vakis, 2022; Adhvaryu et al., 2021).[1] Premand and Stoeffler (2022), for example, combined data from a randomized control trial (RCT) with satellite data to estimate the impact of regular cash transfers on households affected by exogenous drought shocks in Niger. They found that the impact of a drought shock on consumption and food security was much lower for households receiving regular, unconditional cash transfers from a government-led social safety net program (already in place before the drought hit) than on non-beneficiary households exposed to the same shock. Moreover, these welfare impacts were larger than the amounts transferred, as they helped households sustain income from agriculture and off-farm businesses after the shocks. Similarly, a cluster RCT showed that bi-monthly conditional cash transfers implemented in the aftermath of drought had persistent impacts on livelihood diversification and households' ability to mitigate the effects of future drought shocks in Nicaragua when complemented with training or cash grants (Del Carpio & Macours, 2010; Macours, Premand, & Vakis, Transfers, diversification and household risk strategies: experimental evidence with lessons for climate change adaptation, 2012).

On the other hand, there is limited evidence on the impact of the timing of cash transfers and shock-responsive social protection on households' ability to cope with shocks.[2] Jensen, Ikegami, & Mude (2017) investigate the optimal balance between different social protection instruments to support households affected by shocks, including regular CTs, shock-responsive CTs, and insurance products. A few recent studies relying on natural experiments, quasi-experiments, or ex-post data analysis also provide insight into the impact of more timely interventions. Pople et al. (2021) present evidence from a natural experiment on the impact of providing a one-off unconditional CT to households at risk of being affected by an extreme flood in northern Bangladesh. The cash transfer was received on average seven days before the flood peak and about 100 days earlier than traditional humanitarian assistance. The one-off cash transfer reduced the impact of the flood on child and adult food consumption and well-being, household asset losses, and earning potential. They also found that timing matters: Receiving cash a day earlier generated minor improvements in consumption. Similarly, Gros et al. (2019) and Gros, et al. (2022) use quasi-experimental methods to show that anticipatory cash transfers in Bangladesh and Mongolia, respectively, are promising. However, these studies also face the dual limitations of small sample sizes and imbalanced comparison groups. These results point to the potential role that shock-responsive cash transfers can play in mitigating the negative impacts of weather-related events and the importance of the timing of the intervention. However, more evidence is needed to understand the effectiveness of temporary CTs, whether it is more effective to provide them earlier or later and for a shorter or longer duration.[3]

This concept note describes a coordinated multi-country RCT to generate evidence on the relative effectiveness of providing early shock responsive CTs based on triggers in response to drought (either concentrated over a short period or spread over a longer period) compared to traditional responses providing CTs during the lean season (the peak of the drought impact) in the Sahel. It provides the

[1] Similarly, the literature on the role of index insurance to support households affected by shocks is large and insightful, but the generally low take-up of insurance products among poor households reduces the potential role of these products (Cole, Stein, & Tobacman, 2014; Karlan et al., 2014; Carter et al., 2017).

[2] The literature on early warning systems highlights the potential of timely information to enable households to take preventative actions and mitigate the impact of shocks, but the evidence of their effectiveness remains similarly scarce. In the context of floods in Europe for example, several papers have argued that timely early warning help households to take preventative actions that eventually should reduce their losses from the flood (Carsell, Pingel, & Ford, 2004; Kreibich et al., 2005; Thieken et al., 2007).

[3] Related to this needed effort, collaboration between the World Bank and the World Food Programme, under the OEV-DIME's humanitarian workstream, is currently underway. The collaboration entails ongoing impact evaluations assessing the role of Forecast-based Financing (FbF)'s anticipatory CT in response to floods in Nepal and Bangladesh. The humanitarian workstream is a cross-cutting initiative jointly coordinated by the World Food Programme's Office of Evaluation (OEV) and the World Bank's Development Impact Evaluation department (DIME), funded by the United States Agency for International Development's Bureau for Humanitarian Assistance (BHA), which aims to build capacity in the generation of relevant evidence related to emergency-response interventions in fragile and humanitarian contexts. For the latest information on OEV-DIME's humanitarian workstream and other lines of coordinated work, refer to WFP (2022).

backbone for an impact evaluation to be adapted for each country based on the local context. It is complemented by an AEA RCT registry entry, in which a pre-analysis plan will be filed.

2. Background and context

The Sahel region is home to some of the poorest countries in the world and is highly vulnerable to climate change. The G5 Sahel countries are low-income countries (with the exception of Mauritania) where on average 31 percent of the population falls below the international poverty line. The poverty headcount ratio in the Sahel ranges from 49.7 percent in Niger, 49.3 percent in Mali, 43.7 percent in Burkina Faso, 38.4 percent in Chad, 38.0 percent in Senegal, and 5.8 percent in Mauritania as measured by the international poverty line of US$1.90 a day (World Development Indicators (WDI), 2022). The Sahelian countries rank low on the Human Capital Index, so children born today in the G5 Sahel countries will be only 30–38 percent as productive as they could have been with better education and health. Economic diversification remains very limited, with more than half of total employment coming from agriculture—a sector that faces multiple threats of water stress, environmental degradation, and competition between farmers and pastoralists for scarce resources. High levels of poverty and low levels of human capital are at risk of being exacerbated by other growing challenges related to climate change, fragility, and forced displacement. The Sahel region is one of the most vulnerable in the world to more extreme droughts, floods, heat waves, and other impacts of climate change. Poverty rates are expected to rise sharply unless strong adaptation measures are undertaken (The World Bank Group, 2022). Between 2016 and 2020, more than 20 million people were affected by food insecurity and economic hardship induced by drought in the region, and the variability of weather shocks is expected to increase in the coming years. The persistence of these types of shocks erodes traditional coping strategies (e.g., consumption smoothing), contributing to the cycle of negative welfare and development for the households affected (Dercon, 2002).

The predominant model for responding to shocks in the Sahel has been via humanitarian assistance. On average, between 2001 and 2018, the six countries in the Sahel received a total of US$634 million per year in humanitarian assistance. Humanitarian assistance has been increasing significantly since 2001, with humanitarian assistance totaling over US$1.3 billion for the six Sahelian countries in 2012 and 2013. Needs were particularly high in Chad and Niger, with Chad receiving an average of US$257 million per year for the period 2001 and 2018 and Niger receiving an average of US$169 million per year during the same period. A large proportion of humanitarian assistance seeks to address food insecurity. In 2014, 10 million people were targeted for food insecurity, representing only 40 percent of the needs.[1]

Within this context, adaptive social protection (ASP) has emerged as a tool for building the resilience of poor and vulnerable households to shocks. ASP seeks to build the resilience of poor and vulnerable households by investing in their capacity to prepare for, cope with, and adapt to shocks, thus protecting their well-being and ensuring they do not fall into or become trapped in poverty as a result of the impacts (Bowen, et al., 2020). ASP promotes government-led investment via social protection programs in the three resilience capacities of poor and vulnerable households for preparedness, coping, and adaptation along the pre- and post-shock continuum (before, during, and after). An overriding priority for ASP is the continued extension of access to safety net programs, especially for the households identified as most vulnerable to shocks. For example, drawing on early warning climate systems, countries can anticipate climate-related events such as droughts and quickly scale up cash transfers via their social safety net programs in response. In this context, shock-responsive cash transfers are increasingly seen as a key tool to support households affected by shocks by scaling-up support to existing and additional vulnerable beneficiaries.

The Sahel ASP Program (SASPP) has been supporting six countries in the Sahel in building national adaptive social protection (ASP) systems since 2014. The SASPP is funded by a multi-donor trust fund (MDTF) with contributions from Germany, France/AFD, and the United Kingdom/DFID and now FCDO. It is managed by the World Bank's Social Protection and Jobs Global Practice. The program currently supports country programs with recipient and Bank-executed activities, as well as a regional analytical work agenda in six Sahelian countries affected by shocks, including drought and conflicts (Burkina Faso, Chad, Mali, Mauritania, Niger, and Senegal). During the SASPP's initial phase (2014–2019), new foundational adaptive social protection (ASP) systems were introduced. By 2019, nearly 2 million people across the Sahel benefited directly from innovations and programs with SASPP support. Currently, the program is in its second phase (2020–2025). It focuses on strengthening key building blocks of adaptive social protection systems through country operations and promoting a coordinated approach and experience-sharing between countries in the Sahel.

The proposed multi-country impact evaluations are part of the analytical program under SASPP (second pillar "Climate-Shock Responsive Delivery Systems") and aim to generate evidence on the effectiveness of shock-responsive cash transfers and the role of timing. There is a need to create more evidence from the Sahel region on the actual impact of shock-responsive social protection on poor and vulnerable households to inform future programming and optimize investments. Stronger evidence from the Sahel countries would provide valuable guidance to the governments for continued investments/adjustments to these programs. Such evidence would also enable implementing ministries and development partners to allocate resources better between humanitarian support, shock-responsive safety nets, and regular safety net interventions.

3. Description of the interventions

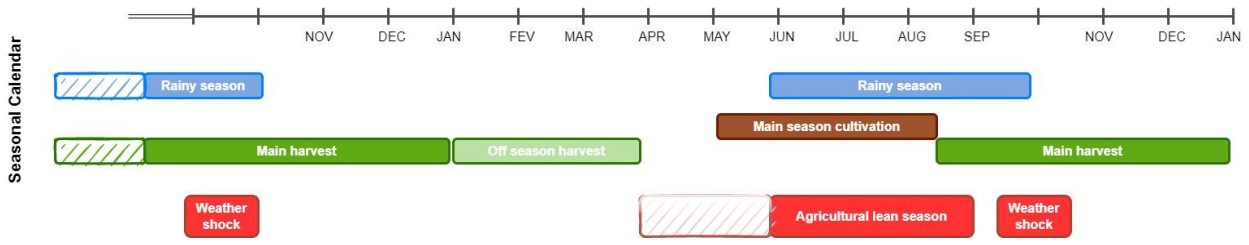
This section first presents the overall early response approach before describing the specific shock-response interventions currently piloted by country.

3.1. Focus on the impact of drought shocks

This proposed multi-country IE focuses on droughts as large covariate shocks with long-lasting impacts on welfare, poverty, and food security in the Sahel. A large share of humanitarian assistance is provided in response to drought. As illustrated in Figure 1, droughts are slow-onset shocks compared to other weather-related emergencies, such as cyclones, whose impacts are immediate and largely felt within the first three days. Droughts start with reduced precipitation and high temperature during the growing season (typically between June and September in the Sahel). This leads to reduced infiltration and increased evapotranspiration (the meteorological drought or weather shock). This results in soil water deficiency, which affects crop and forage yields, leading to a low harvest in October and November (the agricultural drought or production shock) and high livestock mortality rates over the following months. Finally, households' economic outcomes and food security are impacted in the lead-up to the lean season prior to the next agricultural harvest. Households' savings, assets, and food supplies are depleted, with the peak of the food insecurity spells generally felt between June and September (the lean season). The impact of the drought shock on households is measured by reduced consumption, adoption of negative coping strategies, and below-recommended levels of household food consumption and nutrition (usually manifested during the lean season after the failed harvest). Because droughts are slow onset, it is possible to act between the weather/production shock and the peak impact on food security. In other words, it is possible to initiate a response as soon as the weather shock has been identified based on a risk

assessment rather than waiting for a needs assessment once the impact of the weather shock on food security has materialized.

Figure 1: *Seasonal calendar*



3.2. Shock-responsive cash transfers could allow for an earlier response ahead of the lean season

Traditionally, humanitarian responses in the Sahel reach households after the effect of a drought on households' economic outcomes and food security has started to materialize. They are based on a needs assessment conducted within the framework of the Cadre Harmonisé. This is partly the result of operational constraints (delay in decision-making, fundraising) and partly by design: The objective is to support households at the peak of the impact on food security during the lean season. An assessment is conducted after the harvest and informs the Cadre Harmonisé in November and March, which is the basis for humanitarian appeals and assistance to be delivered during the following lean season (generally June to September).

In contrast, an early response involves disbursing shock-responsive cash transfers before the peak of the impact on food security, based on pre-defined satellite-based triggers available at the end of the harvest. Early support could be provided as soon as the weather shock is identified or starting a few months before the subsequent lean season, and it could continue until the end of the lean season or the following harvest. The details will depend on the early warning system in place, the operational constraints, and agricultural or pastoral calendars. An early response requires agreeing ex-ante about the data, the triggers, the geographic and household targeting, and the set of interventions and having money pre-positioned to finance the interventions. It also involves relying on predictions of the impact of the weather shocks on household economic outcomes and well-being, which is likely to involve some mistargeting.

In sum, anticipating the effect of the weather or production shock on households' consumption and food security enables households to use cash transfers to prepare for its impact on food security, smooth their consumption, and prevent the use of negative coping strategies. In addition, households can adjust their investments and livelihoods to reduce exposure to the shock. The expected result is a reduction of the impact of the drought shock on households' economic outcomes and food security and the prevention of longer-term scarring effects. In contrast, CTs received during the lean season primarily serve to smooth consumption during the peak impact of the drought rather than enabling households to prepare and adjust ex-ante.

3.3. Early response requires early triggers

Typically, reliable, and disaggregated data on agricultural production is unavailable until months after the harvest, and an assessment of the impact on households' economic outcomes and food security is even later. However, remote-sensing data is available in real-time and provides an objective, transparent, and easily available source of information about the weather shocks that potentially affect production during the growing season. The activation of the early shock-responsive cash transfers is therefore determined using pre-defined triggers using remote-sensing data available at the end of the harvest. It relies on data on the weather or production shock and the risk it presents to household economic outcomes and food security rather than a full assessment of the needs due to the impact of the shock. The triggers identify high-vulnerability geographic areas and determine the number of people who will be supported in those areas (thereafter caseload). The triggering parameters and thresholds are set according to the budget available for the response and the type of events the program intends to respond to (i.e., extreme events that happen once every few years versus more frequent events). When the triggers are activated in an area, household targeting is conducted within that area to cover poor and vulnerable households not already covered by the safety net based on the available caseload.

The development of early triggers has been finalized in each country using historical remote-sensing data on climate and production and price data from national databases. First, historical data is extracted for a range of remote sensing-based indicators, and an analysis is conducted to select the most important crops and areas most affected by drought shocks. Second, a regression analysis is conducted to identify which indicators are the best predictors of production and price shocks. Finally, the triggering parameters and thresholds are determined for the selected indicators based on the available budget and scenario analysis. Those parameters are then used to activate shock-responsive cash transfers.

Responding early using early triggers means acting with incomplete information about where the shock will hit, who will be affected, and the extent to which they will be affected. Because the objective is to reach households before the impact of the shock materializes, it involves relying on the risk that households will be affected by the shock rather than an ex-post assessment of the impact. This is often referred to as a "no regret" approach. There is a trade-off between the amount of information available (and, therefore, the targeting efficiency) and the timing of the intervention. While traditional interventions might be better targeted at those worse affected by the shocks if they indeed have better information, they reach households later and are, therefore, likely to be less impactful. To isolate the impact of the timing from the impact of the predictive capacity of the indicators selected for the triggers (and therefore the targeting efficiency), it will be critical to use the same early triggers and targeting moments for both early and late interventions in the impact evaluation.

3.4. Description of the shock-responsive interventions by country

With programmatic and analytical support from the SASSP Program, several countries in the region are piloting shock-responsive cash transfers in their ASP programs. The IEs will initially focus on Niger, Mauritania, and Senegal, where shock-responsive cash transfers are already established, and the early-response approach can be tested. The existing interventions vary significantly across the country. While Niger has already started piloting early response shock-responsive cash transfers, Mauritania and Senegal have followed a more traditional lean season response approach until now. The impact evaluations will thus focus on pilots of new modalities of intervention in these countries.

3.4.1 Niger

The government of Niger—specifically the Safety Net Unit (Cellule Filets Sociaux or CFS)—started piloting cash transfers for drought in 2019 in eight communes and three regions as part of the Niger Adaptive Safety Net Project 2 (ASP2). The ASP2 project supports poor households through a regular cash transfer for resilience program that delivers monthly transfers of 15,000 FCFA (around US$27), alongside human capital and economic inclusion accompanying measures, to chronically poor households over a period of 24 months (Premand & Barry, 2022; Premand & Stoeffler, 2020). Cash for Work (CfW) activities also support beneficiaries with a daily salary of US$2.50 per person for 60 days per year.

In addition to the regular program, the national safety net program piloted a shock-responsive component based on satellite-based triggers monitoring extreme drought. The program scaled-up to reach approximately 15,400 additional households following the activation of the triggers within eligible communes at the end of October 2021. This study evaluates the impact of the timing of these cash transfers for a subset of these households.

The design of the triggers involved extensive analytical work. First, historical climate, production, and price data were analyzed to identify the communes most affected by drought within the project area. Millet was selected as the most important crop for poverty and food security. Second, the Water Requirement Satisfaction Index (WRSI) was selected as the best predictor of millet production and price shocks. The WRSI is an indicator of crop performance based on the estimated amount of water available to the crop during the rainy season. Finally, the cost of different scale-up scenarios using different triggering parameters and the historical distribution of shocks was estimated. Based on these scenario analyses, the communes eligible for the pilot were selected, and the triggering parameters were set. Communes were selected for the program based on their vulnerability to shocks, their participation in the national safety net, a low average WRSI value, and the importance of millet production. Different thresholds were set to identify moderate and severe droughts (-10/-25 percent of the median WRSI by the third dekad of October), and the percentage of the population to be covered by the transfers was determined. As a remote sensing indicator is unlikely to capture all shocks affecting production, a secondary trigger was also defined, enabling the scale-up activation based on the decision of a steering committee using Cadre Harmonisé data.

The size and duration of the unconditional cash transfers provided in case of a moderate or severe drought have been pre-agreed to ensure a rapid expansion of the program when the trigger is activated. When the triggers for a moderate or severe drought are activated in a commune, the program scales-up to reach 22 or 44 percent of the population of that commune with shock-responsive cash transfers. The regular program delivers 15,000 FCFA (around US$27) for 12 months, starting shortly after the weather shock impacted production but well before the peak of the shock's impact on household food security and economic outcomes (i.e., the lean season). In addition to the regular cash transfer program, the CFS introduced two new modalities that delivered cash in larger amounts but for a shorter period, either in advance of the lean season ("early cash transfers") or during the lean season ("late cash transfers").

3.4.2. Mauritania

The government of Mauritania is also piloting shock-responsive cash transfers to support households affected by shocks, focusing on providing cash transfers during the lean season. The government plans to support an average of 8,000 vulnerable households each year in the next three years either through a dedicated shock-response program (Elmanoua) or through the scale-up of the National Social Transfer Program (Tekavoul).

The government launched the Elmanoua program in 2017 to provide cash transfers to households affected by drought during the lean season. The program reaches around 3,000 food-insecure households annually. Geographic areas are selected using data from the Cadre Harmonisé. Households are selected through the social registry using criteria defined by the Office de Sécurité Alimentaire (OSA) and receive four monthly transfers of an amount equivalent to 75 percent of the average food basket between June and September. Payments are made through the Tekavoul payment system.

The government is also implementing a new pilot within the National Social Transfer Program, "Tekavoul choc," to support additional households affected by shocks in areas not covered by Elmanoua. The pilot started in 2021 for three years. Tekavoul currently supports 87,542 households in extreme poverty through quarterly cash transfers conditioned on beneficiaries' participation in social promotion activities. Households are targeted using the social registry and receive conditional cash transfers of MRU 6,000 annually (approximately US$160). The objective of the pilot is to scale up transfers horizontally (increase in number of beneficiaries selected from the social registry) and vertically (temporary transfer increase) in shock-affected areas where Elmanoua does not operate. The beneficiaries of Tekavoul choc receive four monthly transfers equivalent to 75 percent of the average food basket between June and September. In addition, in 2022, the government will introduce and test two additional modalities: 1) four monthly transfers of an amount equivalent to 75 percent of the average food basket between January and April; 2) three transfers in December, March, and June for a total amount equivalent to 75 percent of the average food basket. This will enable the GoM to assess the cost-effectiveness and efficiency of the three modalities for shock-responsive cash transfers and build lessons learned for shock response.

Mauritania's response to shocks is usually based on the Annual Response Plan, which draws on the Cadre Harmonisé data from November and March. However, discussions are ongoing to identify early triggers and determine how they could be used for decision-making. Notably, the food security Forecasting Interface is under development as a result of a collaboration between the World Bank, the World Food Program, and OSA. This tool provides estimates of food insecurity during the next lean season at the moughataa level using remote-sensing data (Standardized Precipitation Index (SPI), Normalized Difference Vegetation Index (NDVI), and biomass) and historic household level data from the Food Security Monitoring Survey (FSMS). The estimates are available in November and will be used as an early trigger for the shock-responsive pilot in areas where the three modalities will be tested.

3.4.3 Senegal

In Senegal, the government also developed its capacity to provide temporary assistance in response to shocks. Senegal's national cash transfer program (Programme National de Bourse de Sécurité Familiale—PNBSF) was initiated in 2013 and currently covers 300,000 beneficiary households. It provides nationwide transfers of 25,000 CFA (approximately US$40) per quarter per household for five years and behavior change promotion sessions in health, education, and civil registration. The core elements of the safety net system developed since 2013 have been leveraged to support households affected by shocks.

In 2017, the government piloted a new food insecurity response mechanism during the lean season, building on the infrastructure of the national cash transfer program to deliver cash transfers to selected households. In the departments identified as experiencing a food insecurity crisis based on the Cadre Harmonisé, households were targeted using the registry to receive food or cash transfers during the lean season. Based on this success, the government adopted the same methodology to coordinate the overall response to food insecurity by government and non-government actors in

2018. Another pilot was successfully implemented to respond to fires in 2019. The same mechanism (using the RNU for targeting and cash transfers) was triggered by the President of Senegal in September 2020 to provide rapid assistance to households affected by floods. In 2021 and 2022, the government continued to support households affected by climate shocks (as well as fires and floods) by scaling-up the national cash transfer program horizontally and vertically.

Response to drought is based on the early warning system, which draws on the Cadre Harmonisé. It determines (i) the prioritized areas and (ii) the number of households to be assisted per department based on the risk of food insecurity induced by drought. While no official triggering mechanism is in place, the Secrétariat Exécutif au Conseil National de Sécurité Alimentaire (Se-CNSA), hosting the Cadre Harmonisé process in Senegal, pushes to assist all households in phase 3 (crisis) of the Cadre Harmonisé regardless of departments phase. Objectives are adapted based on the resources available. Resources mobilized by the government for food insecurity are limited to the ARC payouts. Efforts are underway to improve the early warning systems.

An analysis of historical remote-sensing data on climate, production, and price data from national databases (as described above) has been conducted. Early triggers were proposed that will be used for the evaluations.

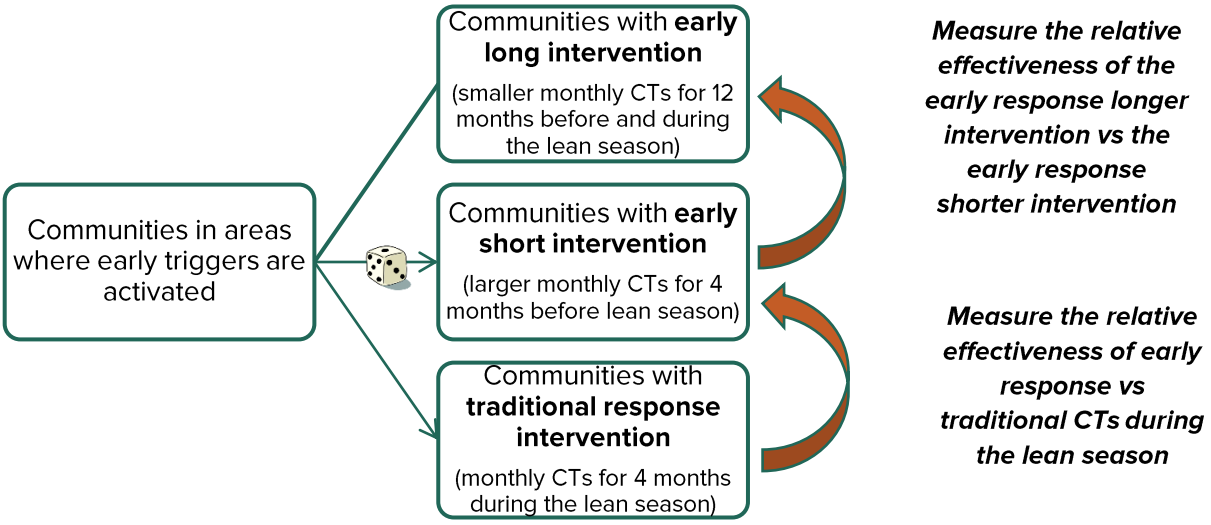
4. Impact evaluation questions and design

This note outlines the RCT design that will be used to assess the relative effectiveness of providing early response CT in anticipation of a drought-related food insecurity crisis compared to providing traditional CT assistance during the lean period after the worst effects of the drought have materialized (i.e., during the next agricultural season after the failed harvest in the previous one). The basic IE design attempts to evaluate the relative effectiveness of providing early shock responsive CTs in response to drought (either concentrated over a short period or spread over a longer period) compared to traditional responses providing CTs during the lean season (see Figure 2). We document whether responding early helps reduce the effect of drought shocks on household economic outcomes and welfare. The standard evaluation will be adjusted to the different countries in the Sahel, for which specific notes will be developed separately and added in annex.

The **leading research question** for the basic RCT design is:

> *What is the impact of early response and timing in adaptive social protection in mitigating the negative effects of a drought shock? In particular, what is the impact of providing temporary cash transfers a few months ahead of the lean season following the activation of triggers identifying a drought shock compared to providing temporary cash transfers of the same amount during the peak of the food insecurity crisis (lean agricultural season)?*

Figure 2: *Three-arm RCT design to assess the effectiveness of different shock-responsive CT modalities*



The impact evaluation design is based on early triggers that identify geographic areas likely to be affected by a drought-related weather or production shock before household food insecurity or food consumption is affected. Once the early triggers are activated in a geographical area, eligible villages are identified for the interventions. These eligible communities will constitute the sampling frame for the evaluation. Within the selected villages, household targeting will then be conducted using transparent and replicable procedures (based on country-level procedures) to identify poor and vulnerable households at risk of being affected by the shock. Early triggers and targeting should be used in all villages prior to their random assignment to different treatment groups. One possibility for identifying these households is leveraging social registry datasets collected by government-led safety net systems or other such registries or pre-existing lists of potentially eligible households. These social registries usually contain data on a household's assets, allowing the definition of consumption indexes (through proxy-means test techniques). In addition, administrative data on household members' occupations and enterprises might be available to target households dependent on rainfed agriculture. Further confirmation from community leaders might also be needed as part of the targeting process. The ability of the triggers to adequately identify drought shocks and the rigorous implementation of targeting strategy prior to randomization and intervention rollouts are critical to the success of the IEs.

We test the impact of timing across three cash transfer interventions, where we randomize target villages to the different treatment groups:

T1. "Early cash transfers" entail cash transfers delivered in advance of the lean season. This group includes villages in which households will receive monthly cash transfers after the weather shock but a few months ahead of the impact of the weather shock on household food security (i.e., as early as possible after the harvest and before the following lean season) and until after the peak of the shock. For instance, in Niger, households receive four cash transfers from March to June 2022. By receiving larger cash transfers ahead of the shock, we hypothesize that households can adopt pre-emptive behaviors and adjust their livelihoods to mitigate the worst impacts during the lean season.

T2. "Late cash transfers" entail cash transfers delivered during the lean season. This group includes villages in which households will receive the same number and amount of cash transfers during the lean season after the failed harvest when the peak impact of the shock materializes on households' economic outcomes and food security. For instance, in Niger, households receive four cash transfers from July to September 2022. The treatment arm replicates how the humanitarian

sector would typically cope with the food insecurity crisis induced by an extreme drought. The cash transfers are intended to help households cope with the effects of the shock at the time when they need it the most (e.g., smoothing household consumption, avoiding food insecurity spells and negative coping strategies, etc.).

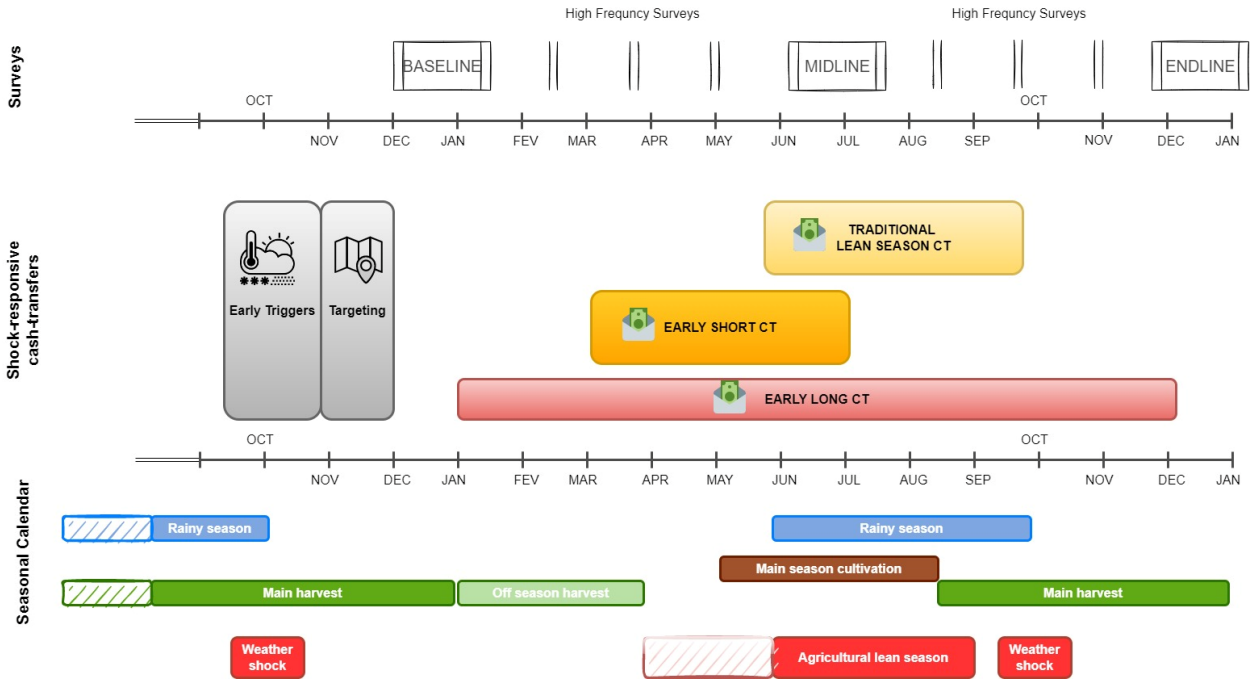
T3. "Early and late cash transfers" entail cash transfers delivered both before and during the lean season. This modality will differ slightly by country to align with their regular programs. For instance, in Niger, eligible households within target villages will receive smaller monthly cash transfers for roughly 12 months, starting in March 2022.[4] This would provide households with resources to prepare for the shock, adjust their livelihood strategies to reduce their exposure, and cope with its effects over a longer time horizon.

In total, the cash transfers amount to roughly 10 to 15 percent of annual household consumption. The total value of the cash transfers is the same across the three modalities in each country. T1 and T2 entail relatively larger cash transfers but fewer payments, compared to T3, which entails relatively smaller cash transfers but more payments. Households receive cash transfers but no additional messaging about drought response.

Households are targeted based on their baseline vulnerability ahead of all three interventions, either through a proxy means test score, community-based targeting, or a combination of both. It is important to note that this design only works if all villages are selected based on early triggers (including those receiving the traditional response) and if household targeting procedures are similar. Across the three groups, the transfer amount needs to be kept constant in a way that only the timing and size of disbursement vary.

[4] The intended start date was January 2022, but the first payment was delayed due to operational and procurement delays.

Figure 3: *RCT design and seasonal calendar*



To estimate the impact of receiving early cash transfers relative to late cash transfers delivered during the lean season, we estimate intent-to-treat using the difference in means between T1 and T2. We also estimate the relative impact of receiving smaller regular cash transfers in advance of and during the lean season compared to the early and late cash transfers by assessing outcomes across T1 versus T3 and T2 versus T3, respectively.

We run the following regression, in which the coefficient of the treatment variable (early) provides the intent-to-treat effect (ITT):

$$(1)\ Y_i = \beta_0 + \beta_1 * Treat_{ij} + \varepsilon_i$$

In this equation, Y_i is the outcome variable (e.g., food security) for household i=1, and $Treat_{ij}$ is the treatment variable (equal to 1 if household i corresponds to community j randomly selected for receiving the anticipatory CT, and 0 if household i corresponds to community j randomly selected for receiving the post-shock CT or regular CT both before and during the lean season). Coefficient β_0 is a constant, and coefficient β_1 is the estimated treatment effect of the anticipatory CT. ε_1 is the error term.

Conducting an RCT design can face ethical and political concerns if it withholds assistance to a group of drought-affected households. However, in the proposed design, all households would receive some sort of CT support, with the only difference being the timing of CT receipt. Given the scarcity of rigorous evidence, there is no certainty about which CT modalities provide higher

benefits to drought-affected populations. In this case, randomizing would be the fairer and more transparent option to assign the subset of beneficiaries, as every drought-affected farmer will have an equal possibility of selection.

This standardized IE design was developed to facilitate the generation of evidence on the effectiveness of more timely shock-responsive cash transfers in multiple countries and contexts.

In addition, the following (secondary) questions can be addressed:

- *What is the heterogeneity of the impact of early shock-responsive CTs on households with different characteristics?* Specifically, we are interested in whether effects differ based on a household's initial asset position at baseline, which proxies their ability to cope with the food insecurity crisis. However, we could also consider other characteristics, such as whether the household head is female. We can measure these heterogeneous effects by drawing on our comprehensive baseline survey.
- *What are the mechanisms through which early shock-responsive CTs affects households' ability to mitigate the effects of drought shocks?* The study adapts the high-frequency measurement approach by Christian et al., 2022. The main outcomes will be measured at baseline, one time during a short high-frequency survey before the lean season, one time during a high-frequency survey before the lean season, and one time during a high-frequency survey after the lean season. We will also collect data on intermediate outcomes and household behaviors through these surveys.
- *To what extent are results externally valid across settings?* We use a standardized RCT design across three countries of the Sahel to the best of our ability, but results are conditional on a trigger activation.

5. Main outcomes of interest

The objective of the IE design is to capture potential improvements in at-risk households' food security, resilience, and well-being, as well as the mechanisms through which these welfare impacts materialize. We expect some of the impacts of the cash transfer interventions to materialize on different time horizons, ranging from the immediate term (e.g., food security and consumption) to longer-term effects (e.g., loss of non-food assets).

The primary outcomes to be measured through data collection are:

1. **Food security:** Food consumption score calculated using the number of days in the past week the household consumed major food categories (e.g., maize, tubers, fish, eggs, vegetables). The final score is the weighted sum of these counts. We measure food security in each survey round, including the high-frequency surveys, midline, and endline.
2. **Subjective well-being**: As proxied by Cantril's ladder of life satisfaction, we measure subjective well-being in each survey round, including the high-frequency surveys, midline, and endline.
3. **Household food consumption:** We measure self-reported consumption (including expenditure and consumption from own production and gifts) over a standard reference period for a comprehensive list of food goods. We measure household food consumption at midline and endline.

In addition, a set of secondary outcomes, such as coping strategies, assets, non-food consumption, income-generating activities, savings, migration, etc., should be captured to understand mechanisms and benefits beyond the immediate food security impacts of the intervention.

High-frequency data collection will be combined with low-frequency data collections (baseline, midline, and endline) to capture behavior in real-time and observe impacts on the dynamics of welfare and food security.

The same outcome indicators will be collected throughout the different IE studies to support cross-country comparison.

Table 1 summarizes and defines potential key outcomes of interest that could be measured as part of the early response cash transfers for droughts IEs.

Table 1: *Main outcomes of interest*

Outcome	Type	Definition	Level	Source
Food security	Primary	• Food consumption score: Number of days in the past week the household consumed major food categories (e.g., maize, tubers, fish, eggs, vegetables). The final score is the sum of these counts. Additional measures for robustness: • Food Insecurity Experience Scale: Eight questions capturing a range of food insecurity severity over the past 12 months, with yes/no responses.	Household and individual	Baseline, midline, endline, and high-frequency surveys
Consumption/ poverty	Primary	• Consumption Expenditure: Expenditures over a standard reference period for a comprehensive list of food (and non-food) goods.	Household	Baseline, midline, endline, and high-frequency surveys
Nutrition	Primary	• Household Dietary Diversity Score: Simple count of food groups that the household has consumed over the preceding 24 hours. • Minimum Dietary Diversity for Women: Dichotomous indicator of whether or not women 15–49 years of age have consumed at least five out of 10 defined food groups the previous day or night.	Household	Baseline and endline surveys
Assets	Secondary	Number and value of assets owned by the household for a contextually pre-defined list	Household	Baseline, midline, and endline surveys
Income generating activities	Secondary	Participation and revenue from non-farm business, agriculture and livestock, and wage employment activities	Household and individual	Baseline, midline, and endline surveys

Agricultural production	Secondary	Plots, types of crops, agricultural production, stocks.	Household	Baseline, midline, and endline surveys
Shocks and coping mechanisms	Secondary	Households' main respondent asked what shocks (drought, flood, family death, asset loss, job loss, etc.) households have suffered over the previous 12 months, the severity of each shock, and which coping mechanisms were used to help manage	Household and individual	Baseline, midline, endline, and high-frequency surveys
Financial Outcomes	Secondary	Current savings levels, number of loans taken and current outstanding debt, any insurance products currently owned, and cash transfers	Household and individual	Baseline, midline, and endline surveys
Migration	Secondary	Number of household members that have migrated over the previous six months (or since the last survey), and whether they send money back home	Household and individual	Baseline and endline surveys
Psycho-social well-being	Secondary	Psycho-social well-being index from stress (Cohen), life satisfaction, self-efficacy, aspirations, CESD	Household and individual	Baseline, midline, and endline surveys
Women's empowerment	Secondary	Index using perceptions around gendered decision-making, control over the situations and experiences that affect their lives, and women's time-use, wage, and labor outcomes	Household and individual	Baseline and endline surveys
Social capital	Secondary	Social cohesion, closeness of community index, financial support index, collective action index	Household and individual	Baseline and endline surveys
CT and safety nets	Secondary	Amount and source of transfers from NGO and gov. sources	Household and individual	Baseline, midline, and endline surveys
Time-use	Secondary	Activities and time spent at points of the day for selected household members	Household and individual	Baseline, midline, and endline surveys
Reservation wages	Secondary	Minimum hourly wage selected household members would accept to engage in short term labor and duration they would be willing to work.	Household and individual	Baseline, midline, and endline surveys

6. Data collection and timeline

A two-pronged measurement strategy combining short high-frequency surveys (every month for a subset of households so that each household is interviewed twice every eight months after the baseline survey and before the endline survey, i.e., before and after the lean season) with traditional longer baseline (before the first CT intervention), midline (at the peak of the lean season), and endline surveys (approximately 12–14 months after the starting the early CT intervention and at least four months after completing the final transfer) is recommended to capture the main outcomes of interest. On one hand, high-frequency surveys can capture variations in a subset of key selected outcomes (from a subsample of households) across seasons or months within a year (e.g., intra-annual dynamics of household well-being food security data), providing valuable information for

program teams to optimize the timing of the interventions. Moreover, the high-frequency surveys can capture the behaviors and choices that households are making in response to the cash in real-time, rather than relying on noisy recall measures. On the other hand, extensive surveys undertaken less frequently can capture long-term outcomes and provide information on the resilience pathways of households.

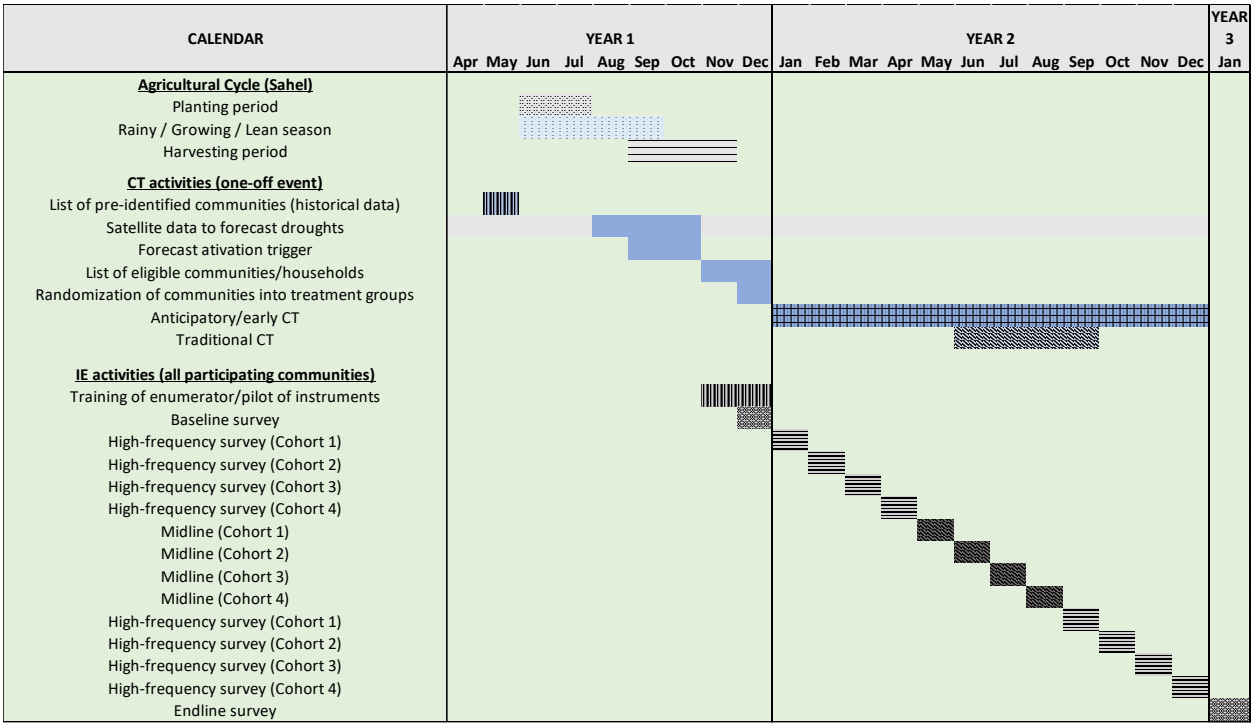
This strategy will allow us to better understand the impacts of early interventions by exploring not only static difference between beneficiaries but also by capturing the dynamics of food security and behaviors throughout the study period. This will build an understanding of how individuals absorb shocks, adapt to changing situations (e.g., stressors), and improve welfare over time. The latter is especially important for interventions attempting to mitigate slow-onset shocks like droughts, as it is expected that climate resilience only improves gradually over time. Climate resilience is a complex concept that is affected by the interaction of many elements, including technology adoption and food security. Therefore, affecting farming households' climate resilience should be considered a medium-term and long-term objective. At the same time, early impact of farmers' climate resilience can and is proposed here to be tested frequently in the short term. Routine data collection should generate the additional benefit of invigorating the dialogue between country offices/policymakers and the research team, as well as predicting potential long-term impact beforehand. Specifically, we intend to present preliminary results emerging from the midline and high-frequency surveys to our government partners as soon as the analysis is complete rather than waiting for the completion of the endline survey.

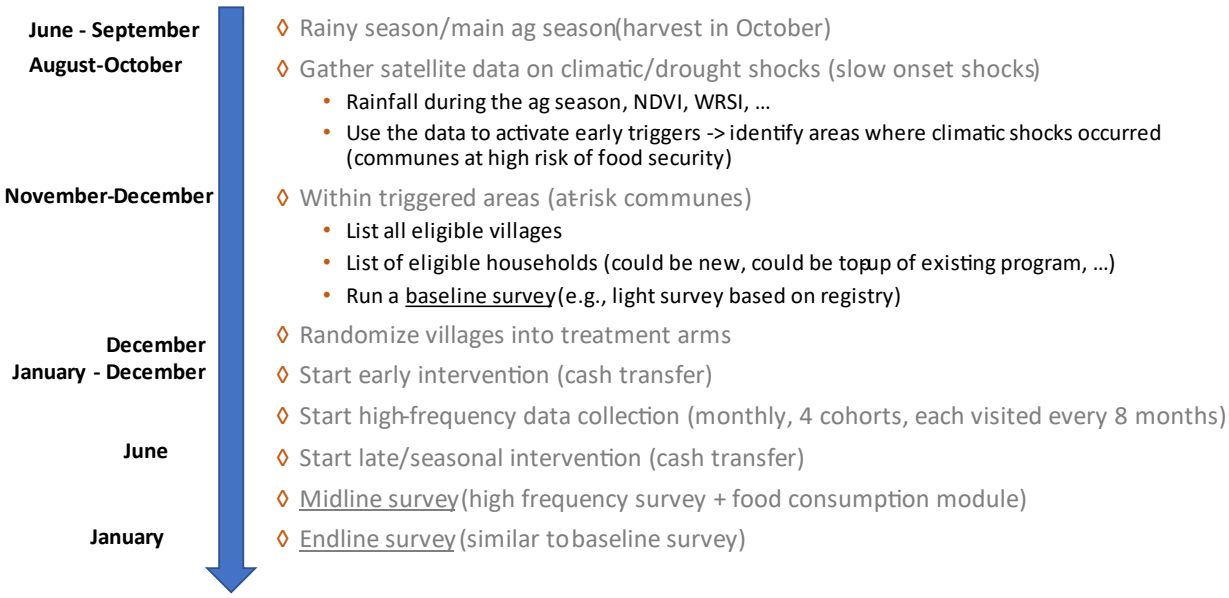
Data will be collected face-to-face using Computer Assisted Personal Interviewing (CAPI) techniques programmed in tablets running the Survey CTO data collection software. Given the outcomes identified, it is estimated that baseline (if possible) and endline surveys should last approximately two hours, while midline surveys last approximately one hour and high-frequency surveys approximately 30 minutes. To compensate for the time spent by respondents during the midline and high-frequency surveys, mechanisms to provide small cash stipends or in-kind rewards (e.g., soap in the case of Niger) should also be considered.

Conducting continuous data collection activities in humanitarian contexts is, nonetheless, challenging in nature. The uncertainty of shocks means that the rapid and agile deployment of data collection should be planned well ahead of time, as the timeline windows to measure effects are usually tight. For instance, the feasibility of baseline data collection depends on the lead time between the forecast trigger and the intervention implementation. Early response programs are implemented based on weather forecasts indicating where hazard impacts are expected to be greatest, implying that, in many contexts, the precise intervention area might be difficult to identify in advance with a high degree of certainty (WFP, forthcoming). This, in turn, can put limitations on the practical feasibility of collecting baseline data.

Table 2 proposes a generic (and tentative) timeline based on the typical agricultural season or cycle observed in the Sahel and the proposed basic RCT design for a one-off CT intervention.

Table 2: *Tentative timeline for the Sahel IE activities*





First, the team pre-identifies regions in the country that are historically prone to drought shocks. Then, Early Warning System (EWS) closely monitors remote sensing data (e.g., satellite images) during the current rainy season (and lean season) from June to September of year one. If weather data forecast a drought event by the end of the harvest period in October of year one, triggers are activated, and planned anticipatory action activities to distribute CT to eligible households are put in motion. To do that, a list of all eligible communities and households within communities should be

developed to comprise the sampling frame for the intervention. This list can be new or a top-up of an existing program (e.g., a safety net program in place).

In the ideal scenario, baseline surveys for a sample of eligible households should take place just prior to the start of the intervention in between November and December of year one. If baseline surveys are not possible, it is proposed to consider a light baseline, leveraging on secondary data from safety nets' social registries (e.g., consumption, assets, income, demographic characteristics) and SOP systems (e.g., data on protracted food insecurity and characteristics of population groups dependent on rainfed agriculture).[5] By December of year one, identified communities must also be randomized into the proposed IE design groups. The CT distribution for the anticipatory group should be in full motion by January of year two. The activities for the impact evaluation in Niger were delayed by two months due to procurement delays on the part of our government counterpart.

High-frequency surveys should start in January to February in year two after the first monthly payment of the early intervention for sampled households representing all randomized communities. Data collection for these short surveys can be conducted monthly in four cohorts of communities, with each cohort being visited once every eight months—once before the lean season and once after.

Traditional response CT for the second randomized group in the basic RCT design should start at the beginning of the lean season, approximately six months after the anticipatory CT, in June of year two. A midline survey (high-frequency survey plus a consumption module) for a sample of households representing all randomized communities should also be planned for June to October, year two, to measure the initial impacts of the intervention at the height of the lean season (e.g., food security). Finally, after all randomized community groups have received some sort of CT support, an endline survey to test longer-term impacts (e.g., nutrition) should be conducted in all randomized communities three to six months after the final cash transfer payment in year three (approximately after 12 to 14 months of the initiation of the anticipatory CT).

7. Power calculations and sample size requirements

Our evaluation is a clustered randomized control trial. We use existing household survey data from Premand and Stoeffler (2022) in Niger to conduct simple power calculations, which will guide the choice of sample size in all three countries. With 56 villages per treatment arm and 23 households per village (1333 households per treatment arm), we are powered to measure an 11.7 percent increase in daily food consumption from a baseline mean of 1.66, a standard deviation of 0.921, and an intra-cluster correlation of 0.12.

To illustrate the tradeoffs made in calculating the sample size, Table 3 illustrates the minimum detectable effect size and number of villages required, with 20 households per village.

Table 3: *Minimum detectable effect sizes and number of clusters required, conditional on a cluster size of 20 households*

[5] In addition, if the baseline is not possible, the research team can consider recall questions during the midline survey.

Minimum detectable effect size (%)	Number of villages required per treatment arm	Number of villages required	Total sample size required
8	124	372	7440
9	98	294	5880
10	80	240	4800
11	66	198	3960
12	55	165	3300
13	47	141	2820
14	41	123	2460
15	36	108	2160

8. Data quality considerations

Protocols based on accepted research standards should guide the IE implementation to ensure that high-quality data is collected, managed, analyzed, and disseminated. DIME has drafted research and coding standards practices that the evaluation team should consider ensuring compliance with data and codes' documentation, archiving, and best-practice standards for high-quality research projects.

The evaluation team will hire survey firms with experienced enumerators who know the local language and field coordinators who are knowledgeable of the context where the data collection is implemented. Data collection instruments were piloted extensively in each country to ensure context-specific details and option-sets for each question were appropriately identified. Enumerators participate in extensive training on the questionnaire and the functioning of the tablets. Training includes classroom and field instruction. At the end of the training sessions, enumerators are selected based on their performance.

During the fieldwork, although the length of the different types of survey will vary depending on the outcomes measured, survey teams will follow the same agreed-upon protocols during each survey round; and the questionnaires will be structured and conducted in an identical format (i.e., multi-module household surveys). Well-programmed CAPI survey instruments ensure that the number of logical inconsistencies in the data is minimized. Additionally, the evaluation team should conduct High Frequency Checks (HFCs) during the entire data collection period. HFCs are a data quality assurance process meant to detect any anomalies in the data collected. They should run daily so the evaluation team can make necessary adjustments to data collection processes in the field. HFCs should look out for the following instances:

- Too many missing observations
- Duplicate observations

- Unusual duration of survey (too short or too long)
- Too many respondents stating “no consent”
- Inconsistent patterns in the data

Any anomalies detected by the research team through this process should be flagged to the survey team immediately. In addition, the evaluation team should also perform a set of back-checks, which consist of drawing a random 10–20 percent sample of households and interviewing them again using a small survey (10 minutes) to validate some of their answers.

As tracking respondents will be needed for follow-up surveys, identifying information such as names, addresses, and phone numbers must be collected. However, personally identifiable information (PII) should be protected through transfer and storage, including in communication with field staff, by using secured cloud servers (OneDrive or Dropbox) and data encryption software (VeraCrypt). Access to PII should be limited to the core impact evaluation team with IRB certification. The impact evaluation team should also consider using GitHub to document the data work and ensure a peer code review environment. Once the research results are published, anonymized data should be made available in a public repository (e.g., WB Microdata Catalog), ensuring data sharing agreements with data owners are in place and reproducibility packages are included as part of the documentation that accompanies the data. Finally, the GitHub entry containing the code should be made publicly available to allow other researchers to replicate the potential research study.

Having an implementation monitoring system is particularly important given the potential multi-country approach where several CT modalities will be simultaneously evaluated. Understanding the challenges and opportunities in implementing these interventions in different contexts would allow learning to validate a more cost-effective anticipatory CT model for future interventions. If possible, evaluations teams should leverage secondary data collected from government institutions implementing related social protections programs. These could participate as part of the SOPs, given the interinstitutional coordination nature of anticipatory interventions to mitigate shocks to assess the implementation process.

The IE team may monitor treatment compliance for IEs in this window in the following way:

- The research team ensures that the unique identifier used in the survey is aligned with the beneficiary ID used in the program.
- The research team cross-checks periodically with field teams to ensure that initial randomization plans are adhered to. Any deviations are recorded and documented systematically to be considered during the analysis stage.
- The research team monitors any new activities introduced into the treatment or control communities and, when possible, captures the impact of these activities through the measurement framework.

9. Ethical considerations

The research team has obtained ethical approval from the University of Oxford, with its internationally accredited International Review Board (IRB), to conduct the proposed RCT study. Where required, local approval will be obtained (and was obtained in Niger). In addition, the following considerations should be paid special attention when implementing the proposed IE design.

9.1. Program Exclusion

Every eligible community and household in the study will be selected through a rigorous process that consults the local authorities to identify the most vulnerable populations to drought. According to the basic design, households from all triggered communities will receive some sort of CT support with differentiation on the timing of the receipt.

9.2. Informed consent

Every household and household member that is enrolled in the research study will provide informed consent to participate in the study. The refusal to respond to participate must not preclude participation in the intervention. Informed consent must be collected for each survey round.

9.3. Privacy during interviews

For more modules, the primary survey respondents will be the head of the household and his/her partner. Despite minimal risks, the research team will take a number of precautions to ensure that questions asked to women are conducted in a manner that ensures privacy and comfort. First, interviews will be conducted outside of earshot of other participants (including those from the same household). Enumerators will request men to step away as they interview the women, with the goal of providing a safe and quiet environment for the survey and ensuring women feel comfortable in answering questions about their time use, income-generating activities, well-being, etc. Second, in contexts where it is particularly necessary, enumerators will also include women to ensure the highest degree of comfort for survey respondents. Third, all enumerators should undergo training that lasts one to two weeks. This should be followed by extensive piloting in the field. The goal of the training is to ensure that enumerators follow survey best practices in terms of protocols and ethics and that questions are asked in a uniform and contextually appropriate manner.

The study will abide by the World Bank Data security guidelines. All data will be anonymized during processing.

10. Impact Evaluation Management

Table 4: *IE Team*

Name	Role	Organization/Unit
Ashley Pople	Principal Investigator (Niger IE co-lead)	Oxford
Patrick Premand	Principal Investigator (Niger IE co-lead)	World Bank (DIME)
Margaux Vinez	Principal Investigator (Mauritania IE lead)	World Bank (SPJ)
Stéphanie Brunelin	Principal Investigator (Senegal IE co-lead)	World Bank (SPJ)
Thomas Bossuroy	Principal Investigator (Senegal IE co-lead)	World Bank (SPJ)
Stefan Dercon	Principal Investigator	Oxford
Mariana Garcia Martinez	Impact Evaluation Analyst	World Bank
Sebastian Insfran Moreno	Impact Evaluation Analyst	World Bank

Dieynab Sidou Faya El Siby Diatta	Research Assistant/Field Coordination	World Bank
Marine Colon de Franciosi	Research Assistant	World Bank
Karim Pare	Field Coordination	World Bank

Margaux Vinez (SPJ) and Patrick Premand (DIME) are responsible for the overall IE activity at the World Bank, together with Ashley Pople (Oxford). Each PI has primary responsibility for a specific country IE, with Stefan Dercon (Oxford) providing scientific oversight at the regional level. The IE team will coordinate closely with operational teams in each country.

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