

Earlier Social Protection and Short-Run Welfare after Drought in Niger

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ABSTRACT

This study examined whether moving cash assistance forward reduced short-run welfare losses among drought-affected households in Niger. It reanalysed verified estimates from a randomized government program that assigned eligible villages to three payment schedules with the same total transfer value. The primary comparison contrasted four large payments delivered before the 2022 lean season with the traditional four-payment schedule delivered during the lean season. Food Consumption Score, monthly food consumption, and borrowing were used to assess short-run welfare and coping. Earlier large payments increased pre-lean food consumption and food security and reduced borrowing relative to the traditional schedule. These differences reversed when the traditional group began receiving transfers and largely disappeared after the lean season. Smaller monthly payments that also started early produced weaker gains, indicating that timing alone did not determine welfare effects. The findings supported a bounded Welfare Protection Window in which sufficiently large liquidity could reduce costly coping before seasonal welfare pressure peaked.



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INTRODUCTION

Drought does not reduce household welfare at a single moment. Income and food availability can weaken well before the period in which humanitarian need is most visible. Poor rural households then have to finance consumption while food prices move against them and farm work remains demanding. Borrowing may bridge part of the gap, but it is a costly substitute when savings are scarce. The timing of cash support can therefore affect welfare even when eligibility and the total transfer amount do not change. Evidence on drought in rural Africa has long shown that households smooth imperfectly when shocks are severe, particularly where assets and credit provide weak protection (Dercon, 2004). Welfare loss can deepen before a crisis is formally recognised by the institutions expected to respond.

Consumption can rise during periods of intense agricultural labour because food has a direct welfare value and also supports work capacity. Prices move across the same agricultural cycle. A household receiving cash before the lean season may buy food when purchasing power is higher, reduce immediate borrowing, or preserve resources that would otherwise be used to cover basic needs. Cash arriving later may still be valuable, yet it reaches the household after some adjustment has already occurred. Classic evidence on seasonal consumption shows why equal consumption across months is not a sensible benchmark in agrarian settings (Paxson, 1993). Liquidity constraints can alter labour supply and production during lean periods (Fink et al., 2020). Credit constraints can also expose households to adverse seasonal prices (Burke et al., 2019).

Social protection research has increasingly absorbed this temporal problem. Adaptive systems connect income support with climate and disaster response when covariate shocks overwhelm household coping (Tenzing, 2020). Cash transfers can reduce vulnerability, although their protective value depends on program design and conditions surrounding delivery (Agrawal et al., 2020). Climate risk mainstreaming raises the same concern (Aleksandrova, 2020). Work on adaptive capacity also separates immediate cash protection from longer adjustment (Sengupta & Costella, 2023). Coverage still says little about whether liquidity arrives while households can avoid expensive adjustments.

Recent Indonesian climate research reaches a similar caution, showing that short-run weather associations depend heavily on local mechanisms and data structure (Kadir, 2026a).

Empirical work on transfer timing is smaller than the literature on transfer size, targeting, or modality. Indonesia's temporary cash transfer program showed that timing affected consumption smoothing around fuel price reforms (Bazzi et al., 2015). Forecast based cash assistance has produced a sharper test in climate settings. Anticipatory transfers before severe flooding in Bangladesh improved welfare and reduced asset loss after the event (Pople et al., 2026). A randomized trial in Bangladesh and Nepal also found that rapid post-flood cash generated food security and psychosocial gains relative to substantially later delivery (Christian et al., 2025). These studies make delivery time an economic variable rather than an administrative footnote.

Drought provides a different setting because the hazard unfolds slowly. A failed rainy season can be detected months before the lean season, while the deepest pressure on food security may emerge later. The interval is economically meaningful. Households may already face weak stocks and high labour needs even though the conventional humanitarian calendar has not reached its peak response period. Niger is particularly useful for studying this margin because rainfall shocks intensify seasonal millet price movements (Kakpo et al., 2022). Credit and asset based self-insurance are also limited in nearby Sahelian settings under severe aggregate drought (Kazianga & Udry, 2006).

A randomized government program in Niger after the 2021 drought varied the schedule of an equal total cash entitlement. Large transfers were paid from March to June 2022 in one arm and during the July to September lean season in another. A third arm started in March with smaller payments extending into January 2023. Pople et al. (2025) report stronger pre-lean food security and food consumption under the large early schedule. The traditional schedule gained ground when its payments began during the lean season.

The comparison raises a narrower question than whether social protection works. All randomized groups received cash, so there is no untreated counterfactual. The relevant question is whether moving a sufficiently large payment forward changes short-run welfare relative to the traditional lean-season schedule. That distinction matters because social protection may have the same nominal value but a different real value across the agricultural year. Related evidence shows that transfer modality and payment architecture can change household responses even when resources are broadly comparable (Hidrobo et al., 2014). Payment mechanisms can also alter transaction costs and the practical value of assistance (Aker et al., 2016).

The Welfare Protection Window is used here as a limited interpretive concept. It refers to the period after a shock has created credible welfare pressure but before costly coping has been fully realised. It is not the earliest possible payment date and it is not a universal number of days. The window begins when additional liquidity has a high marginal value because ordinary buffers are weakening. It closes as debt, consumption compression, or other costly adjustments are already being borne. A transfer can fall inside this window and still be too small to relax the relevant constraint, which is why timing and payment intensity cannot be treated as identical. Its location has to be inferred from household constraints rather than from an administrative calendar alone. The sequence is shown in Picture 1.

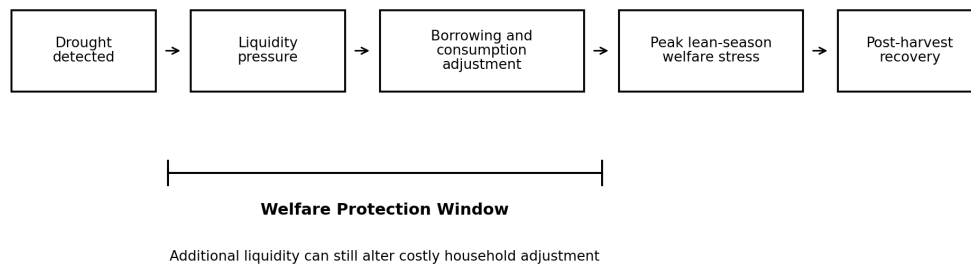


Figure 1 The Welfare Protection Window After Drought

The evidence is examined as a secondary analysis of a verified randomized timing experiment. The primary contrast is the large early schedule against the traditional lean-season schedule because both used four payments of 45,000 CFA francs. The year-long schedule is secondary because frequency and instalment size also changed. Claims are restricted to short-run welfare and financial adjustment. Early cash is not treated as evidence of poverty exit, durable resilience, or a globally optimal payment date.

RESEARCH METHODS

The analysis uses reported estimates and verified outputs from the randomized drought response evaluated by Pople et al. (2025). The study covered 4,144 households in 171 villages across Tagazar, Imanan, and Dantchandou. Severe drought had been detected through a satellite based Water Requirement Satisfaction Index trigger after the 2021 growing season. Eligible households were drawn from the lower part of the proxy means test distribution in the selected communes. The World Bank reproducibility archive confirms the computational reproduction of the published exhibits. At the time of this analysis, the archive contains code and generated outputs but not the household microdata, so no household-level re-estimation is claimed (Pople et al., 2025).

All three arms received 180,000 CFA francs. The traditional schedule paid four instalments of 45,000 CFA francs from July to September 2022. The early short schedule used the same instalment amount and number of payments from March to June, four months earlier. The early long schedule began in March and divided the entitlement into twelve payments of 15,000 CFA francs extending to January 2023. The early short comparison is therefore closest to a timing contrast. Early long is informative, but its interpretation also reflects payment frequency and contemporaneous liquidity.

Table 1 Selected Baseline Characteristics by Randomized Payment Schedule

Variable	Full	Traditional	Early short	Early long	p value
Household size	7.50	7.58	7.47	7.44	0.73
Monthly food consumption in CFA	45,135.21	45,619.31	46,388.48	43,270.29	0.19
Monthly per capita consumption adult equivalent	18,095.72	18,225.26	18,517.61	17,503.42	0.41
Food Consumption Score	20.97	20.92	21.28	20.68	0.88
Food Consumption Score below 21	0.51	0.51	0.50	0.52	0.84
Has savings	0.05	0.05	0.06	0.05	0.63
Took loan in past 12 months	0.64	0.65	0.63	0.63	0.85
Confident of raising CFAF 40,000	0.08	0.08	0.07	0.09	0.45
Drought in past 12 months	0.89	0.90	0.89	0.89	0.90

Food security and monthly food consumption are the two welfare outcomes retained for the present analysis. Food security is measured with the Food Consumption Score, which weights the frequency of consumption across eight food groups. Monthly food consumption records the value of food obtained through purchases, own production, and gifts. Values were price adjusted in the source study. Surveys cover the pre-lean period, the lean season, the months after harvest, and an endline in

May to June 2023. Borrowing is used as a mechanism outcome because short-term credit becomes especially relevant when households lack liquid reserves.

The source study estimates intent-to-treat effects within each period using the traditional response as the reference arm. Treatment assignment was stratified by village size and proxy means test categories. The published specifications include the randomization strata and survey cohort fixed effects, a control for households surveyed twice where relevant, and standard errors clustered at village level. Baseline controls selected through post-double-selection procedures are used as robustness checks in the source analysis. False discovery rate adjustment follows Benjamini, Krieger, and Yekutieli (2006) and the implementation described by Anderson (2008).

No coefficient in this article is presented as a newly estimated household-level treatment effect. Table 2 reproduces the period-specific intent-to-treat contrasts needed for the timing question and reports the source study's test across the pre-lean and lean periods. Picture 2 plots the published group means. Table 3 narrows the pre-specified heterogeneity analysis to baseline liquid asset holdings, which is the closest available indicator of self-insurance capacity. Robustness claims are limited to checks documented in the source paper and verified outputs.

Causal interpretation is confined to relative payment schedules among eligible recipients. The data cannot identify the effect of receiving cash rather than receiving nothing. They also do not identify the effect of drought itself, since the experiment was conducted after drought had already occurred in the study communes. A persistent poverty effect is not estimable from the outcomes used here. Evidence at the 0.10 level is described as suggestive rather than definitive, and the early long arm is not used to isolate timing because instalment size changed with the schedule.

RESULTS AND DISCUSSION

Baseline conditions leave little doubt that the sample had weak capacity to absorb another liquidity shock. Mean Food Consumption Score was 20.97 and 51 percent of households fell below a score of 21. Only 5 percent reported savings. About 64 percent had borrowed during the previous year, while 8 percent were confident that they could raise 40,000 CFA francs in an emergency. The randomized arms were balanced on the selected baseline measures shown in Table 1. These figures matter more than the demographic averages because they establish the limited self-insurance environment in which payment timing was varied.

Large early payments produced a clear pre-lean welfare difference. Relative to the traditional schedule, early short increased the Food Consumption Score by 1.85 points and monthly food consumption by 8,192 CFA francs. The traditional group had a pre-lean mean of 22.83 on the food score and 46,463 CFA francs in monthly food consumption. The corresponding early short means were 24.66 and 54,651 CFA francs. Both primary contrasts remained supported after the source study's multiple inference adjustment. Food needs were already acute in this period, yet the main cereal prices had not reached their lean-season peak. The estimates are therefore consistent with liquidity arriving before a further deterioration in purchasing power, rather than with cash merely advancing consumption that was not yet needed.

Table 2 Reported Intent-to-Treat Contrasts for Economic Welfare

Outcome and schedule	Pre-lean	Lean	Post-lean	Endline	Pre-lean plus lean test p
FCS Early short	1.85*** (0.51)	-1.17** (0.52)	-0.41 (0.54)	0.22 (0.60)	0.41
FCS Early long	0.12 (0.49)	-0.58 (0.56)	-0.04 (0.58)	0.70 (0.59)	0.57
Food consumption Early short	8,192.21*** (1,538.85)	-3,397.97** (1,418.99)	-2,192.22 (1,549.16)	202.18 (1,365.20)	0.06
Food consumption Early long	2,474.94* (1,422.94)	-4,149.97*** (1,358.67)	1,319.88 (1,941.43)	806.56 (1,346.66)	0.49

Note. Coefficients compare each early schedule with the traditional lean-season schedule. Standard errors are in parentheses. The last column reports the source study test across pre-lean and lean periods. Source Pople et al. (2025), Table 2. * $p < .10$, ** $p < .05$, *** $p < .01$.

Early long did not reproduce the same pre-lean pattern despite starting at the same time. Monthly food consumption was 2,475 CFA francs above the traditional group, while the Food Consumption Score difference was small. Each payment in this arm was only one third of the early

short instalment. Timing alone therefore does not explain the early short result. A household may receive cash at the relevant moment and still remain constrained if the payment does not provide enough current liquidity. Evidence from unconditional cash transfers more broadly also shows that transfer size changes the margin on which households can respond (Haushofer & Shapiro, 2016).

Relative differences reversed during the lean season when the traditional group began to receive its larger payments. Food Consumption Score was 1.17 points lower in early short than in the traditional group, and monthly food consumption was about 3,398 CFA francs lower. Early long was also lower by about 4,150 CFA francs. Current payments plainly mattered while households remained constrained. The reversal is therefore part of the timing pattern, not evidence that one schedule dominates in every period.

Across the pre-lean and lean periods, the reported food consumption contrasts point in favour of early short, but the inferential evidence is not strong enough for an unqualified claim. The sum of the two period-specific coefficients is about 4,794 CFA francs, and the source test for whether the combined contrast equals zero gives $p = 0.06$. The Food Consumption Score does not show comparable evidence, with $p = 0.41$ for the corresponding test. The most defensible reading is therefore that earlier large cash produced suggestive net short-run consumption gains, alongside clearer evidence that it shifted the timing of food security protection.

Post-harvest convergence is equally important. Early short differs from the traditional schedule by minus 2,192 CFA francs in post-lean food consumption and only 202 CFA francs at endline, neither of which is statistically distinguishable from zero in the reported models. Food security follows the same broad pattern. These results rule against describing earlier cash as a durable poverty reduction intervention on the basis of this experiment. The program changed the seasonal location of welfare support. It did not produce a persistently higher consumption path after transfers had ended.

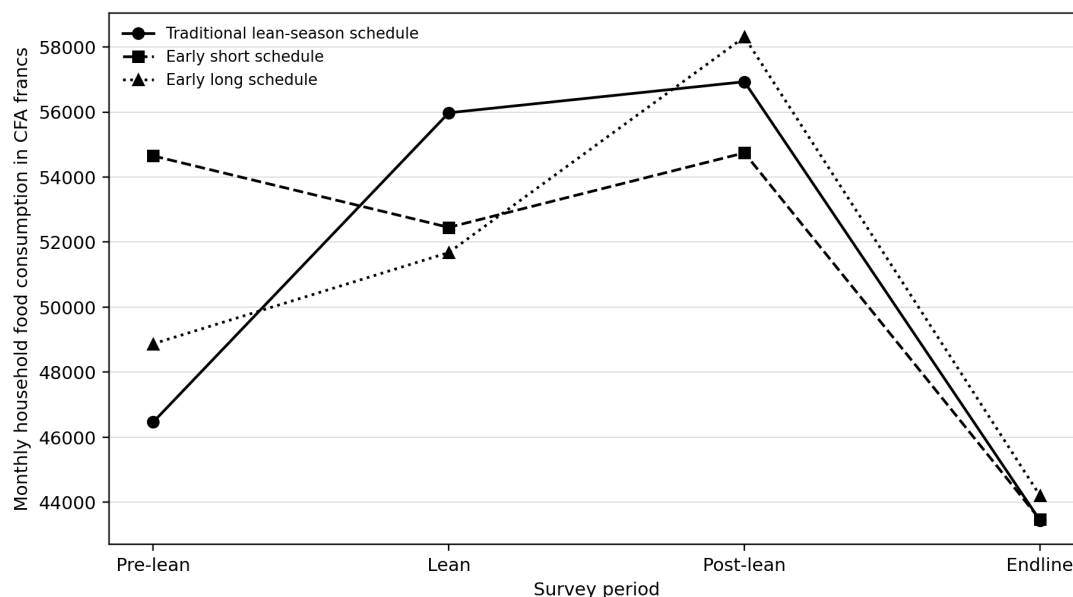


Figure 2 Mean Monthly Food Consumption by Payment Schedule

Borrowing provides a plausible financial mechanism. Before the lean season, 56 percent of households in the traditional group took a loan. Early short reduced borrowing incidence by 16 percentage points and monthly borrowing by about 3,130 CFA francs. Early long also reduced borrowing, though by less. Once traditional payments began during the lean season, borrowing became lower in the traditional arm than in the two early arms. The debt response follows the payment calendar closely. Earlier liquidity reduced the need to borrow before the lean season, but it did not remove financing pressure later in the year. That pattern is important because it ties the welfare result to a concrete household adjustment rather than to an abstract timing label.

That movement in borrowing is economically meaningful in a setting where formal smoothing instruments are thin. Informal debt can preserve consumption but may carry high implicit costs or restrict later choices. Evidence from Burkina Faso shows how severe drought can overwhelm livestock based self-insurance (Kazianga & Udry, 2006). Guaranteed liquidity under climate risk can also change

production and adaptation decisions when credit constraints bind (Lane, 2024). In Niger, however, the trial does not show durable livelihood effects from payment timing. The borrowing result therefore supports a short-run liquidity channel rather than a broader claim about structural transformation.

Baseline liquid assets do not reveal a stable subgroup for whom early payments worked systematically better. The interaction estimates in Table 3 change direction across periods and are generally imprecise. One early long interaction for pre-lean food consumption reaches the 0.10 level, but it does not persist. The source study reports the same absence of a systematic pattern for diversified off-farm work. Vulnerability heterogeneity remains plausible, yet these estimates do not support a targeting claim.

Table 3 Heterogeneity by Baseline Liquid Asset Holdings

Outcome and term	Pre-lean	Lean	Post-lean	Endline
FCS Early short	1.36* (0.77)	-1.34* (0.72)	-1.17 (0.79)	0.24 (0.78)
FCS Early short × liquid	0.76 (0.84)	0.27 (0.77)	1.17 (0.88)	0.00 (0.84)
Food consumption Early short	9,045.78*** (2,423.91)	-2,668.52 (2,137.19)	-4,446.54** (1,848.26)	793.73 (1,947.51)
Food consumption Early short × liquid	-1,654.16 (2,677.09)	-990.10 (2,445.46)	3,430.46 (2,118.48)	-971.46 (1,985.47)

The Welfare Protection Window fits the observed sequence without requiring a permanent treatment effect. Drought had already damaged the agricultural year when early short payments began. Households faced demanding farm work and weak financial buffers before the formal lean-season response. Food prices rose further as the season progressed, with maize and millet prices around 40 percent higher in July and August than after the 2022 harvest. Earlier cash arrived while purchasing power was less eroded and borrowing needs were already material. The same window would not necessarily appear in another setting. It depends on when liquidity constraints tighten, when prices move, and when households begin to use coping strategies that are costly to reverse. Later assistance can still raise current welfare even after that point, as the lean-season coefficients show.

Earlier is not automatically better under this interpretation. A transfer sent too far ahead of predictable need may be saved, diverted to another urgent use, or lose relevance before the constraint becomes binding. A transfer that is early but small may also fail to relax the constraint, as the early long comparison suggests. Cash and voucher experiments show that the same nominal resource can generate different outcomes when delivery conditions and local markets differ (Aker, 2017). Related randomized evidence from Niger also shows that transfer modality can affect food security and expenditure patterns (Hoddinott et al., 2018). The useful policy margin is timely and adequate liquidity, not earliness by itself.

Longer-run resilience should remain separate from this short-run protection function. Multi-year cash programs in the Sahel can strengthen consumption protection after drought through savings and income smoothing (Premand & Stoeffler, 2022). Productive safety nets can alter diversification and household risk strategies when support is sustained and linked to livelihoods (Macours et al., 2022). The Niger timing experiment has a different object. It changes when a fixed shock-response entitlement becomes available. The disappearance of welfare differences after harvest is therefore not a failure of the intervention. It shows the limit of what a temporary timing change can reasonably be expected to do.

Policy design should treat delivery latency as part of benefit quality when the hazard is slow enough to create usable warning time. Forecasts and satellite triggers have welfare value only if financing and payment systems can turn information into spendable household liquidity before coping costs deepen. Stress-testing of social protection systems can help identify where disaster exposure creates temporary poverty and coverage gaps (Gasior et al., 2024). Digital delivery can reduce some transaction costs, although implementation capacity still matters (Aker et al., 2016). Climate-responsive protection is therefore not only a question of expanding enrolment after a crisis has become visible (Costella et al., 2023). Indonesian work on price controls likewise shows that formal policy can redistribute scarcity rather than remove it (Kadir, 2026b), while environmental governance research shows how institutional gaps can weaken formal protection (Mappaselleng & Kadir, 2026).

Flood evidence points in the same direction, although the relevant interval is shorter. Anticipatory cash in Bangladesh improved welfare around a forecast flood and reduced asset loss (Pople et al., 2026). Rapid cash after floods in Bangladesh and Nepal also outperformed much later delivery (Christian et al., 2025). Drought separates warning and peak need over months. Floods compress them into days. What matters is whether liquidity reaches households while it can still change feasible responses.

Three limitations remain. The first is the absence of a no-cash group, which prevents comparison with untreated households. The second is that the public reproducibility archive does not yet contain the household microdata, so the present analysis cannot estimate alternative specifications beyond reported and verified outputs. The third is external validity. The trial took place among very poor households in three drought-affected communes with strong seasonality and limited liquidity. Different market access, social insurance, or agricultural calendars could move the relevant timing window. These limits narrow the claim, but they do not erase the randomized evidence on relative schedules.

CONCLUSION

Large cash transfers delivered before Niger's 2022 lean season improved food security and food consumption relative to the traditional lean-season schedule during the months in which the early group received payments. The relative advantage reversed when the traditional group began to receive cash. For food consumption, the combined pre-lean and lean contrast is suggestive rather than conclusive, while post-harvest and endline differences disappear. Borrowing moved with the payment schedule in a similar way. The evidence therefore supports a timing effect on short-run welfare and liquidity management, not a claim of permanent poverty reduction. The Welfare Protection Window gives that result a bounded interpretation. A useful window exists when the consequences of a shock are already credible, household buffers are weakening, and costly coping has not yet been fully realised. Earlier short transfers fit that setting in Niger. The weaker early long result also shows why timing cannot be separated from payment intensity. A payment can arrive in the relevant period without being large enough to change the household constraint that matters. The concept should therefore be tested against actual welfare trajectories rather than used as a slogan for paying as early as possible.

Future work needs household panel data that place transfer receipt, climate exposure, consumption, and coping on the same timeline. Household fixed effects or difference-in-differences are suitable only when assignment and pre-trends support them. A focused test of pre-shock self-insurance would be more useful than many subgroup interactions. For now, the Niger experiment supports a narrower conclusion. Payment timing belongs inside the design of shock-responsive benefits because households can bear part of the waiting cost before assistance arrives.

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