WFP EVALUATION

Impact Evaluation of Farmer Support Activity in Ghana

Impact Evaluation Report

WFP Office of Evaluation

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Key personnel for the evaluation

WFP OFFICE OF EVALUATION

Director of Evaluation	Anne-Claire Luzot
Head of Impact Evaluation Unit	Jonas Heirman
Evaluation Officer (Impact)	Felipe Alexander Dunsch
Evaluation Officer (Impact)	Jennifer Waidler
Evaluation Analyst	Roxana Elena Manea
Evaluation Analyst	Ola El Toukhi
Evaluation Analyst	Nidhila Adusumalli

WORLD BANK DEVELOPMENT IMPACT (DIME)

Research Manager	Florence Kondylis
Senior Economist	Paul J. Christian

WFP GHANA COUNTRY AND FIELD OFFICES

Deputy Country Director	Anna Mukiibi-Bunnya
Head of RAM	Olatunji Sonoiki
M&E Officer	Louisa Asigri Telly
Programme Policy Officer	Simon Tarr
Head of Tamale Field Office	Gyamila Abdulwahabi
Programme Assistant	Mohammed Salisu
Procurement Officer	Alaa Ismail

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Executive Summary

1. **Context.** Northern Ghana's socioeconomic development is lagging behind the rest of the country. Additionally, the area is exposed to conflict and climate-related shocks. Although the agricultural sector is key to the region's economic welfare, rising agricultural input prices and low soil fertility have discouraged smallholder farmers from engaging in agricultural activities. The violence in Burkina Faso, which led to an influx of refugees into Ghana, has also put additional strain on the north's limited resources. Finally, high food inflation and a generally slow economic recovery have further motivated the need to support farmers in these relatively worse-off areas of the country.

2. **Project intervention.** As a response, the World Food Programme (WFP) in partnership with the United States Agency for International Development (USAID) launched the Farmer Support Activity (FSA) in Ghana in 2023 to reach smallholder famers in four regions: Northern, North East, Upper East, and Upper West. Seventeen districts and 17,000 farmers were targeted. The FSA amounted to a total support of USD 315 per farmer, which was also accompanied by sensitization activities and messaging campaigns during the 2023 main agricultural season.

3. **Impact evaluation.** The WFP Ghana Country Office (CO) as well as USAID were interested to learn which payment schedule would best support the objectives of the Farmer Support Activity in Ghana. The CO had to decide between delivering the money as lump-sum support (1 x 285 USD and 2 x 15 USD) or make the default monthly transfers for three months (3 x 105 USD). *A priori,* it was unclear which strategy would deliver better outcomes in view of the FSA objectives, as the literature comparing payment frequencies is still scarce. Consequently, the Country Office requested WFP's Office of Evaluation (OEV) to conduct a rigorous impact evaluation, which was delivered in partnership with the World Bank Development Impact (DIME) department. Eligible farmers were randomly assigned to receive lump-sum or monthly support for three months. Data was collected in three waves to compare outcomes and establish the relative strengths of each payment schedule.

4. **Lump-sum support increases crop investments and revenues**. Farmers in the lump-sum group cultivate slightly more land (5 percent), use significantly more household labour (18 percent), and spend more on chemical fertilizer (7.5 percent). Lump-sum support is especially suited to relax the financial constraints of smaller farms, which then spend significantly more on fertilizer as compared to equally sized farms receiving monthly transfers. The more intensive use of specific agricultural inputs translates into a 5 percent greater harvest for farmers in the lump-sum group; an increase which is economically meaningful but not statistically significant at conventional levels of confidence due to imprecise measurement. Ultimately, the lump-sum households report significantly higher revenue from the sale of crops: between 13 and 17 percent as compared to the sales of the group receiving monthly transfers. If the boost is expressed as profits, then the advantage of the lump-sum group represents 5 percent of the FSA overall support.

5. **Beneficiaries receiving lump support enjoy better food security in the short run.** The initial advantage of the lump sum group, i.e., a 3.5 percent increase in the Food Consumption Score and a 10.1 percent reduction in the reduced Coping Strategies Index, fades over time, as the monthly group receives their additional transfers. Additionally, there is a slight heterogeneity regarding farm size: smaller farms benefit more from receiving lump-sum as opposed to monthly instalments. For households with bigger farm operations, however, it does not matter whether the transfer is made as lump-sum or monthly support; their food security is largely the same.

6. **Beneficiaries receiving monthly support employ more diverse strategies.** The monthly transfers group holds slightly more livestock (22, 16, and 40 percent more cattle, sheep, and pigs, respectively). Moreover, the households receiving monthly transfers also accumulate more household assets and a few farm assets such as machetes and carts. Furthermore, the monthly transfers group acquires more credit from formal institutions as compared to the lump-sum group. This may suggest the farmers' use of credit to complement the FSA support when buying expensive assets. Finally, children residing in households receiving monthly support are 1 to 2 percentage points more likely to still be in school up to 6 months after the last FSA payment was made.

7. **Instances of modest differential impacts or no significant differences.** There are no significant differences between the two groups regarding wage employment or business engagement. Households also do not allocate resources differently to meet their food or non-food needs. Having recently received a transfer does show a modest positive impact on some mental health measures. However, at endline, mental health outcomes are the same for both programme groups.

8. **Conclusions and considerations.** Lump-sum transfers enabled the channelling of significantly more resources toward crop cultivation, e.g., the buying of inputs such as chemical fertilizer. This was desirable as the FSA objectives were chiefly related to farmers' agricultural output. In turn, households receiving monthly transfers have employed more diversified livelihood strategies. They, too, invested in agriculture but to a lesser extent and instead favoured an increase in livestock (e.g., sheep, cows, and pigs) and assets, the latter of which, however, are likely not all productive (e.g., beds and mattresses), but some can be (e.g., bicycles, phones, motorbikes).

9. **Small (costless) programme variations can increase value.** This impact evaluation has shown that project implementers can create significant additional value by making small adjustments to a project's implementation strategy at little—or in the case of FSA—no additional cost, i.e., switching from monthly to lump-based farmer support.

1. Introduction

11. WFP, in partnership with the U.S. Agency for International Development (USAID), launched the Farmer Support Activity (FSA) in Ghana in response to the compounding effects of the Russia-Ukraine conflict on world markets and the economic downturn caused by COVID-19, which have both deepened the vulnerability of smallholder farmers. The FSA aims to strengthen resilience, preserve agricultural productivity, and enhance the awareness and capacity of 17,000 smallholder farmers across 17 districts located within USAID's Feed the Future Zone of Influence in the Upper East, Upper West, Northeast, and Northern regions. These areas were specifically selected due to their adverse economic conditions and rising inflation, as the country is grappling with its worst economic crisis in decades. WFP executed the FSA goals through a cash transfer program complemented by financial and agricultural sensitization activities.

12. WFP's Country Office (CO) in Ghana, the Impact Evaluation Unit of the Office of Evaluation (OEV), and the World Bank's Development Impact Department (DIME) have partnered, with support from USAID Ghana and USAID's Bureau of Humanitarian Assistance (BHA), to generate evidence on which cash transfer modality is best suited to meet the objectives of strengthening resilience and preserving agricultural productivity in Ghana.

13. This impact evaluation complements the work conducted under the Climate & Resilience Impact Evaluation Window, created by OEV, WFP's Climate and Resilience Service in the Programme Policy and Guidance Division, in partnership with the World Bank DIME. The Climate & Resilience Window aims to establish portfolios of impact evaluations across a series of countries utilizing the same or very similar designs to increase the generalizability of results. This impact evaluation is also part of OEV's "Humanitarian Workstream"—supported by USAID's BHA—whose goal is to optimize humanitarian programming through the use of rigorous evidence.

1.1 Country context

14. Ghana is a lower middle-income country located in the Gulf of Guinea with a population of approx. 34 million. The country benefited from considerable poverty reduction up until 2016. At that time, the poverty rate was estimated to be 25 percent.[1] Thereafter, the trend has been one of poverty concentration, i.e., increasing poverty rates in the north while the southern regions continued to improve. However, the COVID-19 pandemic as well as other shocks, e.g., rising agricultural input prices due to global conflicts, have compounded the country's fiscal vulnerabilities leading to a loss of purchasing power. As food inflation has outpaced non-food inflation, the poorest of households have experienced a continued increase in their food expenditure relative to their total budget.[2]

15. Northern Ghana is affected by slow economic growth, limited development, conflict and climate-related shocks. Violence in Burkina Faso has also led to an influx of refugees into northern Ghana, placing further strain on the north's limited economic resources.

16. Agriculture is a significant contributor to the Ghanaian economy, providing income and employment opportunities for over 40 percent of the population[3] and accounting for almost 20 percent of GDP.[4] The sector remains a critical component of the country's economic growth and development, particularly in rural areas, where industrial activities are not present, and income-generating opportunities are limited.

[1] https://pip.worldbank.org/country-profiles/GHA
[2] World Bank Ghana Poverty and Equity Brief. Downloaded October 2024. https://www.worldbank.org/en/topic/poverty/publication/poverty-and-equity-briefs
[3] https://data.worldbank.org/indicator/SL.AGR.EMPL.ZS?locations=GH&view=chart
[4] https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?locations=GH

17. The evaluation of the WFP Ghana Country Strategic Plan (2019–2023)[5], commissioned by WFP's Office of Evaluation, notes that while agriculture is central to rural livelihoods, productivity is hindered by factors such as limited access to finance, low literacy levels among farmers, outdated technology, poor infrastructure, and high post-harvest losses, especially for perishable crops like fruits and vegetables.

18. The Government of Ghana has encountered challenges in providing fertilizer support to farmers due to budgetary constraints and rising costs. Fertilizer prices have increased significantly, making it challenging for smallholder farmers to access the input. This has been particularly problematic in the northern regions of the country which are characterized by low soil fertility and thus require relatively more fertilizer. In turn, the high input and production costs discourage smallholder farmers, especially youth, from pursuing agriculture as a livelihood. Finally, the upward trend in input costs happened against the background of limited resilience.

19. Against this backdrop, the WFP Ghana Country Office, with financial support from USAID, implemented the Farmer Support Activity in northern Ghana between April 2023 and April 2024 to alleviate the strain faced by smallholder farmers in the most vulnerable regions.

2. Programme description

20. The FSA support consisted of cash-based transfers delivered via mobile money and included financial and agricultural sensitization. Transfers totalled 3,465 GHS (315 USD) per farmer and reached around 17,000 smallholder farmers across 17 districts in four of Ghana's regions: Northern, North East, Upper East, and Upper West.

21. The Country Office had to decide between two cash transfer strategies: (i) giving the support all at once, or (ii) dividing it into 3 regular payments during the lean season. The uncertainty around which strategy may perform better in the context of Ghana motivated the inclusion of an impact evaluation component to accompany the project.

22. The design, data, and results of this impact evaluation are presented in the following sections. The objective of the impact evaluation has been to understand and measure the comparative advantage—in terms of food security, agricultural investment, and production—of disbursing cash to farmers as lump-sum versus equal monthly transfers during the planting season.

23. In collaboration with agricultural extension agents from the Ministry of Food and Agriculture and other partners, such as the Peasant Farmers Association of Ghana and the Chamber of Agribusiness Ghana, all smallholder farmers receiving cash support were also sensitized on how to wisely invest the funds to boost their agricultural output and reduce postharvest losses. Specifically, farmers received information on good agricultural practices, and they were linked to nearby agricultural input dealers to enable them to purchase good-quality inputs like fertilizer and seeds. Sensitization was done through traditional community structures, leveraging print and electronic media.

24. The FSA support was largely designed to cater to the needs of smallholder farmers: notably fertilizer, seed, and mechanization support, in addition to a small food component such that farmers are not forced to make trade-offs between their food and livelihood needs. The transfers were labelled accordingly, and farmers were told about their purposes. The objective was to reinforce their resilience, preserve their agricultural productivity, and prevent them from employing negative coping mechanisms, which in the medium- to long-run can compromise resilience and food security, and heighten poverty.

25. WFP used a two-step approach to identify programme beneficiaries: geographic and community/farmer-level targeting.

26. Regarding the geographic targeting, the main eligibility criteria were: (a) the prevalence of food insecurity, (b) access to livelihood opportunities (particularly farming), (c) the existence of complementary

[5] https://www.wfp.org/operations/gh02-ghana-country-strategic-plan-2019-2023

livelihood interventions, and (d) part of USAID's Feed the Future Zone of Influence in Ghana.[6] See Figure 1 for an overview of the targeted districts.

27. Smallholder farmers with access to arable land (1 or 0.5 hectares or more for men and women, respectively, and up to 10 hectares (24 acres) of land, whether owned or rented) were identified in each community while prioritizing the targeting of vulnerable people such as the elderly, people with disabilities, female-headed households, youth, and large households. In this regard, WFP collaborated closely with the district directorates of agriculture to identify and prioritize communities. Of the 17,000 targeted smallholder farmers, 58.8 percent were female, 26 percent were youth (aged 18 to 29 years old), and 5 percent were people living with disabilities.

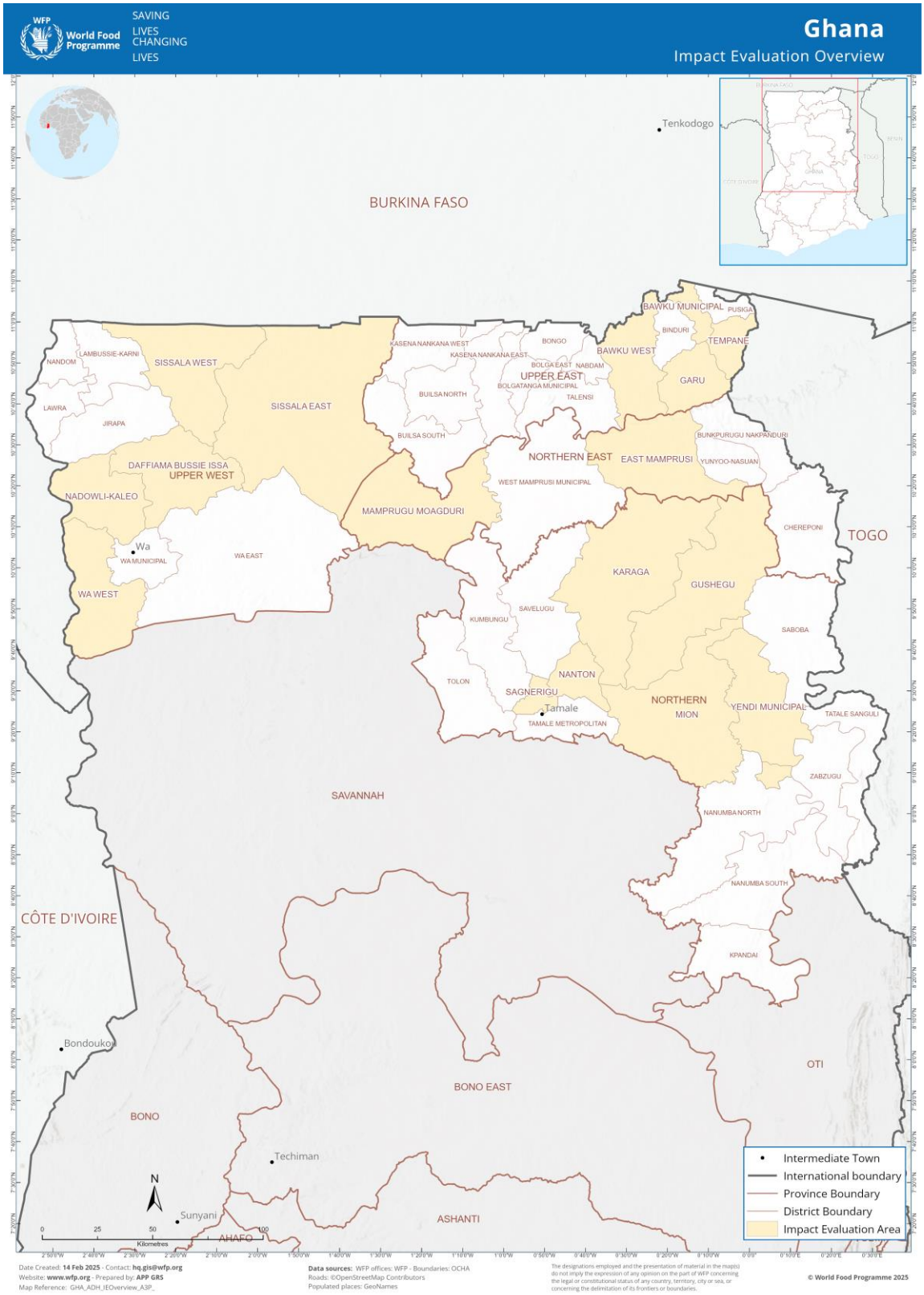
3. Design and methodology

3.1 Motivation

28. Cash transfers targeting vulnerable households and individuals in developing countries have well-documented positive impacts on wellbeing indicators such as food and non-food consumption, school enrolment, access to health services, psychological well-being, and the prevalence of violence.[7,8,9,10] Some studies have also shown productive effects in the form of livelihood diversification through increased assets and livestock ownership.[11]

[6] https://www.feedthefuture.gov/country/ghana/
[7] Leight, J., Hirvonen, K., & Zafar, S. (2024). The effectiveness of cash and cash plus interventions on livelihoods outcomes: Evidence from a systematic review and meta-analysis. IFPRI Discussion Paper 02262.
[8] Loeser, J., Ozler, B. & Premand, P. (2022). What have we learned about cash transfers? Development Impact blog: What have we learned about cash transfers? (worldbank.org).
[9] Tirivayi, N., Waidler, J. & Otchere, F. (2021). Cash transfers: past, present, future. Evidence and lessons learned from the Transfer Project. UNICEF Innocenti Research Brief, 2021-07.
[10] Bastagli, F., Hagen-Zanker, J., Harman, L., Barca, V., Sturge, G., & Schmidt, T. (2019). The impact of cash transfers: a review of the evidence from low-and middle-income countries. Journal of Social Policy, 48(3), 569-594.
[11] Beazley, R., & Farhat, M. (2016). How can Lump-sum Cash Transfers be designed to improve their Productive Potential. Working Paper.

Figure 1: Map of FSA-targeted and data collection districts within Ghana



29. Most cash transfers addressing humanitarian needs are in the form of regular transfers to allow for efficient consumption smoothing. Transfer sizes are often calculated to assist people in meeting their basic needs. However, larger payments may allow farmers to invest in productive assets more easily, as

compared to more frequent and smaller instalments.[12] A second important dimension is the timing of transfers, and there is not enough evidence regarding when cash transfers can be most useful to improving households' productivity (e.g., during the lean, planting, or harvest seasons).

30. To increase the productive potential of cash transfers, key programme decisions relate to the size, frequency, and timing of transfers. This question becomes particularly important for developing economies, given that extreme poverty and saving constraints can lead to poverty traps, thus suggesting a role for 'lumpy' transfers to spur investment.[13] Beazley and Farhat argue that *"[i]f lump-sum payments did significantly increase the productive effects of such programmes, then minor changes to programme designs could reap huge benefits and all at relatively little cost*".[14] However, for lump-sum payments to boost productivity, markets need to be functioning. The same authors note that assets must be readily available for purchase, and farmers should possess the know-how regarding the productive uses of transfers.

31. The number of studies comparing the effects of a lump-sum transfer to equivalent regular cash payments is limited. Haushofer and Shapiro[15, 16] found that households assigned to receive lump support – rather than a series of nine monthly instalments – were more likely to invest in assets like livestock, furniture, and metal roofs, while those receiving the regular transfers experienced an improvement in food security. Although there were no differences between the two treatment arms regarding their self-reported measures of psychological well-being, cortisol levels were nevertheless significantly higher for the recipients of monthly instalments, which suggested higher stress. The authors argued that the results could be explained by households being unable to save or invest their transfers, which in turn led to increased stress.

32. In contrast, a universal basic income trial in Western Kenya did not find large differences between providing lump-sum transfers (500 USD delivered in two equally sized instalments three months apart) and daily instalments (0.75 USD/day) over the course of two years.[17] Meanwhile, an evaluation of a UNICEF program in Democratic Republic of the Congo compared households assigned to receive a single transfer of 120 USD with households receiving the transfer in instalments of 60 USD, 30 USD, and 30 USD over three months. Households that received the three instalments were more likely to have spent the money on livestock, agricultural inputs, school fees, and clothing than those who received the lump-sum sum. There were no differences in impacts on income, savings, food security, children's health and education, or women's decision-making. Nevertheless, qualitative data indicated the beneficiaries' preference for a single transfer because it enabled them to make larger investments and plan their purchases more effectively.[18]

33. A recently published meta-analysis[19] combining 114 studies of unconditional cash transfers found that regular cash transfers (ongoing programmes) produce larger consumption effects, while lump-sum transfers or completed streams (referring to programmes which have ended) enable greater asset accumulation. However, lack of household-level data impedes a further disaggregation of the expenditure categories to understand, for instance, the assets on which recipients spend their cash. Moreover, the authors mention that "*we need more immediate data, data that helps illuminate how [lump-sum] transfers*

[12] Crosta, T., Karlan, D., Ong, F., Rüschenpöhler, J., & Udry, C. (2024). Unconditional Cash Transfers: A Bayesian Meta-Analysis of Randomized Evaluations in Low- and Middle-Income Countries. NBER Working Paper No. 32779.
[13] Banerjee, A., Hanna, B., Olken, B. & Sverdlin-Liske, D. (2022). Social protection in the developing world. Microsoft Word - 221026 social safety nets paper revised (mit.edu)
[14] Beazley, R., & Farhat, M. (2016). How can Lump-sum Cash Transfers be designed to improve their Productive Potential. Working Paper.
[15] Haushofer, J., & Shapiro, J. (2018). The long-term impact of unconditional cash transfers: experimental evidence from Kenya. Busara Center for Behavioral Economics, Nairobi, Kenya.
[16] Haushofer, J., & Shapiro, J. (2016). The short-term impact of unconditional cash transfers to the poor: experimental evidence from Kenya. The Quarterly Journal of Economics, 131(4), 1973-2042.
[17] Banerjee, A., Faye, M., Krueger, A., Niehaus, P., & Suri, T. (2020). Effects of a Universal Basic Income during the pandemic. Innovations for Poverty Action Working Paper.
[18] Bonilla, J., Carson, K., Kiggundu, G., Morey, M., Ring, H., Nillesen, E., ... & Michel, S. (2017). Humanitarian cash transfers in the Democratic Republic of the Congo: evidence from UNICEF's ARCC II Programme. American Institutes for Research Final Report.
[19] Crosta, T., Karlan, D., Ong, F., Rüschenpöhler, J., & Udry, C. (2024). Unconditional Cash Transfers: A Bayesian Meta-Analysis of Randomized Evaluations in Low- and Middle-Income Countries. NBER Working Paper No. 32779.

are spent [...] we need more studies that do the first follow up at about one month, in order to establish the initial changes in outflows that occur because of the receipt of the cash transfer".[20] This impact evaluation contributes to addressing this knowledge gap by directly comparing farmers receiving lump-sum transfers with those receiving regular payments and conducting household surveys just after the receipt of each scheduled payment.

34. In summary, despite the prevalence of cash transfer programmes, there is limited and inconsistent evidence on whether varying the transfer size and frequency can spur investment and help households escape poverty. While there is a solid amount of evidence that shows cash transfers have positive impacts on food security and consumption, there is significantly less evidence on how cash transfers can be optimized to increase productivity and the efficient use of limited project resources. This impact evaluation contributes to reducing this evidence gap.

3.2 Evaluation questions and design

35. Cash and food transfers are widely used in emergency situations for relief and recovery and in development contexts to boost the resilience of targeted beneficiaries. As argued previously, the size and frequency of transfers can influence decision-making patterns (e.g., investment and spending decisions). Thus, the objective of this impact evaluation is to assess which of two possible programme delivery strategies leads to better outcomes. The following evaluation questions (EQs) are studied:

EQ 1. What is the impact of providing lump-sum cash transfers on smallholder farmer-households' food security, coping strategies, and mental health and well-being, as compared to smaller monthly transfers?

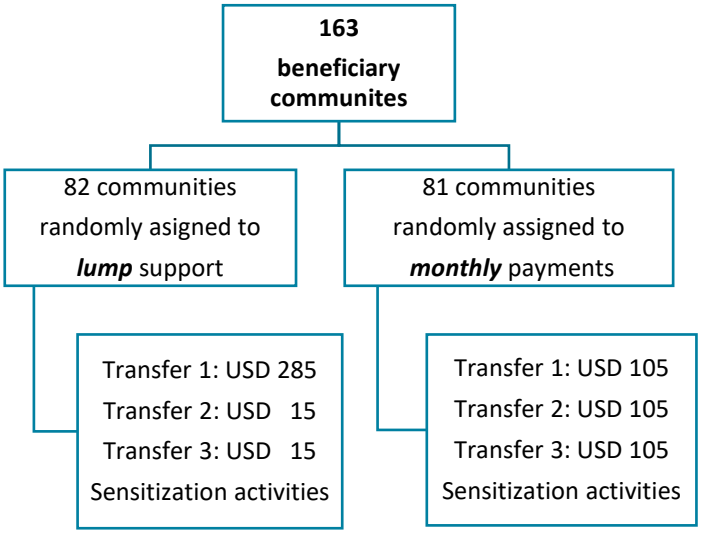
EQ 2. What is the differential impact of providing lump-sum vs monthly cash transfers on agricultural outcomes, livelihood, and other financial outcomes?

36. Answering these questions will provide guidance and considerations for future programming decisions at the CO level. As conclusions can be highly sensitive to context, the insights of country-based studies—such as the current evaluation—are generally considered along with evidence gathered from other contexts to issue stronger overarching conclusions with wider applications. Along this line, the impact evaluation in Ghana is part of and contributes to the Cash-based Transfers & Gender and the Climate & Resilience impact evaluation windows at WFP. These windows compile similar types of evidence from several countries. This evaluation was designed to support programme learning at the CO level and build up the global evidence on cash transfers and resilience.

37. The evaluation uses a cluster randomized controlled trial (RCT) to compare different cash disbursement schedules. A lean design is used, whereby there is no pure comparison group that does not receive support. All participants receive either a lump payment or monthly instalments.

[20] *Ibid*. Page 31.

Figure 2: Impact evaluation design



38. The randomization was implemented at the village level. All 163 beneficiary communities (i.e., villages) were randomly assigned to two comparison groups: lump support or monthly payments. See Figure 2. The small 15 USD transfers made to households benefiting from lump support were designed to keep farmers in this group engaged during sensitisation events throughout the project's lifetime—like their counterparts in the monthly support group—and enable these households to also have some resources labelled for their food-related needs during the lean season.

39. Then, within each community, a subset of 20 households were randomly selected for interviews, including an additional list of 10 households per village as potential replacements for households that are not available or willing to participate in surveys. In total, 3,256 farmer households were sampled for inclusion in the impact evaluation.[21]

4. Data description

40. The impact evaluation collected three waves of data, which were timed such that data would be collected: (1) after the first transfer took place (15 – 27 July 2023), (2) after all transfers took place (25 September – 13 October 2023), and (3) at the end of the agricultural season (19 February – 3 March 2024).

41. Table 1 summarizes the disbursed amounts at the time of each survey round. As of round 1 (July 2023), households from the lump-sum payment group received USD 285, and the households from the monthly payments group only collected USD 105. By the time round 2 took place (October 2023), all households received the entirety of their support, i.e., 315 USD. In the case of the lump-sum households, however, 2 months had elapsed since they received their transfer worth USD 285, while the households receiving monthly payments had just received their last transfer of USD 105. Round 3 took place 4 and 7 months after the last large payment was made for the monthly and lump-sum group, respectively. Round 3 also coincided with the tail end of the harvest season.

[21] The trial was registered in July 2023: https://www.socialscienceregistry.org/trials/11394.

Table 1: Cumulated benefits at the time of each round

Treatment arm	By survey round 1	By survey round 2	By survey round 3
Lump sum group	USD 285	USD 315	USD 315
Monthly transfers group	USD 105	USD 315	USD 315

42. Survey duration varied across the three waves of data collection. For instance, fewer modules were administered in round 1 as the window of time available to collect data was expected to be short. Rounds 2 and 3 collected full surveys. Agriculture data for the 2023 – 2024 season was collected in round 3 only, as the agricultural season was ending. Table 2 summarizes the main outcomes of interest.

43. Differences in attrition among the two intervention groups are not statistically significant. Attrition ranged between 5 and 7 percent relative to round-one interviews, and the probability of being successfully re-interviewed was not linked to the type of disbursement schedule that was assigned to the household.

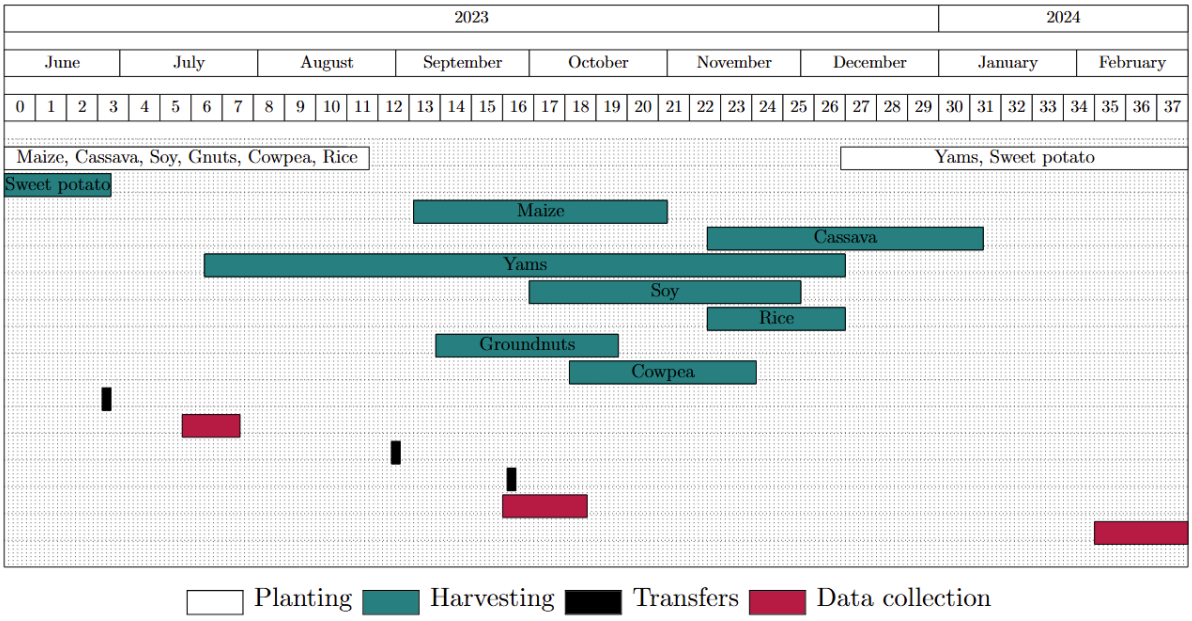
Table 2: Main outcomes of interest

Outcome	Type	Round 1	Round 2	Round 3
Transfer allocations	Monitoring	✓	✓	
Food Consumption Score (FCS)	Food security	✓	✓	✓
reduced Coping Strategies Index (rCSI)	Food security	✓	✓	✓
Food Insecurity Experience Scale (FIES)	Food security	✓	✓	✓
Agricultural inputs, outputs (2023)	Crop cultivation			✓
Livestock-related activities	Other livelihoods		✓	✓
Business-related activities	Other livelihoods		✓	✓
Wage employment	Other livelihoods		✓	✓
Patient Health Questionnaire	Mental wellbeing	✓	✓	✓
Cantril Ladder	Mental wellbeing		✓	✓
Self-Evaluated Resilience Score (SERS)	Mental wellbeing		✓	✓
Food and non-durables expenditure	Household finances		✓	✓
Durables expenditure (assets)	Household finances		✓	✓
Credit, loans, transfers, savings	Household finances		✓	✓
Average interview duration (minutes)		25	110♣	80
Number of successful interviews		3253	3017	3091
Attrition relative to round 1 (percent)			7.3	5.0
Differential attrition (percentage points)			1.1	1.8
Differential attrition signif. test (p-value)			0.43	0.11

Notes: ♣This round includes the compilation of the household roster. The differential attrition is estimated by regressing the binary interview outcome (successful vs. not successful) on the randomized treatment variable, controlling for the district of origin (strata) and clustering errors at the village level. P-values above 0.10 indicate no statistical significance.

44. The schedule of data collection rounds, transfers, and crop-related activities is summarized in Figure 3. The programme objective has been to make the first transfer before the start of the agricultural season to enable the buying of inputs while the remainder of transfers were disbursed during the lean season.

Figure 3: Timing of transfers, data collection, and agricultural activities



45. Table 3 shows how households self-reported spending the transfers. The table points to the fact that households in the lump-sum group may have spent more on agriculture, while the households receiving monthly transfers appear to have favoured investments in livestock and other livelihood strategies as well as education and/or health. Appendix Table 1 provides a detailed figure of group-specific averages for the most significant and relevant categories presented in Table 3.

Table 3: Household-reported transfer allocations (round 2 survey)

Variable	Mean ratio	Difference in mean ratios between treatment arms	P-value	N
Food	0.153	-0.003	0.64	2983
Fertilizer, incl. transport	0.309	0.065	0.00***	2983
Seeds	0.047	0.023	0.00***	2983
Mechanization	0.109	0.029	0.00***	2983
Pesticides and herbicides	0.064	0.004	0.16	2983
Labour	0.041	-0.002	0.54	2983
Livestock	0.028	-0.016	0.00***	2983
Assets for long-term use	0.012	-0.002	0.43	2983
Non-food items and services	0.013	0.000	0.69	2983
Savings	0.074	-0.030	0.00***	2983
Debt repayment	0.014	-0.010	0.00***	2983
Health or education	0.052	-0.010	0.03**	2983

Variable	Mean ratio	Difference in mean ratios between treatment arms	P-value	N
Business investments	0.025	-0.027	0.00***	2983
Charges, fees to withdraw transfers	0.001	-0.001	0.05*	2983
Shared without expecting repayment	0.003	-0.001	0.12	2983
Other allocations or not spent yet	0.030	-0.013	0.00***	2983

Notes: Expenditures are computed as percentage of the total FSA support. The difference in percentage means is computed by subtracting the average of the monthly transfers group from the average of the lump-sum group. A positive difference denotes a higher average for the lump-sum group. These data were collected in round 2. A few households did not answer the questions or said they did not know/remember. The difference in means is computed by regressing the outcome variables on the randomized treatment variable, controlling for the district of origin (strata), and clustering errors at the village level. * denotes (0.05 to 0.10] significance level, ** (0.01 to 0.05] significance level, and *** is less than 0.01 significance level (or 99 percent confidence). P-values of less than 0.1 indicate statistical significance at conventional levels.

46. As many as 99 percent of the sampled farmers reported having cultivated their land during the 2023 – 2024 agricultural season. The season was subjectively rated 5.8 (on a scale from 1 to 10) in terms of how much farmers expected to harvest relative to previous seasons. On average, farmers cultivated 6 acres of land and 3 types of crops. The most frequently cultivated crops were maize (reported by 93 percent of farmers), soya (59 percent), groundnut (37 percent), rice (30 percent), beans (20 percent), and millet (19 percent). More than 75 percent of households also kept livestock, and roughly a third engaged in business activities. Wage employment, however, has been relatively rare, with only 10 percent of individuals reporting paid work.

47. Eighty-five percent of the sampled farmers have an acceptable Food Consumption Score, whose average was at 55 score points (out of a maximum of 112 score points) across the three rounds of data collection.[22]

48. During the year prior to data collection, households experienced an average of 7 shocks. The most important were rising input prices (reported by 92 percent of households), rising food prices (83 percent), irregular weather/changing climate (80 percent), and crop pests (73 percent). Then, households experienced 1 to 2 additional shocks during data collection, which were mostly related to the poor health of household members.

49. The sampled farmers showed signs of mild depression and/or anxiety (i.e., approximately 49 – 61 percent of households observations per round), but also optimism regarding the future as compared to the present, and especially relative to the past two years. See Appendix Table 2 and Appendix Table 3.

5. Limitations

50. **External validity.** The results of a single experimental evaluation might not generalize to other settings. However, the robustness of findings across contexts can be assessed through a synthesis of results from all countries that participate in the Climate and Resilience Impact Evaluation Window and the Humanitarian Workstream. The use of coordinated survey instruments and data collection protocols help

[22] An acceptable Food Consumption Score is of at least 35 score points.

to ensure that the data collected in Ghana are comparable to other countries in the Window/Workstream and in other WFP-supported evaluation windows. The objective is to maximize the potential to draw general conclusions.

51. **Internal validity.** Risks to the internal validity of the evaluation are mitigated by the employment of the most rigorous impact evaluation method – a randomized controlled trial (RCT). RCTs allow the attribution of (differential) impacts to each of the implementation strategies that are evaluated. To mitigate the internal validity risks, RCTs must be implemented according to a rigorous set of rules. Differential attrition, evaluation-driven effects, spillovers, and partial compliance are potential risks to the internal validity of an RCT. The evaluation team worked closely with the survey firm, the WFP Country and Field Offices to monitor the intervention and the collection of survey data.

52. Firstly, no statistically significant differences were observed in attrition rates between the two comparison groups. Thus, differential attrition is unlikely to have affected the internal validity of the results presented in this report. See Table 2.

53. Secondly, evaluation-driven effects mean that people may behave differently and may make decisions or answer the survey differently depending on their treatment arm as well as their belief with respect to the evaluator/enumerator's expectations and objectives, the future of the intervention, or the mere fact that the households are surveyed repeatedly.[23] A cluster randomized evaluation was used to mitigate these risks. The purpose was to limit the interactions between the two comparison groups by assigning all eligible households within a village to one of the treatment arms (lump or monthly support). Moreover, the data collection team had no specific knowledge about the programme or the plans for it in the future. Thus, it is unlikely that the enumerators have created or fed any expectations that the households may have had regarding future benefits. Finally, the impact evaluation team used the same survey, the same procedures, and the same enumerators regardless of the programme groups from which data were collected.

54. Thirdly, spillovers happen when one comparison group has unintended impacts on the other comparison group. It is unlikely that spillovers have affected the comparability of the two payment groups. The main mitigation strategy was once again that of using a cluster randomization design, which was meant to limit the contamination of the comparison households. Spillovers would mean that households re-allocate benefits from lump-sum beneficiaries to their monthly-support counterparts at the beginning of the project cycle or vice-versa in the later months of implementation and would thus eliminate or limit differential impacts. This would have likely happened had the two types of disbursement schemes been present in the same village—beneficiaries would have easily interacted and reallocated benefits according to their needs. The evaluation design thus made sure that there was only one type of disbursement scheme per village to limit such threats to the internal validity of the RCT to the extent possible.

55. Lastly, partial compliance would happen if some households benefited in practice from a different payment scheme than the one assigned randomly to them by the RCT design, or if they did not receive their benefits at all. The benefits were in the form of mobile money disbursed by a mobile operator. Thus, the monitoring of each household's benefits was straightforward. The mobile operator would report if phone numbers did not exist. Then, households would use WFP's feedback mechanisms to report their inability to access the money if such was the case (e.g., wrong phone number, SIM limits for receiving money, forgotten PIN, etc.). These cases were few across the 17,000 beneficiaries (and even fewer among the impact evaluation participants). Moreover, there were no reported mistakes in terms of the observed disbursement scheme versus the RCT-assigned disbursement schedule. However, due to the beneficiaries' occasionally limited experience with receiving mobile money, it is likely that they might not have all become aware of the receipt of their transfers immediately, or it took them a while to access their money and have thus behaved as if they benefited from a different disbursement schedule than the intended one. Nevertheless, there is no reason to believe that such cases were more numerous in one group than the other. In the case of this experiment, the risk of partial compliance has been mainly that of not being able

[23] See Glennerster, R. and Takavarasha, K. 2014. '7 Threats' in Running Randomized Evaluations: A Practical Guide. Princeton, Princeton University Press, 298–323.

to capture the true size of differential impacts or that the differential impacts would be smaller and harder to detect.

56. The absence of a non-beneficiary comparison group does not enable the report to evaluate the overall impact of the FSA support but only to compare the impacts of the alternate implementation strategies that are tested.

6. Main findings

57. The main findings are described below and show that households receiving lump support have better food security after the first cash disbursement takes place. However, differences ultimately fade away. Importantly, the lump-sum group invests more in agricultural inputs, it also produces and sells more, thus reporting significantly higher agricultural revenues at the end of the season. Nevertheless, the monthly transfers group holds slightly more livestock, buys more household assets, and is more likely to keep children in school throughout. Then, the monthly transfers group also acquires more credit from formal institutions than the lump sum group and has a higher balance to pay on average at the end of data collection.

58. Regardless of the type of support that was randomly assigned and received, 58 percent of households said they preferred monthly disbursements, 37 percent opted for the lump-sum approach, and 5 percent were indifferent. A more nuanced summary can be obtained based on the cross-tabulation of this information with the households' actual type of support, in which case 22 percent of those receiving lump-sum support would switch to the other scheme, while 12 percent of those receiving monthly support would make the switch to the lump-sum transfer. Nevertheless, most households, i.e., 62 percent, were satisfied with the type of support that was randomly assigned to them.

6.1 Food security

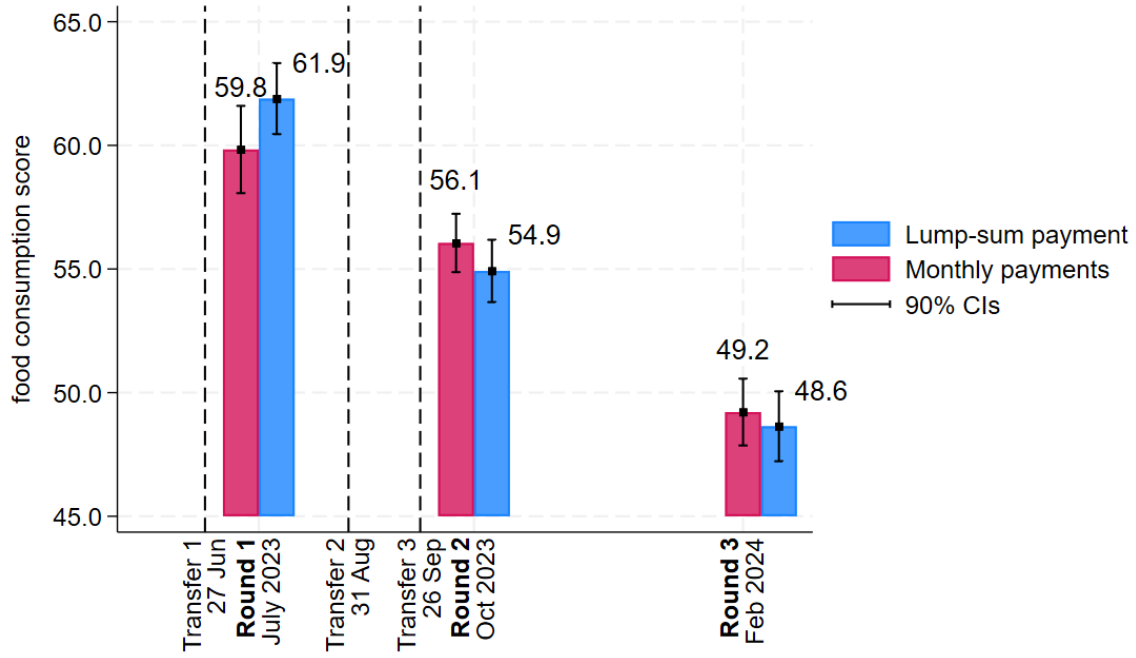
Food Consumption Score

59. The Food Consumption Score (FCS) is computed based on the frequency of consuming eight weighted food groups during the 7 days preceding each round of surveying. FCS can take values between 0 and 112 score points. A high FCS increases the likelihood that a household's food intake is adequate.[24]

60. As seen in Figure 4, the average FCS score in round 1 was 2.1 points higher for the households receiving lump support as compared to the households assigned to monthly payments. The difference is statistically significant with 90 percent confidence. For instance, the gap can be interpreted as the lump-sum group consuming 2 additional days of vegetables as compared to the monthly payments group, or 1 additional day of staples on average. Alternatively, one could also interpret the differential impact as one in two lump-sum households reporting 1 additional day of eating meat in the last 7 days.

[24] Figure 4 indicates a negative evolution of FCS even though rounds 2 and 3 overlap with the harvest season. The following aspects should be considered to interpret the trend cautiously. (1) FCS is a difficult indicator, and it takes time for enumerators to master despite rigorous training. In fact, enumerators have had the tendency to inflate the consumption of staples in round 1, which may have led to a higher FCS on average. Despite this measurement error, the comparison between the households receiving lump and monthly transfers is still valid as both groups have been impacted by the same problem equally. (2) Even if the negative FCS trend were accurate, no data is available to measure the FCS outcomes of non-beneficiary households. Thus, the trend should in no way be used to comment on the effectiveness of the programme. The study was not designed to include a pure control group that would have otherwise enabled such insights. (3) Finally, FCS is just one measure of food security. For instance, other indicators such as the reduced Coping Strategies Index and the Food Insecurity Experience Scale point to a favourable round-to-round evolution in terms of food security (see Figure 5 and Figure 6).

Figure 4: Food Consumption Score



Notes: FCS describes the diversity of the household's food intake (last 7 days). Higher FCS means better food security. 90 percent confidence intervals are plotted. Round 1 sample size: 3,253 households; round 2: 3,017; round 3: 3,091. The estimation controls for round and district dummies and their interaction. Errors are clustered at the village level.

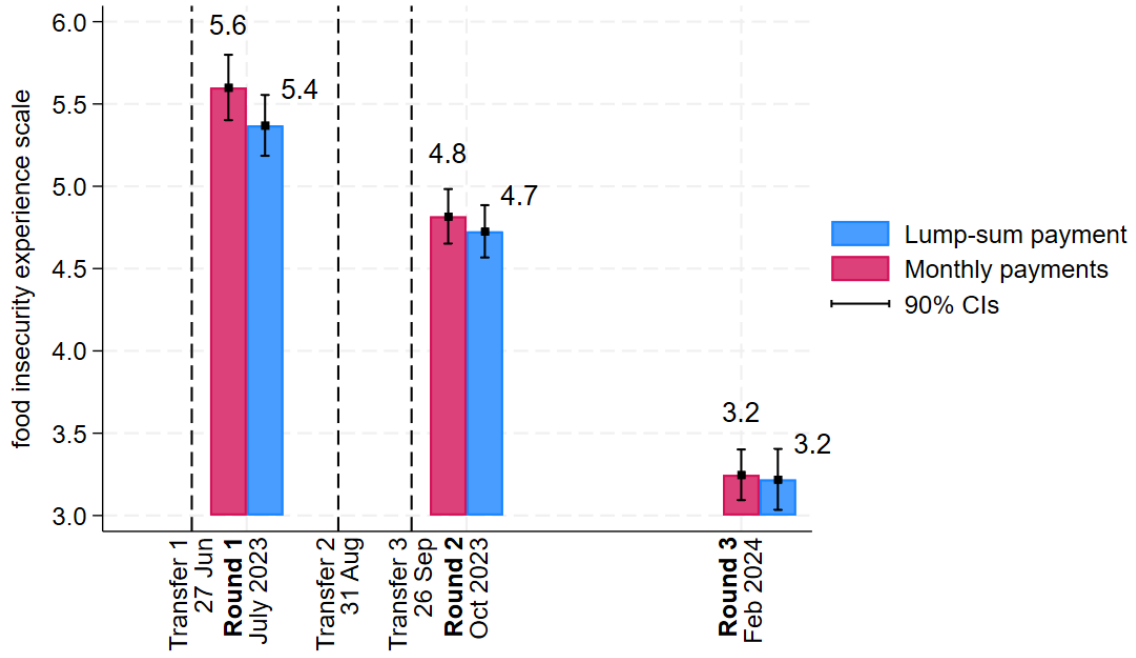
61. At the time of round 2, however, the same figure shows that the gap between the two groups is reversed, i.e., the households in the monthly transfers group have a higher average FCS score. Nevertheless, the gap is reduced to 1.2 score points and becomes statistically insignificant. The gap between the two groups becomes even smaller as of round 3, and it equals to just 0.6 FCS score points, making the two groups statistically indistinguishable. The slight advantage of the monthly group over the lump-sum group in rounds 2 and 3 may be indicative of slightly better consumption smoothing for the former.

62. Further on the Food Consumption Score, Appendix Figure 2, Appendix Figure 3, and Appendix Figure 4 suggest that the lump-sum group enjoyed better consumption of key food groups at the time of round 1 (i.e., vitamin A-rich, protein-rich, and hem iron-rich foods). However, the estimates are only statistically significant at the 10 percent level for the case of the vitamin A-rich foods. For the same food group, the gap is reversed in round 2 in favour of the monthly transfers group and is statistically significant. Although the same pattern applies to iron-rich foods and the gap is comparable, these estimates are less precise and not significant. These figures further point to the monthly group's slightly better capacity to smooth consumption, especially as it regards key food items.

Food Insecurity Experience Scale

63. The Food Insecurity Experience Scale (FIES) is an experience-based measure of household food insecurity and consists of eight questions regarding the respondents' access to adequate food (e.g., enough to eat, skipping meals, etc.). As opposed to FCS, FIES measures food insecurity. For instance, if the respondent worried about having enough to eat during the 30 days prior to data collection, then the question receives a score of 1, otherwise 0. The range is 0 to 8, with 8 being maximum food *in*security.

Figure 5: Food Insecurity Experience Scale



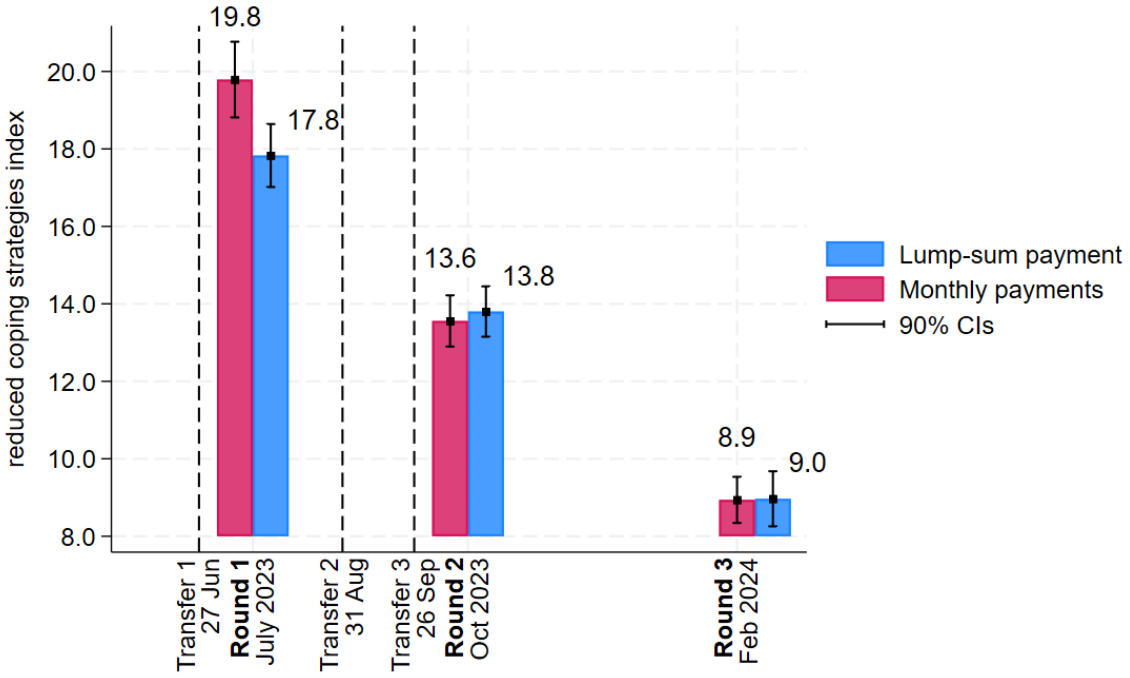
Notes: FIES describes the extensive margin of food insecurity (last 30 days). Higher FIES means more food insecurity. 90 percent confidence intervals are plotted. Round 1 sample size: 3,253 households; round 2: 3,017; round 3: 3,091. The estimation controls for round and district dummies and their interaction. Errors are clustered at the village level.

64. Figure 5 confirms that the beneficiaries of lump-sum support were better off at the time of round 1. Specifically, FIES was 0.2 points lower for them as compared to the monthly group. This can be interpreted as one additional household every five households in the lump-sum group saying "no" to one additional question among the 8 FIES questions, e.g., worrying about food, eating few kinds of food, running out of food, going hungry, etc. The difference becomes smaller after round 1 and statistically insignificant, thus pointing to the same pattern as for FCS, whereby lump-sum households have better food security at the time of round 1—as they received three times the support of the monthly group households. Nevertheless, this gap becomes smaller and insignificant during subsequent rounds. As of round 3, the two groups largely experience the same level of food insecurity, which is lower than its level in round 1, e.g., 3.2 average FIES points in round 3 versus approx. 5.5 in round 1.

Reduced Coping Strategies Index

65. The reduced Coping Strategies Index (rCSI) is a weighted indicator used to compare the hardship faced by households, as measured by the frequency and severity of the coping strategies they used when faced with food shortages. rCSI is based on 5 questions regarding coping strategies, with 0–7 number of days as answer options and various weights. Similarly to FIES, rCSI also measures food insecurity. However, it can be regarded as an “intensive” measure (length of hardship), while FIES measured the “extensive” dimension of food insecurity (occurrence of hardship). The range of rCSI is 0 to 56, with 56 being maximum food insecurity.

Figure 6: reduced Coping Strategies Index



Notes: rCSI describes the intensive margin of food insecurity (last 7 days). Higher rCSI means more food insecurity. 90 percent confidence intervals are plotted. Round 1 sample size: 3,253 households; round 2: 3,017; round 3: 3,091. The estimation controls for round and district dummies and their interaction. Errors are clustered at the village level.

66. Figure 6 further confirms the pattern identified by the FCS and FIES measures. As of round 1, the households in the lump-sum group relied less frequently on negative coping strategies. The difference of two days means these households employed one of the five coping strategies two fewer days on average (if weight is 1, e.g., relying on less preferred or less expensive foods, reducing portion size or number of meals). The difference is no longer significant after round 1, as households in the two groups resort to negative coping strategies for roughly the same number of days, e.g., approx. 9 instances, which is notably lower as compared to the average in round 1, i.e., 17 instances.

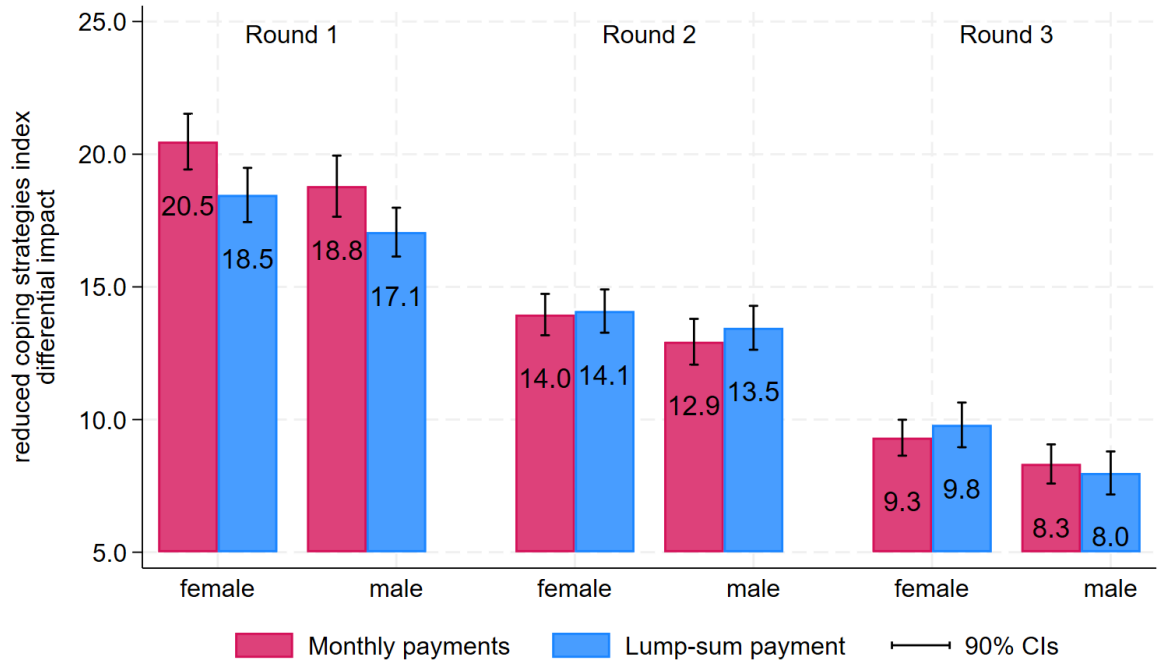
67. In sum, all three food security measures, FCS, FIES, and rCSI, show that the lump-sum transfers create an initial advantage for households in this group as of round 1 without any significant downside for these same households during subsequent rounds.

68. Appendix Table 4 also shows that the lump-sum scheme is weakly associated with lower variance in food security. The impact, however, is not significant.

Heterogeneity exploration for food security and female recipients

69. Figure 7 explores whether there is a gender dimension to the differential impact between lump and monthly support regarding food insecurity as measured by rCSI. Appendix Figure 5 and Appendix Figure 6 show the analysis for FCS and FIES, respectively. Insights are largely similar across the three measures of food (in)security.

Figure 7: Gender heterogeneity for the reduced Coping Strategies Index



Notes: rCSI describes the intensive margin of food insecurity (last 7 days). Higher rCSI means more food insecurity. Round 1 sample size: 3,253 households; round 2: 3,017; round 3: 3,091. Rounds are pooled for the analysis. Estimations control for the round of data collection, sex of beneficiaries, district dummies, and all their interactions, including the interaction of the treatment arm with the sex of beneficiaries and the round of data collection. Errors are clustered at village level.

70. The objective of Figure 7 is to compare lump- and monthly-group results within each gender and *not* between genders. The between-gender comparison only shows that the households of female beneficiaries are more food insecure. Then, the within-gender comparison can provide evidence on whether lump or monthly transfers are more helpful to any one gender. However, Figure 7 shows that the households of female and male beneficiaries gained similarly from receiving lump-sum as opposed to monthly support during round 1, i.e., approx. 2 rCSI score points, and thereafter, food insecurity is statistically indistinguishable between the lump and monthly groups within each gender. Thus, there is no significant evidence that any one gender benefits more from lump support as compared to monthly transfers. If lump-monthly impact estimations are averaged across rounds (not reported), then the same insights remain: a gap in favour of lump-sum recipients, which is not significantly larger for any one gender.

71. The caveat of the analysis in this sub-section is that the gender of the recipient was not randomized. Thus, the analysis should be interpreted cautiously. For instance, the households of the sampled female beneficiaries may be a very specific sub-sample of the population, e.g., widowed or wives from polygamous marriage arrangements that constitute separate households, among other explanations. Consequently, the female heterogeneity analysis that is possible in the context of this impact evaluation likely speaks to this sub-sample of female beneficiaries and not to female beneficiaries more generally.

Heterogeneity exploration for food security and farm scale

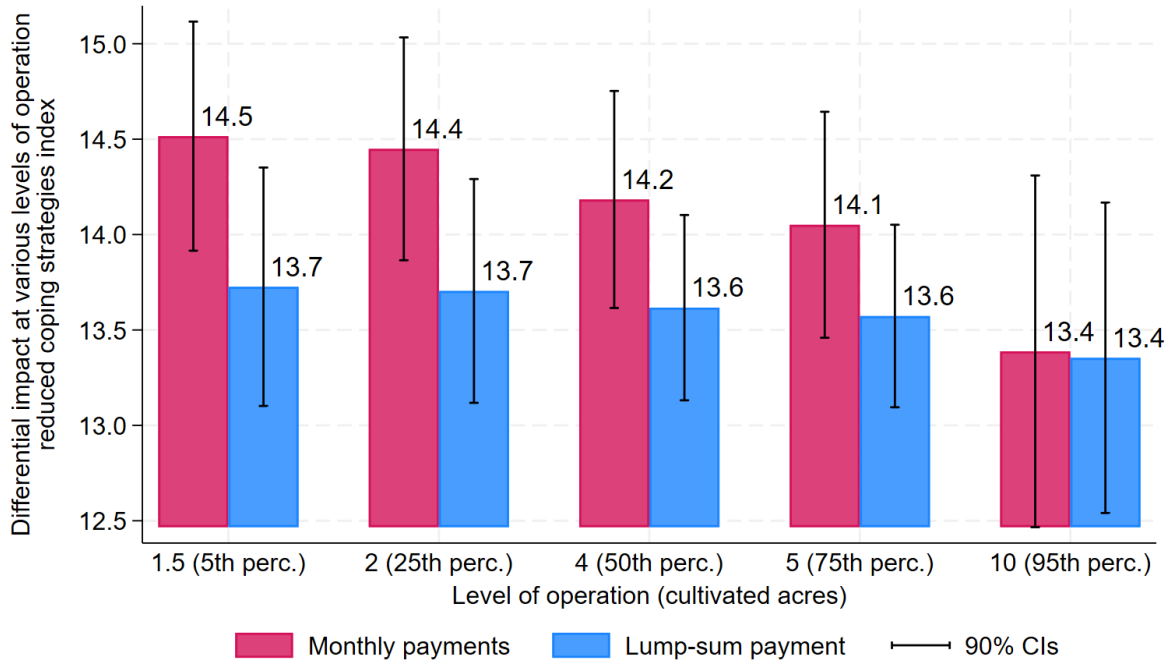
72. Figure 8 further explores whether the differential impact in terms of food insecurity (i.e., rCSI) between the lump and monthly groups exhibits heterogeneity according to the scale of households' agricultural operations as declared pre-programme, i.e., at the time of FSA registration and as measured by the number of acres they cultivated. Marginal means are estimated for farmers at the 5th, 25th, 50th, 75th, and 95th percentiles of the farmland distribution. These thresholds translate into estimations for farmers cultivating 1.5, 2, 4, 5, and 10 acres, respectively.

73. It was previously shown that the lump-sum transfer helps households relatively more than monthly support. Figure 8 further shows that this insight is stronger for households cultivating smaller farms (significant differences of around 0.7 – 0.8 rCSI score points in favour of the lump-sum group). For larger farms, the distinction between the lump and monthly groups becomes increasingly smaller and statistically insignificant. This pattern, however, is not sufficiently strong. Although it is significant for smaller farms and the slope is also decreasing (i.e., negative correlation between the lump-monthly gap and farm size), Figure 7 in conjunction with Appendix Table 5 add an important caveat: While there is evidence that the lump-monthly effect differs significantly by farm size for smaller farms, the heterogeneity is not systematic or sufficiently pronounced. Thus, the documented evidence is of *partial* heterogeneity with respect to farm size.

74. The insights of Figure 7 mainly apply if all round-based household observations are pooled. In contrast, round 1 lump-monthly differences are largely significant and positive regardless of farm size (Appendix Figure 7), while for rounds 2 and 3, the advantage switches slightly in favour of the monthly group, and the bigger the farm, the bigger this advantage is, though not large enough to ever be significant (Appendix Figure 8 and Appendix Figure 9). Thus, by pooling the rounds, the analysis gains in power, and the pattern in Figure 7 becomes clearer and suggestive of partial heterogeneity with respect to farm scale. Similar insights apply to FCS (Appendix Figure 10) and FIES (Appendix Figure 11)—although the insights for the former are weaker.

75. All figures in the food security sub-section are summarised in Appendix Table 5.

Figure 8: Scale of operation heterogeneity for the reduced Coping Strategies Index



Notes: rCSI describes the intensive margin of food insecurity (last 7 days). Higher rCSI means more food insecurity. The sample includes all rounds. Round 1 sample size: 3,082 households; round 2: 2,968; round 3: 3,087. Rounds are pooled for the analysis. Estimations control for the round of data collection, size of the agricultural operation as declared at

registration, district dummies, and all their interactions, including the interaction of the treatment arm with the scale of the agricultural operation. Errors are clustered at village level.

6.2 Crop production and sales

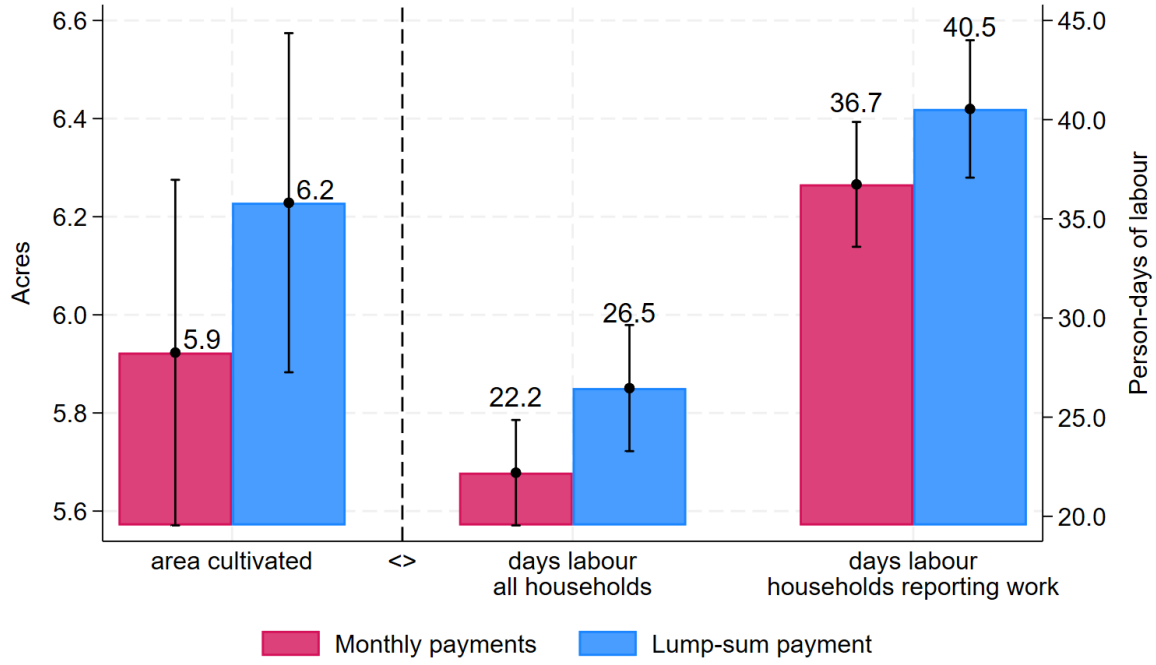
Inputs

76. Figure 9 shows that households who benefited from lump support cultivated 0.3 more acres (+5.1 percent) during the current agricultural season and used roughly 4.3 additional days of household labour (+19.5 percent) during the 30 days preceding the round 3 survey as compared to households receiving monthly instalments.

77. If the analysis focuses on households reporting the use of household labour for agriculture, then the gap between the two groups is of 3.8 additional days of pooled labour (+10.4 percent), which suggests that there are slightly fewer households relying on household labour for agriculture in the group receiving monthly transfers. While the difference is statistically significant for the number of labour days, it is not for the area cultivated during the 2023 rainy season. The estimated days of labour refer to the month of February 2024, which means farmer activities were mostly for harvesting.

78. Looking beyond the households' use of own labour and land, Figure 10 plots the differential use of other inputs such as seeds, chemical and organic fertilizers, pesticides and herbicides, and hired labour. As illustrated in this figure, households from the two groups are statistically indistinguishable. They tend to buy inputs at the same rate. Notably, more than 90 percent of households reported buying chemical fertilizers and pesticides during the 2023 rainy season. Then, 71 to 72 percent of households bought seeds, and 66 to 67 percent hired labour for agricultural tasks.

Figure 9: Use of household land and labour for crop cultivation (round 3 survey)



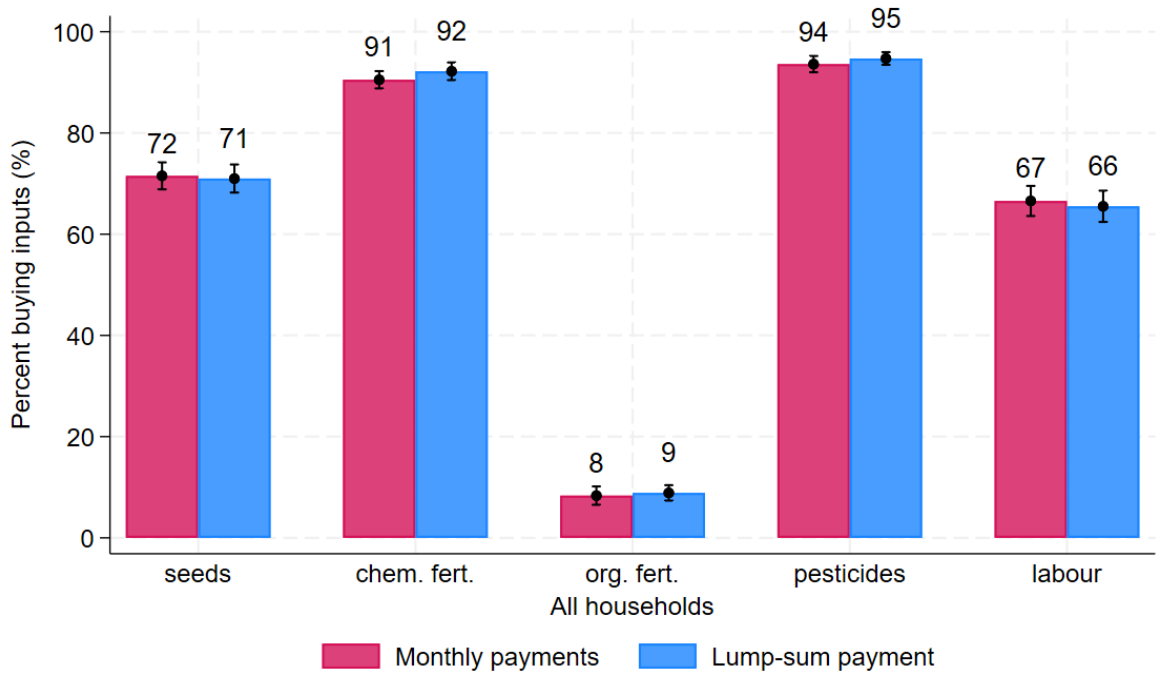
Notes: All households are used to estimate and plot the differential impact in terms of the area cultivated across plots and crops and the number of days they worked on the household farm during the 30 days prior to the survey taking place ("days labour, all households"). The latter is computed by pooling the work of all household members. If a person worked for one hour in agriculture, it is counted as a day of work on agriculture. Almost all households reported having cultivated at least half an acre. Only 35 households are considered with zero acres of cultivated land for the area

estimates. The third set of estimates, "days labour, households reporting work" narrows the sample to households reporting that their members worked on the household farm during the last 30 days (1,950 households). 90 percent confidence intervals are plotted. Outcome variables are winsorized to limit extreme values, which could be due to data entry errors. Outliers below the 1st and above the 99th percentiles are replaced with the values of the 1st and 99th percentiles. Estimations control for district dummies.

79. Figure 11 gives a more nuanced overview regarding input use among the interviewed households. It switches attention from the *likelihood* of buying inputs to the *amount paid* for the purchased inputs. Thus, it emerges that households spend mostly on fertilizer. Then, although they buy pesticides at the same rate as fertilizers (as shown in Figure 10), their expenditure is 4 to 5 times lower for the former and roughly similar to the households' expenditure on seeds, for which the rate of buying was roughly 20 percentage points lower as compared to pesticides.

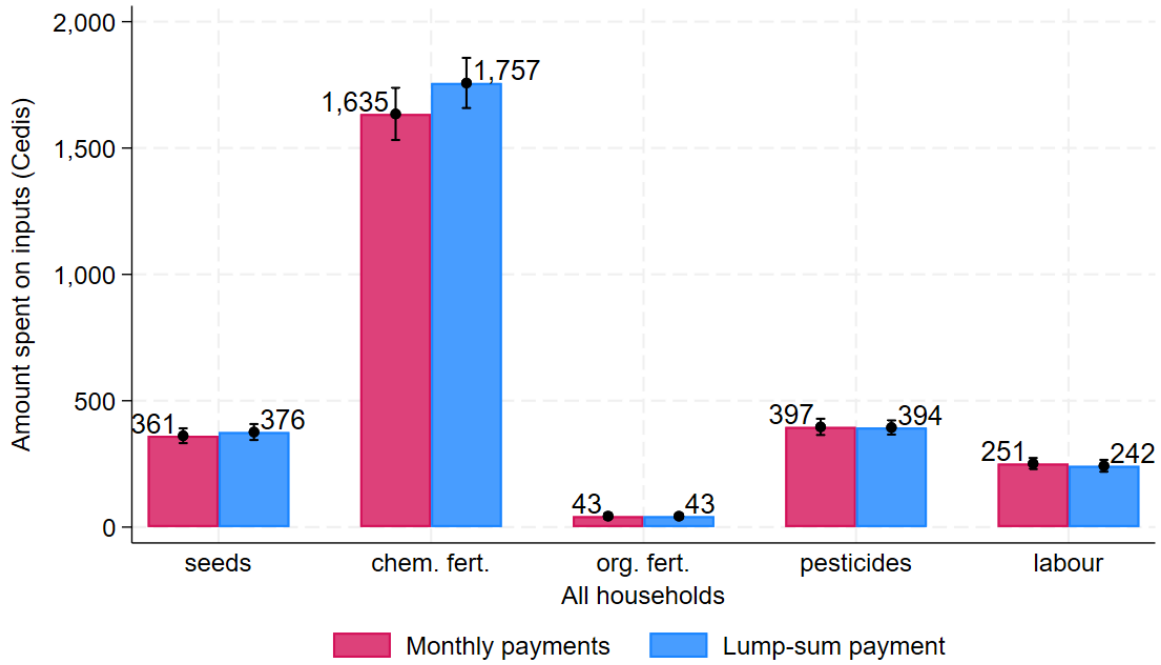
80. Figure 11 also shows that although the disbursement scheme did not matter in terms of the farmers' likelihood of buying inputs (Figure 10), it did matter for the amount spent on chemical fertilizers. The differential impact is of approximately GHS 125 (i.e., the lump-sum group spends more) and is statistically significant at the 5 percent level. Differences regarding the expenditure on other inputs are small and statistically not significant.

Figure 10: Likelihood of buying inputs (round 3 survey)



Notes: Only round 3 data are used because data was collected once for the season that was observed during the study: the 2023 rainy season. Pesticides include herbicides. All households are used to estimate and plot the differential impact of the two disbursement schemes on the propensity of households to buy inputs. Round 3 included 3,091 households. 90 percent confidence intervals are plotted. Estimations control for district dummies.

Figure 11: Amount spent on inputs, all households (round 3 survey)

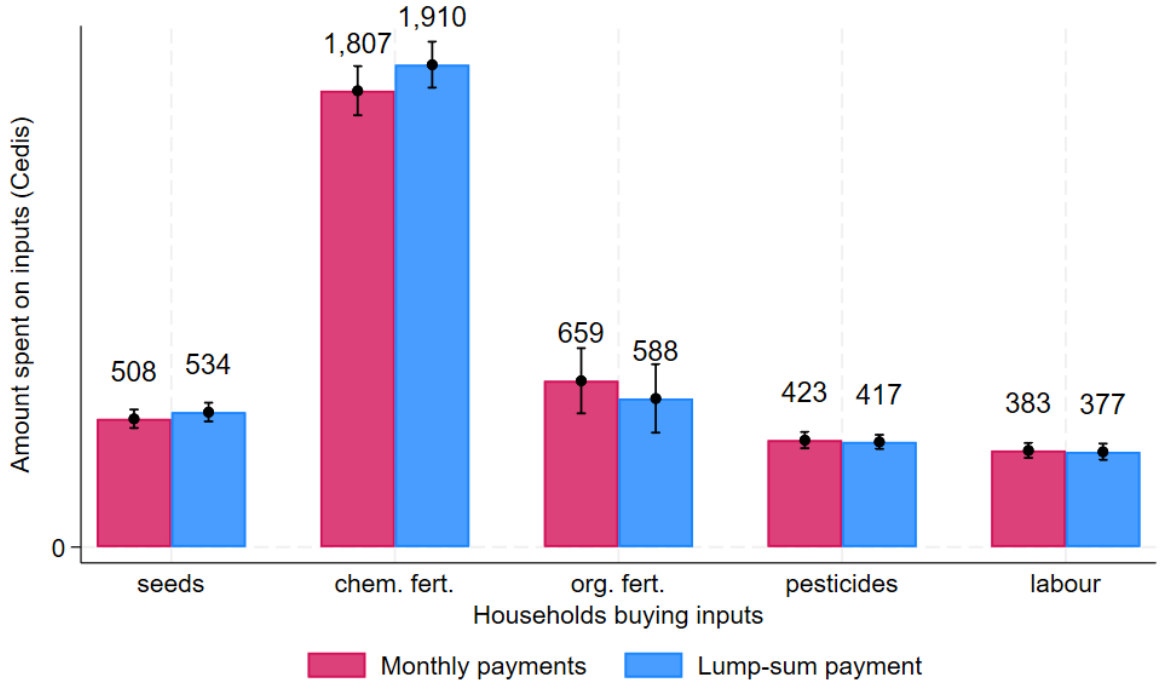


Notes: Only round 3 data are used because data was collected once for the season that was observed during the study: the 2023 rainy season. Round 3 included 3,091 households. 90 percent confidence intervals are plotted. Outcome variables are winsorized to limit extreme values, which could be due to data entry errors. Outliers below the 1st and above the 99th percentiles are replaced with the values of the 1st and 99th percentiles. Estimations control for district dummies.

81. In Figure 12, the sample is narrowed to now only include households who reported having bought inputs at all. One notable observation is that the low rate of buying organic fertilizers was obscuring the considerable average amount that is spent on this input when households purchase it: approximately GHS 622.

82. Moreover, Figure 12 corroborates the pattern identified in Figure 11. The payment modality matters for the amount spent on chemical fertilizers. The differential impact in this case is of approximately GHS 105 and is statistically significant at the 10 percent level. Other differences regarding inputs expenditure are small and statistically not significant.

Figure 12: Amount spent on inputs, households who reported buying inputs (round 3 survey)



Notes: Reference period: 2023 – 2024 agricultural season. According to the plotted order of outcomes, the sample was: 2,199, 2,820, 266, 2,903, and 2,040 households. 90 percent confidence intervals are plotted. Outcome variables are winsorized to limit extreme values, which could be due to data entry errors. Outliers below the 1st and above the 99th percentiles are replaced with the values of the 1st and 99th percentiles. Estimations control for district dummies.

83. Overall, farmers receiving lump support cultivate slightly more land (5.1 percent), use significantly more household labour on their farm (19.5 percent), and spend more on chemical fertilizers (7.6 percent) as compared to their counterparts receiving monthly support. Beyond these measures of input use, the decisions of farmers benefiting from monthly transfers are largely the same as those of the lump-sum farmers.

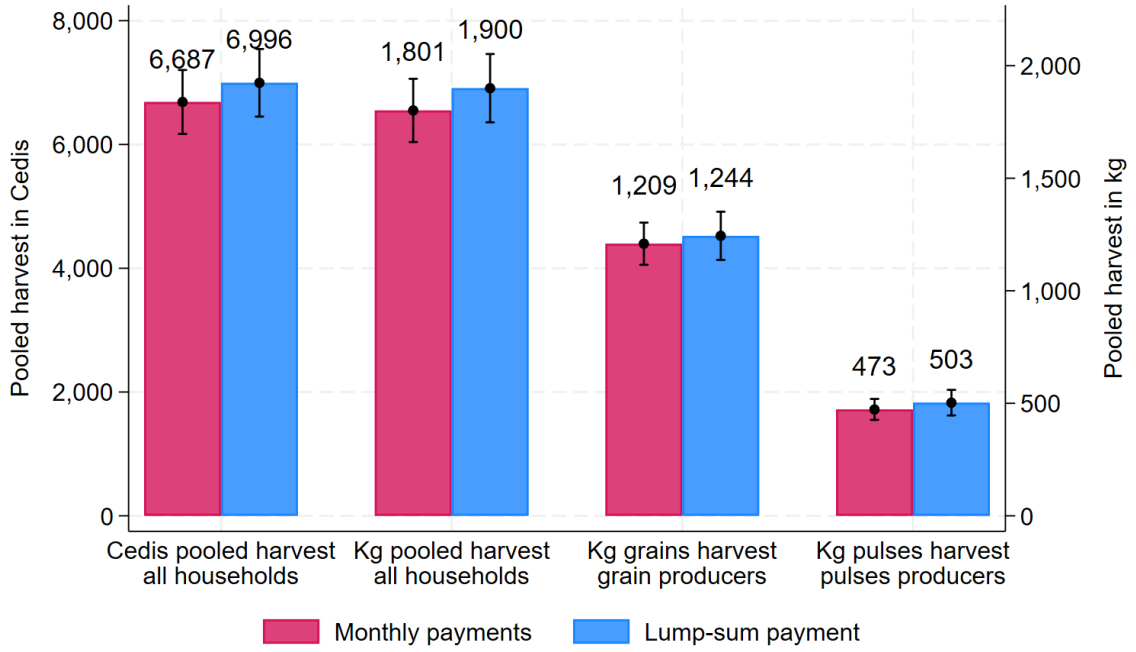
84. The FSA transfers were "labelled" for use in agriculture. Such labelling can promote the desired behaviours without incurring the costs of setting up a system that checks the fulfilment of potentially imposed conditionalities and could have augmented the impact of the lump-sum distribution strategy.[25,26]

Crop harvests

85. Households harvested approximately 1,850 kilograms on average. This quantity was worth roughly GHS 6,840. Limiting the sample to grain producers only, their average harvest was 1,225 kilograms of grains. Corroborating this average with the fact that more than 90 percent of farmers reported the cultivation of cereal grains, it becomes clear that cereal grains are the preferred crop. Specifically, that is the case of maize, which is cultivated by 93 percent of farmers. Then, famers tend to complement the cultivation of cereal crops with that of pulses. See Appendix Figure 13 for a histogram of harvested quantities per household.

[25] Benhassine, N., Devoto, F., Duflo, E., Dupas, P., & Pouliquen, V. (2015). Turning a shove into a nudge? A "labeled cash transfer" for education. American Economic Journal: Economic Policy, 7(3), 86-125.
[26] Heinrich, C. J., & Knowles, M. T. (2020). A fine predicament: Conditioning, compliance and consequences in a labeled cash transfer program. World Development, 129, 104876.

Figure 13: Harvest, all households and producers only (round 3 survey)



Notes: Only round 3 data are used because data was collected once for the season that was observed during the study: the 2023 rainy season. Data from all households are used to estimate the differential impact on the pooled harvest, as measured in Cedis and kilograms. The following main crops are included: maize, soya, groundnut, rice, beans, millet, yams, sorghum, cowpeas, and Bambara beans. Note that the pooled harvest includes groundnuts and yams beside the crops that can be classified as grains or pulses. Crops reported by at least 100 farmers are considered main crops. The sample size is of 3,091 households. For the plotted differential impact on grains and pulses, only the producers of these crops are considered: the sample is of 2,910 and 2,373, respectively. If farmers did not cultivate or cultivated but lost their harvest, their outcome value is 0. Crop states (e.g., grain, flour, etc.) are harmonized to sum up harvests across various states and crops. 90 percent confidence intervals are plotted. Outcome variables are winsorized to limit extreme values, which could be due to data entry errors. Outliers below the 1st and above the 99th percentiles are replaced with the values of the 1st and 99th percentiles. Estimations control for district dummies.

86. Figure 13 shows that households benefiting from lump support reported larger harvested quantities: 99 additional kilograms worth approx. GHS 305 (5 percent more than the monthly group's harvested average expressed as quantity and value).[27] Nevertheless, even though the magnitude of the differential impact is large, the difference is not statistically significant because of low precision, i.e., confidence intervals are large on account of high variation in the data related to harvest measurement. Despite the lack of significance, the magnitude of the gap is economically meaningful and judged relevant to understanding how the two disbursements schemes impact the behaviour of farmers.

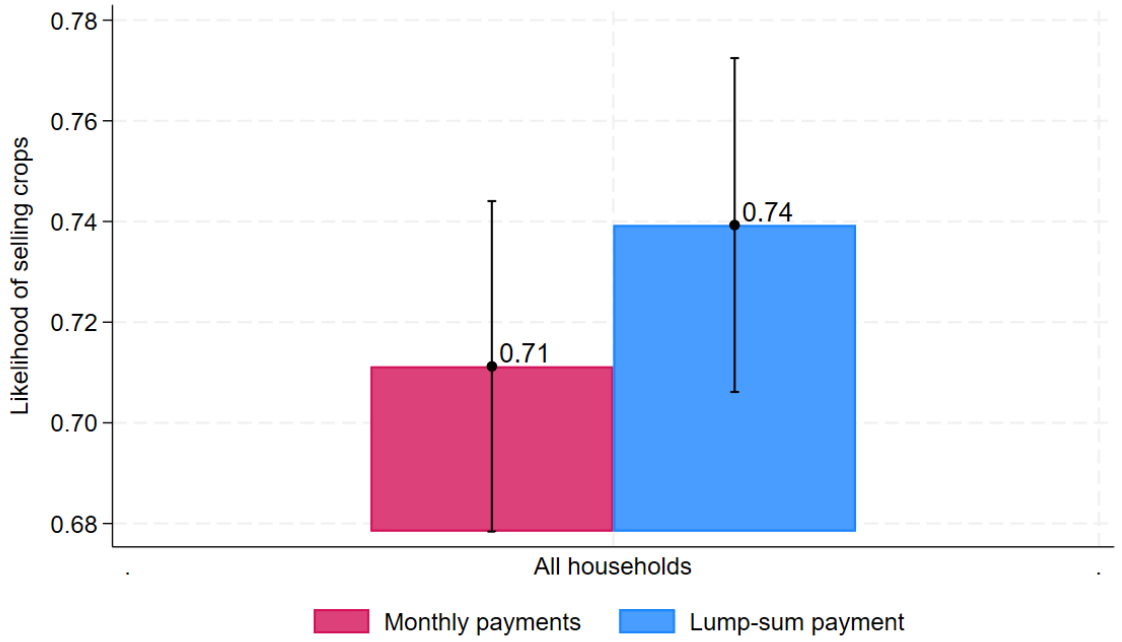
Crop sales

87. In the previous sub-sections, it was shown that the lump-sum households used more chemical fertilizers (~GHS 125 or 7.5 percent more than the monthly payments group) and harvested more crops (~GHS 305 or 5 percent more quantity- and value-wise). The remaining unknown aspect of the agriculture overview is related to the households' behaviour associated with the sale of crops.

[27] The value is computed using the median price per crop (using the reported sales) multiplied with the quantity per crop for each farmer. Then, values are summed up across crops and the total harvest value is computed per farmer.

88. To begin with, Figure 14 shows that the difference between the two groups regarding their likelihood of selling crops is not large enough to be significant at the 10 percent level: 3 percentage points in favour of the lump-sum group. This group is slightly more likely to sell crops.

Figure 14: Likelihood of selling crops (round 3 survey)

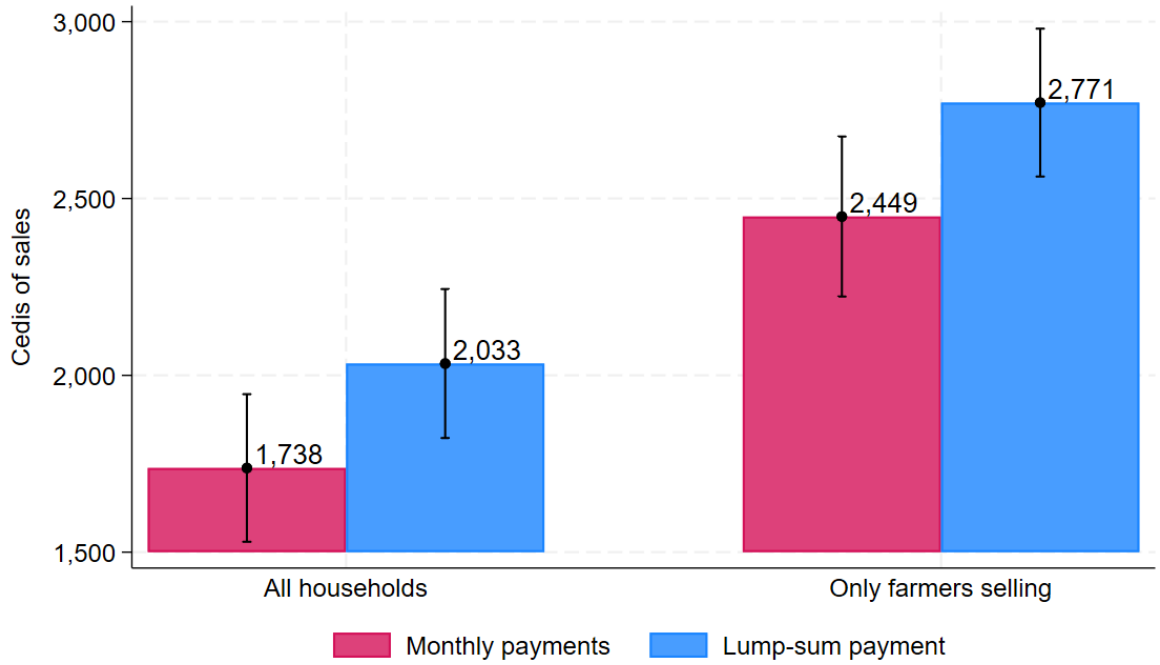


Notes: Only round 3 data are used because data was collected once for the season that was observed during the study: the 2023 rainy season. Data from all households are used to estimate the differential impact on the likelihood of selling crops. The following main crops are included: soya, maize, groundnut, rice, beans, millet, and yams. Crops reported by at least 100 farmers as (partially) sold are considered main crops. The sample size is of 3,091 households. 90 percent confidence intervals are plotted. Estimations control for district dummies.

89. Then, Figure 15 looks beyond the likelihood of selling crops and explores the differential impact regarding farmers' reported crop sale revenues. The first set of estimates presents the average agricultural revenues for the entire sample. This includes farmers who have not reported sales and who are assigned a value of zero for their crop sales. This set of estimations speaks to both the increased likelihood of selling crops and the increased volume for those selling. The second set of estimates, however, focuses on sellers only.

90. Based on Figure 15, one learns that regardless of the sample that is used (only farmers that sell or all households), the revenues of farmers in the lump-sum group are larger than those of the households receiving monthly support. Depending on the sample that is used, the additional revenue that is reported by households in the lump-sum group ranges from GHS 295 to about GHS 325, which is roughly 9 percent of the total FSA support to farmers.

Figure 15: Value of sold crops (round 3 survey)



Notes: Only round 3 data are used because data was collected once for the season that was observed during the study: the 2023 rainy season. The first set of estimates used data from all households to estimate the differential impact on the pooled harvest, as measured in Cedis and kilograms (sample size 3,091 households). The second set of estimates narrows the sample to only include farmers who sold (sample size 2,242 households). The following main crops are included: soya, maize, groundnut, rice, beans, millet, and yams. Crops reported by at least 100 farmers as (partially) sold are considered main crops. 90 percent confidence intervals are plotted. Outcome variables are winsorized to limit extreme values, which could be due to data entry errors. Outliers below the 1st and above the 99th percentiles are replaced with the values of the 1st and 99th percentiles. Estimations control for district dummies.

91. The sales differential in favour of the lump-sum group is aligned with the previous agriculture-related insights: lump-sum households invest more in inputs and produce slightly more, too. By comparing the lump-sum group's additional harvest and their extra cash from sales, the conclusion is that the additional harvest was most likely entirely sold. In fact, further analysis shows that the lump-sum group sells on average 92 additional kilograms of harvest as compared to the monthly support group (not reported). By also considering the additional expense on inputs, roughly GHS 125[28], it follows that the additional profits for the lump-sum group were of approximately GHS 180 (5 percent of the FSA support)—if one focuses on agricultural activities alone.[29] In Section 6.3, the report expands on other revenue-generating dimensions that may have been impacted differently by the two disbursement schemes.

Heterogeneity exploration for agricultural activities and female recipients

92. Figure 16 shows that the households of female beneficiaries perform better in terms of harvested crops if they receive lump support as opposed to monthly transfers. The former group reports 145 additional kilograms of harvest. Though economically meaningful, the household sample is not sufficiently large to claim that the difference is significantly different from zero (two-sided test). Statistical power is only sufficient to say that female crop production in the lump-sum group is significantly higher than in the monthly group with 90 percent confidence (one-sided test). This may seem a sufficient statement; however,

[28] In terms of chemical fertilizer but also inputs overall: GHS 122 to 125.
[29] This is a simplification meant to give a ballpark figure. For instance, the estimation does not consider the differential employment of household labour to cultivate or harvest or other such costs.

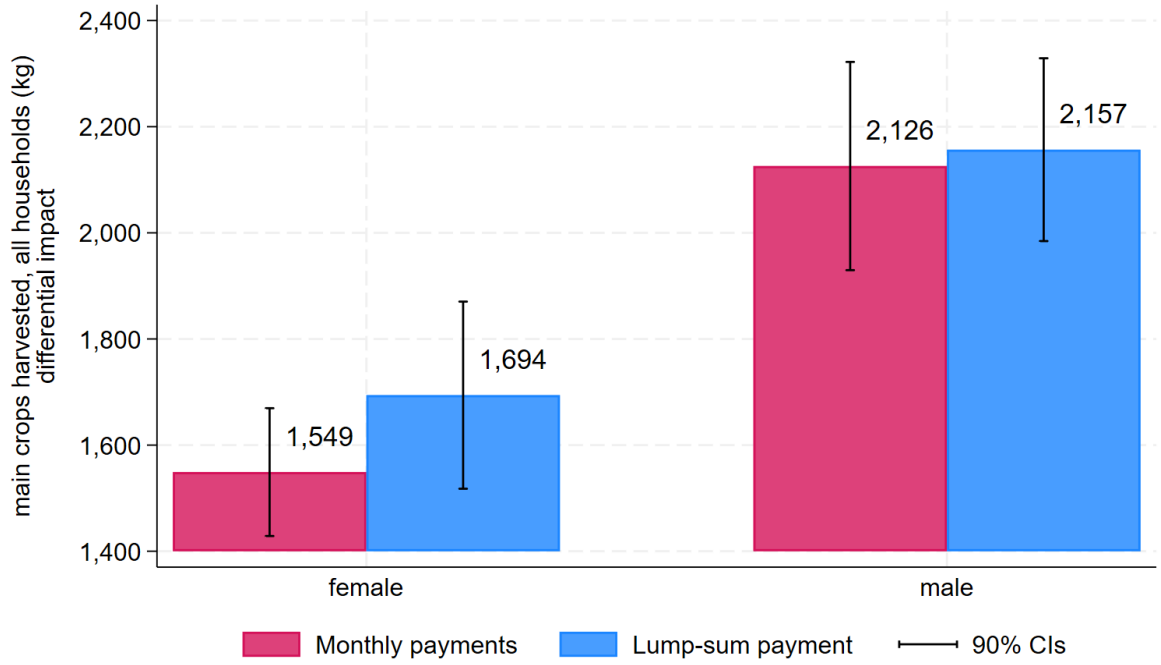
it means that one cannot also state with the same level of confidence that the female crop production in the monthly group is lower than in the lump-sum group. The statistical confidence in this case is lower than 90 percent, which would be the lowest level that is conventionally accepted. Regarding the households of male beneficiaries, lump support leads to a boost of only 31 kilograms, which is economically less meaningful and statistically not significant.

93. Noteworthy is also the fact that regardless of the disbursement scheme, the households of male beneficiaries are generally producing significantly more as compared to their female counterparts. Even pre-programme, the households of male beneficiaries cultivated 2.2 additional acres as compared to the households of female beneficiaries. This only shows that the households of female beneficiaries are generally more vulnerable, and one cannot make between-gender lump-monthly comparisons because the households of female beneficiaries start at a disadvantage. The same insights apply if the harvest is expressed in the local currency (Appendix Figure 14).

94. Moreover, Appendix Figure 15 shows that regardless of the sex of the beneficiary, all households spend more on chemical fertilizer if they benefit from lump-sum support, which is in line with the previous gender-pooled analysis, albeit the households of male beneficiaries spend more overall because their production capacity is significantly larger and thus they require more fertilizer.

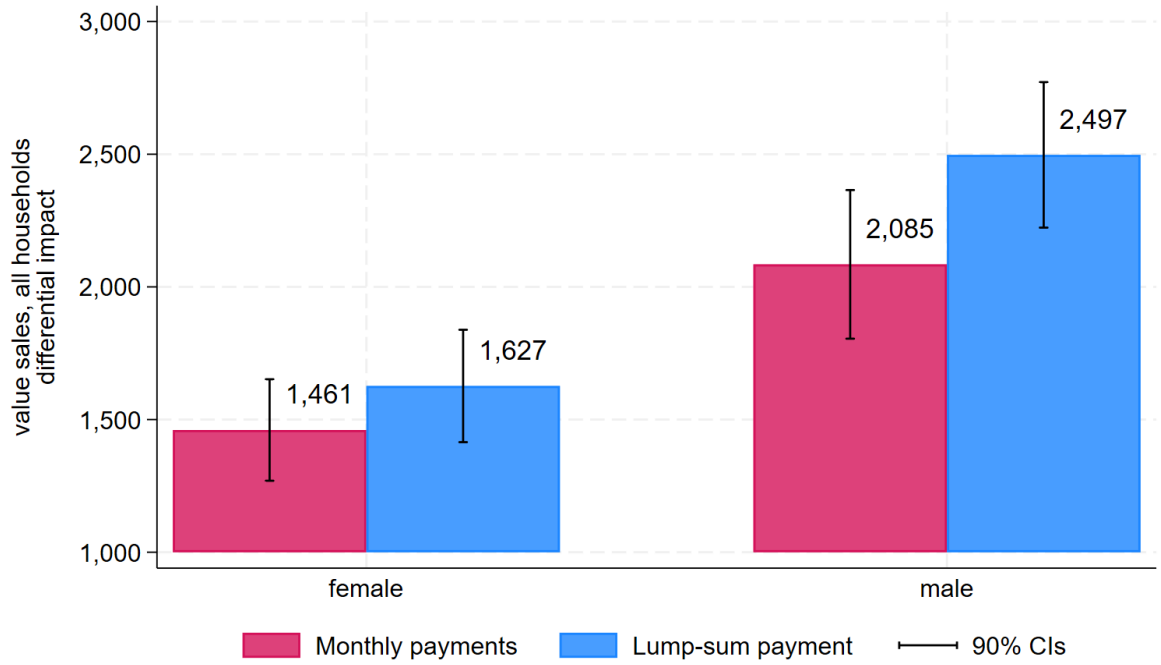
95. Regarding the reported revenue from selling crops, the lump-monthly differential impact is of GHS 166 and GHS 412 for the households of female and male beneficiaries, respectively (see Figure 17). That is 11 and 20 percent of the sales of the monthly group for each respective gender. While the households of both male and female lump-sum beneficiaries report more revenue as compared to their monthly group counterparts, the lump-sum male beneficiaries do so in a statistically significant manner. Male beneficiaries in the lump-sum group seem to sell their entire harvest boost, and this group's higher revenue is also explained by its significantly higher likelihood to sell (78 percent) as compared to males receiving monthly support (74 percent), females in the lump group (70 percent), and monthly group (69 percent). See Appendix Figure 16. Nevertheless, the former appendix table in conjunction with Appendix Table 11 point only to a *partial* heterogeneity of crop sales behaviour based on gender. The pattern for female beneficiaries is not sufficiently different from that of males as they, too, report more crop revenue following the receipt of lump support.

Figure 16: Gender heterogeneity for harvest (kilograms, round 3 survey)



Notes: Round 3 sample size: 3,091. Each column has the following number of household observations: 849, 838, 689, and 715. Estimations control for the sex of beneficiaries, district dummies, and all their interactions, including the interaction of the treatment arm with the sex of beneficiaries. Clustering at village level.

Figure 17: Gender heterogeneity for agricultural sales (Cedis, round 3 survey)

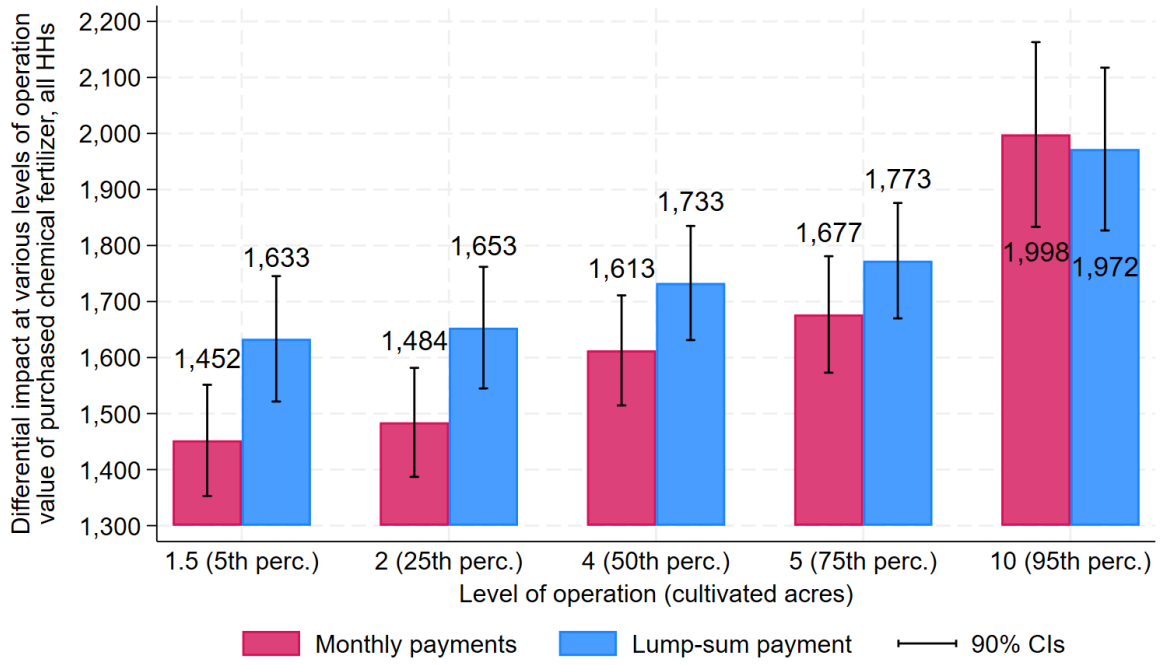


Notes: Round 3 sample size: 3,091. Each column has the following number of household observations: 849, 838, 689, and 715. Estimations control for the sex of beneficiaries, district dummies, and all their interactions, including the interaction of the treatment arm with the sex of beneficiaries. Clustering at village level.

Heterogeneity exploration for agricultural activities and farm scale

96. Figure 18 shows that there is significant impact heterogeneity in terms of fertilizer expenditure based on farm size. The lump-monthly differential gap can be as high as GHS 181 in favour of the lump-sum group for the smallest of farms and even flip and change sign in favour of the monthly-support group for the largest of farms. This pattern is suggestive of credit constraints among the smaller farms, who do not have sufficient liquidities to purchase fertilizer in the desired quantity at the start of the season. Lump support however, if timed well, is shown to alleviate the credit constraints of smaller farms and enable them to buy more fertilizer relative to other farms of the same size. The farm scale heterogeneity for fertilizer purchase is significant as Appendix Table 11 also confirms. The smaller the farm, monthly support makes this group less able or willing to spend on fertilizer at the start of the agricultural season. These heterogeneity insights are not gender dependent.

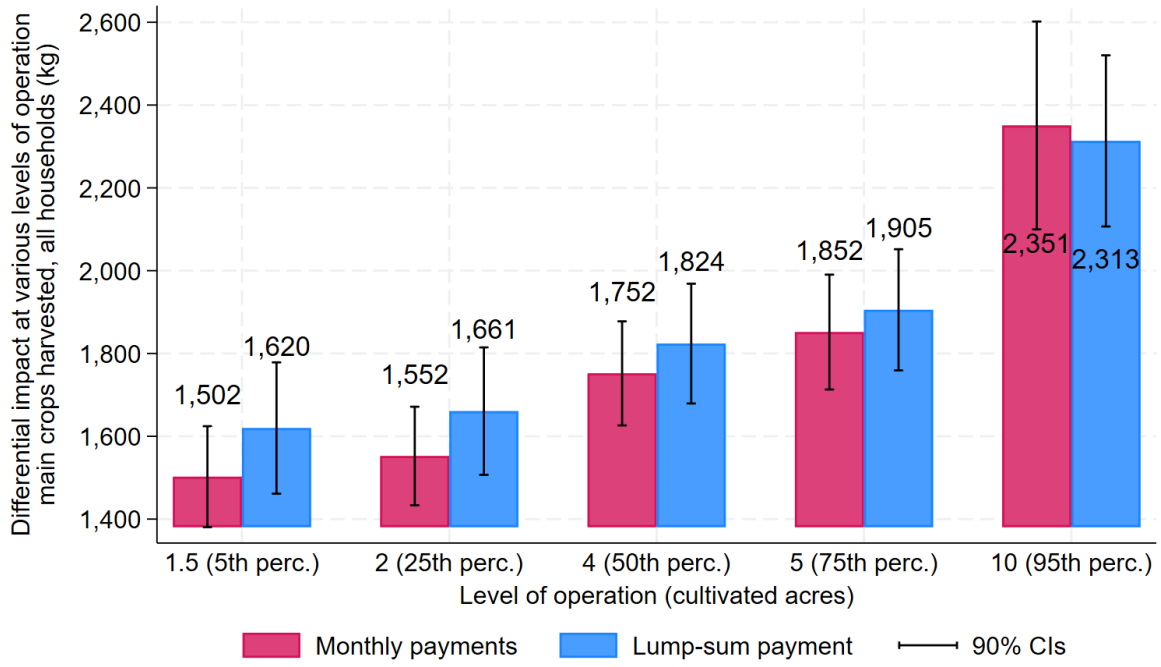
Figure 18: Scale of operation heterogeneity for fertilizer expenditure



Notes: The plotted averages are the linear predictions of fertilizer expenditure for each treatment group at various levels of farm operation, as measured in acres at the time of FSA registration. The predictions are the result of regressing the expenditure variable on treatment, the interaction between treatment and farm scale (continuous variable), and controls for the area cultivated as declared at registration, district of data collection, and their interaction. Errors are clustered at village level.

97. In contrast to fertilizer purchases, Figure 19 points to the limited heterogeneity of harvested quantities with respect to farm size. This is also confirmed by Appendix Table 11. The analysis leads to a similar conclusion if Cedis are used to quantify the harvest (Appendix Figure 17). The beneficiaries of lump-sum support and monthly transfers report similar harvests if they cultivate similar areas of land. Nevertheless, the correlation between the size of the lump-monthly differential and farm scale is negative. It suggests that smaller farms may be gaining more if they receive lump-sum support, but the link is insufficiently strong to issue any general conclusions in this regard with 90 percent or more confidence. The same conclusions apply when gender is further factored in (Appendix Figure 18 and Appendix Figure 19).

Figure 19: Scale of operation heterogeneity for harvested kilograms

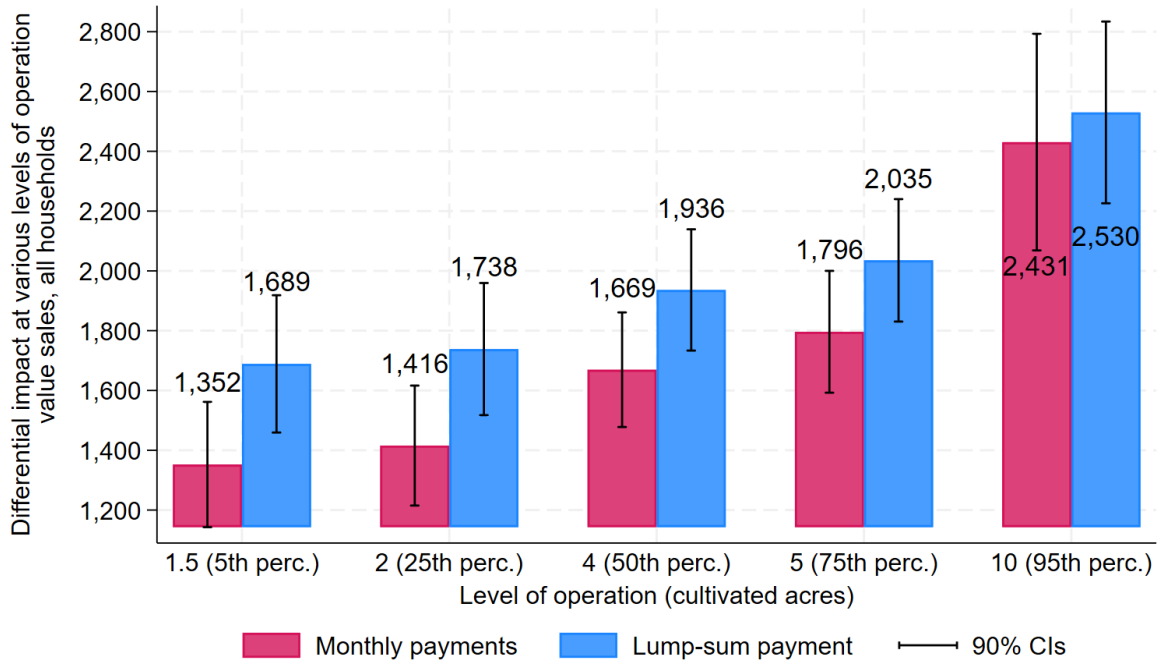


Notes: The plotted averages are the linear predictions of fertilizer expenditure for each treatment group at various levels of farm operation, as measured in acres at the time of FSA registration. The predictions are the result of regressing the harvest variable on treatment, the interaction between treatment and farm scale (continuous variable), and controls for the cultivated area as declared at registration, district of data collection, and their interaction. Clustering at village level.

98. Lastly, Figure 20 and Appendix Table 11 shows that lump-sum households report a significantly higher value of crop sales, but that the evidence is limited in terms of heterogeneity with respect to farm scale. The lump-monthly differential does become smaller with increasing farm size, i.e., the GHS 337 lump-monthly gap for the smallest of farms becomes GHS 239 for larger farms of approx. 5 acres, and it ultimately changes sign in favour of the monthly transfers group for the largest of farms. Nevertheless, the decrease is not sufficiently sharp to confidently say the sales differential is farm scale dependent.

99. However, upon further investigation and the inclusion of gender in the farm scale heterogeneity analysis of crop sales, we learn that male farmers are the main source of the documented farm scale heterogeneity, while female farmers show relatively more modest outcome differences based on farm scale. The propensity to sell crops is particularly high for male beneficiaries operating small farms in the lump sum group (Appendix Figure 21 versus Appendix Figure 22). Similarly, the sales differential is also the most pronounced for these farmers (Appendix Figure 23 versus Appendix Figure 24).

Figure 20: Scale of operation heterogeneity for agricultural sales



Notes: The plotted averages are the linear predictions of fertilizer expenditure for each treatment group at various levels of farm operation, as measured in acres at the time of FSA registration. The predictions are the result of regressing the sales variable on treatment, the interaction between treatment and farm scale (continuous variable), and controls for the cultivated area as declared at registration, district of data collection, and their interaction. Clustering at village level.

100. All regressions behind the figures presented in sub-section 6.2 are summarised in Appendix Table 6 – Appendix Table 11.

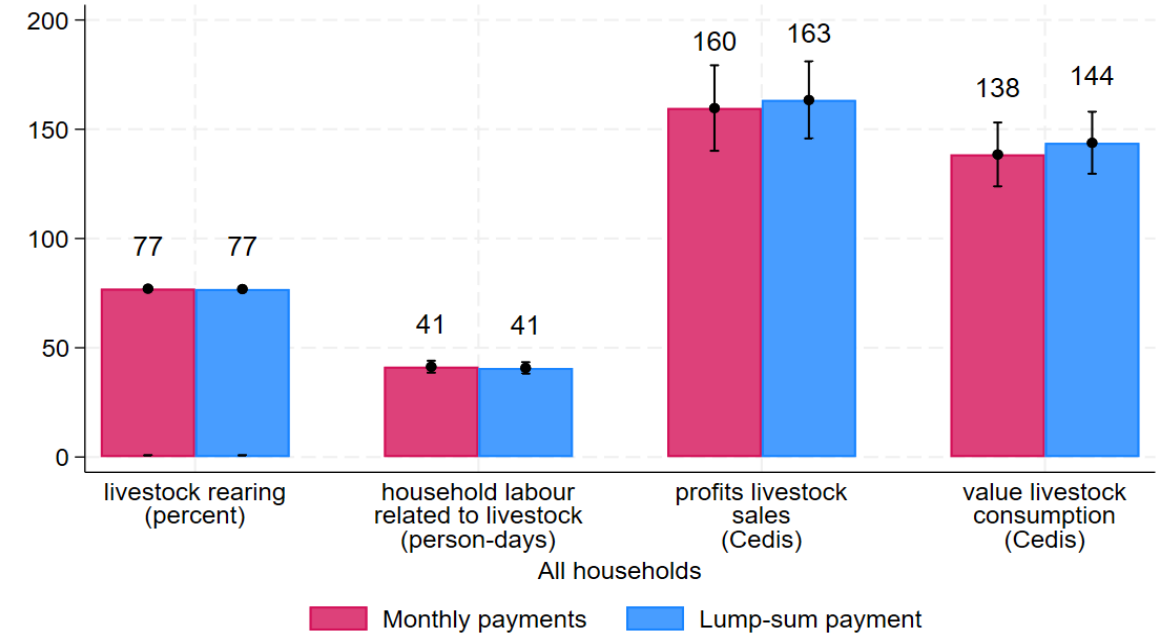
6.3 Other livelihood strategies

Livestock rearing

101. Most households keep some form of livestock, i.e., 77 percent of beneficiaries; nevertheless, there are fewer households rearing livestock than there are households cultivating land, the latter of which represent 97 percent of the sample, and which thus suggests the secondary nature of livestock rearing as a livelihood strategy.

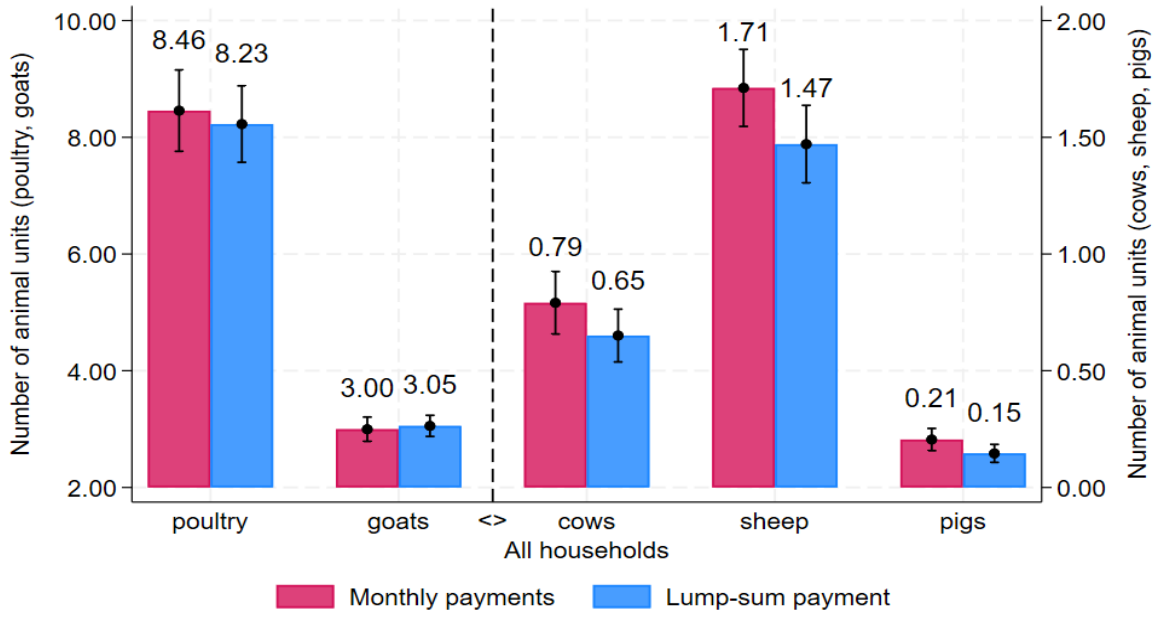
102. Figure 21 shows that the rate of rearing livestock is the same regardless of the treatment group to which the households belong. Figure 21 further shows that households across the lump and monthly payments groups are also statistically indistinguishable in terms of the household person-days labour they used for rearing livestock during the month prior to round 2 and round 3 of data collection, the value of the livestock they consumed, or the profits they declared following the sale of livestock or animal products during the six months prior to data collection.

Figure 21: Livestock rearing and related profit (last six months)



Notes: Livestock data was not collected in round 1. Recall period for value variables: last 6 months. Recall period for the labour variable: last 30 days. Livestock rearing refers to current livestock-related activities. If a household does not report livestock, then the outcomes related to labour, profits, and consumption are coded zero. Sample size is of approx. 6,100 observations. Except for the percentage of households engaged in livestock rearing, the other outcome variables are winsorized to limit extreme values. Outliers below the 1st and above the 99th percentiles are replaced with the values of the 1st and 99th percentiles. Estimations control for round and district dummies and their interaction.

Figure 22: Stock of animals



Notes: Livestock data was not collected in round 1. These are stock numbers at the time of data collection. If a household does not keep livestock, then for each type of livestock, it has a coded stock of zero. If the household keeps some but not all types of livestock, then for those types that it does not have it receives a value of zero. Sample size is of approx. 6,100

observations. Outcome variables are winsorized. Outliers below the 1st and above the 99th percentiles are replaced with the values of the 1st and 99th percentiles. Estimations control for round and district dummies and their interaction.

103. Figure 22 complements Figure 21 and plots the stock of animals that households report. The most numerous livestock is poultry, with an average of 8.3 units per household across all 6,100 household observations (rounds 2 and 3). The second most numerous livestock is goats: an average of 3 goats per household. For these two types of livestock, there are no significant differences between the lump-sum households and the households receiving monthly payments. For the other types of livestock, however, differences are statistically significant. The households receiving monthly transfers have 22, 16, and 40 percent more cattle, sheep, and pigs, respectively. These differences are significant at the 10, 10, and 5 percent levels, respectively.

104. By combining the insights from Figure 21 and Figure 22, one can reach the conclusion that the two disbursement schemes do not lead to different rates of engagement in livestock rearing or different decisions regarding the sale or consumption of livestock. The differential impact mainly regards the occasional decision of adding units of cattle, sheep, or pigs to the household's existing stock. These units, however, are not linked to increased sales or consumption in the short run. The analysis is unable to offer insights as to what happens with these additional units in the medium to long run because of the limited length of the data collection cycle.

105. Conclusions hold also if the analysis is only performed for those households that report livestock (Appendix Figure 25 and Appendix Figure 26).

Heterogeneity exploration for livestock activities and subsistence farmers

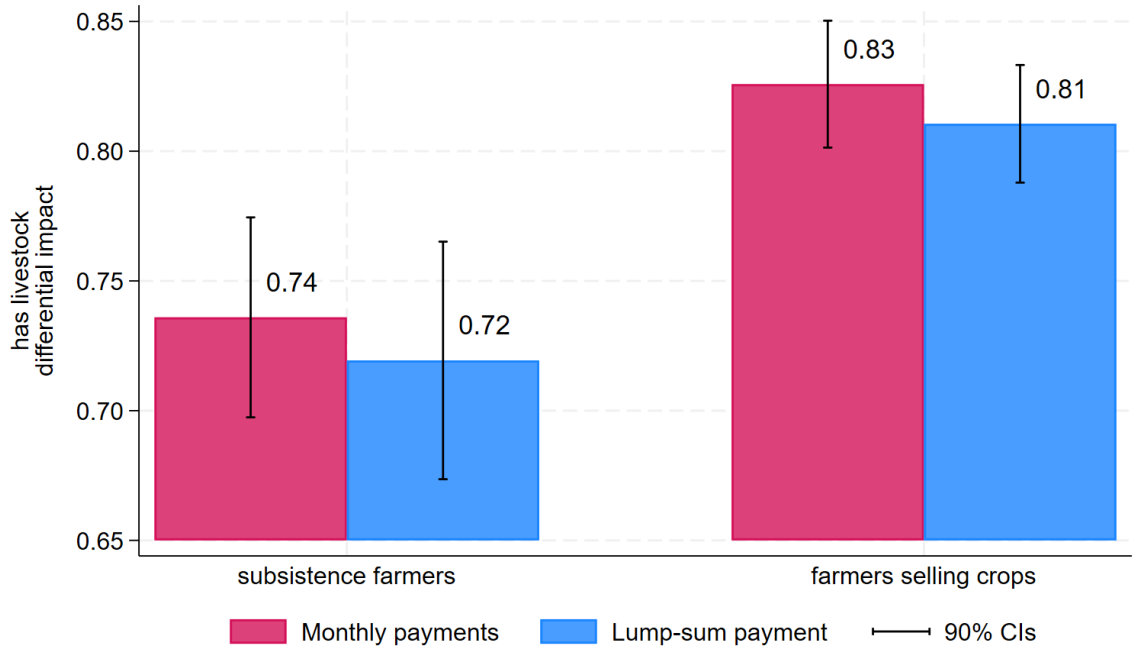
106. Among farming households, approximately 27 percent do not report selling crops, and 6 percent do not sell crops or rear livestock. Then, the remainder of subsistence farmers (not selling crops), representing 21 percent of the sample, do engage in livestock activities. Moreover, 14 percent report agricultural sales but do not rear livestock. Finally, approx. 59 percent of farming households report both selling crops and engaging in livestock rearing. See Appendix Figure 27 and Appendix Figure 28 for a histogram of animal ownership for the main types of livestock: poultry, goats, and sheep.

107. The average six-month profits from the sale of livestock for households that also sold crops is estimated at GHS 170. Then, the average revenues from livestock for subsistence farmers were significantly lower at GHS 125. Similarly, the direction of the gap is maintained for the value of the consumed livestock, although it is smaller in size, GHS 24. Figure 23 suggests that subsistence farmers are generally poorer. They also engage less in livestock activities regardless of their treatment group, monthly or lump-sum support.

108. Figure 24 shows that—conditional on livestock ownership—subsistence farmers were also less likely to sell livestock over August 2023 – January 2024 as compared to farmers who sold crops. Moreover, households adopt the same sales behaviour as it relates to livestock across the two treatment groups, namely an average sale rate of 30 percent, irrespective of whether they receive lump-sum or monthly support.

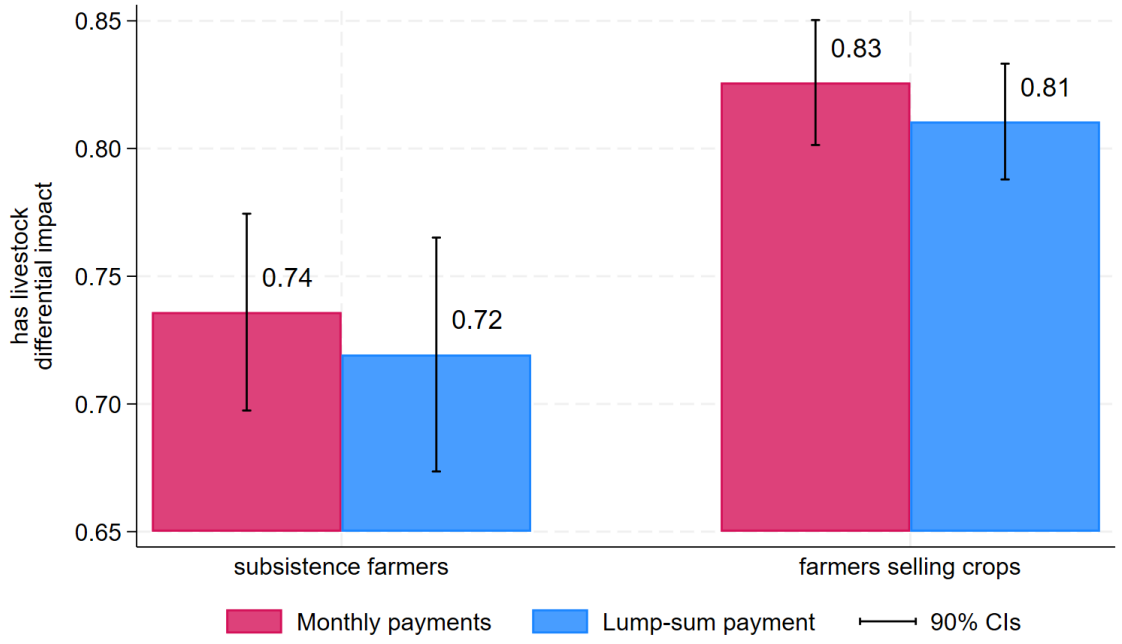
109. All regressions behind the livestock-related figures are summarised in Appendix Table 12 – Appendix Table 14.

Figure 23: Subsistence heterogeneity for livestock rearing



Notes: Round 3 data are used as both agriculture and livestock data are collected for this round. All households are considered. Sample size is 3,091 household observations. Each column has the following number of household observations: 441, 1,097, 408, and 1145. Estimations control for whether the farmers sell crops, district dummies, and their interaction with the sale dummy. Errors are clustered at village level.

Figure 24: Subsistence heterogeneity for livestock selling

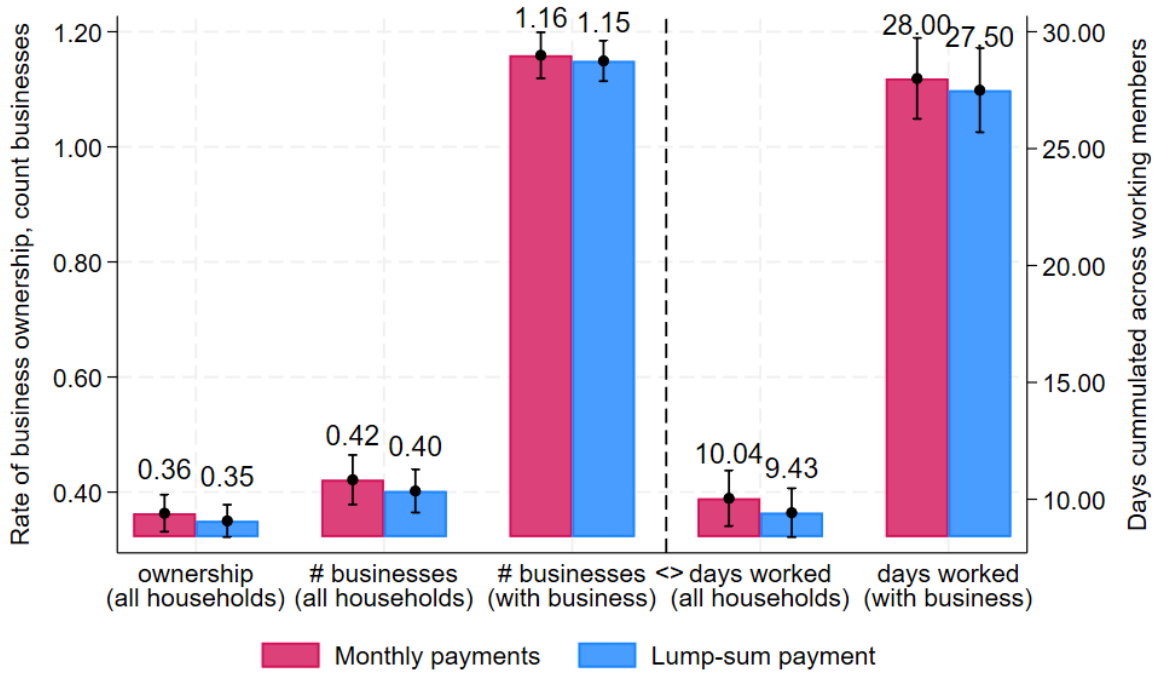


Notes: Round 3 data are used as both agriculture and livestock data are collected for this round. Only households reporting livestock are considered. Sample size is 2,474 household observations. Each column has the following number of household observations: 350, 894, 317, and 913. Recall period: last 6 months. Estimations control for whether the farmers sell crops, district dummies, and their interaction with the sales dummy. Errors clustered at village level.

Business activities

110. Approximately a third of households operated a business during the year prior to data collection, and only a few of those reporting business activities operated more than one type of business. The most common businesses consist of buying and selling goods (approx. 39 percent of the main business instances) and the processing of agricultural products (approx. 36 percent). Business owners make roughly GHS 300 in profits per month and have 1 or 2 household members working for the household business. They dedicate an estimated pooled average of 28 days of work per month.

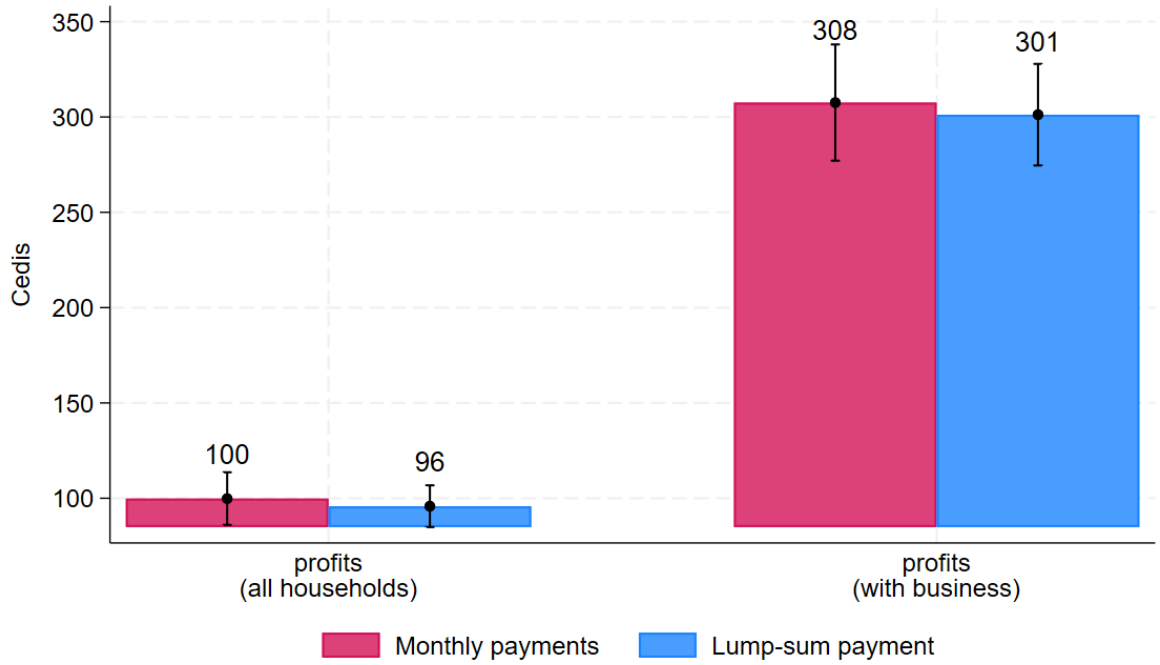
Figure 25: Engagement in business activities



Notes: Rounds 2 and 3 are used. Business data was not collected in round 1. These estimates are pooled across rounds for increased power and simplified view. Estimates are for all households who answered the survey and for those households who reported a business. Business activities relate to the 12 months prior to data collection, and the number of days worked relates to the 30 days prior to each survey round. If a household does not report business activities, it receives a value of zero for its number of businesses and days of work. Sample size is of approx. 6,100 household observations across 2 waves. 90 percent confidence intervals are plotted. The number of workdays is winsorized to limit extreme values. Outliers below the 1st and above the 99th percentiles are replaced with the values of the 1st and 99th percentiles. Estimations control for round and district dummies and their interaction.

111. Figure 25 shows that household business activities are largely unaffected by the type of disbursement scheme they were randomly assigned. Whether lump-sum or monthly transfers were made, households reported very similar rates of business ownership and engagement, the latter of which is measured by the number of businesses households operated and the dedicated labour days across household members during the last month.

Figure 26: Profits from business activities (last 30 days)



Notes: Rounds 2 and 3 are used. These estimates are pooled across rounds. Estimates are for all households who answered the survey and for those households who reported a business. Profits relate to the 30 days prior to each survey round. If a household does not report business activities, it receives a value of zero for its profit outcome. Sample size is of approx. 6,100 household observations. 90 percent confidence intervals are plotted. The number of workdays is winsorized to limit extreme values. Outliers below the 1st and above the 99th percentiles are replaced with the values of the 1st and 99th percentiles. Estimations control for round and district dummies and their interaction.

112. Moreover, Figure 26 further confirms that the difference in terms of profits between the two comparison groups is also not statistically significant or economically meaningful. Households benefiting from lump-sum support or monthly transfers report by and large the same level of profits.[30]

113. Overall, there is no evidence that the lump-sum and monthly transfer modalities lead to different outcomes as far as household business activities are regarded.

114. The regressions behind the figures in this sub-section are in Appendix Table 15.

Wage employment

115. Approximately 10 percent of individuals aged 12 or above and residing in the surveyed households are reported to benefit from wage employment. Those who report wage employment report working an average of 5.5 months in the last 12 months at their main occupation. The median is 4 months. For each of the months worked, the average is 15 days per month at roughly 7.3 hours a day. The winsorized monthly salary is estimated at GHS 835 for the main occupation (sample of ~ 2,625 wage reports). Most often, the main occupation is agricultural labourer (60 percent of instances).

116. A further 11 percent of those reporting wage employment also reported a secondary source of employment. The duration of the secondary employment is slightly less than the main occupation and is

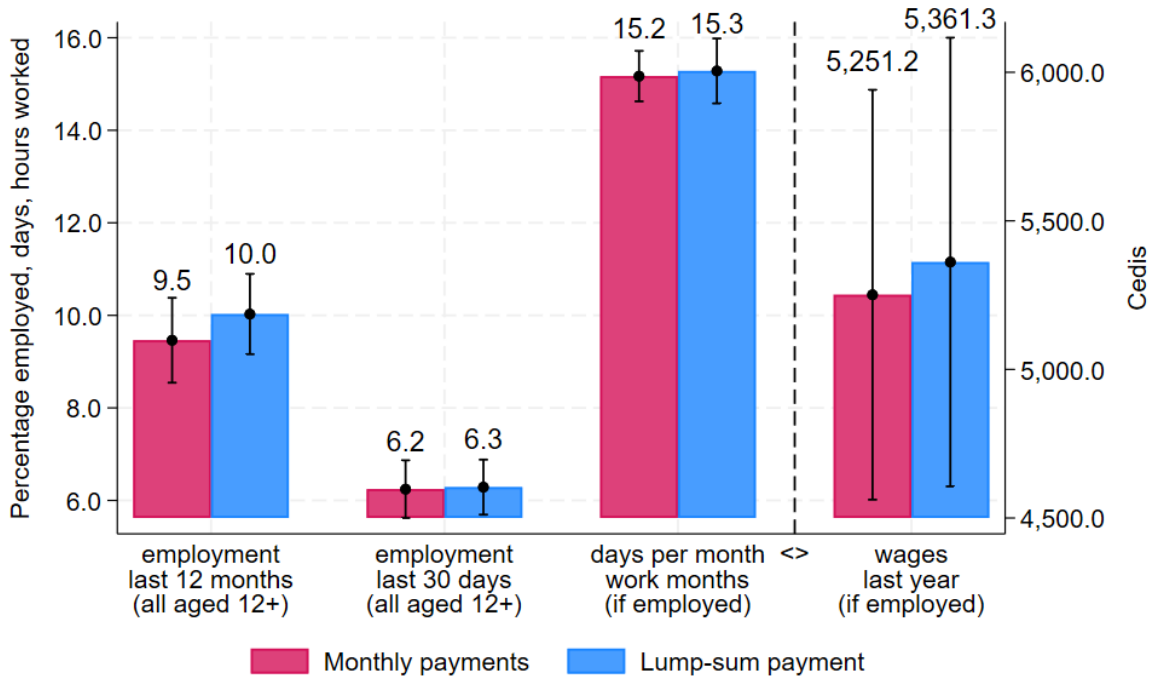
[30] Estimations were also compiled to compare business investments (not reported). The same insights apply. There are no statistically significant or economically meaningful differences between the two comparison groups.

remunerated at roughly GHS 575 (sample of ~ 270 wage reports). The wages plotted in Figure 27 include both occupations when a secondary occupation is reported.

117. Figure 27 shows that the above statistics do not change when factoring in the type of support received by the households. There is no distinguishable differential impact between the groups receiving lump-sum or monthly payments regarding both the extensive and intensive margins of households' engagement in wage employment (i.e., rate of employment or effort and remuneration, respectively).

118. The regressions behind the wage-related figures are in Appendix Table 16.

Figure 27: Wage labour



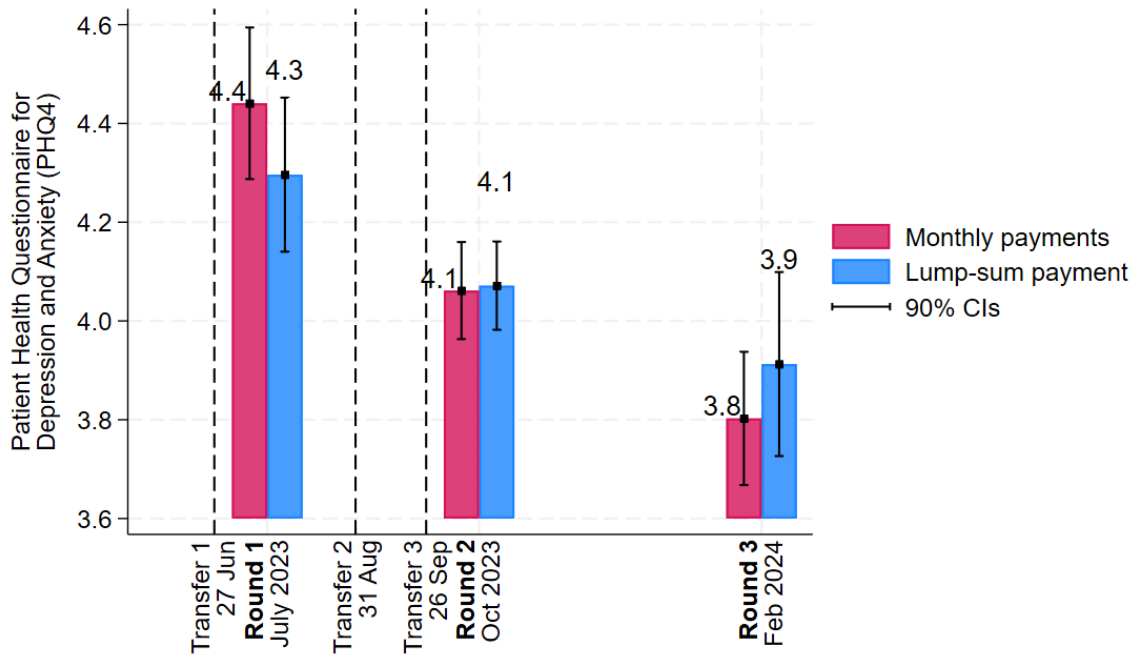
Notes: Rounds 2 and 3 are used. Employment data was not collected in round 1. These estimates are pooled across rounds for increased power and simplified view. Estimates are for all individuals who are at least 12 years of age and for those individuals who reported employment among them. A day is counted as a workday regardless of the number of hours worked during that day. Wages are estimated for the entire year given the reported number of months, weeks, and days a person worked and at the wage rate that is most recent. *If more than one occupation, then both are used to compute the year-based wage.* Sample size is of approx. 30,500 individuals aged at least 12 across 2 waves. 90 percent confidence intervals are plotted. The wage outcome is winsorized to limit extreme values. Outliers below the 1st and above the 99th percentiles are replaced with the values of the 1st and 99th percentiles. Estimations control for round and district dummies and their interaction.

6.4 Mental health and wellbeing

119. The Patient Health Questionnaire for Depression and Anxiety (PHQ4) is an ultra-brief screening tool for anxiety and depression. PHQ4 scores can be categorized as normal (0–2), mild (3–5), moderate (6–8), or severe (9–12). The average PHQ4 in round 1 was 4.4 across the two comparison groups, which suggests that the sampled populations were mildly impacted by depression and/or anxiety at that time (transfer 1 had been disbursed). The average score goes down to 3.9 at the time of round 3, and the trend

appears to be one of decreasing anxiety and depression.[31] Nevertheless, Figure 28 shows that differences among the groups receiving lump-sum versus monthly transfers are small in magnitude and not statistically significant. Thus, the households' anxiety and depression are not significantly influenced by the transfers' disbursement scheme.

Figure 28: Patient health questionnaire for depression and anxiety



Notes: PHQ4 aims to grasp and estimate the level of depression and/or anxiety in a person. Higher PHQ4 means more anxiety and/or depression. The questions that were asked: How often have you felt nervous, anxious or on edge? How often have you felt unable to stop or control worrying? How often have you felt down, depressed or hopeless? How often have you felt little interest or pleasure in doing things? The timeframe is the last two weeks. Note that the round 2 answer choices differed from those of rounds 1 and 3 (5 vs. 4 categories). The round 1 and round 3 answer options were: 0-Not at all, 1-Several days, 2-More than half the days, and 3-Nearly every day. The round 2 categories were: 1-Never, 2-Not often, 3-Sometimes, 4-Often, 5-Very often. Categories 2 and 3 from round 2 are collapsed and recoded to category 2 per rounds 2 and 3. This is the recoding that happened (round2 to rounds1/3): (1=0) (2=1) (3=1) (4=2) (5=3). This recoding does not impact the ability to compare the outcomes of the two groups; however, it may impact the interpretation of the cross-round trend in the outcome. 90 percent confidence intervals are plotted. Round 1 sample size: 3,237 households; round 2: 3,011 households; round 3: 3,077 households. A few households refused to answer the questions. The estimation controls for round and district dummies and their interaction.

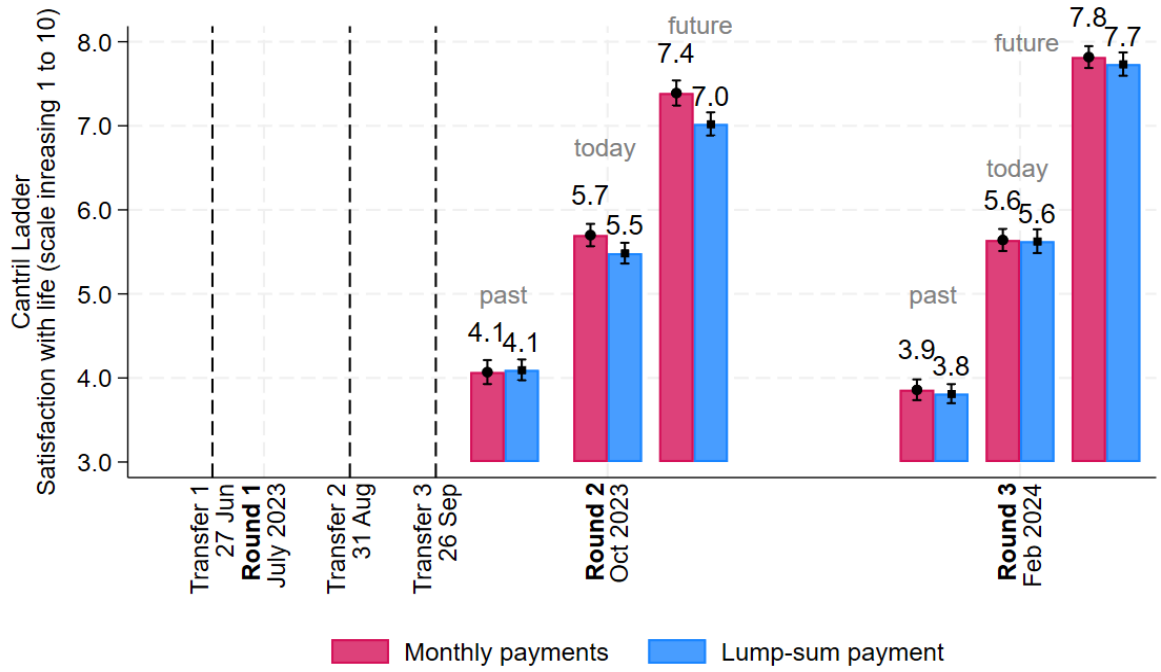
120. The Cantril ladder is an additional outcome that can be used to measure mental well-being. Respondents are asked how they see their past, current, and future lives. They are asked to think of a ladder, with the best possible life being a 10 and the worst possible life a 0. Data is only available for two rounds.

121. Figure 29 shows that the sampled populations are overall more optimistic about the future (7.5) than they are about the present (5.6) or past (4.0). On the other hand, the same graph suggests that one's outlook on life is influenced by the recent receipt of cash. Round 2 took place immediately after the monthly group received its third and last payment. Figure 29 shows that this group is significantly happier about the present (0.2 differential impact ~ 10 percent of a standard deviation) and more optimistic about

[31] No data is available for non-beneficiaries. The downward trend should be interpreted with caution. One cannot claim that the project has reduced anxiety and depression among the beneficiary populations for lack of a reference group to show how the latter's indicators have evolved.

the future too (0.4 differential impact ~ 20 percent of a standard deviation). The fact that both groups regard the past the same way further corroborates the hypothesis that the recent receipt of cash impacts one's outlook on life. The past cannot be changed, but the present and future look better. Importantly, however, this effect is temporary. As of round 3, several months after both groups received their transfers, the differential impact becomes insignificant. Both groups have the same outlook on life at the end of the study.

Figure 29: Satisfaction with life



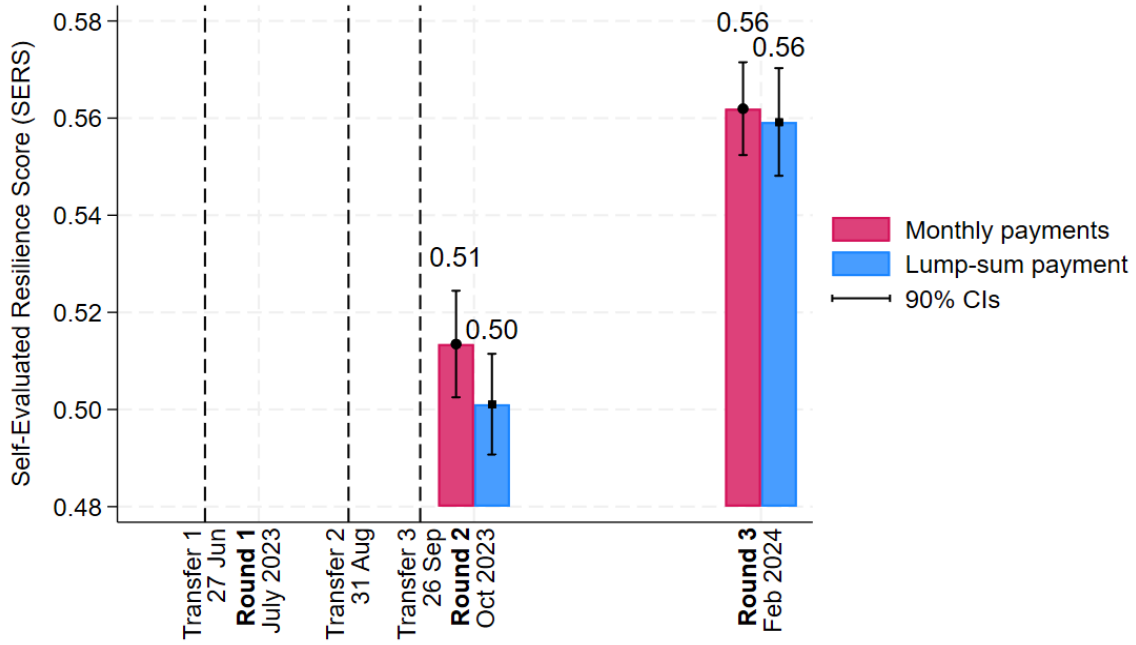
Notes: Higher values indicate greater satisfaction with life 2 years back, present, and 2 years in the future. Respondents are asked to rate their life on the scale from 0 to 10. 90 percent confidence intervals are plotted. Round 2: 3,017 households; round 3: 3,091 households. The estimation controls for round and district dummies and their interaction.

122. The Subjectively Evaluated Resilience Score (SERS) indicator measures overall resilience, i.e., a household's ability to respond to various threats and disturbances (see Figure 28 below). As of round 2, the households who had just received their third monthly instalment deemed themselves significantly more resilient (0.012 differential impact, 7.5 percent of a standard deviation). Although the magnitude of the difference is very modest, it is aligned with the interpretation of Figure 29, especially as SERS in round 3 also shows no statistically significant difference between the two groups—as did the Cantril ladder assessments.

123. Across the three measures for mental well-being, the conclusion is that cash does have a modest positive impact on some mental well-being outcomes soon after it is received. However, whether the payments are done in lump-sum or as monthly transfers, it does not matter in the medium run. The endline mental health is largely the same for the interviewed households, regardless of their treatment group. They have very similar levels of depression, anxiety, happiness, and subjective resilience at endline.

124. The regressions behind figures in sub-section 6.4 are summarized in Appendix Table 17.

Figure 30: Self-Evaluated Resilience Score



Notes: Higher values indicate greater subjective resilience. 9 questions posed indirectly. For example, on a scale from 1 to 5, with 1 being strong disagreement and 5 being strong agreement, would you say that: During times of hardship, your household can access the financial support you need? Answers are added and transformed to range from 0 to 1. 90 percent confidence intervals are plotted. Round 2: 3,017 households; round 3: 3,091 households. The estimation controls for round and district dummies and their interaction.

6.5 Expenditure and household financial tools

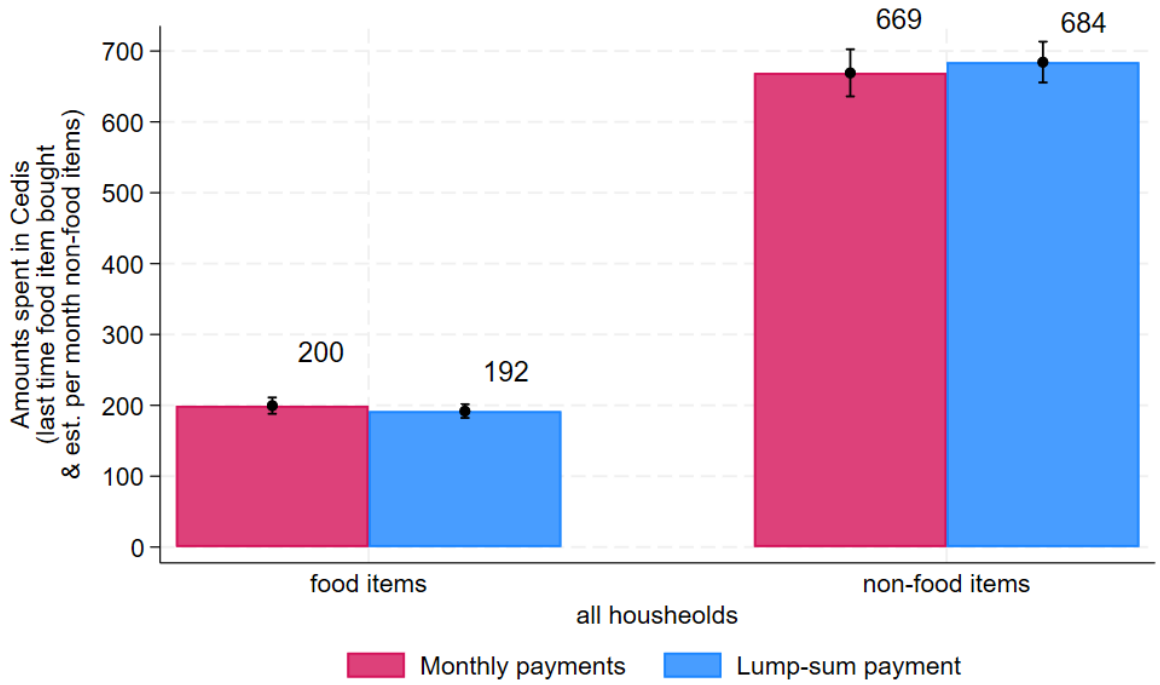
Allocation of household resources

Spending on food and non-food goods and services

125. Figure 31 shows that households receiving lump-sum support allocate their resources in a very similar manner as those receiving monthly support to meet their food and non-food needs, the latter of which include services and non-durables. Note that the accumulation of household assets (i.e., durables) is analysed separately after this sub-section. This insight holds even after exploring household expenditure wave-by-wave to account for the potential sensitivity of such decisions to the timing of the support received by the two groups (see Appendix Figure 29). The analysis was also disaggregated per type of expenditure, and there are no significant differential impacts either (not reported).

126. Neither group is likely to spend more on education. However, school enrolment for children residing in households receiving monthly support is 2 (round 2) and 1 (round 3) percentage points higher. The average rate of being in school is already high at over 90 percent, and any increase at this level can be considered a valuable achievement. See Appendix Figure 30 for a plot of these results per round of data collection. The regressions behind Figure 31 are summarized in Appendix Table 18.

Figure 31: Household food and non-food expenditure



Notes: Food items include cereal-based items, tubers, pulses, fruits, vegetables, meat, fish and seafood, dairy products, oil, fats, butter, sugar and sweetened foods, condiments, ready-made meals, non-alcoholic beverages. Reference period: last time the food item was bought. Non-food items include: alcohol and tobacco, hygiene items and services, transport of goods and people, fuel for vehicles, water, electricity, fuel for cooking, heating, and lighting, services related to the dwelling, communication, goods and services related to recreation, medical expenses, clothing, shoes, tailor services, education (all preceding categories are recalls for the month prior to data collection), rent, household *non*-durables, routine maintenance, veterinary expenses (last 6 months), and expenses with funerals, marriages, and other social events (last year). All the non-food categories were either kept as is (i.e., last month's expenses), or divided by 6 or 12 for expenses in the last 6 months and 12 months, respectively. If one of the food or non-food expenditure categories had a "don't know" as an answer to the amount of the expenditure, then those households were taken out of the analysis (18 such cases for food items and 75 for non-food items). Round 2 and 3 data only. Total observations: 6,090 for the analysis of the food budget and 6,033 observations for the analysis of the non-food budget. The variables were winsorized to limit extreme values. Outliers below the 1st and above the 99th percentiles are replaced with the values of the 1st and 99th percentiles. Estimations control for round and district dummies and their interaction.

Household asset holdings

127. Appendix Figure 31 and Appendix Figure 32 indicate that households from the monthly transfers group own slightly more assets (especially bicycles, cell phones, motorcycles, and yokes) than households from the lump-sum group. These two figures give a joint picture of the monthly group's increased likelihood of owning these assets as well as its higher average stock at the household level and per household member, respectively.

128. The differential impact between the two groups becomes more telling in Appendix Figure 33, which only includes households who report owning the assets. In fact, most of the differential impact between the two groups is due to monthly-group households owning assets in higher quantities relative to lump-sum households, contingent on asset ownership. For instance, the strongest effect is related to cell phone ownership. Among 6,011 household observations who report owning at least 1 cell phone, the lump-sum group has an average ownership level of 0.391 phones per household member (e.g., households of 3 members would normally have a phone, households of 5 members would normally be close to having 2 phones per household). In contrast, the average ownership per household member for the monthly transfers group is 0.4 phones. The difference of 0.024 phone units per household member is significant

with 99 percent confidence. To interpret the magnitude, take roughly 10-11 households of 4 members each. If they were all from the monthly transfers group, then 1 additional household among them would have 1 additional phone as compared to a scenario whereby all households belonged to the lump-sum group. Appendix Figure 33 shows similar significant impacts which favour the monthly group for mattresses and beds, bicycles, mosquito nets, carts, TVs, machetes, and motorcycles (listed in order of their magnitude and significance). The smallest differential impact is for motorcycles at 0.011 but still significant with 95 percent confidence.

129. The overall insight is that the distribution schedule of the FSA transfers does impact farmers' decision-making as it relates to the purchase of assets. Giving monthly transfers makes it more likely that households increase the number of assets they own contingent on their ownership of some positive stock to begin with. While this insight applies to some farm assets, it mostly describes the situation of household assets. The assets-related regressions are presented in Appendix Table 19 – Appendix Table 21.

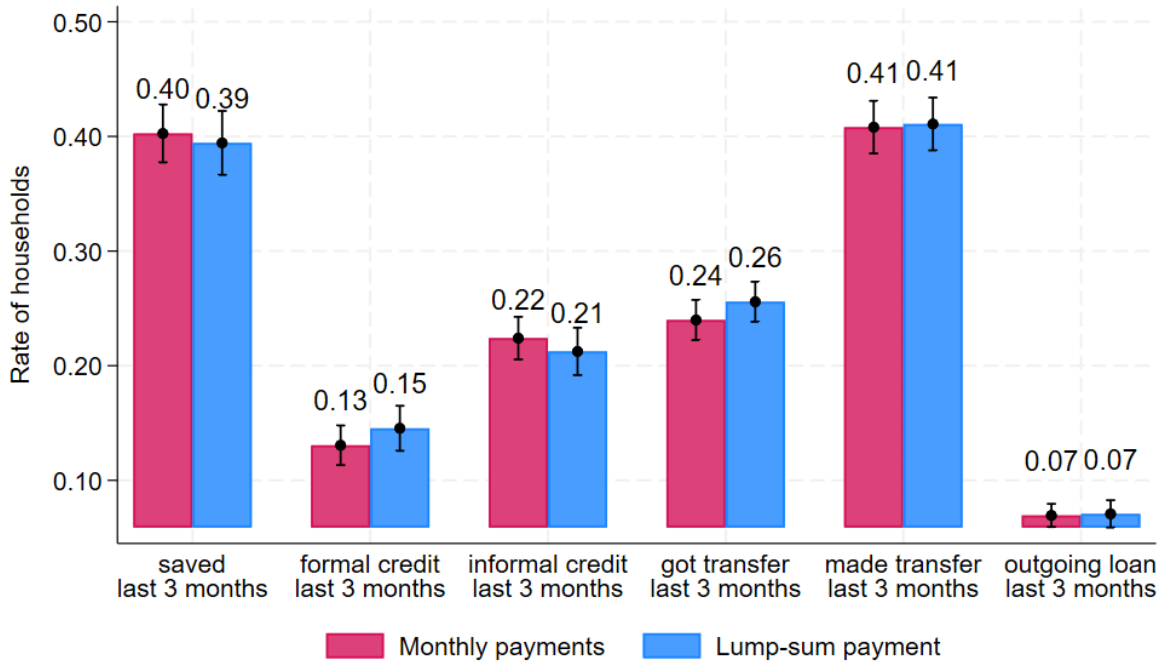
Savings, loans, and transfers

130. Figure 32 shows that the type of disbursement scheme does not impact the households' propensity to save, acquire credit (formal or informal), receive or make transfers, or give loans. The differential impact between the two groups is generally smaller than 2 percentage points and not statistically significant.

131. However, Figure 33 gives a more nuanced account of the households' financial behaviour. Specifically, although reporting almost the same rate of accessing formal credit as the households in the lump-sum group, the households receiving monthly transfers acquired approx. GHS 280 in additional credit (95 percent confidence) and consequently had an approx. GHS 190 higher balance left to repay (95 percent confidence). Beyond formal credit, the two groups only further distinguish themselves in terms of the amounts they save, although the differential impact is slight. For instance, the households in the monthly group save just slightly more (GHS 46 and just barely significant with 90 percent confidence). However, in terms of their savings balance, the households receiving monthly transfers are not significantly different from their counterparts in the lump-sum group, which suggests that they may be using up slightly more of their savings assuming roughly similar savings among the two groups pre-programme.

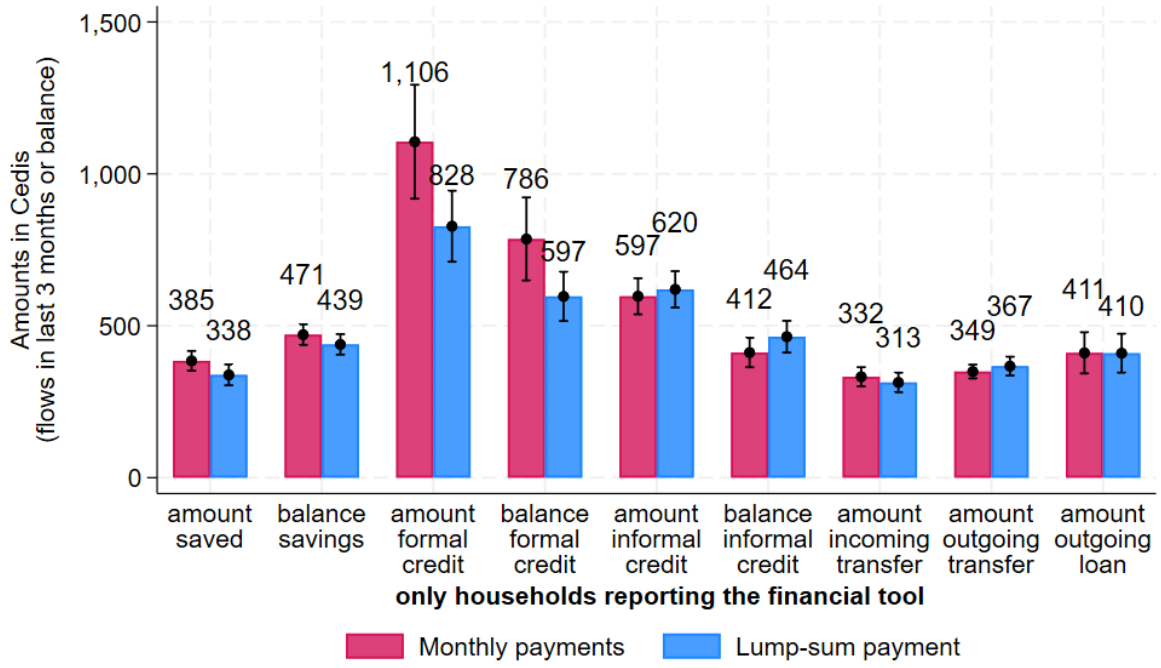
132. The regressions summarizing the figures in this section are presented in Appendix Table 22 and Appendix Table 23.

Figure 32: Rate of saving, transfers, accessing credit



Notes: These are yes/no questions whether the household saved, obtained formal/informal credit, received/made transfers or gave loans to friends/family. 90 percent confidence intervals are plotted. Financial data was only collected in rounds 2 and 3: 6,108 observations. The estimation controls for round, district dummies and their interaction.

Figure 33: Balance and amounts saved, credited, transferred



Notes: Flows in the last 3 months (savings, credit, transfers, loans) and balance as of the date of data collection. Only the households reporting each type of financial instrument are used for the analysis. Thus, the sample sizes in the order results are plotted are as follows: 2,353, 2,372, 843, 831, 1,333, 1,333, 1,514, 2,501, and 426. Outliers below the 1st and above the 99th percentiles are replaced with the values of the 1st and 99th percentiles due to probable data entry errors. 90 percent confidence intervals are plotted. The estimation controls for round and district dummies and their interaction.

7. Conclusions and considerations for future programming

133. Both disbursement methods have their respective merits, and each approach is better suited at improving a specific set of outcomes. Moreover, there are also outcomes which seem indifferent to the type of support. Thus, the choice of payment modality largely relies on project objectives and the outcomes deemed critical.

Evaluation Question 1: What is the impact of providing lump-sum cash transfers on smallholder farmer-households' food security, coping strategies, and mental health and well-being, as compared to smaller monthly transfers?

134. The lump-sum group has a clear and significant advantage during round 1 of data collection in terms of food security and coping strategies (i.e., a 3.5 percent increase in FCS and a 10.1 percent reduction in rCSI). Over time, once the monthly transfers group receive their additional transfers (totalling USD 315), both groups converge and reach very similar levels of food security.[32] Importantly, however, the lump-sum group never becomes significantly worse off due to their initial disproportionate focus on food security, thus indicating a net welfare gain in terms of food security for this group.[33] The two small transfers of USD 15 each that were made to the lump-sum group following the receipt of the lump transfer (USD 285) have likely contributed to the balancing of food security outcomes relative to the monthly group in the medium run. Finally, there are only marginal differences in the measures for mental wellbeing and life satisfaction: round 2 data indicates that shortly after receiving the last tranche, the group benefiting from monthly support reported slightly higher current and expected life satisfaction. At endline, the two groups were statistically indistinguishable in terms of mental health.

Evaluation Question 2: What is the differential impact of providing lump-sum vs monthly cash transfers on agricultural outcomes, livelihood, and other financial outcomes?

135. Households receiving lump-sum support report better agricultural outcomes (e.g., input use, harvested quantities, and sales revenue). This is likely due to the large, upfront investments required at the start of the agricultural season, which lump-sum transfers enable. Farmers receiving lump-sum support cultivate slightly more land (5 percent), use significantly more household labour (18 percent), and spend more on chemical fertilizers (7.5 percent). Their relatively more intensive use of specific agricultural inputs translates into a greater harvest too (5 percent more than the monthly group's harvested average). The harvest differential connects the insights related to input use and agricultural sales. Specifically, the lump-sum households report significantly more revenue from the sale of crops: between 13 and 17 percent as compared to the sales of the group receiving monthly transfers.[34]

136. In contrast, the effects on other livelihood outcomes, such as livestock, business activities, and wage employment, are more nuanced. For instance, making monthly payments favours investments in livestock (i.e., households buy more livestock) as compared to lump-sum support: the monthly group owns

[32] The convergence of consumption, irrespective of the disbursement schedule and after the completion of the intervention in the medium- to long-run, was also observed by Crosta et al. (2024) following their pooling of the findings of studies that compare the beneficiaries of regular transfers/streams and/or lump-sum support with non-beneficiaries.
[33] This compares to findings on the impacts of early transfers/anticipatory action in Dunsch, F.; Adusumalli, N.; Balantrapu, T; Batmunkh, O.; Christian, P; Heirman, J.; Kelley, E.; Kondylis, F.; Lane, G.; Malhotra, K.; Moreno, S. & Paulose, H. (2025). Impact Evaluation of Anticipatory Action in Nepal. World Food Programme Office of Evaluation.
[34] In their meta-analysis, Crosta et al. (2024) find that lump-sums and regular streams of cash lead to similar investment patterns contrary to the finding that lump transfers favour investments in durable assets (as in e.g. Haushofer and Shapiro, 2016). Due to the limitations of pooling, Crosta et al. (2024) only compared a subset of possible investments across multiple studies, e.g., household assets. This report draws on a richer overview of possible household investments.

22, 16, and 40 percent more cattle, sheep, and pigs, respectively. However, the behaviour and decision-making processes related to business and wage activities show no sensitivity to the payment schedule. Lastly, households receiving monthly support report accessing more credit via formal institutions and have a higher outstanding balance at endline relative to the lump-sum group. This is likely linked to the former group's significantly higher investments in assets (e.g., phones, beds, mattresses, carts, mosquito nets, etc.), which likely required taking loans.

Consideration 1: Lump-sum support to increase crop investments and revenues

137. Lump-sum support enabled channelling significantly more resources toward crop cultivation, e.g., the purchase of inputs and use of significantly more household resources (labour and land) for agriculture. Consequently, households produce and sell slightly more and collect significantly higher revenues. Projects that aim to boost agricultural outcomes should therefore consider providing a larger and *timely* lump-sum support that enables farmers to optimize investments and simultaneously increase food security in the short run. The "labelling" of the FSA support for agricultural support might have additionally favoured spending on agricultural inputs. [35,36]

Consideration 2: Monthly support to grow the livestock and asset base

138. Households from the monthly group report significantly more livestock ownership, e.g., sheep, cows, and pigs. However, the timeframe of data collection does not allow to formulate any insights regarding the potential uses of the additional livestock units, i.e., for consumption or investment. The monthly group also reports significantly higher access to formal lending and ownership of other assets, the latter of which, however, are not all productive (e.g., beds and mattresses), but some can be (bicycles, phones, motorbikes).

Consideration 3: Lump-sum transfers to support smaller farms

139. Farmers cultivating smaller plots, e.g., less than 5 acres, experience the most significant food security boost based on their receipt of lump as opposed to monthly support. Additionally, lump-sum support also enabled higher spending on chemical fertilizer by smaller farms relative to equally sized farms receiving monthly transfers. This farm scale effect was mostly present among male beneficiaries. Future projects aiming to boost the livelihoods of smaller farms might therefore lean toward using lump-sum transfers.

Consideration 4: Introducing small (often costless) tweaks can have considerable effects

140. The simple switch from business as usual (i.e., monthly transfers) to lump-sum has increased agricultural revenue by an amount which represents roughly 9 percent of the total FSA support (or 5 percent if profits are the measure).[37] This shows that projects can create additional value by making small changes to their implementation strategy. In many cases – as was the case of the FSA – these changes do not incur additional costs.

[35] Benhassine, N., Devoto, F., Duflo, E., Dupas, P., & Pouliquen, V. (2015). Turning a shove into a nudge? A "labeled cash transfer" for education. American Economic Journal: Economic Policy, 7(3), 86-125.
[36] Heinrich, C. J., & Knowles, M. T. (2020). A fine predicament: Conditioning, compliance and consequences in a labeled cash transfer program. World Development, 129, 104876.
[37] https://wfp-evaluation.medium.com/lean-impact-evaluations-experimental-evidence-in-adaptive-humanitarian-interventions-c6f5fe48b691

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Acronyms

CBT&G	Cash-Based Transfers & Gender
CO	Country Office
CSP	Country Strategic Plan
CSPE	Country Strategic Plan Evaluation
DIME	Development Impact (World Bank)
FCS	Food Consumption Score
FIES	Food Insecurity Experience Scale
FGD	Focus Group Discussion
FSA	Farmer Support Activity
GHS	Ghana Cedis
HH	Household
OEV	Office of Evaluation
PHQ	Patient Health Questionnaire
PPP	Purchasing Power Parity
RCT	Randomized Controlled Trial
rCSI	Reduced Coping Strategy Index
SERS	Self-Evaluated Resilience Score
USAID	U.S. Agency for International Development
USD	United States Dollar
WFP	World Food Programme

Annexes

Annex 1: Ethical considerations

141. The study strictly adheres to ethical guidelines, including the 2020 United Nations Evaluation Group (UNEG) standards. Oversight and enforcement of ethical considerations are diligently managed by WFP OEV and the DIME team at all phases of the evaluation.

142. The following key ethical principles and practices were rigorously implemented.

a. Design: In contrast to more traditional RCT designs, this evaluation tests alternate approaches to implementing an intervention, with no control group. This ensures that all those in need of assistance receive some variation of the intervention.

i. Informed consent: In each case of primary data collection, respondents must give their informed consent before interviews can take place. The script for consent is programmed directly into the digital questionnaire, such that if a respondent does not express consent, the survey does not allow the enumerator to continue the interview. Refusal to respond to the survey did not preclude participation in WFP programming. The enumerators were trained to explain in detail and administer the informed consent form correctly.

ii. Privacy during interviews: Several precautions are taken to ensure questions respect the privacy and comfort of respondents. Interviews were conducted outside of the earshot of other participants (including those from the same household). All enumerators underwent extensive training that was followed by piloting in the field. The goal of the training was to ensure enumerators followed best practices in terms of protocols and ethics, but also that questions were asked in a uniform and contextually appropriate manner. These issues were monitored and managed during the implementation of the evaluation. If any additional ethical issues arose during the implementation of the evaluation, they were recorded and managed in consultation with OEV-DIME.

iii. Ethical Review: The evaluation obtained ethical clearance from a recognised Institutional Review Board (IRB), both international and national, before collecting survey data. Ongoing monitoring and management of ethical issues took place during the study, with additional concerns addressed in line with established guidelines.

b. Data Management and Confidentiality: All personally identifiable information (PII) data was stored securely in encrypted folders to minimize any risk or harm to subjects. PII is only available to WFP Principal Investigators and coordinators working on this project, who are required to follow strict data protection protocols such as those indicated in the WFP Guide for Personal Data Protection and Privacy. None of the direct identifiers were shared outside of the study, and all identifiers and codes were removed once the data collection exercise was completed. Anonymized data collected during the impact evaluation may also be made publicly available for research transparency purposes. If datasets are made available, the research team will follow strict protocols such as obtaining informed consent from the interviewed parties; properly preparing, cleaning, and anonymizing data for sharing; and obtaining written authorization by the WFP Country Office.

143. In summary, the study prioritizes ethical conduct, covering informed consent, privacy, cultural sensitivity, and vulnerable participant protection. Ethical integrity was consistently upheld and monitored to safeguard participants throughout the research process.

Annex 2: Stakeholder analysis

144. The stakeholder analysis for this evaluation identifies those who may influence or be influenced by the evaluation's outcomes. Stakeholders encompass internal and external parties, including programme beneficiaries. The primary user is the WFP County Office in Ghana, but the evaluation aims for broader utilization of its findings.

145. Stakeholder categories include:

146. Internal Ghana-based stakeholders: Key personnel within the Country Office.

147. Internal stakeholders outside of Ghana: Involving the WFP Office of Evaluation (OEV), the WFP Regional Bureau of West Africa (RBD), and headquarter divisions.

148. Populations in need: Both resident communities and migrants of various demographics.

149. External stakeholders: Comprising the World Bank DIME, international NGOs, donors, UN agencies, and local forums.

150. National stakeholders: Encompassing government entities at national and sub-national levels, as well as local NGOs.

151. Stakeholder engagement methods differ by category but may involve reviewing and providing input on evaluation documents, actively monitoring the evaluation's design during programme implementation, participating in workshops, and offering feedback on evaluation reports.

152. The engagement aims to ensure diverse perspectives are considered and that the evaluation's results are effectively used by stakeholders.

Annex 3: Regression specification

153. The objective of the analysis is to estimate the differential impact of the two cash transfer modalities on the main outcomes of interest. Three main approaches are employed, and three additional specifications are used to explore the heterogeneity of the two disbursement schemes' differential impact.

154. For the outcomes that are collected in more than one round and for which the round-based differential impact is of interest (e.g., all food security and mental health indicators), the specification is below.

Equation 1: Round-based differential impact estimation

$$y_{fvr} = \alpha + \beta t_v + \sum_{r=2}^{3} \delta_r r_r + \sum_{r=2}^{3} \theta_r t_v r_r + \sum_{s=2}^{17} \gamma_s s_s + \sum_{r=2}^{3}\sum_{s=2}^{17} \eta_{sr} s_s r_r + \varepsilon_{fvr}$$

155. y_{fvr} is the outcome for farmer f from village v in round r. α is a constant. The variable denoting the treatment arm is t_v, it varies at the village level, and the coefficient of interest is β, i.e., the estimated impact of receiving the lump-sum transfer as compared to the three regular monthly payments. Then, r_r as well as s_s are dummy variables for rounds 2 and 3, and for each of the 16 districts on which treatment at the village level was stratified. Round 1 and district 1 are the base categories. The model also interacts treatment with the round of data collection as well as the district with the round of data collection.

156. The treatment arm was randomly assigned at the village level. Moreover, it is also likely that farmer outcomes are correlated within a village. Thus, for conservative inference and to avoid overestimating precision, errors are assumed uncorrelated across clusters (villages) but correlated for individuals belonging to the same cluster. Thus, for farmers i and j in the same village, the following is assumed to apply:

Equation 2: Intra-cluster correlation

$$E[\varepsilon_{ivr}\varepsilon_{jvr}] = \rho\sigma_\varepsilon^2 > 0$$

157. ρ is the intra-village/cluster correlation coefficient and σ_ε^2 is the residual variance. Consequently, the ordinary least squares estimation method is used to estimate Equation 1 with errors clustered at the village level.

158. For the outcomes that are collected more than once, but the interest falls on their cumulated/stock numbers at endline (e.g., employment, business operation, livestock, and asset stock), the specification is below. Equation 2 applies as well.

Equation 3: Pooled differential impact estimation

$$y_{fvr} = \alpha + \beta t_v + \sum_{r=2}^{3} \delta_r r_r + \sum_{s=2}^{17} \gamma_s s_s + \sum_{r=2}^{3}\sum_{s=2}^{17} \eta_{sr} s_s r_r + \varepsilon_{fvr}$$

159. Equation 3 is then adapted to assess the heterogeneity of the differential impact in terms of the dimensions of interest (scale of operation and gender): h_f, which vary at the farmer level, either binary or continuous variables, respectively. θ and ω are additional coefficients. Equation 2 applies.

Equation 4: Heterogeneity specification for the pooled differential impact

$$y_{fvr} = \alpha + \beta_1 t_v + \beta_2 t_v \mathrm{h_f} + \theta_1 h_f + \sum_{r=2}^{3} \theta_r r_r h_f + \sum_{s=2}^{17} \omega_s s_s h_f + \sum_{r=2}^{3} \delta_r r_r + \sum_{s=2}^{17} \gamma_s s_s + \sum_{r=2}^{3}\sum_{s=2}^{17} \eta_{sr} s_s r_r + \varepsilon_{fvr}$$

160. Additionally, data was collected only once for outcomes such as agriculture-related inputs and outputs. Thus, the model specification simplifies to Equation 5. Equation 2 applies again.

Equation 5: Differential impact estimation for single-round outcomes

$$y_{fv} = \alpha + \beta t_v + \sum_{s=2}^{17} \gamma_s s_s + \varepsilon_{fv}$$

161. Then, Equation 5 is also adapted for assessing the heterogeneity of the differential impact in terms of the dimensions of interest (scale of operation, gender, and the farmer subsistence status): h_f, which vary at the farmer level, either binary or continuous variables. θ and ω are additional coefficients. Equation 2 applies.

Equation 6: Heterogeneity specification for single-round outcomes

$$y_{fv} = \alpha + \beta_1 t_v + \beta_2 t_v \mathrm{h_f} + \theta_1 h_\mathrm{f} + \sum_{s=2}^{17} \omega_s s_s h_f + \sum_{s=2}^{17} \gamma_s s_s + \varepsilon_{fv}$$

162. Finally, there is one further heterogeneity specification that was applied to the agriculture-related outcomes, per which gender is interacted with the scale of the farm's operation: $h_f^1 \; and \; h_f^2$, which vary at the farmer level, either binary or continuous variables. θ and ω are additional coefficients. Equation 2 continues to apply.

Equation 7: Triple heterogeneity specification for single-round outcomes

$$y_{fv} = \alpha + \beta_0 t_v + \beta_1 t_v \mathrm{h_f^1} + \beta_2 t_v \mathrm{h_f^2} + \beta_3 t_v h_\mathrm{f}^1 \mathrm{h_f^2} + \theta_1 h_\mathrm{f}^1 + \; \theta_2 h_\mathrm{f}^2 + \theta_3 h_\mathrm{f}^1 \mathrm{h_f^2} + \sum_{s=2}^{17} \omega_s^1 s_s h_f^1 + \sum_{s=2}^{17} \omega_s^2 s_s h_f^2 + \sum_{s=2}^{17} \gamma_s s_s + \varepsilon_{fv}$$

Annex 4: Baseline balance tests

163. Appendix Table 1 shows balance tests using targeting data, i.e., data collected before the deployment of the intervention. The average characteristics/outcomes of households in the lump-sum group are compared against those of the households receiving monthly transfers. All relevant variables that were collected during the targeting exercise were included in the balance tests. According to Appendix Table 1, there is only one difference that is weakly statistically significant, and it relates to the households' previous use of agricultural inputs. Despite this slight difference, the table is deemed supportive of the conclusion that the treatment group randomization has successfully created groups of households that are comparable.

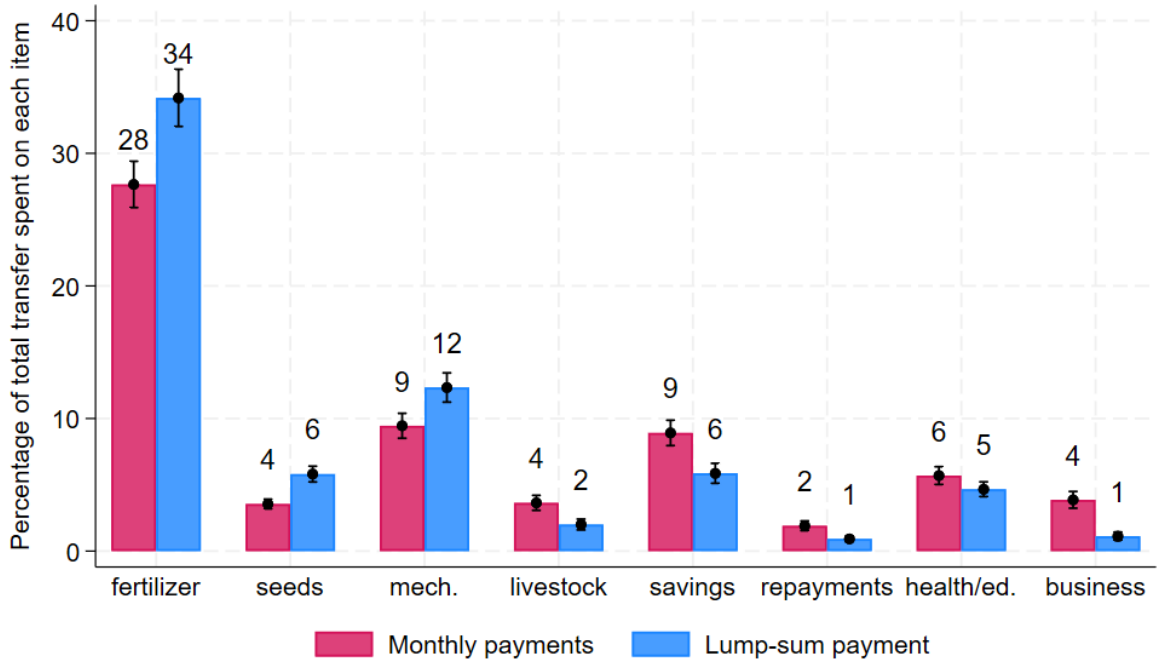
Appendix Table 1: Balance checks

Variable	Mean monthly group	Mean lump group	Diff in means	Two-sided p-value	N
Household size at registration	8.66	9.27	-0.62	0.18	3258
Household size at registration (winsorized)	8.57	8.77	-0.2	0.31	3258
Age of registered beneficiary	38.75	39.63	-0.88	0.18	3258
Has some education (primary or above)	0.38	0.37	0.01	0.65	3258
Female beneficiary	0.55	0.54	0.01	0.65	3258
Land size at registration	4.61	5.12	-0.51	0.18	3091
Land size at registration (winsorized)	4.44	4.73	-0.29	0.10	3091
Cultivates maize	0.87	0.86	0.01	0.66	3091
Cultivates rice	0.35	0.33	0.02	0.34	3091
Has own storage facility	0.35	0.37	-0.02	0.38	3091
Engaged in the processing of ag output	0.22	0.25	-0.03	0.28	3091
Is part of a cooperative	0.04	0.04	-0.01	0.53	3091
Amount spent on ag inputs last season	1929	2153	-224	0.09	3091
Amount spent on ag inputs last season (winsorized)	1867	2010	-143	0.14	3091
Amount planned for ag inputs this season	2680	2902	-222	0.23	3091
Amount planned for ag inputs this season (winsorized)	2539	2712	-173	0.18	3091

Notes: The difference in means is computed by subtracting the average of the monthly transfers group from the average of the lump-sum group. A positive difference denotes a higher average for the lump-sum group. The maximum sized sample is used for household characteristics (i.e., households that have participated successfully at least once in the survey). For the agriculture-specific variables, the round 3 sample is used, as this was also the analysis sample. Outcome variables that are not a ratio, percentage, or otherwise capped are also shown winsorized to limit extreme values, which could be due to data entry errors. Outliers below the 1st and above the 99th percentiles are replaced with the values of the 1st and 99th percentiles. The difference in means is computed by regressing the outcome variables on the randomized treatment variable, controlling for the district of origin (strata), and clustering errors at the village level. This is also the standard analysis specification. The two groups are statistically indistinguishable regarding any given characteristic if the p-value is higher than 0.10 (fail to reject the null hypothesis of no difference).

Annex 5: Additional summaries and results

Appendix Figure 1: Household-reported transfer allocations per group (round 2 survey)



Appendix Table 2: Mental health of respondents per round (PHQ4, across groups)

PHQ4	Round 1 (%)	Round 2 (%)	Round 3 (%)	Total
0	8.53	5.28	9.49	7.8
1	4.54	5.75	7.41	5.88
2	8.55	8.2	12.73	9.81
Normal (0 to 2)	*21.62*	*19.23*	*29.63*	*23.49*
3	10.69	13.32	14.62	12.84
4	26.07	34.01	24.83	28.23
5	11.83	13.38	8.97	11.39
Mild (3 to 5)	*48.59*	*60.71*	*48.42*	*52.46*
6	9.79	9.43	8.35	9.2
7	8.9	5.18	4.35	6.2
8	5.81	2.86	4.39	4.39
Moderate (6 to 8)	*24.5*	*17.47*	*17.09*	*19.79*
9	2.19	1.16	1.85	1.75
10	1.67	0.9	1.59	1.39
11	0.53	0.23	0.19	0.32
12	0.9	0.3	1.23	0.82
Severe (9 to 12)	*5.29*	*2.59*	*4.86*	*4.28*
Total	100	100	100	100

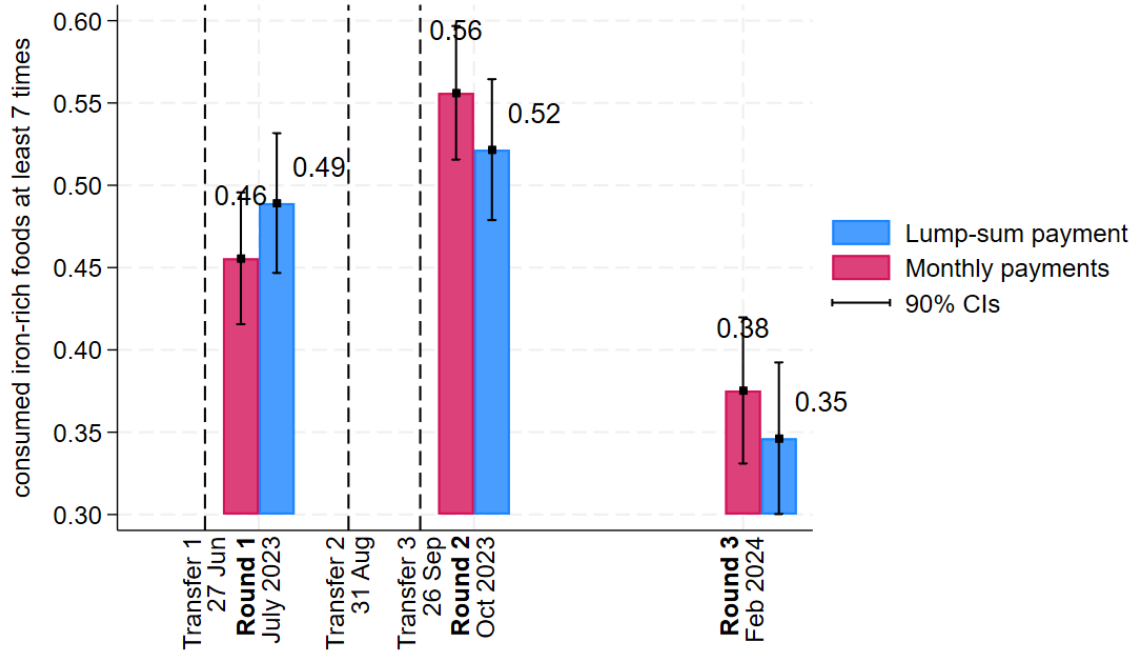
Notes: The questions that were asked: How often have you felt nervous, anxious or on edge? How often have you felt unable to stop or control worrying? How often have you felt down, depressed or hopeless? How often have you felt little interest or pleasure in doing things? The timeframe is the last two weeks. Answer options were: 0-Not at all, 1-Several days, 2-More than half the days, and 3-Nearly every day.

Appendix Table 3: Mental health of respondents per round (Cantril ladder, across groups)

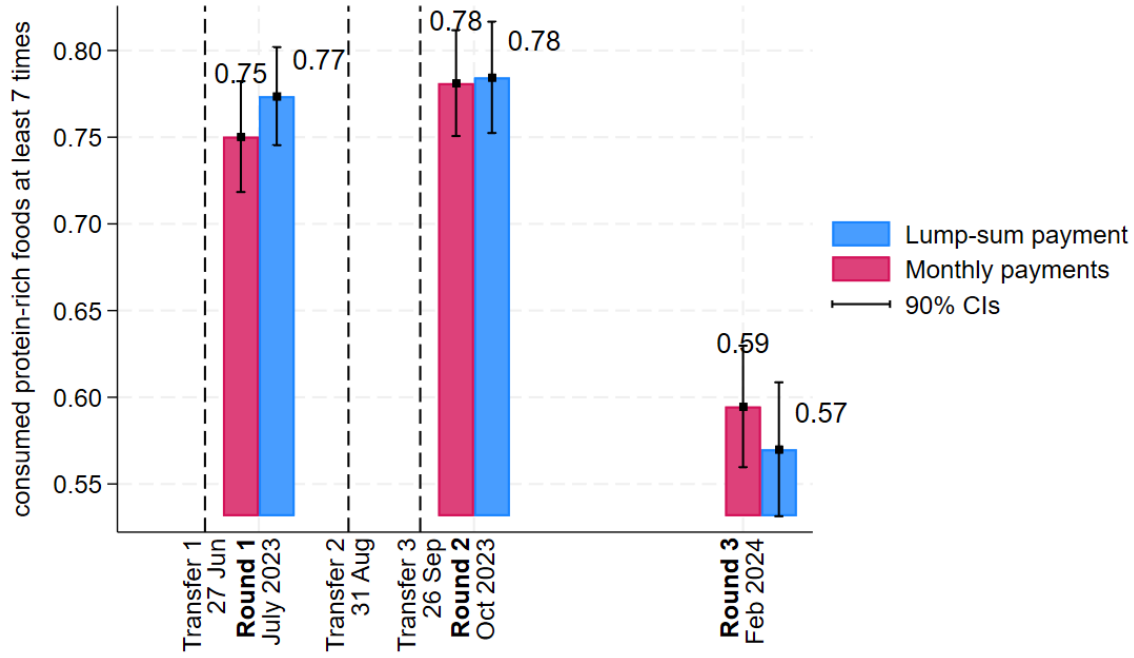
Step ladder	2 years in the past (%)			Present day (%)			2 years into the future (%)		
	round 2	round 3	Total	round 2	round 3	Total	round 2	round 3	Total
1	10.37	8.51	**9.43**	2.52	1.36	**1.93**	0.63	0.06	**0.34**
2	15.81	17.21	**16.52**	4.94	4.3	**4.62**	2.02	0.61	**1.31**
3	19.92	24.39	**22.18**	9.38	7.83	**8.6**	3.48	1.78	**2.62**
4	19.22	18.8	**19.01**	13.72	12.71	**13.21**	5.44	3.24	**4.32**
5	11.47	14.2	**12.85**	21.78	24.94	**23.38**	11.37	7.67	**9.5**
6	7.82	7.31	**7.56**	15.28	17.34	**16.32**	11.97	11.1	**11.53**
7	5.7	3.82	**4.75**	12.4	14.53	**13.47**	16.37	16.01	**16.19**
8	4.14	2.81	**3.47**	9.31	9.12	**9.22**	16.77	19.93	**18.37**
9	2.55	1.65	**2.1**	4.67	3.49	**4.08**	13.29	14.82	**14.06**
10	2.98	1.29	**2.13**	6	4.37	**5.17**	18.66	24.78	**21.76**
Total	100	100	**100**	100	100	**100**	100	100	**100**

Notes: Higher values indicate greater satisfaction with life 2 years back, present, and 2 years in the future. Respondents are asked to rate their life on the scale from 0 to 10.

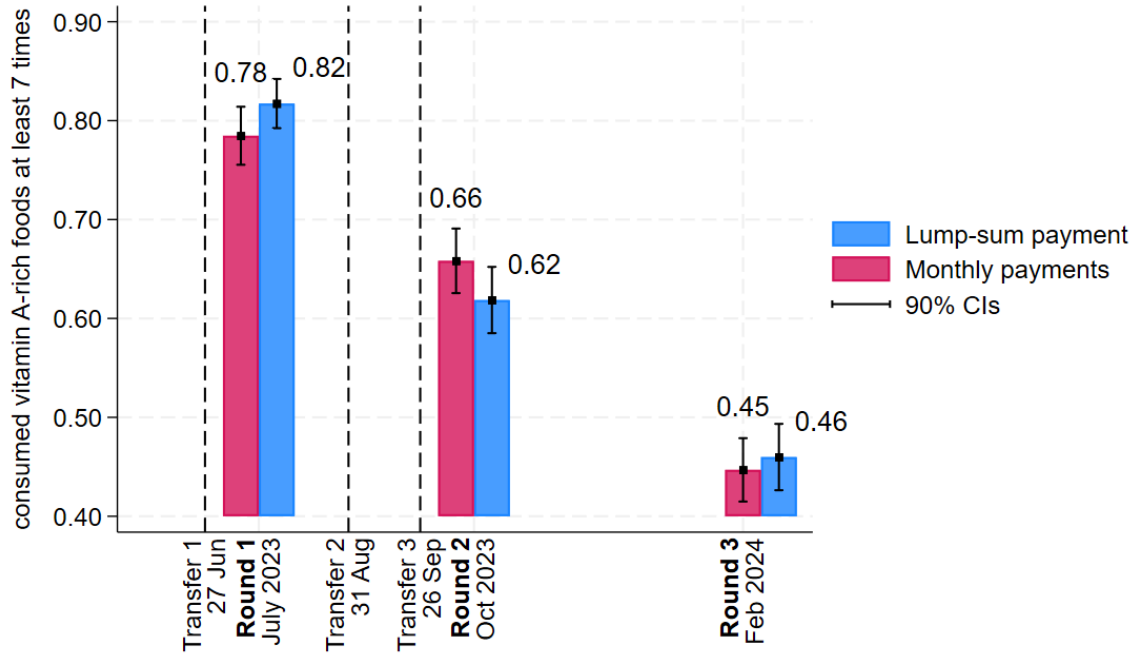
Appendix Figure 2: Rate of consuming iron-rich foods at least 7 times in the last 7 days



Appendix Figure 3: Rate of consuming protein-rich foods at least 7 times in the last 7 days



Appendix Figure 4: Rate of consuming Vit. A-rich foods at least 7 times in the last 7 days

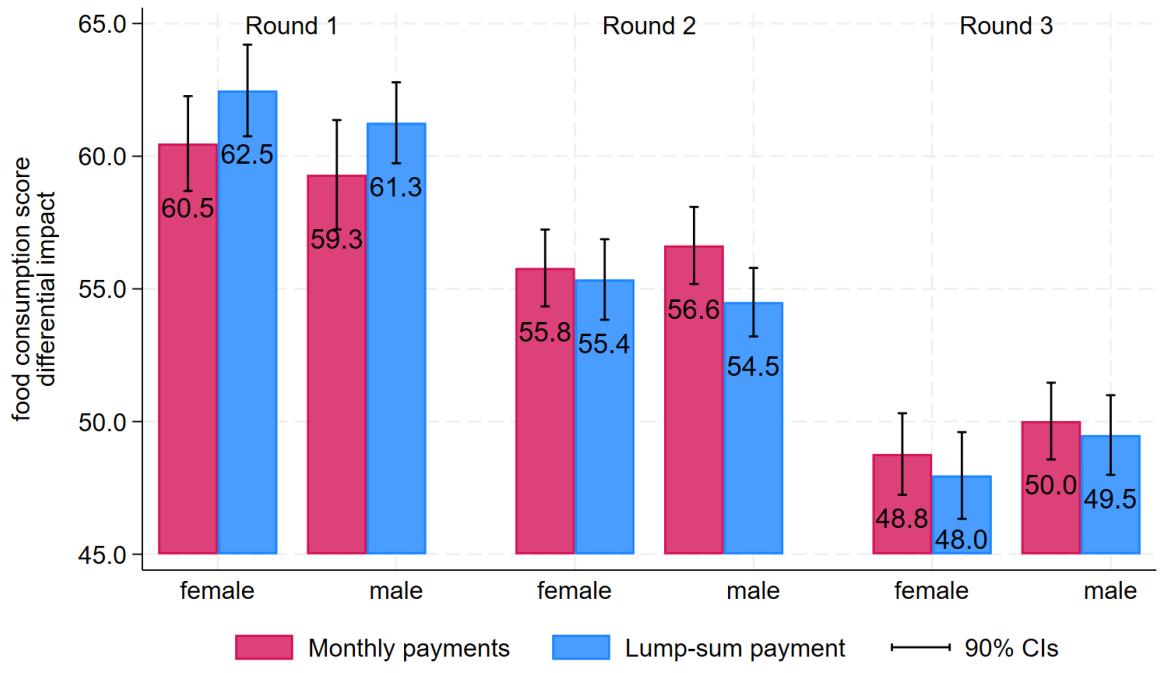


Appendix Table 4: Regressions variance of food security outcomes, gender, and scale heterogeneity

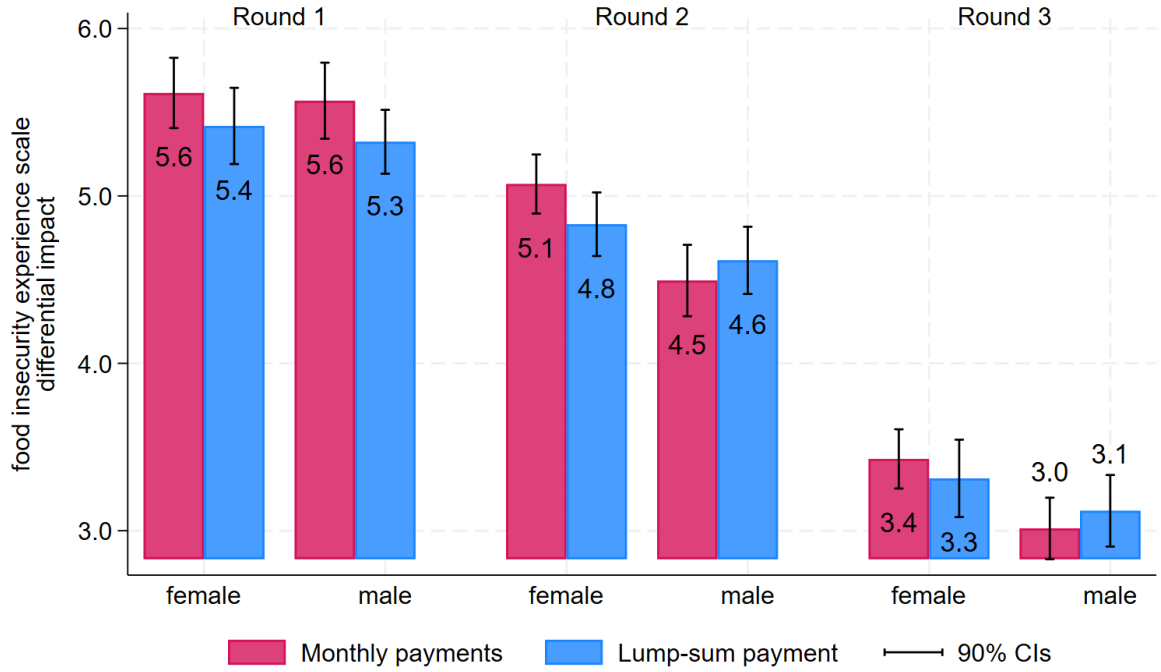
	FCS			rCSI			FIES		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
lump-sum payment	-16.81	13.82	-16.00	-6.490	-10.19	-2.105	-0.00700	0.0146	-0.158
	(12.56)	(19.57)	(15.29)	(6.269)	(9.020)	(7.765)	(0.250)	(0.349)	(0.344)
lump-sum payment × area cultivated		-6.393**			1.101			-0.00795	
		(3.131)			(1.383)			(0.0628)	
lump-sum payment × female			1.035			-9.133			0.238
			(20.71)			(9.899)			(0.412)
District dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes
Sex dummy			yes			yes			yes
Area cultivated		yes			yes			yes	
District × Sex			yes			yes			yes
District × Area cultivated		yes			yes			yes	
Observations	3136	3136	3136	3136	3136	3136	3136	3136	3136

Notes: * p < 0.10, ** p < 0.05, *** p < 0.01. Standard errors in parenthesis. For each household with two or more observations, the variance of the three food security outcomes presented in the table is computed. These dependent variables are then regressed on the sex of the beneficiary (or area cultivated), district dummies, and their interactions. The sample is thus comprised of the households observed in more than one round.

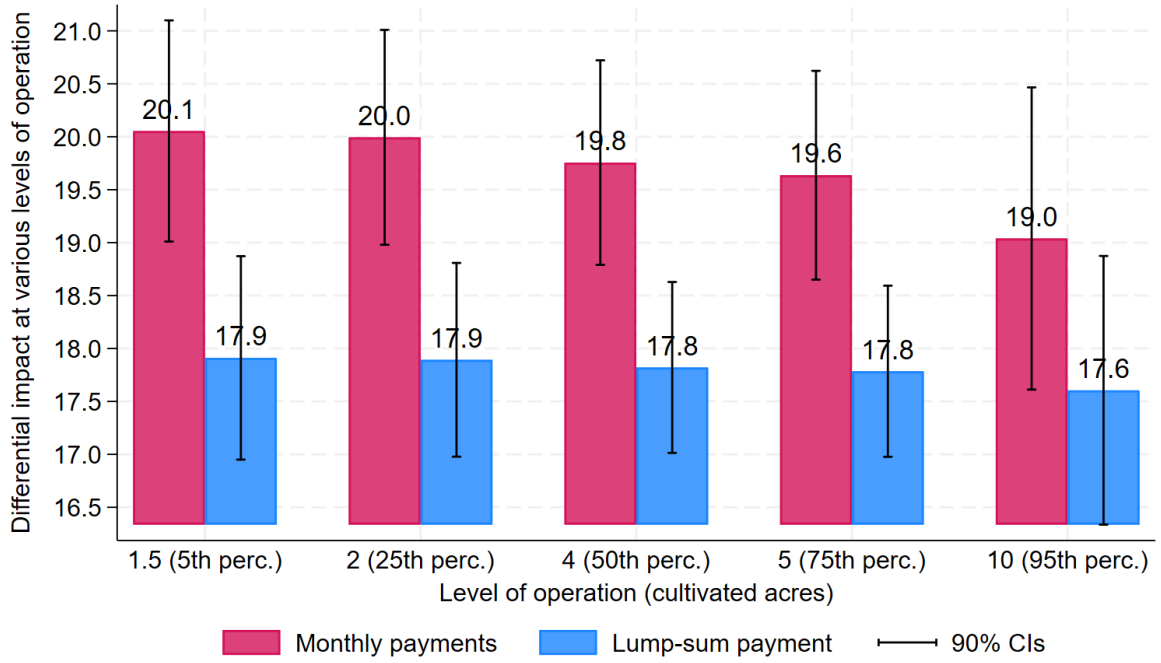
Appendix Figure 5: Gender heterogeneity for the Food Consumption Score



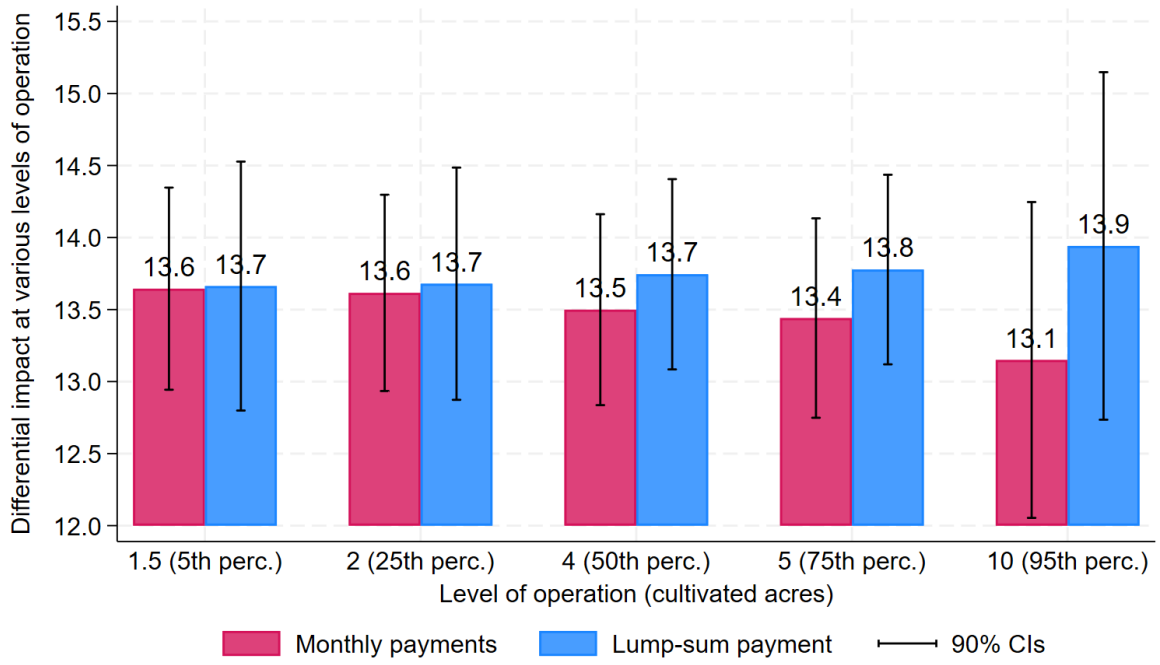
Appendix Figure 6: Gender heterogeneity for the Food Insecurity Experience Scale



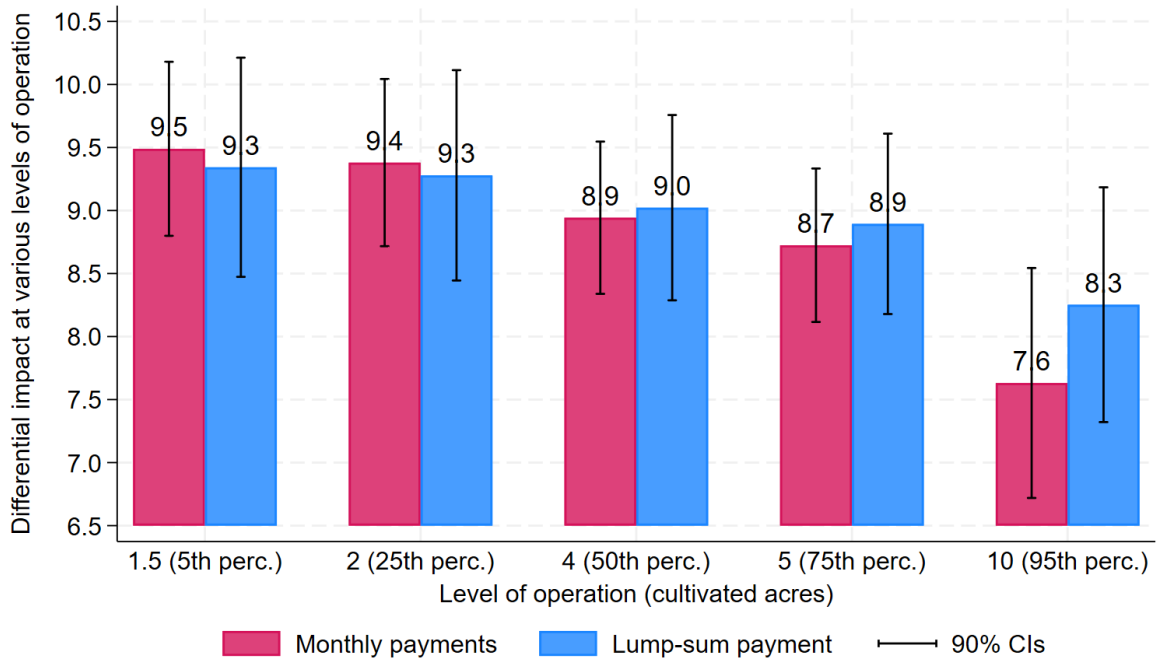
Appendix Figure 7: Farm scale heterogeneity for the reduced Coping Strategies Index (round 1)



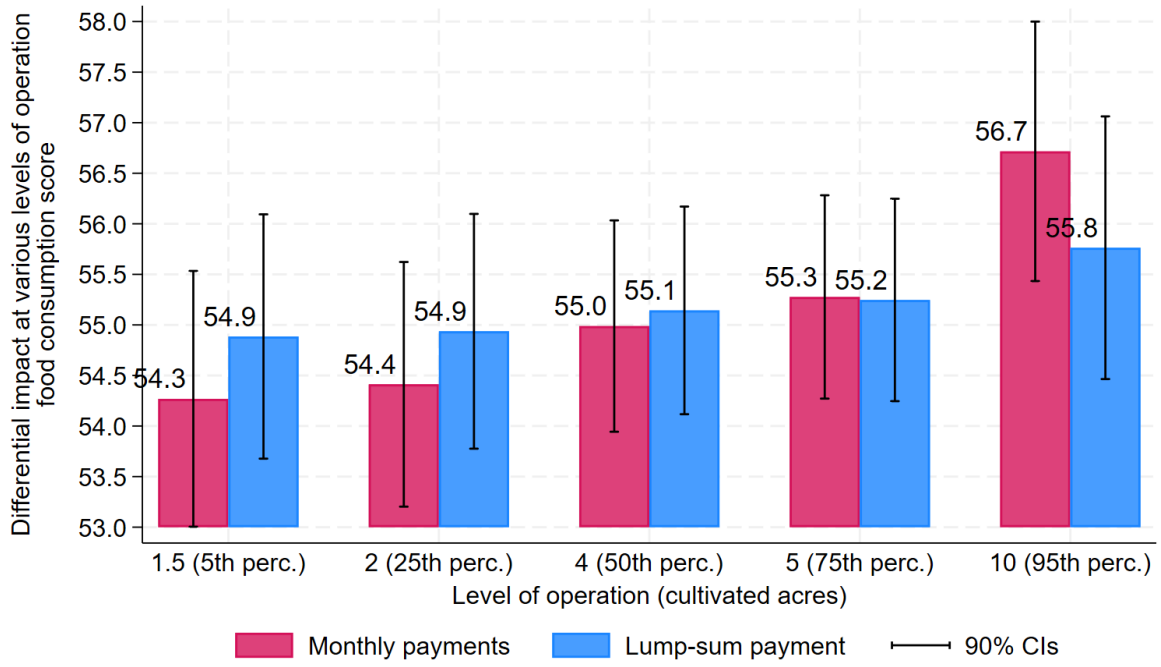
Appendix Figure 8: Farm scale heterogeneity for the reduced Coping Strategies Index (round 2)



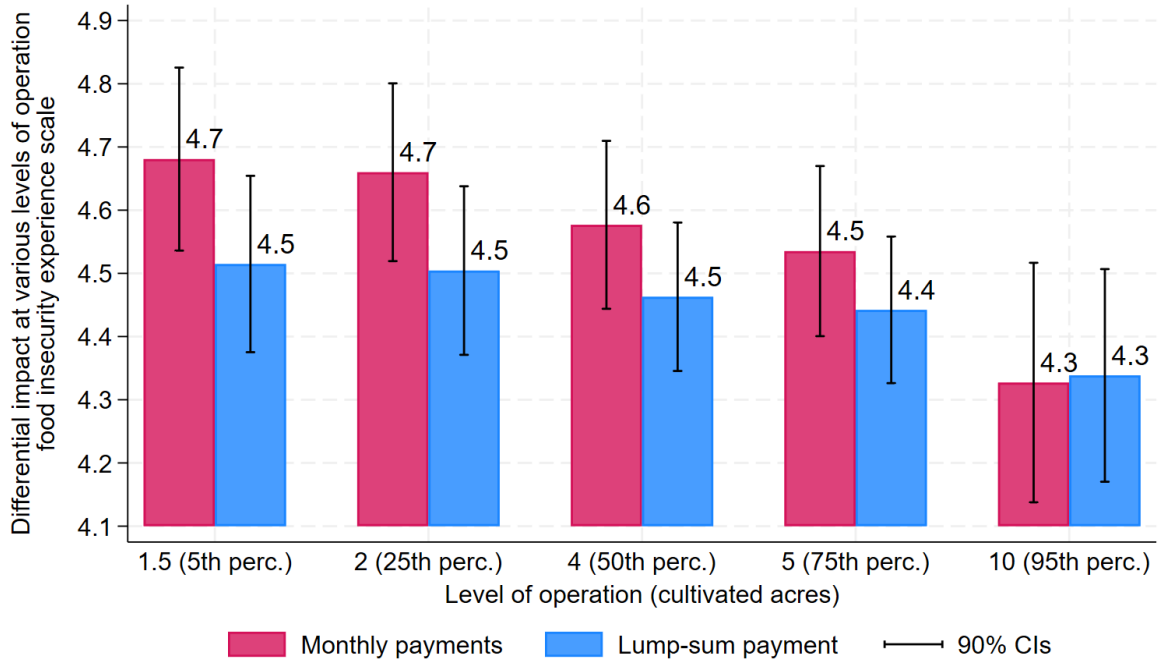
Appendix Figure 9: Farm scale heterogeneity for the reduced Coping Strategies Index (round 3)



Appendix Figure 10: Farm scale heterogeneity for the Food Consumption Score



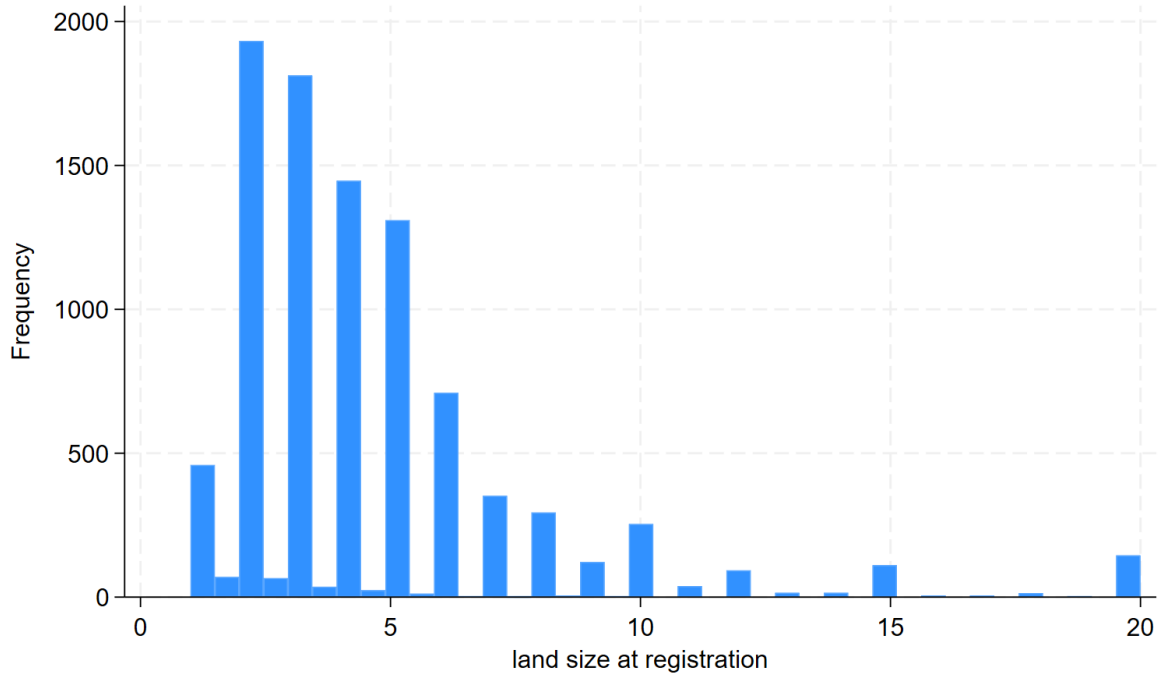
Appendix Figure 11: Farm scale heterogeneity for the Food Insecurity Experience Scale



	FCS				rCSI				FIES			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
lump-sum payment	2.057*	-0.186	1.958	0.894	-1.961***	-0.542	-1.732**	-0.922*	-0.230	-0.0110	-0.245	-0.197
	(1.083)	(0.821)	(1.251)	(1.084)	(0.698)	(0.461)	(0.822)	(0.548)	(0.144)	(0.106)	(0.163)	(0.125)
lump-sum payment × round 2	-3.189***		-4.094***		2.204***		2.259**		0.139		0.366*	
	(1.144)		(1.494)		(0.737)		(0.936)		(0.169)		(0.212)	
lump-sum payment × round 3	-2.631**		-2.484*		1.989**		1.392		0.202		0.351*	
	(1.187)		(1.431)		(0.785)		(0.949)		(0.167)		(0.194)	
lump-sum payment × female		0.477	0.0436			0.0436	-0.278			-0.173	0.0481	
		(0.792)	(1.306)			(0.490)	(0.860)			(0.114)	(0.166)	
lump-sum payment × female × round 2			1.660				-0.117				-0.409*	
			(1.684)				(1.150)				(0.213)	
lump-sum payment × female × round 3			-0.326				1.100				-0.270	
			(1.595)				(1.056)				(0.232)	
lump-sum payment × area cultivated				-0.185				0.0889				0.0209
				(0.132)				(0.0853)				(0.0169)
District dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Round dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Sex dummy		yes	yes			yes	yes			yes	yes	
Area cultivated				yes				yes				yes
District × Round	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
District × Sex		yes	yes			yes	yes			yes	yes	
District × Area cultivated				yes				yes				yes
Round × Sex		yes	yes			yes	yes			yes	yes	
Round × Area cultivated				yes				yes				yes
Mean monthly group	55.07	55.07	55.07	55.07	14.20	14.20	14.20	14.20	4.57	4.57	4.57	4.57
Observations	9361	9361	9361	9361	9361	9361	9361	9361	9361	9361	9361	9361

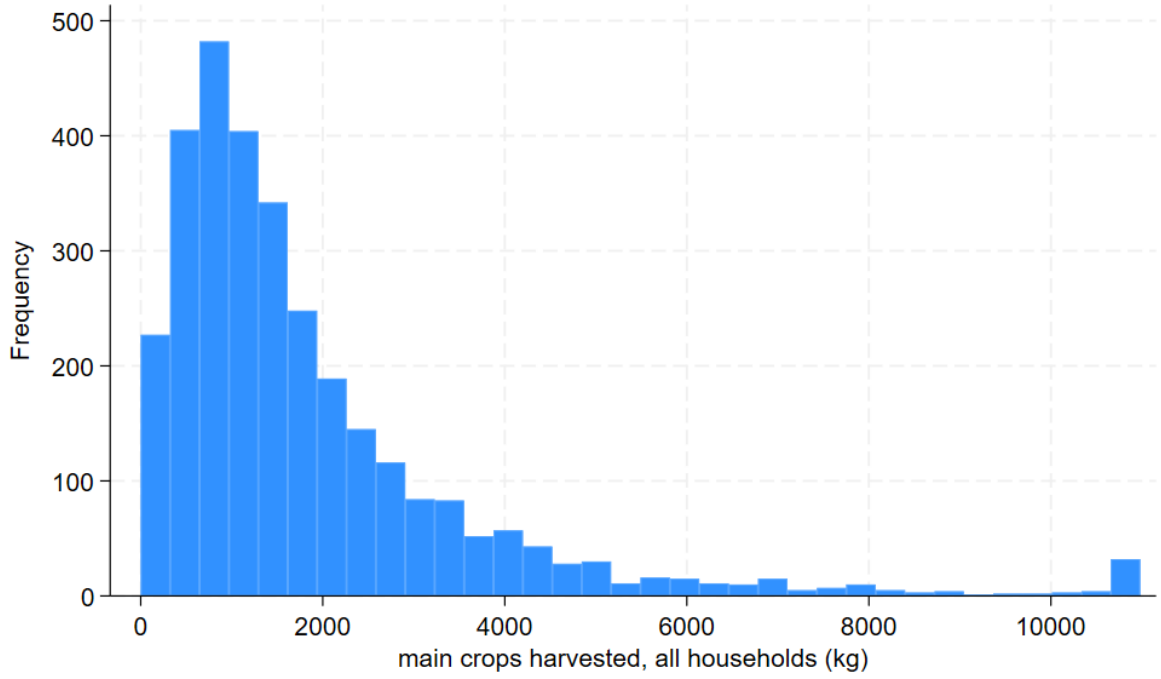
Notes: * p < 0.10, ** p < 0.05, *** p < 0.01. Standard errors in parenthesis.

Appendix Figure 12: Histogram of cultivated acres per household



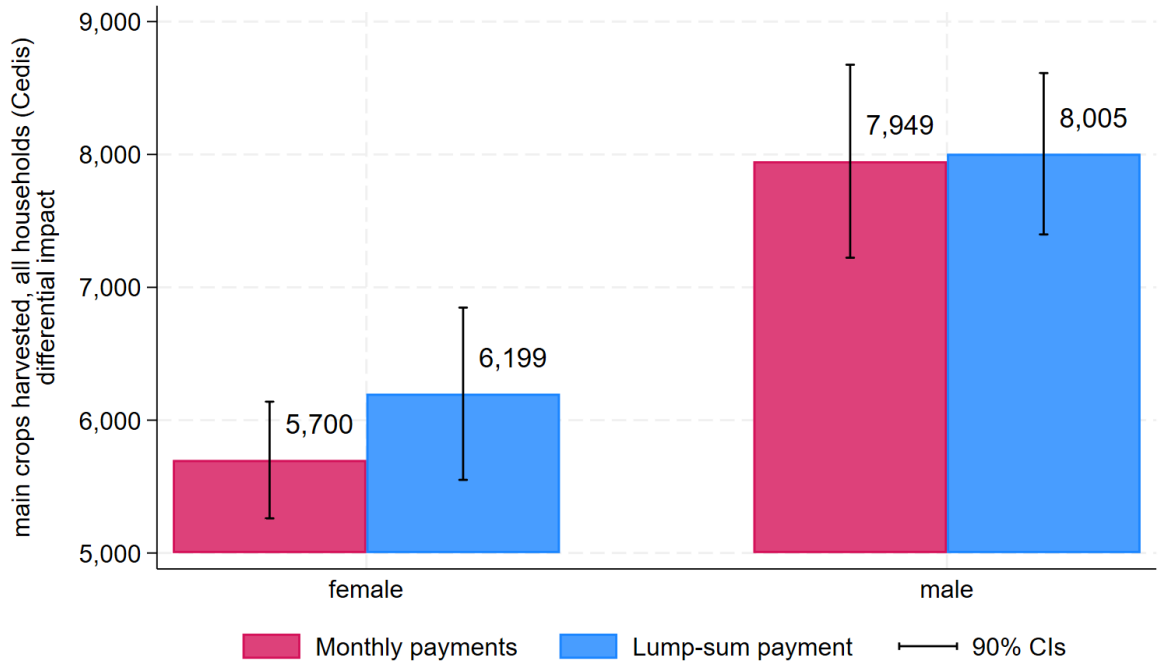
Notes: Frequency refers to the number of households who reported a certain cultivated area (pre-programme) as plotted horizontally.

Appendix Figure 13: Histogram of reported total harvested quantities per household

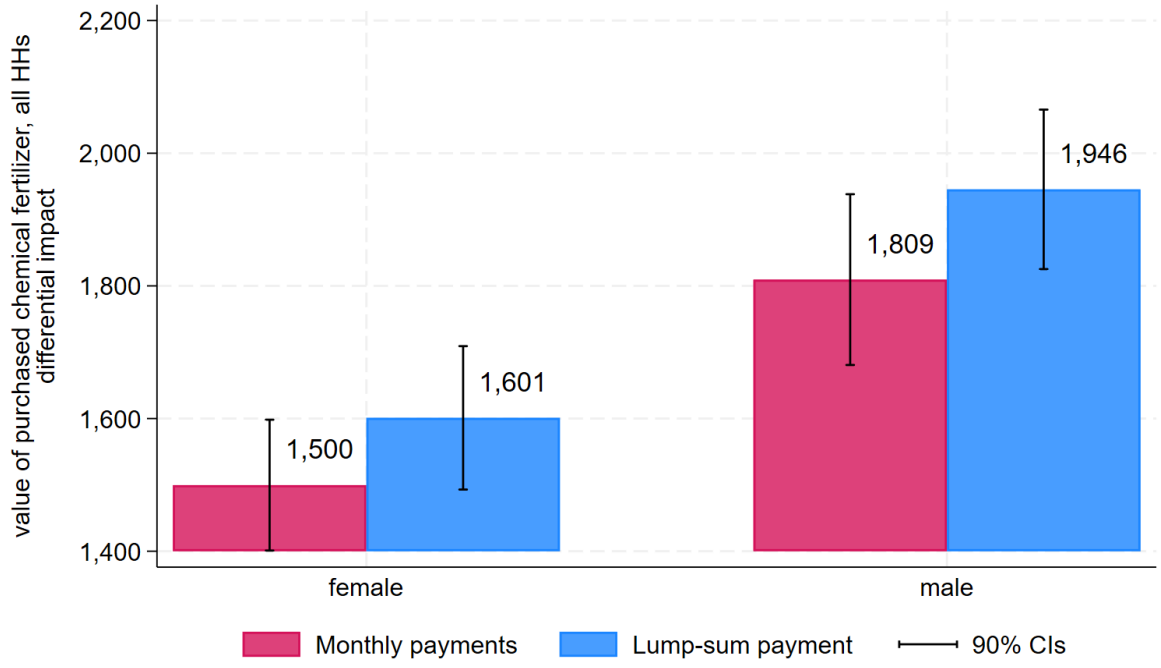


Notes: Frequency refers to the number of households who reported a certain harvest quantity as plotted horizontally.

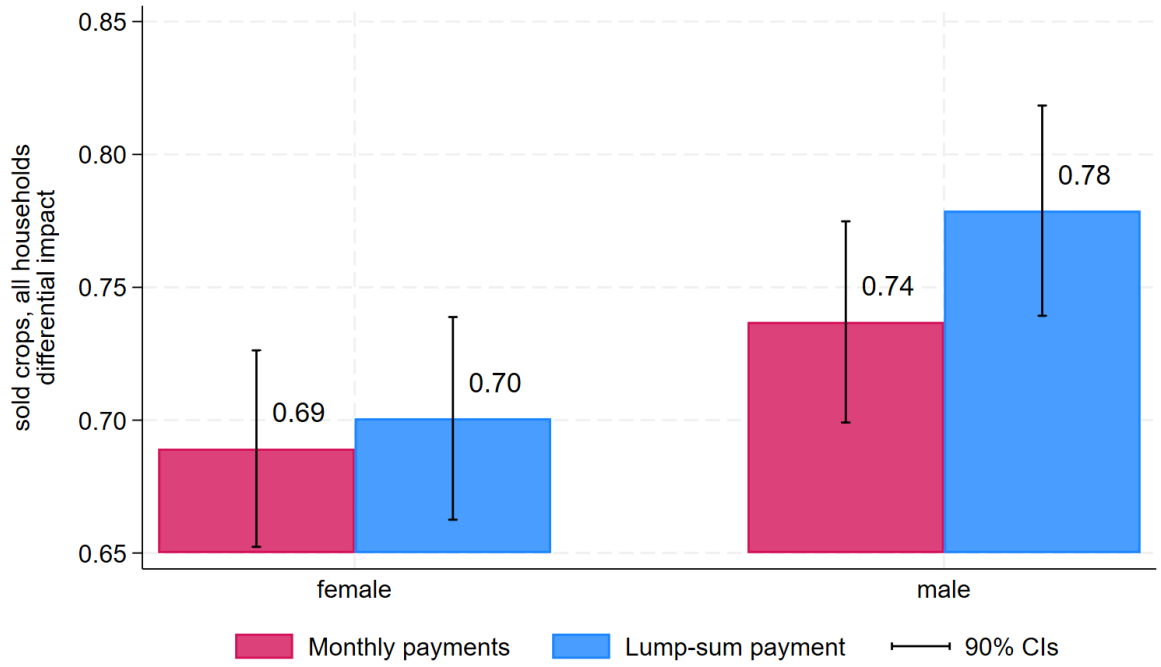
Appendix Figure 14: Gender heterogeneity for harvest (Cedis)



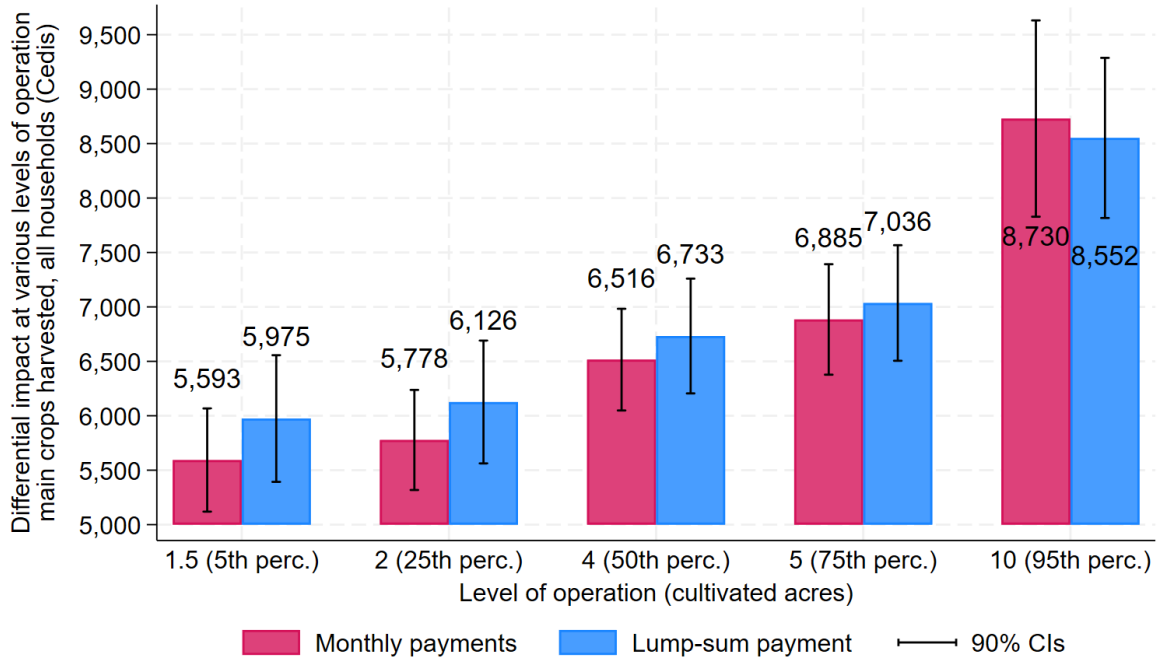
Appendix Figure 15: Gender heterogeneity for spending on chemical fertilizers



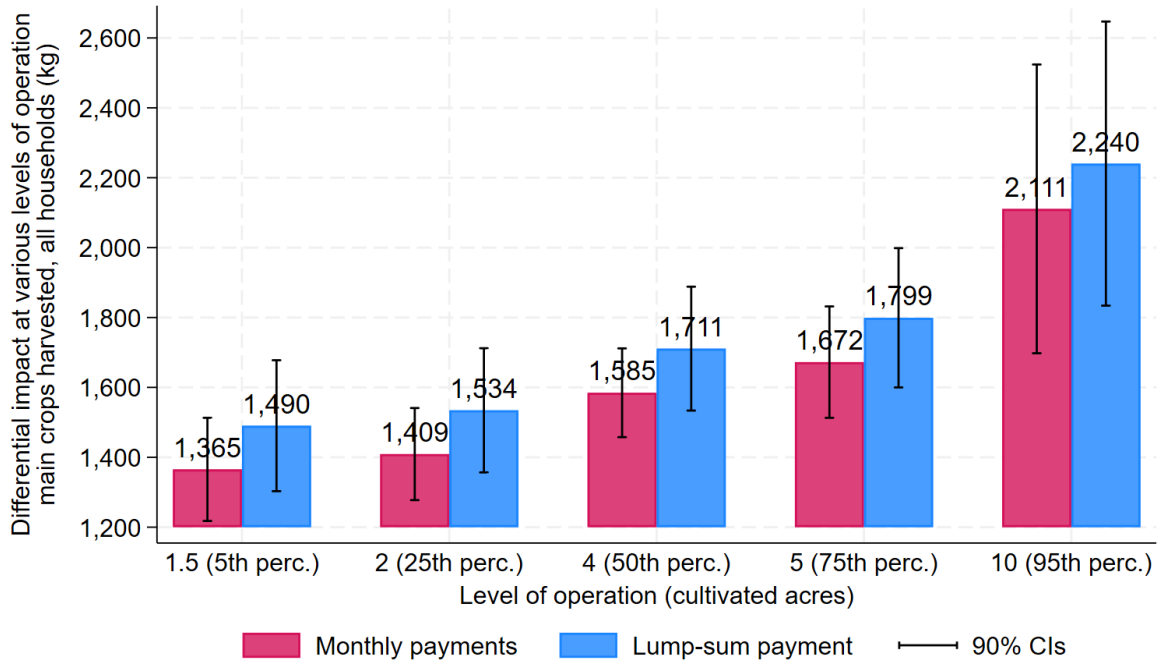
Appendix Figure 16: Gender heterogeneity for the propensity to sell crops



Appendix Figure 17: Scale of operation heterogeneity for harvested crops (Cedis, both sexes)

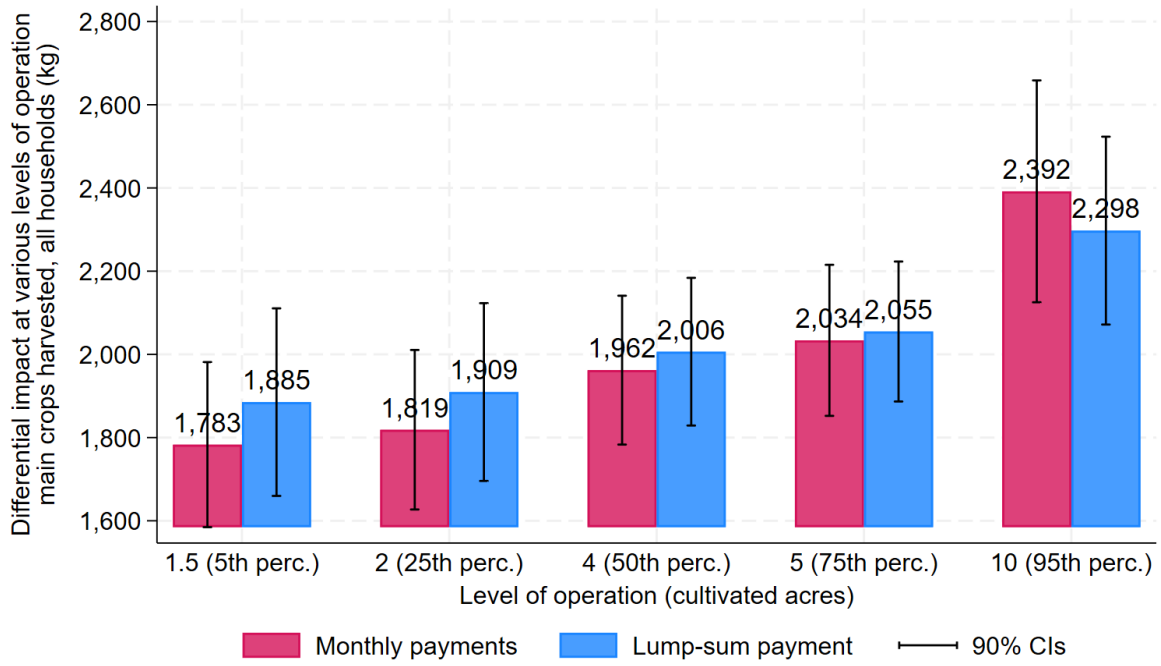


Appendix Figure 18: Scale of operation heterogeneity for harvested crops (Cedis, females)



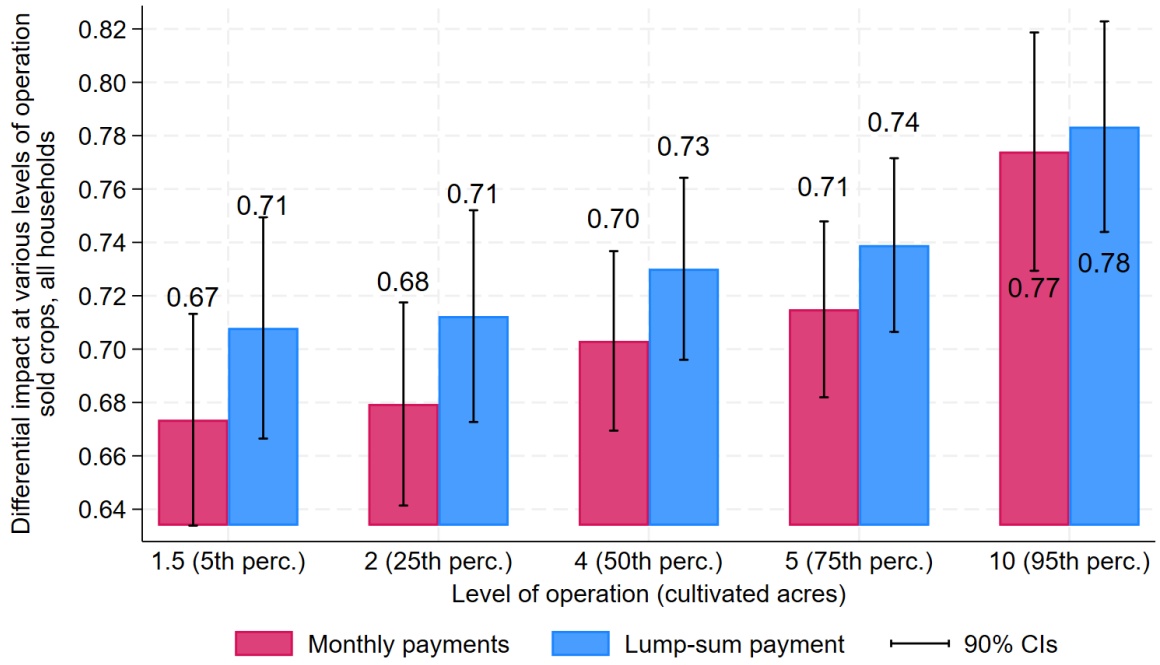
Notes: The predictions are the result of regressing the harvest variable on treatment interacted with the gender of the beneficiary (binary variable) and the scale of operation (continuous variable) as a triple interaction and combinations of double interactions, followed by controls for the cultivated area, district of data collection, and gender of the beneficiary, plus their double interactions.

Appendix Figure 19: Scale of operation heterogeneity for harvested crops (Cedis, males)

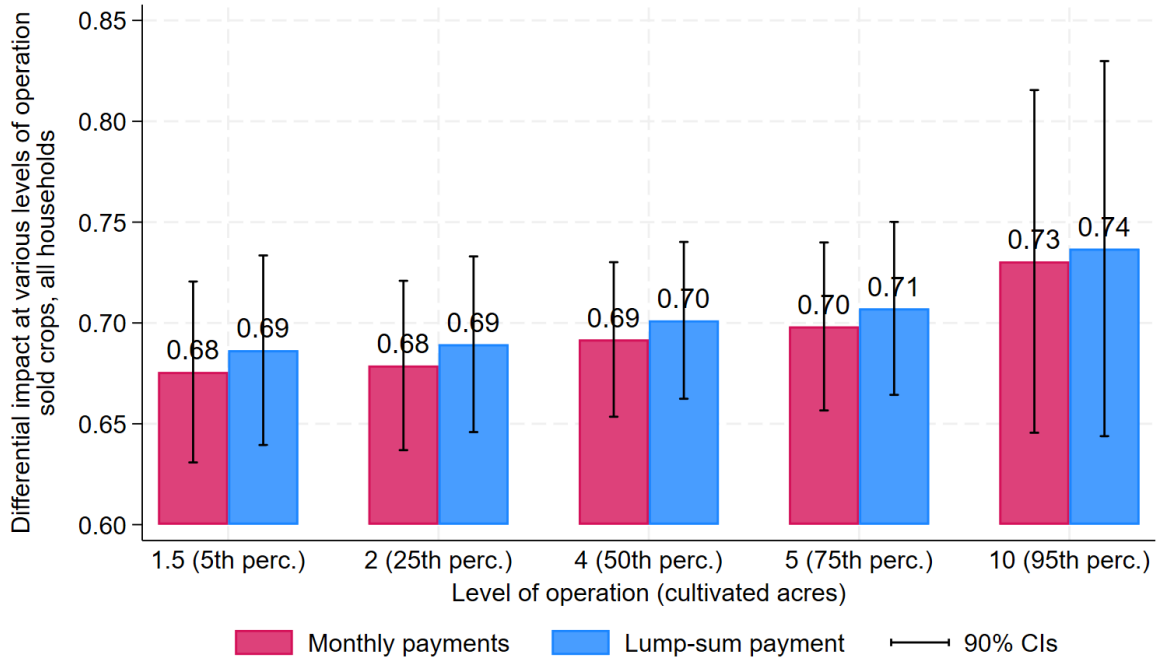


Notes: The predictions are the result of regressing the harvest variable on treatment interacted with the gender of the beneficiary (binary variable) and the scale of operation (continuous variable) as a triple interaction and combinations of double interactions, followed by controls for the cultivated area, district of data collection, and gender of the beneficiary, plus their double interactions.

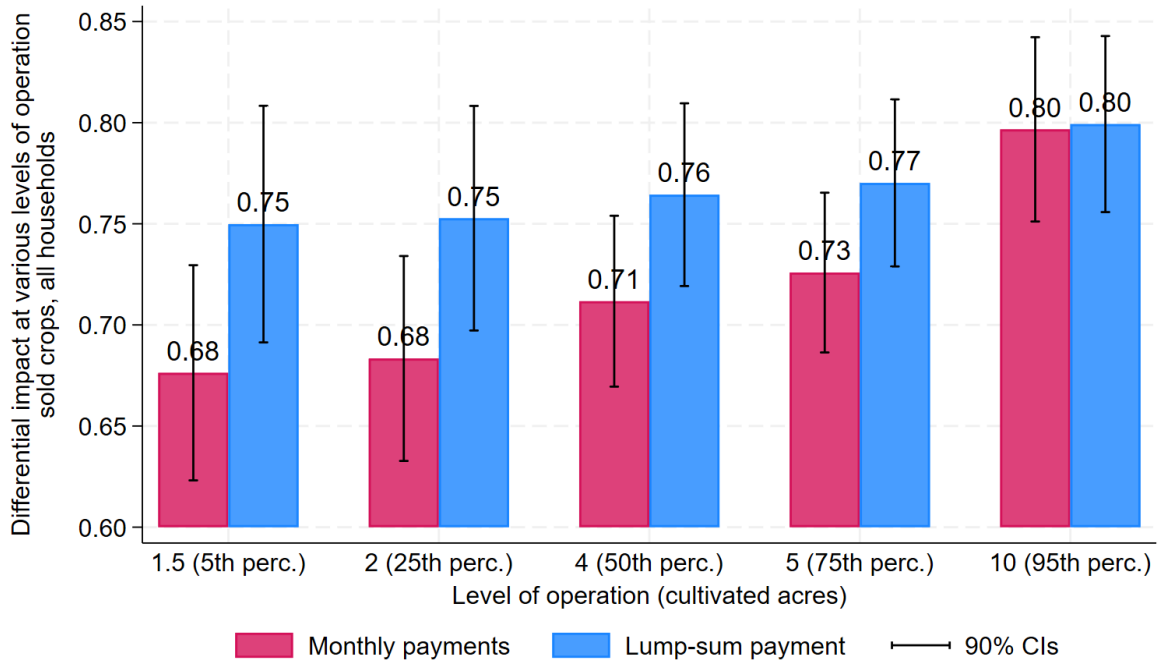
Appendix Figure 20: Scale of operation heterogeneity for propensity to sell crops (both sexes)



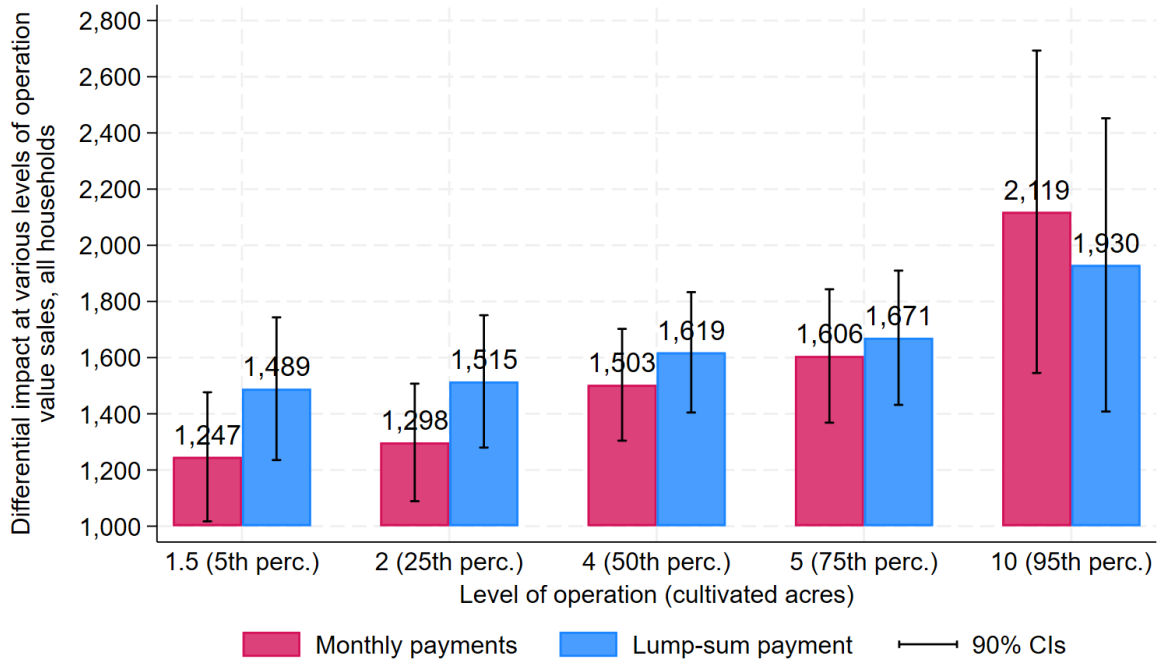
Appendix Figure 21: Scale of operation heterogeneity for propensity to sell crops (females)



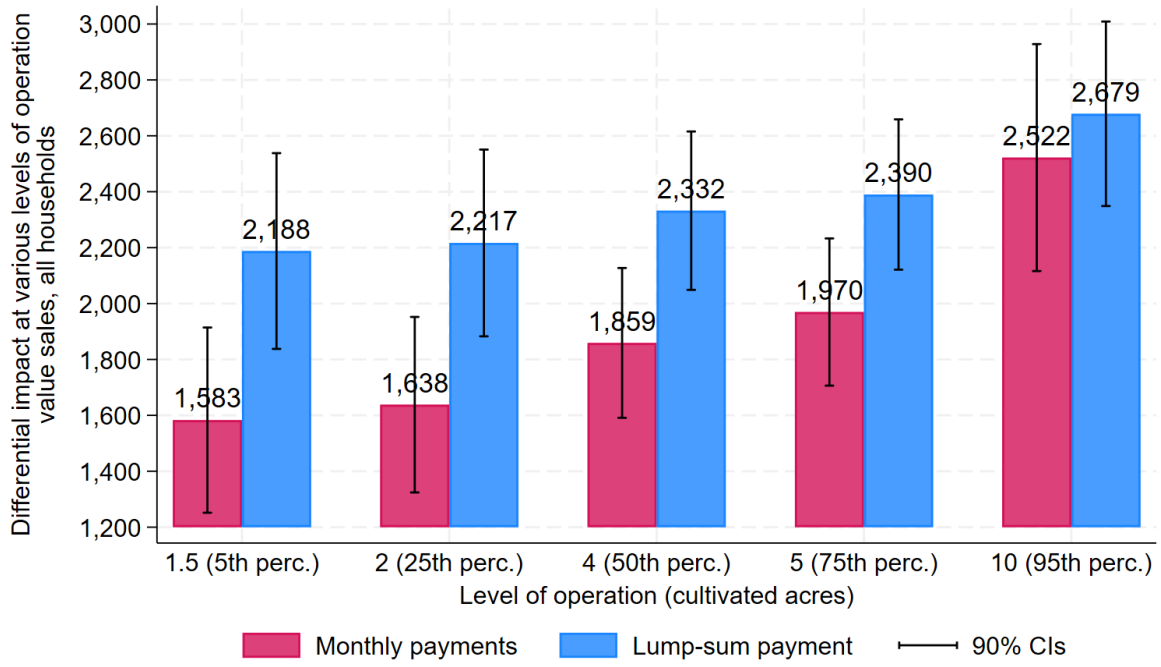
Appendix Figure 22: Scale of operation heterogeneity for propensity to sell crops (males)



Appendix Figure 23: Scale of operation heterogeneity for agricultural sales (females)



Appendix Figure 24: Scale of operation heterogeneity for agricultural sales (males)



Appendix Table 6: Regressions use of household land and labour for crop cultivation

	(1) Area cultivated (acres) (all HHs)	(2) Pooled labour (person-days) (all HHs)	(3) Pooled labour (person-days) (w. work)
lump-sum payment	0.305	4.265*	3.803*
	(0.248)	(2.241)	(2.248)
District dummies	yes	yes	yes
Observations	3087	3091	1950
Mean monthly group	5.923	22.11	35.92

Notes: * p < 0.10, ** p < 0.05, *** p < 0.01. Standard errors in parenthesis.

Appendix Table 7: Regressions likelihood of buying inputs

	(1) Seeds (Yes/No) (all HHs)	(2) Chem. fert. (Yes/No) (all HHs)	(3) Org. fert. (Yes/No) (all HHs)	(4) Pesticides (Yes/No) (all HHs)	(5) Hired labour (Yes/No) (all HHs)
lump-sum payment	-0.00532	0.0168	0.00541	0.0111	-0.0106
	(0.0204)	(0.0110)	(0.0132)	(0.0110)	(0.0215)
District dummies	yes	yes	yes	yes	yes
Observations	3086	3087	3088	3083	3091
Mean monthly group	0.715	0.902	0.0839	0.937	0.664

Notes: * p < 0.10, ** p < 0.05, *** p < 0.01. Standard errors in parenthesis.

Appendix Table 8: Regressions amount spent on inputs (all households)

	(1) Seeds (GHS) (all HHs)	(2) Chem. fert. (GHS) (all HHs)	(3) Org. fert. (GHS) (all HHs)	(4) Pesticides (GHS) (all HHs)	(5) Hired labour (GHS) (all HHs)
lump-sum payment	14.67	122.6**	-0.0304	-2.453	-9.040
	(23.81)	(58.75)	(8.626)	(20.43)	(18.43)
District dummies	yes	yes	yes	yes	yes
Observations	3086	3087	3088	3083	3090
Mean monthly group	362.1	1627.0	42.81	396.9	250.2

Notes: * p < 0.10, ** p < 0.05, *** p < 0.01. Standard errors in parenthesis.

Appendix Table 9: Regressions amount spent on inputs (farmers who bought inputs)

	(1) Seeds (GHS) (buyers)	(2) Chem. fert. (GHS) (buyers)	(3) Org. fert. (GHS) (buyers)	(4) Pesticides (GHS) (buyers)	(5) Hired labour (GHS) (buyers)
lump-sum payment	26.74	103.0*	-70.16	-6.921	-5.251
	(27.72)	(60.05)	(108.4)	(20.68)	(25.05)
District dummies	yes	yes	yes	yes	yes
Observations	2199	2820	266	2903	2040
Mean monthly group	509.7	1805.4	659.2	423.8	381.7

Notes: * p < 0.10, ** p < 0.05, *** p < 0.01. Standard errors in parenthesis.

Appendix Table 10: Regressions harvest and sales

	(1) Harvest (Cedis) (all HHs)	(2) Harvest (Kg) (all HHs)	(3) Grains (Kg) (producers)	(4) Pulses (Kg) (producers)	(5) Sales (Cedis) (all HHs)	(6) Sales (Cedis) (sellers)
lump-sum payment	309.8	98.89	34.89	30.01	295.3*	322.2**
	(385.4)	(105.8)	(71.29)	(33.58)	(154.6)	(162.2)
District dummies	yes	yes	yes	yes	yes	yes
Observations	3091	3091	2910	2373	3091	2242
Mean monthly group	6707.4	1809.7	1213.0	470.5	1752.4	2468.6

Notes: * p < 0.10, ** p < 0.05, *** p < 0.01. Standard errors in parenthesis.

Appendix Table 11: Regressions heterogeneity for harvest and sales

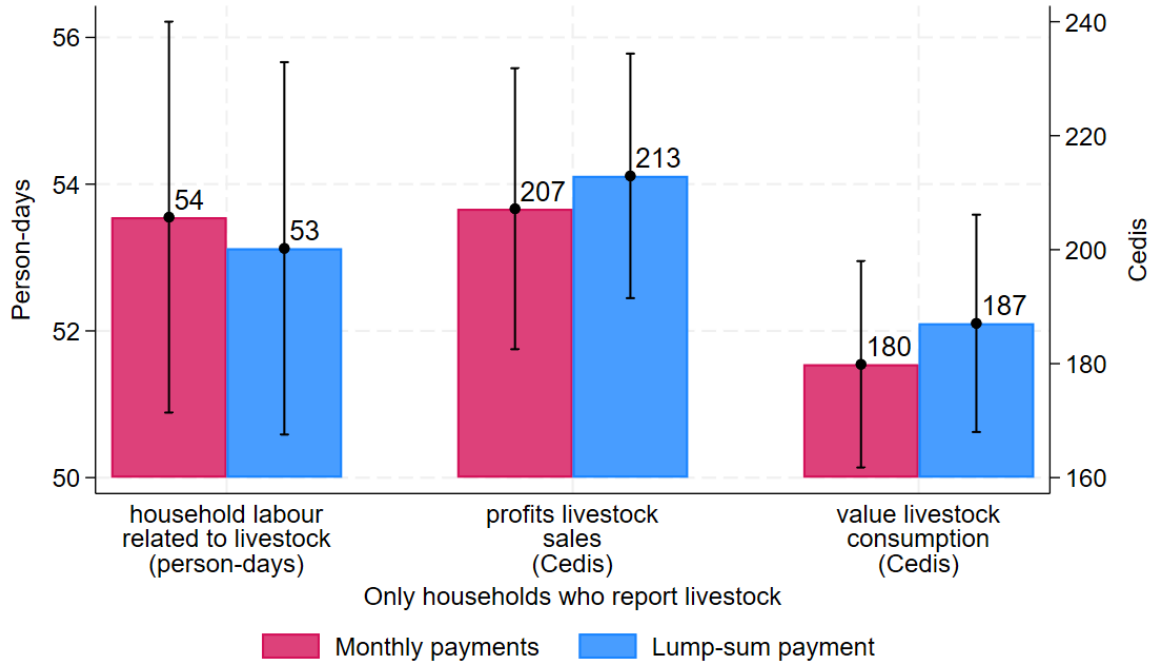
	Chemical fertilizer		
	(1)	(2)	(3)
lump-sum payment	122.6**	136.1*	217.8***
	(58.75)	(80.29)	(83.36)
lump-sum payment × female		-34.62	
		(85.40)	
lump-sum payment × area cultivated			-24.39*
			(14.04)
District dummies	yes	yes	yes
Sex dummy		yes	
Area cultivated			yes
District × Sex		yes	
District × Area cultivated			yes
Observations	3087	3087	3087
Mean monthly group	1627.0	1627.0	1627.0

	Harvest (kg)			Harvest (Cedis)		
	(1)	(2)	(3)	(4)	(5)	(6)
lump-sum payment	98.89	30.86	144.8	309.8	56.06	480.1
	(105.8)	(132.0)	(117.6)	(385.4)	(479.4)	(445.0)
lump-sum payment × female		114.1			443.0	
		(125.1)			(452.6)	
lump-sum payment × area cultivated			-18.20			-65.77
			(23.41)			(83.92)
District dummies	yes	yes	yes	yes	yes	yes
Sex dummy		yes			yes	
Area cultivated			yes			yes
District × Sex		yes			yes	
District × Area cultivated			yes			yes
Observations	3091	3091	3091	3091	3091	3091
Mean monthly group	1809.7	1809.7	1809.7	6707.4	6707.4	6707.4

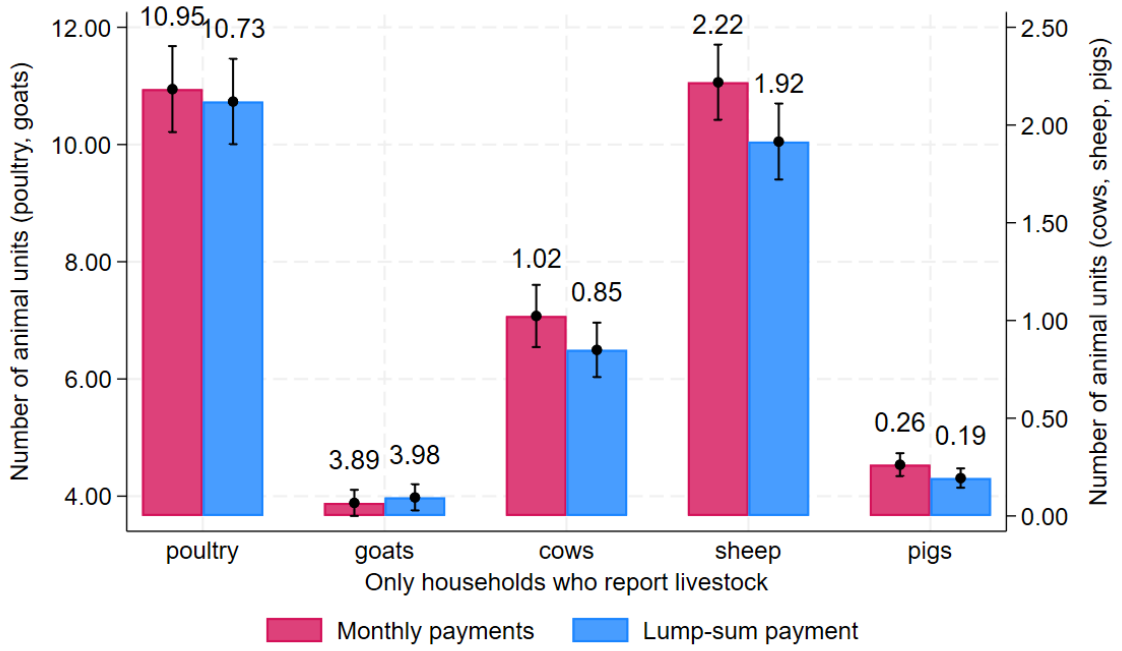
	Sales (yes/no)			Sales (Cedis)		
	(1)	(2)	(3)	(4)	(5)	(6)
lump-sum payment	0.0281	0.0419	0.0388	295.3*	412.6*	378.6*
	(0.0241)	(0.0299)	(0.0335)	(154.6)	(210.0)	(194.5)
lump-sum payment × female		-0.0305			-246.6	
		(0.0326)			(185.5)	
lump-sum payment × area cultivated			-0.00295			-27.92
			(0.00407)			(36.01)
District dummies	yes	yes	yes	yes	yes	yes
Sex dummy		yes			yes	
Area cultivated			yes			yes
District × Sex		yes			yes	
District × Area cultivated			yes			yes
Observations	3091	3091	3091	3091	3091	3091
Mean monthly group	0.713	0.713	0.713	1752.4	1752.4	1752.4

Notes: * p < 0.10, ** p < 0.05, *** p < 0.01. Standard errors in parenthesis.

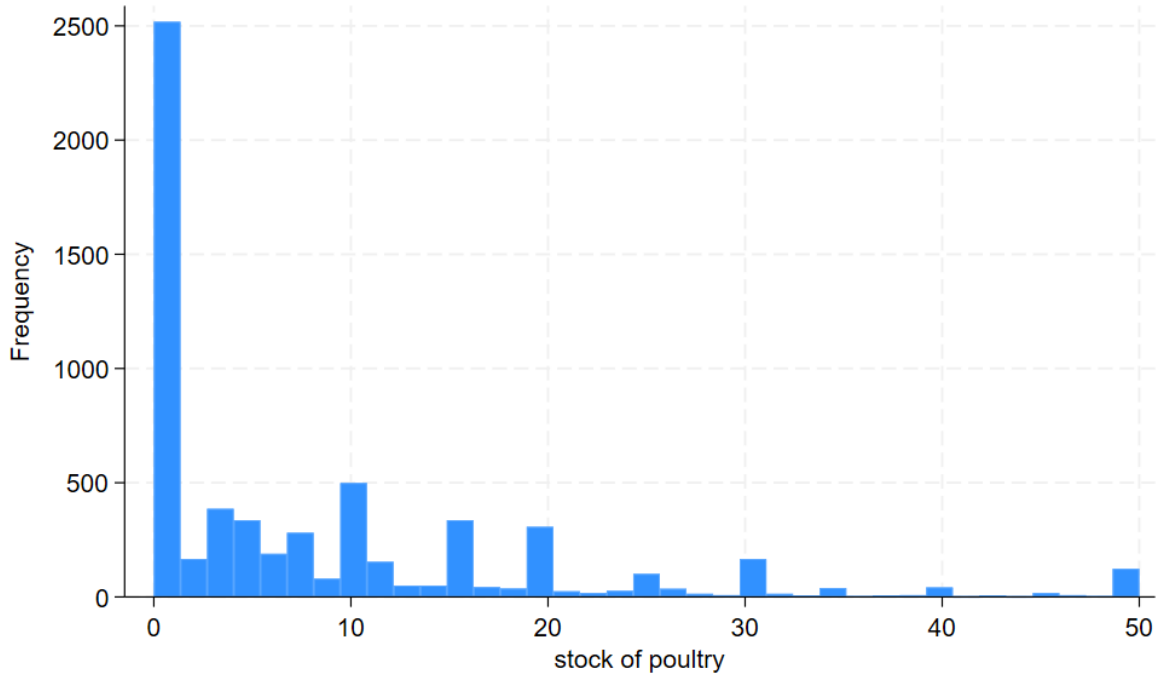
Appendix Figure 25: Livestock-related labour and profits (only households reporting livestock)



Appendix Figure 26: Stock of animals (only households reporting livestock)

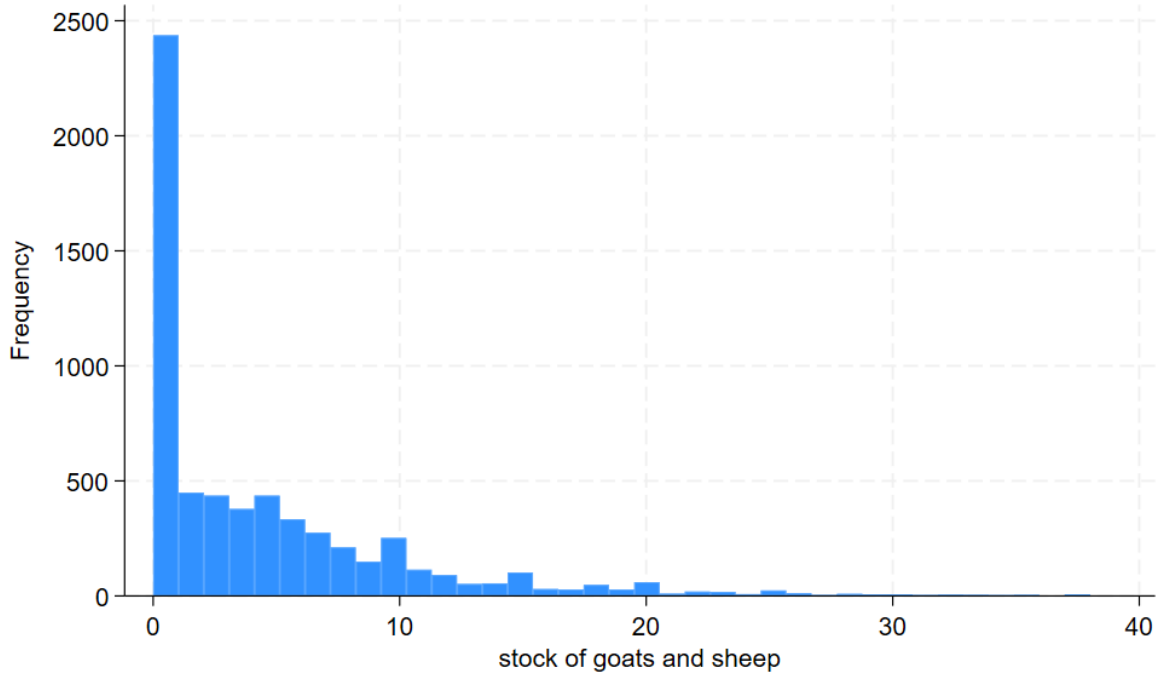


Appendix Figure 27: Histogram of poultry stock (all households)



Notes: Frequency refers to the number of households who reported a certain stock of poultry as plotted on the horizontal axis. All round 2 and round 3 household observations are included.

Appendix Figure 28: Histogram of sheep and goat stock (all households)



Notes: Frequency refers to the number of households who reported a certain total number of goats and sheep as plotted on the horizontal axis. All round 2 and round 3 household observations are included.

Appendix Table 12: Regressions livestock rearing, related profit

	(1) Rearing ratio (all households)	(2) Person-days labour last 30 days (all households)	(3) Person-days labour last 30 days (owners)	(4) Profits Cedis last 6 months (all households)	(5) Profits Cedis last 6 months (owners)	(6) Consumed value last 6 months (all households)	(7) Consumed value last 6 months (owners)
lump-sum payment	-0.00175	-0.561	-0.425	3.694	5.765	5.336	7.192
	(0.0158)	(1.648)	(1.700)	(14.44)	(18.61)	(11.51)	(14.58)
District dummies	yes	yes	yes	yes	yes	yes	yes
Round dummies	yes	yes	yes	yes	yes	yes	yes
District × Round	yes	yes	yes	yes	yes	yes	yes
Observations	6108	6108	4701	6094	4687	6098	4691
Mean monthly group	0.772	41.27	53.49	160.5	208.2	138.2	179.2

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parenthesis.

Appendix Table 13: Regressions heterogeneity for livestock rearing and selling

	(1) Rearing livestock ratio (all HHs)	(2) Rearing livestock ratio (all HHs)	(3) Sold livestock ratio (owners)	(4) Sold livestock ratio (owners)
lump-sum payment	-0.0148	-0.0166	-0.00727	0.0143
	(0.0162)	(0.0271)	(0.0191)	(0.0332)
lump-sum payment × farmers selling crops		0.00132		-0.0354
		(0.0290)		(0.0393)
District dummies	yes	yes	yes	yes
Commercial farmer		yes		yes
District × Commercial farmer		yes		yes
Observations	3091	3091	2474	2474
Mean monthly group	0.809	0.809	0.305	0.305

Notes: $*$ p < 0.10, $**$ p < 0.05, $***$ p < 0.01. Standard errors in parenthesis

Appendix Table 14: Regressions stock of animals

	(1) Poultry (all HHs)	(2) Poultry (owners)	(3) Goats (all HHs)	(4) Goats (owners)	(5) Cows (all HHs)	(6) Cows (owners)	(7) Sheep (all HHs)	(8) Sheep (owners)	(9) Pigs (all HHs)	(10) Pigs (owners)
lump-sum payment	-0.230	-0.212	0.0565	0.0935	-0.140*	-0.173*	-0.241*	-0.303**	-0.0594*	-0.0686*
	(0.460)	(0.536)	(0.151)	(0.172)	(0.0749)	(0.0921)	(0.125)	(0.150)	(0.0301)	(0.0385)
District dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Round dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
District × Round	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	6105	4698	6106	4699	6107	4700	6106	4699	6108	4701
Mean monthly group	8.441	10.94	2.989	3.874	0.776	1.006	1.714	2.222	0.205	0.265

Notes: $*$ $p < 0.10$, $**$ $p < 0.05$, $***$ $p < 0.01$. Standard errors in parenthesis.

Appendix Table 15: Regressions business ownership and engagement

	(1) Has business (all HHs) (last year)	(2) # businesses (all HHs) (last year)	(3) # businesses (owners) (last year)	(4) Days worked (all HHs) (last month)	(5) Days worked (w. business) (last month)	(6) Profits (all HHs) (last month)	(7) Profits (w. business) (last month)
lump-sum payment	-0.0133	-0.0196	-0.00981	-0.614	-0.506	-4.003	-6.352
	(0.0215)	(0.0289)	(0.0297)	(0.822)	(1.428)	(10.06)	(23.32)
District dummies	yes	yes	yes	yes	yes	yes	yes
Round dummies	yes	yes	yes	yes	yes	yes	yes
District × Round	yes	yes	yes	yes	yes	yes	yes
Observations	6108	6108	2178	6108	2177	5950	2020
Mean monthly group	0.364	0.422	1.161	10.06	28.20	99.58	304.4

Notes: $*$ $p < 0.10$, $**$ $p < 0.05$, $***$ $p < 0.01$. Standard errors in parenthesis.

Appendix Table 16: Regressions wage labour

	(1) Employed (last year) (ratio)	(2) Employed (last month) (ratio)	(3) Days worked (monthly) (if employed)	(4) Wages (last year) (if employed)
lump-sum payment	0.00566	0.000437	0.113	106.9
	(0.00627)	(0.00461)	(0.529)	(543.4)
District dummies	yes	yes	yes	yes
Round dummies	yes	yes	yes	yes
District × Round	yes	yes	yes	yes
Observations	30505	30514	2937	2644
Mean monthly group	0.0966	0.0631	15.06	5110.4

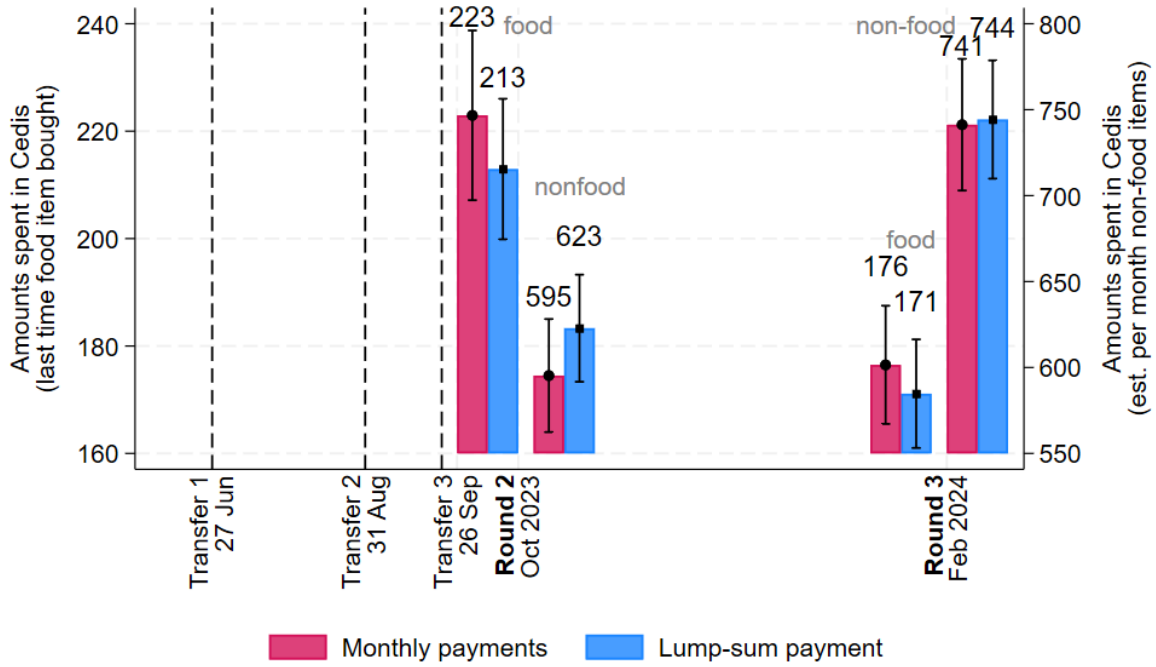
Notes: * p < 0.10, ** p < 0.05, *** p < 0.01. Standard errors in parenthesis.

Appendix Table 17: Regressions mental wellbeing

	(1) PHQ4 (last 2 weeks)	(2) Cantril (past 2 years)	(3) Cantril (present)	(4) Cantril (next 2 years)	(5) SERS
lump-sum payment	-0.144	0.0262	-0.215**	-0.368***	-0.0124
	(0.101)	(0.102)	(0.104)	(0.117)	(0.00822)
lump-sum payment × round 2	0.154				
	(0.115)				
lump-sum payment × round 3	0.255*	-0.0724	0.201*	0.284**	0.00965
	(0.137)	(0.119)	(0.119)	(0.137)	(0.00989)
District dummies	yes	yes	yes	yes	yes
Round dummies	yes	yes	yes	yes	yes
District × Round	yes	yes	yes	yes	yes
Observations	9325	6108	6108	6108	6108
Mean monthly group	4.112	3.965	5.663	7.600	0.539

Notes: * p < 0.10, ** p < 0.05, *** p < 0.01. Standard errors in parenthesis.

Appendix Figure 29: Round-level household food and non-food expenditure (excluding assets)

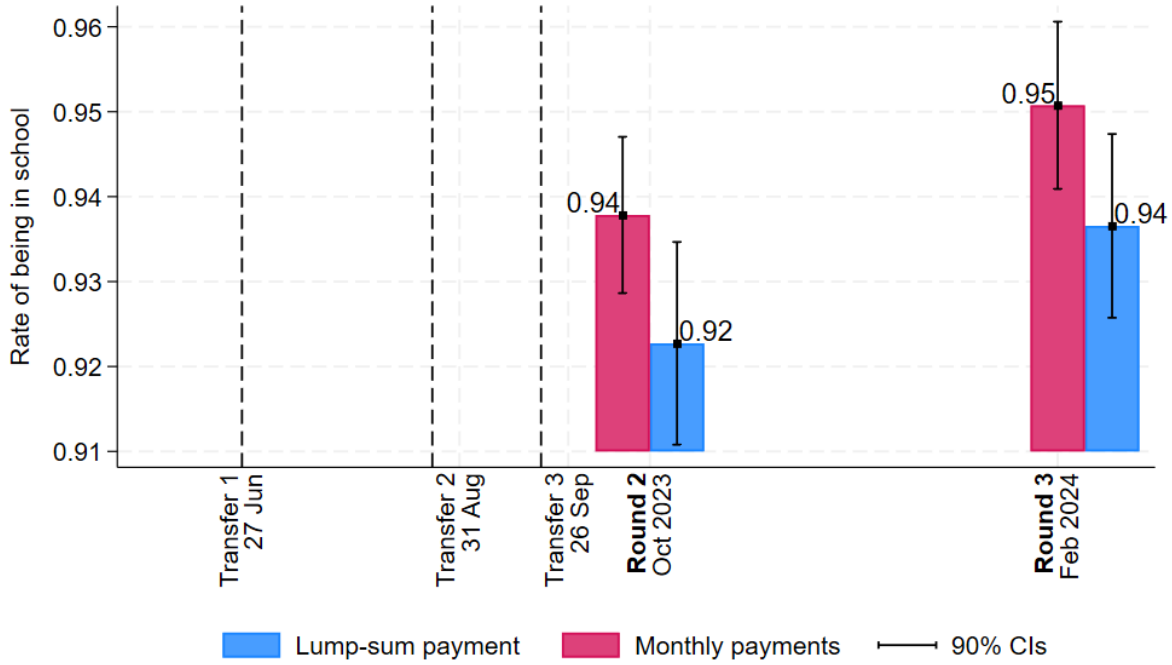


Appendix Table 18: Regressions household food and non-food expenditure

	(1) Amount spent on food items last time item bought (all HHs)	(2) Amount spent on non-food last month (all HHs)
lump-sum payment	-7.657	15.09
	(8.587)	(24.89)
District dummies	yes	yes
Round dummies	yes	yes
District × Round	yes	yes
Observations	6090	6033
Mean monthly group	200.4	668.3

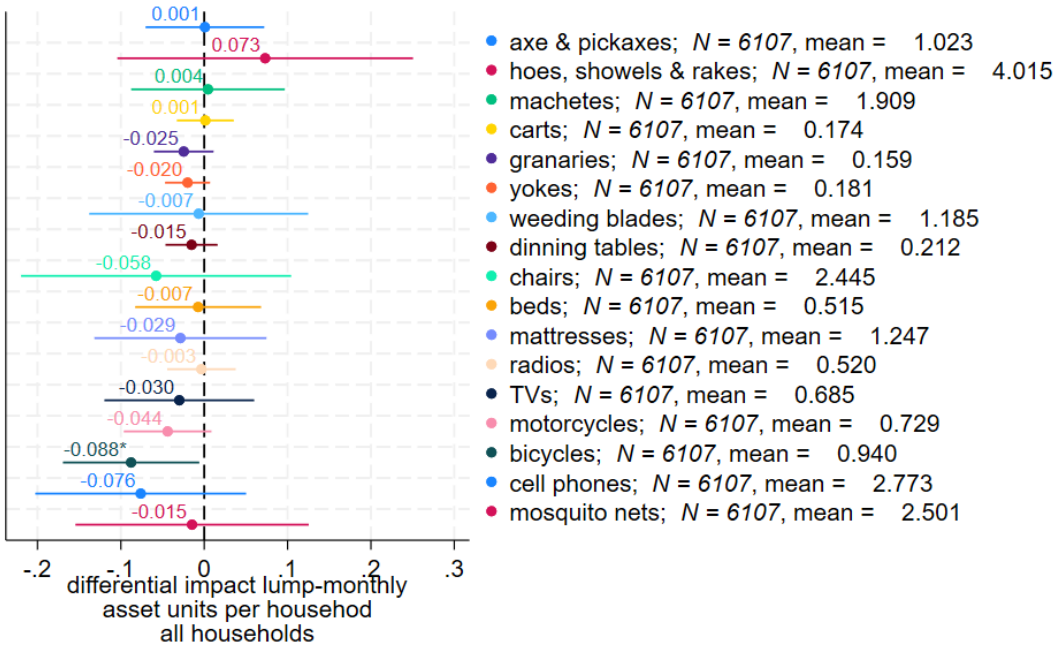
Notes: * p < 0.10, ** p < 0.05, *** p < 0.01. Standard errors in parenthesis.

Appendix Figure 30: Rate of being in school at the time of the survey



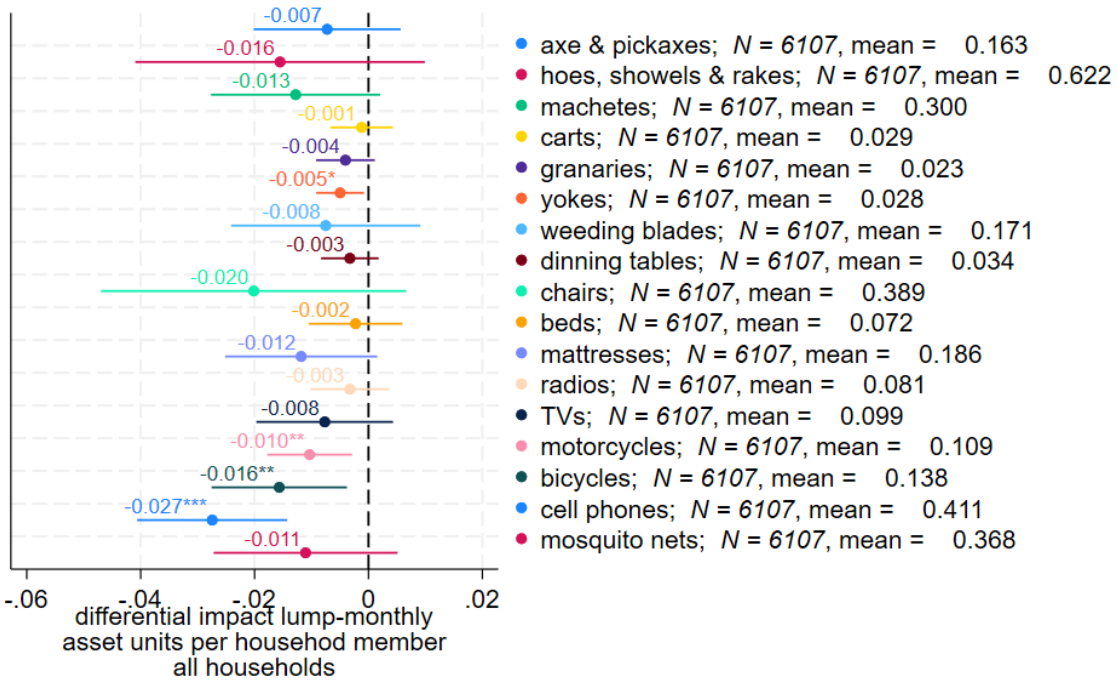
Notes: The sample includes children aged between 6 (enrolment age in primary 1) and 17, included. For each child, the interviewee mentions whether s/he is in school at the time of the survey. Households with children in the age bracket of interest are considered. Total observations: 11,510 child instances across the two rounds. Estimations control for round and district dummies and their interaction. Treatment is interacted with the round of data collection.

Appendix Figure 31: Assets owned per household (all households)



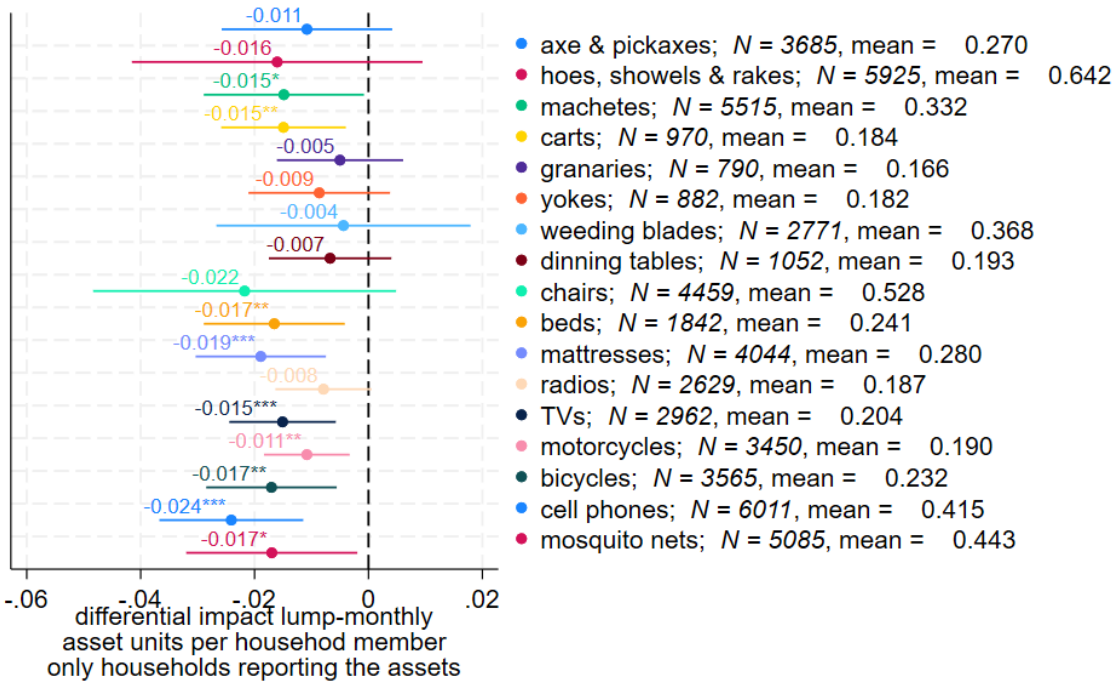
Notes: The differential impact is plotted, i.e., the difference between the average of the household asset ownership in the lump group and the average in the monthly group. 90 percent confidence intervals. If the confidence interval of an estimate is entirely to the left of the vertical 0 axis, then the monthly group asset average is higher than that of the lump group, and the estimate is statistically significant (i.e., different from 0) with 90 percent confidence. *Vice-versa*, point estimates that are to the right of the 0 axis indicate a higher average for the lump group. If confidence intervals cross the 0 vertical axis, then those estimates are not statistically significant. Sample includes all households, i.e., if they do not own an asset, they are coded with a 0 stock. The outcome variables are winsorized to limit extreme values. Outliers below the 1st and above the 99th percentiles are replaced with the values of the 1st and 99th percentiles due to probable data entry errors. The sample size is reported in the graph as well as the average of the monthly group. Asset data was only collected in rounds 2 and 3. The estimation controls for round and district dummies and their interaction.

Appendix Figure 32: Assets owned per household member (all households)



Notes: The differential impact is plotted, i.e., the difference between the average asset ownership *per household member* in the lump group and the average *per household member* in the monthly group. The outcome variables are the various household-level asset stocks divided by the household size. 90 percent confidence intervals. If the confidence interval of an estimate is entirely to the left of the vertical 0 axis, then the monthly group asset average is higher than that of the lump group, and the estimate is statistically significant (i.e., different from 0) with 90 percent confidence. *Vice-versa*, point estimates that are to the right of the 0 axis indicate a higher average for the lump group. If confidence intervals cross the 0 vertical axis, then those estimates are not statistically significant. Sample includes all households, i.e., if they do not own an asset, they are coded with a 0 stock per household member. The outcome variables are winsorized to limit extreme values. Outliers below the 1st and above the 99th percentiles are replaced with the values of the 1st and 99th percentiles due to probable data entry errors. The sample size is reported in the graph as well as the per-member household average of the monthly group. Asset data was only collected in rounds 2 and 3. The estimation controls for round and district dummies and their interaction.

Appendix Figure 33: Assets owned per household member (asset owners)



Notes: The differential impact contingent on asset ownership is plotted, i.e., the difference between the average asset ownership *per household member* in the lump group and the average *per household member* in the monthly group. The outcome variables are the various household-level asset stocks divided by the household size. 90 percent confidence intervals. If the confidence interval of an estimate is entirely to the left of the vertical 0 axis, then the monthly group asset average is higher than that of the lump group, and the estimate is statistically significant (i.e., different from 0) with 90 percent confidence. *Vice-versa*, point estimates that are to the right of the 0 axis indicate a higher average for the lump group. If confidence intervals cross the 0 vertical axis, then those estimates are not statistically significant. The *s*ample *only includes* the households that reported the plotted asset, i.e., if they do not own the asset, they are excluded from the analysis for that asset. The outcome variables are winsorized to limit extreme values. Outliers below the 1st and above the 99th percentiles are replaced with the values of the 1st and 99th percentiles due to probable data entry errors. The sample size is reported in the graph as well as the per-member household average of the monthly group. Asset data was only collected in rounds 2 and 3. The estimation controls for round and district dummies and their interaction.

Appendix Table 19: Regressions asset ownership per household (all households)

	(1) Axes	(2) Hoes	(3) Machetes	(4) Carts	(5) Granaries	(6) Yokes	(7) Blades
lump-sum payment	0.000872	0.0731	0.00449	0.00132	-0.0246	-0.0200	-0.00663
	(0.0430)	(0.107)	(0.0557)	(0.0207)	(0.0216)	(0.0163)	(0.0794)
District dummies	yes	yes	yes	yes	yes	yes	yes
Round dummies	yes	yes	yes	yes	yes	yes	yes
District × Round	yes	yes	yes	yes	yes	yes	yes
Observations	6107	6107	6107	6107	6107	6107	6107
Mean monthly group	1.023	4.015	1.909	0.174	0.159	0.181	1.185

	(1) Tables	(2) Chairs	(3) Beds	(4) Mattresses	(5) Radios	(6) TVs	(7) Motorcycles	(8) Bicycles	(9) Phones	(10) Msq. nets
lump-sum payment	-0.0152	-0.0578	-0.00733	-0.0286	-0.00334	-0.0299	-0.0439	-0.0877*	-0.0762	-0.0146
	(0.0189)	(0.0980)	(0.0457)	(0.0624)	(0.0248)	(0.0543)	(0.0318)	(0.0495)	(0.0764)	(0.0846)
District dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Round dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
District × Round	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	6107	6107	6107	6107	6107	6107	6107	6107	6107	6107
Mean monthly group	0.212	2.445	0.515	1.247	0.520	0.685	0.729	0.940	2.773	2.501

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parenthesis.

Appendix Table 20: Regressions asset ownership per household (asset owners)

	(1) Axes	(2) Hoes	(3) Machetes	(4) Carts	(5) Granaries	(6) Yokes	(7) Blades
lump-sum payment	0.00408	0.0732	-0.000464	-0.0271	-0.00557	0.0342	0.0557
	(0.0395)	(0.105)	(0.0536)	(0.0231)	(0.0266)	(0.0414)	(0.103)
District dummies	yes	yes	yes	yes	yes	yes	yes
Round dummies	yes	yes	yes	yes	yes	yes	yes
District × Round	yes	yes	yes	yes	yes	yes	yes
Observations	3685	5925	5515	970	790	882	2771
Mean monthly group	1.693	4.143	2.116	1.107	1.149	1.191	2.559

	(1) Tables	(2) Chairs	(3) Beds	(4) Mattresses	(5) Radios	(6) TVs	(7) Motorcycles	(8) Bicycles	(9) Phones	(10) Msq. nets
lump-sum payment	-0.000969	-0.0471	-0.0750	-0.0553	-0.0141	-0.0578	-0.0328	-0.0807*	-0.0544	-0.0593
	(0.0293)	(0.0923)	(0.0748)	(0.0604)	(0.0239)	(0.0440)	(0.0282)	(0.0437)	(0.0749)	(0.0796)
District dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Round dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
District × Round	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	1052	4459	1842	4044	2629	2962	3450	3565	6011	5085
Mean monthly group	1.203	3.319	1.725	1.880	1.208	1.402	1.269	1.576	2.804	3.013

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parenthesis.

Appendix Table 21: Regressions asset ownership per household member (asset owners)

	(1) Axes	(2) Hoes	(3) Machetes	(4) Carts	(5) Granaries	(6) Yokes	(7) Blades
lump-sum payment	-0.0108	-0.0160	-0.0149*	-0.0149**	-0.00500	-0.00864	-0.00439
	(0.00905)	(0.0154)	(0.00850)	(0.00661)	(0.00669)	(0.00749)	(0.0135)
District dummies	yes	yes	yes	yes	yes	yes	yes
Round dummies	yes	yes	yes	yes	yes	yes	yes
District × Round	yes	yes	yes	yes	yes	yes	yes
Observations	3685	5925	5515	970	790	882	2771
Mean monthly group	0.270	0.642	0.332	0.184	0.166	0.182	0.368

	(1) Tables	(2) Chairs	(3) Beds	(4) Mattresses	(5) Radios	(6) TVs	(7) Motorcycles	(8) Bicycles	(9) Phones	(10) Msq. nets
lump-sum payment	-0.00674	-0.0218	-0.0165**	-0.0189***	-0.00790	-0.0151***	-0.0108**	-0.0170**	-0.0241***	-0.0170*
	(0.00649)	(0.0161)	(0.00748)	(0.00692)	(0.00510)	(0.00565)	(0.00455)	(0.00693)	(0.00764)	(0.00908)
District dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Round dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
District × Round	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	1052	4459	1842	4044	2629	2962	3450	3565	6011	5085
Mean monthly group	0.193	0.528	0.241	0.280	0.187	0.204	0.190	0.232	0.415	0.443

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parenthesis.

Appendix Table 22: Regressions rate of saving, transfers, accessing credit (last 3 months)

	(1) Saved	(2) Accessed formal credit	(3) Accessed informal credit	(4) Got transfer	(5) Made transfer	(6) Gave loan
lump-sum payment	-0.00821	0.0148	-0.0116	0.0159	0.00280	0.00131
	(0.0180)	(0.0142)	(0.0151)	(0.0135)	(0.0177)	(0.00896)
District dummies	yes	yes	yes	yes	yes	yes
Round dummies	yes	yes	yes	yes	yes	yes
District × Round	yes	yes	yes	yes	yes	yes
Observations	6101	6108	6108	6108	6108	6108
Mean monthly group	0.401	0.131	0.226	0.240	0.410	0.0700

Notes: * p < 0.10, ** p < 0.05, *** p < 0.01. Standard errors in parenthesis.

Appendix Table 23: Regressions balance, amounts saved, credited, transferred (last 3 months)

	(1) Balance savings	(2) Amount saved	(3) Amount obtained formal credit	(4) Balance formal credit	(5) Amount obtained informal credit	(6) Balance informal credit	(7) Amount obtained transfer	(8) Amount sent via transfer	(9) Amount loaned
lump-sum payment	-32.11	-46.26*	-278.2**	-189.0**	22.91	52.18	-18.87	17.79	-1.164
	(27.92)	(27.86)	(130.8)	(93.66)	(49.09)	(40.53)	(27.51)	(20.54)	(55.71)
District dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes
Round dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes
District × Round	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	2372	2353	843	831	1333	1333	1514	2501	426
Mean monthly group	472.6	384.2	1137.4	804.2	600.3	416.4	332.6	348.5	412.1

Notes: * p < 0.10, ** p < 0.05, *** p < 0.01. Standard errors in parenthesis.

World Food Programme

Via Cesare Giulio Viola 68/70
00148 Rome, Italy
T +39 06 65131

wfp.org