Does the Graduation Program Scale? Evidence from India*

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Abstract

Graduation programs, which feature bundled interventions that combine asset transfers, training, coaching, and consumption support to lift households out of extreme poverty, have a robust evidence base from NGO-led pilots, but limited evidence on whether they deliver comparable gains under government scale-up. We evaluate the Satat Jeevikoparjan Yojana (SJY), the Government of Bihar's scale-up of the graduation model to 155,000 ultra-poor, women-headed households, using a randomized "carve-out" design across 129 Gram Panchayats ("GPs") in three of India's poorest districts, wherein the experimental sample is set aside in the context of a scale up of the program. Households in treated GPs experience large gains across a wide array of outcomes at a first endline conducted approximately two years after asset transfer, and these gains persist in a second endline conducted over a year after the program participation ended for beneficiaries. Across both endlines, per capita monthly consumption rises by 0.38–0.44 SD (27–29%) over the control mean; total monthly income is 109–220% higher; An asset index rises by 0.81–1.15 SD; food security improves by 0.46–0.55 SD; borrowing falls by 60% while bank savings rise to six to eleven times the control mean. The program also produces large gains in mental health (1.35 SD), women's empowerment (0.16–0.17 SD), and political participation (0.26 SD). A Marginal Value of Public Funds calculation indicates that SJY breaks even on consumption gains within its three-year program horizon, with much larger returns under income-based valuations. The results show that a state-led graduation program, delivered through Bihar's mature Self-Help Group (SHG) platform, can match or exceed the effects documented in NGO-led pilots.

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1 Introduction

Graduation programs are bundled "big-push" interventions that combine a lumpy productive asset transfer, consumption support for a few weeks, training, and ongoing coaching for 18 months with the goal of lifting households permanently out of extreme poverty. Pioneered by BRAC, a Bangladeshi NGO, and now among the most extensively evaluated anti-poverty interventions in development economics, they have been shown to raise consumption, assets, and income across a wide range of contexts (Banerjee et al., 2015; Bedoya et al., 2019), with effects that persist from seven to ten to even fifteen years after cessation of the program (Bandiera et al., 2017; Banerjee et al., 2021).[1] Indeed, the strength of this evidence has prompted governments in over 75 countries to adopt and scale graduation programs as part of their own social protection systems (Andrews et al., 2021). Yet direct evidence on whether the approach delivers comparable gains under a government scale-up remains limited.

There are reasons, moreover, to expect government scale-ups in low-income settings to have different effects from those found in the NGO-led pilots that produced the bulk of existing evidence. Banerjee et al. (2017) cite six widely recognized challenges that mean the effect of a scale-up could be very different from that of a proof of concept: market equilibrium effects, spillovers, political reactions, context dependence, randomization or site-selection bias, and piloting bias (implementation quality may decline as programs move from NGO pilots into government delivery systems). Moreover, there is evidence that treatment effects sometimes shrink when programs move from NGO pilots to government implementation (Vivalt, 2020; DellaVigna and Linos, 2022; Bold et al., 2018). Conversely, in other settings, implementation improves when a program is run at scale, as the original kinks in implementation are absorbed (Banerjee et al., 2018).

Governments can, in principle, preserve impact by devoting the resources required to maintain delivery quality, but this raises a separate, equally policy-relevant question: whether the program remains cost-effective once those resources are accounted for. Muralidharan and Niehaus (2017) argue that to bridge the gap between experimentation and practice, more RCTs should be "at-scale", in the sense that they are representative of a large population, are implemented by the government (or by whoever would scale the program eventually), and are run at a level sufficiently aggregated to capture general-equilibrium effects.

In this paper, we propose an experimental design that meets most of these criteria and more: a "carve-out" model in which the government is scaling a program that has already shown promise, and an experimental sample is preserved for a period of time, allowing for a standard RCT to be run. Banerjee et al. (2017) ran a version of this design when they evaluated, in two districts in Bihar and Uttarakhand, a pedagogy intervention that was being simultaneously scaled up in other districts of the same states. In the present project, set in Bihar, the carve-out sample is more intentional: it comprises 129 Gram Panchayats (GPs) across 9 blocks in 3 districts. The Government of Bihar randomly assigned 63 GPs to receive the program in May 2022, while the remaining 66 GPs served as the experimental control over the three-year evaluation window, and were brought into the program after that. In all other respects, the program was run by the state government following standard operating procedure.

GPs are clusters of contiguous villages within blocks that share a common local government called the

[1] The exception is Barker et al. (2024), who follow up the Ethiopia arm of Banerjee et al. (2015) at seven years and find that the initial gains in consumption and wealth fade substantially, driven by strong catch-up growth among control households.

Gram Panchayat (hence GP). Most welfare programs that are not administered by the state government (Bihar is a state) or, in rare cases, by the federal government are in the hands of the Gram Panchayat. We therefore evaluate a program that already incorporates most of the relevant scale effects, including political economy and equilibrium effects, alongside the implementation challenges and advantages that arise when a government runs a program as part of routine operations.

By running this evaluation in Bihar, we also address to some extent the issue of external validity of the previous estimates for India, which was run in West Bengal. Bihar is, in many respects, a hard test case for any anti-poverty intervention: it is India's poorest state, with historically weak state capacity (Banerjee et al., 2020) and strong patriarchal social norms — precisely the conditions under which the gap between an NGO-led pilot and a government scale-up might be expected to be widest. On the other hand, the scale-up, called the Satat Jeevikoparjan Yojana (SJY), was run by Jeevika, the state government's livelihoods arm. Jeevika has led what is considered to be one of the most successful women's self-help group (SHG) movements in India (World Bank Group, 2017). Jeevika boasts over a million SHGs and covers over 10 million households, spanning nearly 60% of Bihar's rural population. SHGs foster savings, mutual insurance, and productive activities and are largely self organized and financed. Jeevika used the SHG to scale the intervention, which reduced administrative costs and provided a solid implementation network on the field.

In June 2020, following the standard graduation template, SJY used community identification to select beneficiary households, then delivered six partly sequential components — a productive asset, training, coaching, access to savings, and consumption support — over 18 to 24 months until June 2024. The program was scaled to 155,000 ultra-poor, women-headed households across the state.

The community identification process — through which the universe of ultra-poor households eligible for the program was identified in each GP — was completed in both treatment and control GPs prior to May 2022, ensuring that the treated and control samples are drawn from the same selection process and differ only in their assignment into treatment or control. Our sample covers 2743 households across the 129 GPs. We conducted two endline surveys, first when the program ended in September 2024 (endline 1 henceforth) – about 30 months after the median beneficiary entered into treatment – and next in October 2025 (endline 2 henceforth) – about a year after the end of the intervention window – reaching over 90% of baseline households at each round.

Given the policy importance of our evaluation findings in this context, we took particular care to follow strict evaluation guidelines to guarantee independence. Our experiment was pre-registered with the AEA registry, our pre-analysis plan followed closely the analysis plan of the original evaluation of the graduation program in six countries (Banerjee et al., 2015), and we adhered to that plan throughout, noting deviations wherever they occurred. J-PAL organized the design of the evaluation and conducted primary surveys with its in-house team through the first endline; for the second endline, we hired an independent survey organization that was kept at arm's length, to make the data collection as close to a "blind" exercise as possible. Endline 2 allows us to validate endline 1's results and study persistence.

We estimate treatment effects via intent-to-treat regressions of the endline outcomes on the GP-level treatment indicator, controlling for the baseline value of the outcome where available (in a set of GPs, treatment begun before baseline was conducted) and selecting additional baseline covariates via post-double-selection

LASSO following Belloni et al. (2014); all specifications include strata fixed effects and cluster standard errors at the GP level. We report treatment effects from both endline rounds throughout.

We find that SJY produced large and broad-based gains for treated households. Per capita monthly consumption rose by 0.38 SD at endline 1 and 0.44 SD at endline 2, equivalent to a 30% (27%) increase over the control mean. These proportional increases in consumption expenditure are comparable to or exceeding the medium-run effects of the largest graduation pilots anywhere. Treated households earned substantially more — total monthly income was 220% higher than the control group at endline 1 and remained 109% higher at endline 2 — driven by sharp increases in livestock, agricultural, and microenterprise revenues. Household assets rose by 1.15 SD at endline 1 and 0.81 SD at endline 2, and by endline 2 treated households also lived in materially better-quality dwellings (living conditions index rose by 0.33 SD). These gains were also accompanied by improvements in food security (0.55 SD and 0.46 SD across the two rounds). Crucially, households became substantially less indebted: total borrowing fell by about 60% relative to the control mean, while savings rose sharply — bank deposits in treated households were nearly eleven times the control mean at endline 1, and remained six times the control mean a year later.

What drives these effects? The time-use module suggests a clear shift in how effort is allocated. SJY beneficiaries in treated GPs spent significantly more time in productive work overall— particularly on livestock, microenterprise, and agriculture. Within the time allocated to productive work, they also spent significantly less time on working for a wage. The pattern is consistent with the asset transfer moving women away from low-paying casual labour toward higher-return self-employment activities, the same channel documented in earlier graduation studies (Banerjee et al., 2015; Bandiera et al., 2017).

The benefits extend well beyond consumption, income, and finance. Treated households report a 1.35 SD improvement in the mental health index at endline 1, with large gains in perceived status in life and large reductions in worry. Women's empowerment within the household rises by 0.16 SD at endline 1 and 0.17 SD at endline 2. Treated households are more likely to keep their children enrolled in school, with the gap between treatment and control widening over time. Finally, political involvement among adult respondents — voting, attending village meetings, speaking with village members about local concerns — is 0.26 SD higher in treated households at endline 1. The program, in other words, has impacts that extend beyond consumption and earnings: it reshapes women's agency, schooling outcomes for children and how households engage with the state.

Our coefficients are large, and precisely estimated – p-values for consumption, income, asset, food security and women's empowerment indices are < 0.01 across both endline 1 and 2 – and our results are robust along three margins. They are insensitive to the choice of baseline controls — including specifications without LASSO selection. They survive multiple-hypothesis adjustment: Benjamini–Hochberg q-values for all primary outcomes remain below conventional thresholds. And they survive correction for differential attrition: Lee bounds on the primary outcomes remain large and significantly different from zero. Quantile regressions suggest that benefits from SJY are spread across a wide range of households.

To place these magnitudes in a comparable welfare framework, we compute the Marginal Value of Public Funds (MVPF) for SJY following Hendren and Sprung-Keyser (2020). Valuing beneficiary welfare using consumption gains, the MVPF crosses unity by the end of the three-year program — SJY breaks even on con-

sumption alone by the end of 3 years, with every subsequent year of persistence delivering benefits against an already paid-up cost. Valuing welfare using income gains, which capture savings and productive investment alongside consumption, the MVPF is 4.33*. and exceeds six within three years of post-program persistence.

This paper contributes to the literature on graduation programs. To our knowledge, we provide the first evidence on a randomized carve-out of a government-led scale-up of the graduation model. NGO-led pilots have established that the bundled package raises consumption, assets, income, and broader welfare across a wide range of contexts, with effects that often persist for seven to ten years (Banerjee et al., 2015; Bandiera et al., 2017; Bedoya et al., 2019; Banerjee et al., 2021). While a small number of evaluations work with government-led graduation programs in other settings (Bossuroy et al., 2022; Botea et al., 2023; Leight et al., 2026), none studies impacts of a randomized carve-out of a full-package scale-up. [2] Our effect sizes are comparable to the largest NGO-led graduation pilots.

Our randomized carve-out design makes both a methodological and an empirical contribution to the "science of scaling" literature (Al-Ubaydli et al., 2017b,a; List, 2026; Banerjee et al., 2017; Muralidharan and Niehaus, 2017). Methodologically, we are able to provide a novel way to establish causal effects of a scale-up. By embedding the experiment within an actual scale-up – one that is government-funded and is delivered through the existing state bureaucracy rather than a dedicated project team – we can estimate the true treatment effects of a scale-up. This allows us to compare impacts of a government scale-up and past NGO pilots in a way much of the previous literature cannot.[3] Empirically, unlike most of the literature the science of scaling engages with, which focuses on of dilution of effects during scale-up (Vivalt, 2020; Bold et al., 2018; DellaVigna and Linos, 2022; Allcott, 2015) – or "voltage drops" (List, 2022) – we find, like Banerjee et al. (2018), the contrary: if anything, our scaled effects exceed those of the typical NGO-led graduation program pilot, a voltage *surge*. We attribute this to the institutional setting. Implementation was entrusted to Jeevika, the state's livelihoods arm, whose SHG platform, built up over two decades and now spanning over half the rural households, likely lowered both the marginal cost of identifying eligible households and the marginal cost of delivering the program to them. This suggests that successful implementation of complex programs is possible even in states historically considered to have low state capacity.

2 Background and Context

2.1 Bihar

Bihar provides a stringent test case for large-scale anti-poverty interventions. It is India's poorest state, with per capita income of INR 42,242 at SJY's launch in 2017–18 (2,672 USD PPP 2024), rising to INR 76,490 by

*Subject to refinement

[2]The closest evaluations come from Niger (Bossuroy et al., 2022), where the intervention is layered on top of an existing national cash transfer program and tested in three alternative bundles; Zambia (Botea et al., 2023), where a streamlined standalone package is randomized across communities within a nationwide rollout; and Ethiopia (Leight et al., 2026), where the underlying program is delivered by an international NGO layered on the Productive Safety Net Programme. All three compare alternative program bundles, such as capital-only, training-only, or psychosocial-only, against the full package. None evaluates a government-led scale-up of the standard full-package model delivered through an SHG federation.

[3]For instance, most of the studies discussed in List (2026) – which together form the core evidence base for "voltage drops" in scaling – compare NGO pilots to scale-ups via structural simulation, observational analysis of already-scaled programs, or small-scale efficacy experiments. They do not provide experimental evidence on the efficacy of scale-ups themselves; our carve-out does.

2024–25 (3,794 USD PPP 2024) (Directorate of Economics & Statistics, 2018; Finance Department, Govt. of Bihar, 2026). Despite recent reductions in multidimensional poverty, Bihar still exhibits the highest poverty headcount in the country, with 33.76% of the population classified as multidimensionally poor in 2019–21, more than double the national average (NITI Aayog, 2023).

Bihar has also been historically characterized by weak state capacity and limited success in implementing social programs at scale. Recent policy initiatives, including the adoption and scale-up of SJY, suggest a shift toward evidence-based policymaking and bureaucratic engagement with large-scale programmatic innovation.

A further contextual factor shaping the policy environment is the statewide alcohol prohibition enacted in 2016. The ban disrupted the livelihoods of households engaged in traditional liquor production, creating a new pool of ultra-poor households in need of targeted livelihood support. SJY was, in part, designed to provide alternative livelihood pathways for these households.

2.2 Jeevika and the SHG platform

The Bihar Rural Livelihoods Promotion Society, known as Jeevika, is the Government of Bihar's flagship rural livelihoods program and serves as the institutional backbone for SJY. Established in 2007 under the Department of Rural Development, Jeevika operates through a three-tier community architecture: Self-Help Groups (SHGs) comprising 10–15 women, Village Organizations (VOs) federating multiple SHGs, and Cluster-Level Federations (CLFs) aggregating VOs. The platform now reaches over 13 million rural women through more than 1 million SHGs, 68,000 VOs, and 1,400 cluster-level federations, and functions as the primary delivery channel for financial inclusion and government programs in rural Bihar. SHG affiliated women save together, identify beneficiaries for various programs, take up productive activity.

Implementation relies on community-based cadres such as Community Resource Persons and Master Resource Persons (MRPs), enabling decentralized targeting, verification, and last-mile delivery.

Because SHG participation is voluntary and requires regular savings contributions, however, the poorest households are typically excluded from the platform. The graduation program, SJY was intended to close this gap.

2.3 SJY in context

The Satat Jeevikoparjan Yojana (SJY), launched in 2018, is a large-scale government adaptation of the graduation approach pioneered by the Bengladeshi organization BRAC. The program initially targeted 100,000 households with a budgetary allocation of INR 8,400 million (around 529 million USD PPP 2024) and has since expanded to over 155,000 ultra-poor, women-headed households, with a target of 200,000. Following the standard graduation template, beneficiaries are identified through a participatory community-based process, verified by program staff, and provided with a productive asset, training, coaching, access to savings, and temporary consumption support over 18–24 months.

Table 1 presents a summary of the SJY program and its implementation. The defining feature of SJY's delivery model is its reliance on Jeevika's existing community institutions. A trained cadre of approximately

5,000 MRPs, each supporting up to 40 households, provides intensive household-level engagement at scale. This cadre was already existing, and could be mobilized for this program.

SJY is delivered through a multi-partner model anchored by Jeevika. The NGO Bandhan-Konnagar, who implemented first the version of the graduation program in India, which was evaluated in West Bengal as part of the six-countries study (Banerjee et al., 2015) provided technical assistance and capacity building, J-PAL South Asia participated in process monitoring and evaluation, and the international donor consortium Co-Impact contributed catalytic funding for systems strengthening. The program is supported by a centralized Management Information System that tracks beneficiary outcomes and delivery in real time, allowing iterative refinement of program design across administrative levels. The combination of government leadership, embedded research support, and continuous monitoring distinguishes SJY from earlier NGO-led graduation pilots and from typical government scale-ups.

3 Experimental Design

3.1 Research design

This study implements a relatively novel research design: a carve out experiment as part of a government state-wide scale up. The Government of Bihar planned to scale up the program to 100,000 families (and then 200,000 families) throughout the state. However, they were interested in assessing the impact at scale, since there were genuine uncertainty on whether it would scale successfully. They agreed to carve out a few blocks to allow for an RCT, where randomly selected GPs would be left as the control group (where SJY would not be immediately rolled out).

The study covers three districts of Bihar – Saharsa, Siwan, and Purnia. These districts were chosen to be representative of one poor, one middle, and one relatively well off district. Within those, we picked nine blocks where implementation was not under way or about to launch, which comprised of 129 Gram Panchayats (GPs). This is our experimental sample. We stratified and randomized 129 GPs along three dimensions: a GP poverty index constructed from the SECC 2011 (terciles); SC/ST population share from the Census 2011 (high >50%, moderate 30–50%, low <30%); and distance to district headquarters from the Census 2011 (quartiles).[4] Of the 129 GPs, 63 received SJY for all identified ultra-poor households and 66 served as controls.

The analytical sample consists of 2,743 ultra-poor households identified by JEEViKA under SJY's targeting criteria. All estimations compare households assigned to control to those assigned to treatment, irrespective of whether the latter ultimately received the program, yielding intent-to-treat (ITT) estimates.

Table 2 summarizes the research design, survey timeline, and sample sizes across waves.

The baseline survey was attempted with all 2,743 targeted beneficiaries between December 2021 and May 2022, completing 2,477 surveys (90% of target). The in-person RCT endline 1 household survey ran from 24 June to 12 September 2024 with 27 surveyors and 8 supervisors, completing 2,381 surveys (87%

[4]Our power calculation required 78 SJY panchayats split equally between treatment and control. Because the identification process sometimes yielded zero ultra-poor households – particularly in less deprived districts – we conservatively aimed for at least 100 SJY panchayats

of target). A separate in-person endline health survey ran from 5 July to 8 October 2024 and covered 2,262 households (82% of target). The in-person RCT endline 2 household survey ran from 14 October to 18 December 2025, completing 2,255 surveys (82% of target).[5]

Asset transfer before baseline. In a subset of treated households, the baseline survey was conducted *after* the asset had already been distributed: 53% of treated households in Siwan, 25% in Purnia, and 0.84% in Saharsa. By the end of the baseline (May 2022), 239 of the 1,241 treatment-assigned households (19%) had already received the asset. We address this in the empirical specification by using a district-level early-asset dummy.[6] At randomization, treatment and control GPs are balanced on the stratification variables (poverty index, SC/ST share, distance to headquarters) (Table S1a). For household-level balance, we follow our pre-analysis plan and report balance across household-level variables and baseline values of our key outcomes for Saharsa – the district where the asset was not distributed at baseline (Table S1b).[7]

4 Empirical Strategy

4.1 Outcomes

Following our pre-analysis plan, outcomes are chosen and indices are constructed following Banerjee et al. (2015): for each variable, compute a z-score (subtract the baseline control mean and divide by the baseline control SD); average z-scores across the variables in the index; then re-standardize to the baseline control value of the index. Results are reported in units of baseline SDs of the index. The exceptions are the food security and mental health index, and some subcomponents of the income and revenues, living conditions, and the women empowerment index for which baseline data was not collected. These sub-components and indexes are instead standardized to the control mean and reported in control-group standard deviations. Table 6 describes our main outcome indices and their construction.

4.2 Estimating treatment effects

Since the SJY program was randomly rolled out, we run the following regression specifications to estimate the causal average treatment effect of the program. This is an intention to treat (ITT) design, where all households in the sample are followed, regardless of their actual treatment status.

$$Y_{ig(t=1)} = \alpha + \beta_1 Treatment_g + \beta_2 Asset_{d(t=0)} + \beta_3 Y_{ig(t=0)} + \beta_4 X_{ig(t=0)} + \lambda_g + \epsilon_{ig(t=1)} \quad (1)$$

where $Y_{ig(t=i)}$ is the outcome of interest for household i in District d, Gram Panchayat g, measured in period $(t = i)$. $t = 0$ for baseline and $t = 1$ for endline. $Treatment_g$ is a dummy variable that indicates whether it is a

[5] We find differential attrition between treatment and control samples at endline; Section 6 reports Lee bounds for the primary outcomes.

[6] We gleaned data on asset transfer by administering an RCT adherence module during baseline.

[7] For completeness, we also show balance with imputations (Table S1a) for the places where the treated districts where the asset was delivered before baseline. We see that, barring incomes, revenue and asset-related variables, most variables are balanced.

treated GP (GP that received SJY). Thus, β_1 is the intent-to-treat (ITT) estimate of SJY impact. $Asset_{d(t=0)}$, flags the districts where the rollout of the asset has started at the time of the baseline survey. λ_g are the strata fixed effects. $X_{ig(t=0)}$ is the vector of HH-level controls, selected using post double-selection LASSO (Belloni et al., 2014).

This specification was specified in the pre-analysis plan, but we had to implement one deviation, because in two districts, the roll out had begun before the baseline was conducted.

Baseline values for households in districts where rollout had begun (Siwan, Purnia) are replaced with the mean of still-untreated households in Saharsa, the one district where the baseline was completed before the roll-out started (and a dummy to indicate that the baseline data is missing).[8] All standard errors are clustered at the GP level. All monetary variables (consumption, financial indicators, incomes) are winsorized at the 99th percentile. Baseline data are unavailable for the health and food-security modules, so HH-level baseline values of those outcomes cannot be included as controls.

5 Results

We examine the standard set of outcomes for graduation-program evaluations, beginning with consumption and turning sequentially to its underlying drivers (earnings and assets) and to broader measures of household welfare (food security, finance, mental health, time use, women's empowerment, political participation, living conditions, schooling, and child health). Figures 1a and 1b present the headline impact estimates for endline 1 and endline 2; Table 3 reports standardized treatment effects on the primary indices, and Table 4 reports effects in monetary terms and natural units. Across nearly every outcome, treated households improve substantially relative to control at endline 1, and the gains persist — and in several cases grow — at endline 2. All monetary figures are reported in 2024 USD, PPP-adjusted.

5.1 Consumption

Per-capita monthly consumption is 0.38 SD higher in treated households at endline 1 ($p < 0.01$) and 0.44 SD higher ($p < 0.01$; Table 3) in endline 2. In levels, treated households spend \$22.84 more per capita per month at endline 1 and \$26.76 more at endline 2, roughly 30% and 27% above the control mean. The increase is broad-based: at endline 1, treated households spend \$7.65 more on food, \$15.84 more on non-food, and \$4.75 more on durables, and endline 2 estimates are qualitatively identical. The magnitudes are large for this literature. The medium-run consumption effects of the six-country pilots in Banerjee et al. (2015) are roughly a third of the size we document, and the closest direct comparator, the West Bengal Bandhan TUP, produced consumption gains of 0.31 SD at 18 months and 0.29 SD at three years (Banerjee et al., 2021), both somewhat smaller than the 0.38 SD and 0.44 SD effects we estimate at the corresponding horizons.

[8] The results are unaffected by the way we treat the baseline control. In particular the effects are the same with no control for baseline variables.

5.2 Food security and hunger

The consumption gains are reflected in measures of food adequacy (Table 4). The food security index, which aggregates whether any household member cut the size of, or skipped, a meal in the past 12 months and whether all members had two complete meals every day in the past month, is 0.55 SD higher in treated households at endline 1 ($p < 0.01$) and 0.46 SD higher at endline 2. The likelihood of adequate food for all members in the past year rises by 0.63 SD at endline 1 and 0.52 SD at endline 2; the likelihood that all members consumed two meals per day rises by 25 and 20 percentage points (all $p < 0.01$).

5.3 Earnings

Treated households also see rise in earnings (Table 4). Total monthly income is 2.12 SD higher in treated households at endline 1 and 1.33 SD higher at endline 2 (both $p < 0.01$), reflecting gains of approximately 220% ($535 against a control mean of $244) and 109% ($315 against a control mean of $289) over the control mean (Table 4, columns 1 and 3). The increase is concentrated in livestock, agriculture, and microenterprise, the three activities the asset transfer is designed to support: treated households earn $90, $38, and $374 more across these categories at endline 1, and $56, $33, and $174 more at endline 2. Effects attenuate between rounds but remain extremely large by any standard.

5.4 Asset ownership

Treated households also accumulate substantially more assets. The asset ownership index — constructed via principal component analysis over household durables (electric fans, mobile phones, cots) and productive assets (bicycles, pump sets, sewing machines) - rises by 1.15 SD at endline 1 and 0.81 SD at endline 2 (both $p < 0.01$). The control means are negative at both endlines, indicating, if anything, asset liquidation among untreated households relative to baseline. Decomposing the aggregate effect, the productive asset sub-index rises by 0.75 SD at endline 1 and 0.20 SD at endline 2; the household asset sub-index rises by 0.99 SD and 0.65 SD (all $p < 0.01$). We see that treated households accumulate both types of assets — directly relevant for the income generation we document above — and household assets that signal a broader improvement in living standards.

5.5 Financial behaviour

The financial inclusion index is 0.76 SD higher in treated households at endline 1 and 0.60 SD higher in endline 2 ($p < 0.01$ in both instances; Table 3), and the underlying components reveal a clear restructuring of household balance sheets. On the liability side, treated households borrow $1,037 less at endline 1 and $749 less at endline 2 (both $p < 0.01$), reductions of roughly 60% and 40% relative to the control mean, with the decline holding for both formal and informal sources. On the asset side, treated households are 14 percentage points more likely to hold an SHG account at endline 1; SHG savings balances are $24 higher at endline 1 and $52 higher at endline 2; and bank deposits are higher across both rounds. The combined picture is one of households moving from heavy indebtedness to net savers.

5.6 Mental health

The economic gains we have documented are accompanied by large psychological gains. The mental health index, which aggregates perceived status in life, stress, and periods of worry, is 1.35 SD higher in treated households ($p < 0.01$) at endline 1 (Table 4).[9] All three components contribute: treated households are 0.69 SD less likely to report a period of worry in the past year and report a 1.46 SD improvement in perceived status in life (both $p < 0.01$).

5.7 Time Use

Time use shifts in parallel. Total time in productive activities rises by 151.7 minutes per day in treated households ($p < 0.01$), against a control mean of 160.9 minutes, nearly doubling productive time in endline 1 (Table 4).[10] The increase is driven by 124.6 additional minutes on own business and 41.3 additional minutes on livestock tending; time on paid labour falls by 32.9 minutes (all $p < 0.01$). This is the labour-supply analogue of the earnings result above: treated households are not just earning more, they are doing so by reallocating effort from low-return wage labour toward higher-return self-employment, the same channel documented in earlier graduation studies.

5.8 Women's empowerment and political involvement

The benefits of SJY extend beyond economic and psychological outcomes to how women within the household engage with each other and with the village. The women's empowerment index, constructed from indicators of autonomy in market transactions and decision-making authority over education, health, and household expenditures, is 0.16 SD higher in treated households at endline 1 and 0.17 SD higher at endline 2 (both $p < 0.01$). The persistence across rounds suggests the program shifts intra-household dynamics in a way that survives beyond the program period. The political involvement index — aggregating whether the respondent voted in the last election, attended a village meeting in the past year, and has spoken with other villagers about local concerns — is 0.26 SD higher in treated households at endline 1 ($p < 0.01$), against a control mean of -0.61.[11]

5.9 Living conditions, water, schooling, and child health

A final set of outcomes captures slower-moving dimensions of household welfare. The living conditions index — capturing pucca construction, roof type, flooring, absence of rain leakages, security of dwelling, and cooking facilities — increases by 0.35 SDs at endline 1, and 0.33 SD at endline 2 ($p < 0.01$). The control mean is 0.61 at endline 1 and increases to 0.66 at endline 2, indicating that both groups upgrade their dwellings over time but treated households do so faster.

The water security index, which captures (i) the number of households sharing a water source (ii) distance to source (iii) water treatment practices, and (iv) sanitation privacy, is 0.35 SD higher in treated households

[9] We did not collect data related to mental health in endline 2.

[10] Owing to time constraints, we did not collect data on time use in endline 2.

[11] We did not collect political involvement in endline 2.

at endline 1 and 0.23 SD higher at endline 2 (both $p < 0.01$). Negative control means at both rounds indicate substantial water insecurity in the absence of the program.

The number of children enrolled in school increases by 0.30 at endline 1 and 0.27 at endline 2 (both $p < 0.01$), indicating that treated households' continue to enrol their children to school, and higher investments in early human capital. On child health, neither vaccination at birth ($p = 0.12$) nor total immunization coverage ($p = 0.65$) shows a significant treatment effect at endline 1. While vaccination rates increase by 5.8 p.p, it is not significant – we may be underpowered owing to the fact that only 19% of households had a young child. Moreover, both the control-group vaccination rate (78%) and immunization coverage are relatively high.

6 Discussion

Robustness: Our results are robust to a range of alternative specifications. Because the asset transfer began before baseline in two of the three study districts (Siwan and Purnia), our preferred specifications impute baseline outcome values for households in those districts using the mean among still-untreated households in Saharsa, the unphased district. The results, as Table S4 shows, are insensitive to this choice. They survive estimation without any baseline outcome controls (columns 1 and 5); they survive dropping the LASSO-selected covariates entirely (columns 2 and 6); and they hold, with similar magnitudes, when we restrict the sample to Saharsa alone, where asset transfers occurred after the baseline survey concluded (columns 4 and 8). Finally, we report Benjamini–Hochberg q-values for all primary outcomes; the headline effects are robust multiple-hypothesis adjustment. Indeed, for most outcomes, across all robustness checks and both endlines, the p-values with the adjustment are always under 0.01.

Attrition: Attrition is a second potential threat to inference. We surveyed 90% of targeted beneficiaries at baseline, and reached 87% and 82% of the baseline sample at endline 1 and endline 2 respectively. We are marginally more likely to reach treated than control households at endline 2 (Table S1d), raising a concern about differential attrition. We address this by calculating Lee bounds (Lee, 2009). Table S3 presents the results: even the lower bounds on our main indices are significantly different from 0.

Quantile Treatment Effects: The treatment effects we document are not concentrated at the top of the post-treatment distribution. Quantile treatment effects on every primary outcome are positive and statistically significant at every quantile examined — including the 10th percentile (Table 5). Effects do, however, rise with quantile: the 90th-percentile gain in consumption (0.69 SD at endline 1) is roughly three times the 10th-percentile gain (0.24 SD), and the corresponding ratio for monthly income exceeds eighteen. We interpret this gradient as evidence that all treated households benefit from the program, but those with marginally higher baseline endowments leverage the asset transfer further. A Kolmogorov–Smirnov test rejects equality of the treatment and control distributions at $p < 0.001$ for every primary outcome at both endlines. This pattern of quantile treatment effects we document mirrors previous findings in the literature (Banerjee et al., 2015; Bandiera et al., 2017).

Cost-Benefit Analysis: To place the magnitude of these gains in a comparable welfare framework, we compute the Marginal Value of Public Funds (MVPF) for SJY following Hendren and Sprung-Keyser (2020). Valuing beneficiary welfare using consumption gains and including program fixed costs, the MVPF over a

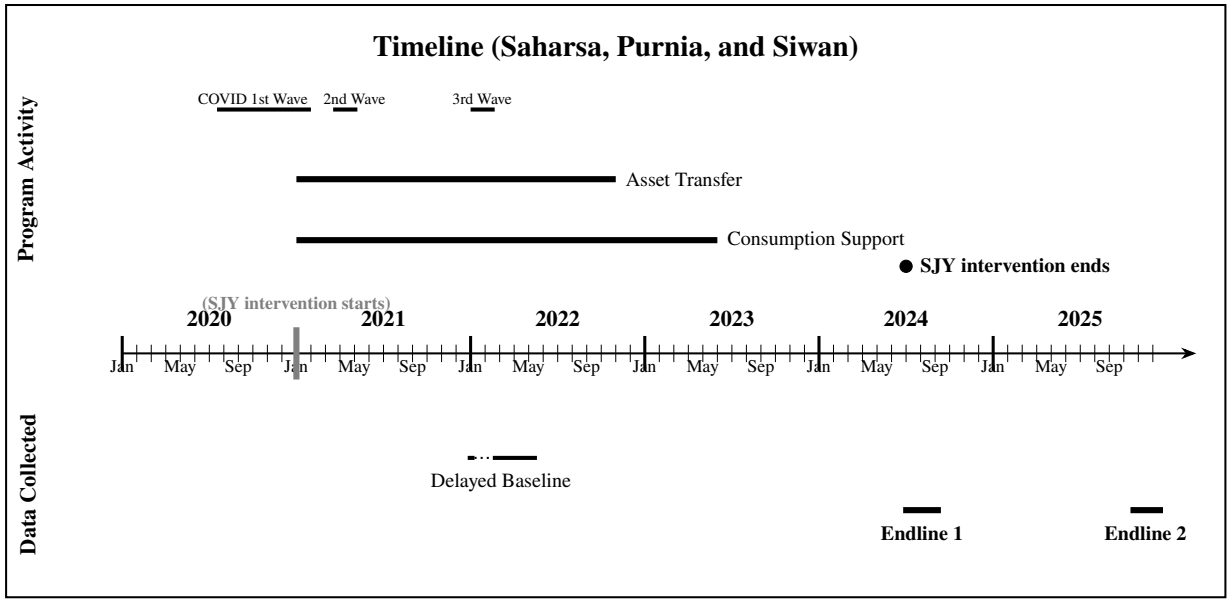
single program-month is 0.59, rising to 0.64 once one-time setup costs are stripped out. These below-unity values reflect that the per-beneficiary monthly consumption gain (roughly Rs. 436) is smaller than SJY's net per-beneficiary monthly cost (roughly Rs. 742), even after accounting for the fiscal externality from higher VAT receipts on beneficiary spending. However cumulating these flows over the program's three-year duration, the consumption-based MVPF crosses unity by the end of year three — meaning SJY breaks even on consumption gains alone over a horizon equal to the program itself, with every subsequent year of persistence delivering benefits against an already-paid cost. If we value welfare using income gains, which capture savings and productive investment alongside consumption, the picture is sharper still: the MVPF is 4.33 with fixed costs and 4.93 without, exceeding six within three years of post-program persistence and reaching the self-financing region — where cumulative fiscal externalities offset the full cost of the program — within seven to nine years.

7 Conclusion

We evaluate a randomized carve-out of the Government of Bihar's scale-up of the graduation program, the Satat Jeevikoparjan Yojana, delivered through Jeevika's SHG federation to 155,000 ultra-poor women-headed households across the state. Banerjee et al. (2017) draw a sharp distinction between proof-of-concept evaluations, run with exceptional partners under tight research supervision, and stage-two trials in which the program is delivered at scale, by the bureaucracy that will eventually implement it, in a setting representative of the eventual rollout. The published graduation literature consists almost entirely of the former; SJY meets the conditions for the latter, since it is delivered by Jeevika's regular field staff, using the same community-identification and targeting process applied to all statewide beneficiaries, in the state that will continue to run the program. The magnitudes we estimate are therefore at-scale effects rather than pilot effects, reflecting implementation under the resource and capacity constraints of an actual government rollout.

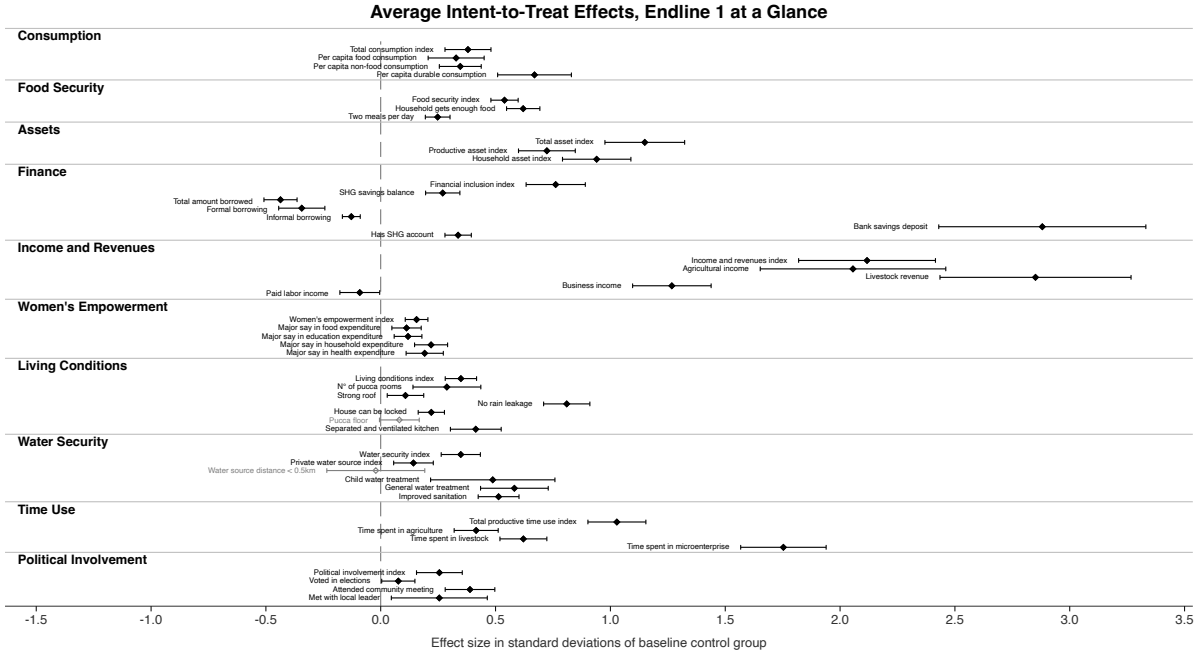
Across two endline rounds spaced fifteen months apart, treated households experience large and persistent gains in consumption, income, assets, food security, and savings, alongside improvements in mental health, women's empowerment, and political participation, and the MVPF calculation indicates that the program breaks even on consumption gains within its three-year horizon and delivers substantially larger returns under income-based valuations. Some part of the SJY's success owes to Jeevika's two-decade investment in community-based delivery infrastructure. Within those bounds, the canonical graduation model can be delivered at scale, and at sufficient quality, by a state government in one of India's weakest-capacity settings, and existing SHG networks may be a particularly cost-effective channel for doing so.

8 Figures

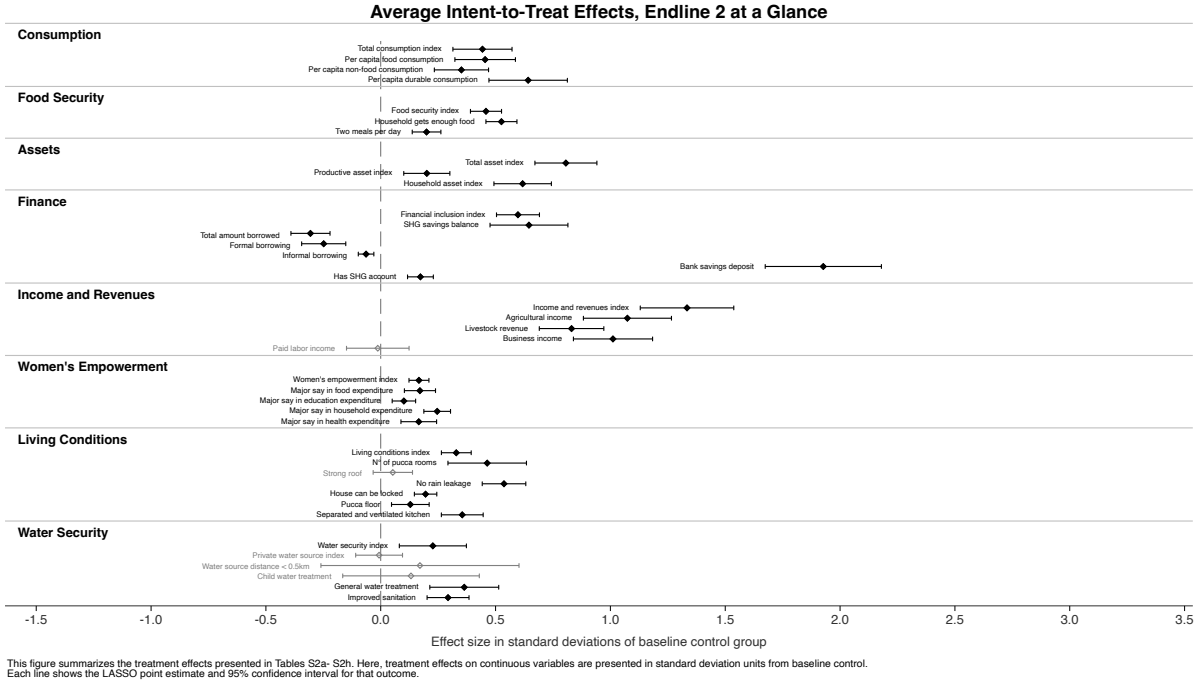


Note: Delayed baseline was paused during 3rd wave of COVID.

Figure 1: Average Intent-to-Treat Effects



(a) Endline 1 at a Glance



(b) Endline 2 at a Glance

Note: This figure summarizes intention-to-treat (ITT) effects presented in tables S2a to S2h. Effects are presented in standard deviation units from baseline control. Food security section, and punctually the z-scores of livestock, agriculture revenue, "Pucca floor", "Separated and ventilated kitchen", "Major say in health expenditure" are presented as standard deviations from same wave control, given limitations of baseline data. Each entry shows the PDS Lasso estimate and 95% confidence interval for that outcome.

9 Tables

Table 1: Implementation summary

Location	Saharsa, Purnia, and Siwan districts in Bihar, India.
Implementing organisation	Bihar Rural Livelihoods Promotion Society (JEEViKA), with Bandhan Konnagar (BK) providing technical assistance and J-PAL South Asia at IFMR serving as the knowledge and learning partner.
Type of agency	Government
Eligibility requirements	Participants are selected based on their income and whether they belong to any of the following categories: 1. Individuals engaged in insecure or unstable occupations. 2. Members of socially vulnerable caste groups, such as Scheduled Castes and Scheduled Tribes. 3. Women-headed households that fall among the poorest of the poor.
Method of identifying participants	Identification was carried out through transect walks, social mapping, and a household survey. Trained community resource persons conduct the transect walks. The list of ultra-poor households identified by the community resource persons is shared during the village organisation meeting, where it is reviewed and endorsed. Final verification of the household list is conducted by officials at the block level.
Savings component	Households were mandated to save INR 250 (PPP US$14.86) per quarter. Additionally, households who were members of SHGs were encouraged to save a minimum of INR 10 (PPP US$0.59) per week during SHG meetings.
Health component	Master Resource Persons (MRPs)—a cadre of individuals established to work as "last-mile agents" for programme delivery, with each MRP supporting up to 40 households—educate participants on best practices related to sanitation and nutrition as a part of coaching provided on social issues and life skills.
Asset transfer	Asset transfer has occured during Jan 2021 - Nov 2022. Asset transfer takes place by way of the disbursement of the Livelihoods Investment Fund, which is a component under SJY and is a tranche-based support spread over 2–3 tranches.
Value of asset transfer	Asset transfer takes place by way of the disbursement of the Livelihoods Investment Fund, which is a component under SJY and is a tranche-based support spread over 2–3 tranches. Investment per household can be up to INR 100,000(PPP US$5945.87), which is provided in a phased manner. The a average value of asset is INR 54,284.44(PPP US$3227.84) per household.
Most common asset chosen	Micro-enterprise(55.03%)

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Second most common asset chosen	Livestock(44.45%)
Third most common asset chosen	Agriculture(0.52%)
Consumption support	A subsistence allowance of INR 1,000 (59.46 US$ PPP) is provided to each targeted household by the endorsing village organisation on a monthly basis for a period of seven months. This is called the Livelihood Gap Assistance Fund.
Consumption support, measured in calories of cereals that could be purchased for the household(daily) if transfer were in cash	3626.63
Baseline daily per capita consumption, measured in number of buyable calories of cereals	4546.44
Consumption support provided to control households	No
Support provided from village organizations	Yes

Table 2: Research design summary

Location	Saharsa, Purnia, and Siwan districts in Bihar, India
Sample size	2,743
Unit of randomization	Gram Panchayat
Number of units randomized	129 Gram Panchayats (63 treatment, 66 control) across 9 blocks and 3 districts.
Method of randomization	Randomization conducted remotely by research team
Stratification variables	GP poverty index (SECC 2011), SC/ST population share (Census 2011), and distance to district headquarters (Census 2011)
Stratification variables to verify orthogonality, used in rerandomization procedure	Same as stratification variables.
Months between midpoint of baseline and midpoint of asset transfers	2.5 months

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Months between midpoint of asset transfer and midpoint of endline 1	31.6 months
Months between midpoint of endline 1 and midpoint of endline 2	15.5 months
Household survey modules	Household demographics; household characteristics; assets; incomes; expenditures; consumption; enterprise module; financial information; food security; women's empowerment; participation and leadership in community groups; demise in the family; RCT adherence check
Health survey modules	Basic respondent information; short-term health indicators; long-term health indicators; women's health and awareness; mental health; family relations; anthropometric measurements.
Baseline data collection	Completed May 2022; $N = 2{,}477$
Endline 1 (household) data collection	Completed September 2024; $N = 2{,}381$
Endline 1 (health) data collection	Completed October 2024; $N = 2{,}262$
Endline 2 (household) data collection	Completed December 2025; $N = 2{,}255$

Table 3: Indexed Family Outcome Variables and Aggregates

	Endline 1			*Endline 2*		
	(1)	(2)	(3)	(4)	(5)	(6)
	Standardized Mean Treatment Effect	q-value for all 10 hypotheses	Control mean	Standardized Mean Treatment Effect	q-value for all 10 hypotheses	Control mean
Indexed Outcomes						
Total per capita consumption, standardized	0.380***	0.001	0.196	0.443***	0.001	0.602
	(0.061)			(0.078)		
Total family income, standardized	2.117***	0.001	0.066	1.334***	0.001	0.266
	(0.181)			(0.124)		
Asset index	1.150***	0.001	-0.519	0.806***	0.001	-0.324
	(0.105)			(0.082)		
Food security index (2 components)	0.539***	0.001	-0.000	0.458***	0.001	-0.000
	(0.036)			(0.041)		
Financial inclusion index (4 components)	0.762***	0.001	-0.004	0.598***	0.001	0.141
	(0.078)			(0.057)		
Womens empowerment index (4 components)	0.156***	0.001	0.036	0.166***	0.001	0.083
	(0.030)			(0.026)		
Living conditions index (6 components)	0.349***	0.001	0.608	0.329***	0.001	0.660
	(-0.042)			(-0.039)		
Water security index (5 components)	0.349***	0.001	-0.109	0.227**	0.011	-0.264
	(0.052)			(0.089)		
Total time spent working, standardized	1.028***	0.001	0.332			
	(0.077)					
Political involvement index (4 components)	0.255***	0.001	-0.605			
	(0.060)					

Notes: Standardized intent-to-treat estimates are presented in SD units. All indices are standardized with respect to the baseline control group, except for Food security index which is standardized with respect to the control group in that same time period. Standard errors clustered at the unit of randomization in parentheses. q-values control the false discovery rate across all 10 hypotheses following the Benjamini-Hochberg procedure. Control mean is the mean of the outcome variable among the control group. *** p<0.01, ** p<0.05, * p<0.10.

Table 4: Executive Summary of Outcomes and Treatment Effects

	Endline 1		*Endline 2*	
Outcomes	ITT	Control mean	ITT	Control mean
Per capita total consumption	22.836***	78.010	26.760***	99.956
Per capita food consumption	7.654***	40.924	10.182***	49.966
Per capita non-food consumption	15.842***	36.317	15.813***	48.934
Per capita durable consumption	4.756***	3.456	4.181***	3.421
Total asset index	1.150***	-0.519	0.806***	-0.324
Productive asset index	0.749***	-0.277	0.199***	0.018
Household asset index	0.986***	-0.426	0.654***	-0.239
Food security index	0.549***	-0.000	0.459***	-0.000
Household gets enough food	0.630***	0.000	0.527***	-0.000
Two meals per day	0.253***	0.000	0.204***	-0.000
Total amount borrowed	-1037.030***	1718.578	-749.700***	1892.880
Informal borrowing	-212.851***	332.794	-93.514***	287.414
Formal borrowing	-310.058***	564.781	-230.900***	704.186
SHG savings balance	23.868***	81.460	52.067***	96.196
Bank savings deposit	184.983***	17.108	123.891***	21.247
Has SHG account	0.139***	0.757	0.070***	0.861
Total productive time	151.667***	160.859	-	-
Time spent in agriculture	20.298***	17.971	-	-
Time spent in livestock	41.330***	55.247	-	-
Time spent in microenterprise	124.602***	12.549	-	-
Time spent in paid labour	-32.867***	75.092	-	-
Livestock revenue	97.971***	9.427	57.461***	13.285
Agricultural income	35.875***	2.839	26.404***	3.898
Business revenue	340.986***	41.963	270.130***	27.525
Business income	-7.871	5.414	-41.594***	-8.424
Paid labor income	-20.979**	157.329	-4.645	178.946
Total monthly income	535.614***	243.787	315.668***	288.755
Livestock revenue (Section A)	90.650***	8.670	56.403***	12.517
Agricultural income (Section A)	38.594***	5.172	33.975***	10.187
Business income (Section A)	373.881***	26.297	174.264***	19.050
Mental Health Index	1.347***	-0.000	-	-
No period of worry in last year	0.692***	-0.000	-	-
Perception of status in Life	1.464***	0.000	-	-
Vaccinated at birth	0.058	0.777	-	-
Total Vaccine Index	-0.052	0.017	-	-
Living conditions index	0.349***	0.608	0.329***	0.660
Water security index	0.333***	-0.109	0.251***	-0.264
Children in school	0.300***	1.232	0.273***	1.364
Women's empowerment index	0.156***	0.036	0.166***	0.083
Political involvement index	0.264***	-0.605	-	-
Observations	2381		2255	

Notes: ITT results are estimated using PDS Lasso, forcing baseline outcome control and controls ensuring balance in the delayed baseline. They absorb the fixed effects of GP stratification variables, and standard deviations clustered at the GP level. Monetary variables are in 2024 PPP USD.

Table 5: Quantile Treatment Effects, Indexed Family Outcomes

	Endline 1					*Endline 2*				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Indexed Outcomes	10th percentile	25th percentile	50th percentile	75th percentile	90th percentile	10th percentile	25th percentile	50th percentile	75th percentile	90th percentile
Total per capita consumption, standardized	0.240***	0.259***	0.342***	0.442***	0.685***	0.244***	0.247***	0.363***	0.565***	0.905***
	(0.031)	(0.045)	(0.063)	(0.083)	(0.142)	(0.036)	(0.043)	(0.068)	(0.102)	(0.207)
Total family income, standardized	0.300***	0.805***	1.587***	2.595***	5.447***	0.215***	0.493***	1.100***	1.799***	2.951***
	(0.040)	(0.086)	(0.166)	(0.283)	(0.716)	(0.035)	(0.060)	(0.110)	(0.231)	(0.369)
Asset index	0.957***	0.887***	1.209***	1.280***	1.521***	0.398**	0.734***	0.821***	1.051***	1.105***
	(0.133)	(0.134)	(0.148)	(0.164)	(0.190)	(0.177)	(0.146)	(0.113)	(0.121)	(0.124)
Financial inclusion index (4 components)	0.540***	0.369***	0.299***	0.674***	1.426***	0.298***	0.216***	0.406***	0.734***	1.358***
	(0.048)	(0.065)	(0.039)	(0.108)	(0.143)	(0.080)	(0.032)	(0.043)	(0.098)	(0.190)
Total time spent working, standardized	0.217***	0.870***	1.196***	1.397***	1.305***					
	(0.081)	(0.075)	(0.105)	(0.119)	(0.207)					

Notes: 1. Regressions include baseline outcome control and controls ensuring balance in the delayed baseline. They do not include GP stratification variables. Standard deviations clustered at the GP level.
2. We perform a Kolmogorov-Smirnov test for equality of distributions between treatment and control households for each indexed outcome in both endlines. The p-value for each of these 20 tests is 0.000.

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Appendix

SOM Text 1: Description of outcomes

Outcome	**Component variables**
Panel A: Indices	
Food security	Meals per day; ever cut size of meal or skipped meal in last 12 months; all members had two complete meals every day last month.
Asset ownership (PCA)	Full asset stock, with sub-indices for livestock; household durables (electric fans, mobile phones, cots); productive assets (bicycles, pump sets, sewing machines).
Income and revenue	Earnings from livestock, agriculture, paid labour, and microenterprise.
Financial inclusion	Two sub-indices: credit access (total borrowing; formal vs. informal sources) and savings behaviour (SHG account ownership; SHG savings balance; bank deposits).
Mental health	Perceived status in life; periods of worry in last year; stress.
Time use in productive activities	Minutes per day on own business; livestock tending; agriculture; paid labour.
Political involvement	Voted in last election; attended a village meeting in past year; engaged with other villagers on community concerns.
Women's empowerment	Autonomy in market transactions; decision-making authority over education, health, and household expenditures.
Living conditions	Pucca construction; roof type; flooring; rain leakages; security of dwelling; cooking facilities.
Water security	Number of households sharing a water source; distance to source; water treatment practices for infants and adults; latrine type; latrine sharing.
Panel B: Standalone outcomes (not indexed)	
Per-capita monthly consumption	Total monthly consumption; food; non-food; durables.
School enrolment	Number of children not enrolled in school.
Child health	Vaccination at birth; total immunization coverage.

Table S1a: Balance, All districts with imputations

	Treatment	Control	N	$X_i = \alpha + \beta T_i + \epsilon_i$	p-value
Panel A: Stratification variables					
GP poverty index	0.199	0.242	129	-0.006	0.913
SC population share	0.120	0.123	129	-0.004	0.485
Distance to district headquarters	23.855	21.007	129	0.336	0.654
Nearest statutory town distance	21.114	18.720	129	-0.422	0.718
Total households (sum)	2190.540	2224.136	129	-64.170	0.646
Number of villages in GP	4.270	4.242	129	-0.081	0.855
Total geographical area, hectares (sum)	967.638	928.639	129	26.662	0.698
Female share of population (sum female / sum total)	0.486	0.487	129	-0.001	0.537
Share of villages with govt primary school	0.906	0.938	129	-0.026	0.426
Share of villages with govt secondary school	0.149	0.129	129	0.018	0.690
Share of villages with primary health sub-centre	0.346	0.319	129	0.039	0.499
Share of villages with black-topped (pucca) road	0.807	0.826	129	0.001	0.984
Share of villages with power supply for domestic use	0.761	0.777	129	0.007	0.903
Share of villages with tube well / borehole	0.579	0.479	129	0.102	0.146
Share of villages with post office	0.367	0.367	129	-0.008	0.886
Share of villages with mobile phone coverage	0.552	0.598	129	-0.060	0.396
Share of villages with self-help group (SHG)	0.493	0.468	129	0.037	0.610
Share of villages with commercial bank	0.198	0.155	129	0.041	0.473
Panel B: Household level variables					
Last month bank deposit	21.414	22.759	2477	-0.848	0.456
SHG savings balance	61.305	59.973	2477	-0.286	0.919
Total amount borrowed in the last year by all members	1683.262	1814.196	2477	-99.773	0.186
Nº of children in school	1.086	1.045	2190	0.054	0.148
Microenterprise revenue	47.855	52.294	2477	0.740	0.903
Livestock revenue	2.180	1.905	2477	0.257	0.429
Agricultural revenue	-0.995	-1.181	2477	0.253	0.139
Total paid labour income	126.501	144.724	2477	-15.762	0.037
Total family income	195.768	217.042	2477	-16.422	0.048
Productive asset index	-0.188	-0.138	2292	-0.047	0.084
Household asset index	-0.112	-0.085	2477	-0.007	0.860
Minutes spent in agriculture	8.735	11.395	2477	-1.975	0.135
Minutes spent in livestock	59.446	55.589	2477	3.412	0.322
Minutes spent in microenterprise	24.226	18.249	2477	7.163	0.013

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	Treatment	Control	N	$X_i = \alpha + \beta T_i + \epsilon_i$	p-value
Minutes spent in paid labour	33.367	33.672	2477	2.745	0.456
Per capita food consumption	30.622	30.583	2477	-0.218	0.812
Per capita total consumption	64.954	66.561	2477	-1.529	0.494
Per capita non food consumption	34.034	35.685	2477	-1.269	0.378
Per capita durable goods consumption	2.275	2.355	2477	-0.033	0.883
Panel C: Indexed outcomes					
Total per capita consumption, standardized	-0.046	-0.017	2477	-0.028	0.494
Incomes and revenues index	-0.147	-0.052	2477	-0.073	0.048
Asset index	-0.176	-0.125	2292	-0.034	0.310
Financial inclusion index (4 components)	0.052	0.019	2477	0.022	0.490
Women's empowerment index (4 components)	0.101	0.057	2477	0.026	0.543
Living conditions index (6 components)	-0.201	-0.238	2477	0.055	0.136
Water Security index (5 components)	0.023	0.005	2477	-0.009	0.815
Total time spent working, standardized	0.077	0.028	2477	0.082	0.107
Political Involvement index (3 components)	-0.038	-0.043	2477	0.001	0.979

Notes: Columns 1 and 2 report the mean of each baseline characteristic among treatment and control units, Column 3 the number of observations, and Column 4 the coefficient on treatment from a regression of the characteristic on a treatment indicator and strata fixed effects. Column 5 reports the p-value of that coefficient, with standard errors clustered at the GP level for household-level variables (Panels B and C) and heteroskedasticity-robust standard errors for GP-level variables (Panel A). We include all households from all districts. For households in districts where the asset rollout had started before the baseline (Siwan and Purnia), and for the 5 households in Saharsa that received the asset before their baseline interview, baseline values are replaced with the mean among the remaining households

Table S1b: Balance, Saharsa district only

	Treatment	Control	N	$X_i = \alpha + \beta T_i + \epsilon_i$	p-value
Panel A: Stratification variables					
GP poverty index	-0.223	-0.433	38	0.182	0.093
SC population share	0.151	0.154	38	-0.008	0.637
SC/ST population share	0.153	0.159	38	-0.008	0.625
Distance to district headquarters	18.023	20.624	38	-1.069	0.257
Nearest statutory town distance	18.037	20.624	38	-1.043	0.267
Total households (sum)	2523.444	2459.950	38	151.424	0.605
Number of villages in GP	3.111	2.900	38	0.309	0.613
Total geographical area, hectares (sum)	1230.111	1116.426	38	241.613	0.195
Female share of population (sum female / sum total)	0.477	0.475	38	0.002	0.367
Share of villages with govt primary school	0.949	0.962	38	-0.037	0.476
Share of villages with govt secondary school	0.218	0.193	38	0.048	0.767
Share of villages with primary health sub-centre	0.218	0.364	38	-0.229	0.228
Share of villages with black-topped (pucca) road	0.883	0.897	38	0.015	0.892
Share of villages with power supply for domestic use	0.827	0.805	38	0.072	0.588
Share of villages with tube well / borehole	0.739	0.626	38	0.072	0.374
Share of villages with post office	0.390	0.490	38	-0.058	0.693
Share of villages with mobile phone coverage	0.708	0.728	38	0.038	0.827
Share of villages with self-help group (SHG)	0.361	0.170	38	0.065	0.733
Share of villages with commercial bank	0.310	0.225	38	0.115	0.579
Panel B: Household level variables					
Last month bank deposit	20.754	23.506	1212	-1.416	0.611
SHG savings balance	61.960	59.233	1212	-0.993	0.902
Total amount borrowed in the last year by all members	1618.976	1886.897	1212	-159.520	0.388
Nº of children in school	1.111	1.014	925	0.143	0.211
Microenterprise revenue	45.676	54.758	1212	-1.049	0.956
Livestock revenue	2.315	1.753	1212	0.876	0.292
Agricultural revenue	-0.904	-1.284	1212	0.526	0.309
Total paid labour income	117.555	154.842	1212	-45.747	0.032
Total family income	185.323	228.854	1212	-45.425	0.049
Productive asset index	-0.216	-0.104	1027	-0.129	0.082
Household asset index	-0.126	-0.070	1212	0.028	0.804
Minutes spent in agriculture	7.429	12.872	1212	-5.494	0.108
Minutes spent in livestock	61.341	53.446	1212	12.061	0.154

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	Treatment	Control	N	$X_i = \alpha + \beta T_i + \epsilon_i$	p-value
Minutes spent in microenterprise	27.161	14.931	1212	23.019	0.002
Minutes spent in paid labour	33.218	33.841	1212	2.249	0.769
Per capita food consumption	30.641	30.562	1212	-0.758	0.776
Per capita total consumption	64.164	67.454	1212	-4.604	0.477
Per capita non food consumption	33.223	36.602	1212	-3.730	0.377
Per capita durable goods consumption	2.235	2.399	1212	0.042	0.939
Panel C: Indexed outcomes					
Total per capita consumption, standardized	-0.061	-0.000	1212	-0.085	0.477
Incomes and revenues index	-0.193	0.000	1212	-0.201	0.049
Asset index	-0.204	-0.091	1027	-0.076	0.464
Financial inclusion index (4 components)	0.069	-0.000	1212	0.045	0.606
Women's empowerment index (4 components)	0.122	0.033	1212	0.063	0.560
Living conditions index (6 components)	-0.184	-0.258	1212	0.115	0.273
Water Security index (5 components)	0.032	-0.005	1212	-0.013	0.907
Total time spent working, standardized	0.102	0.000	1212	0.231	0.056
Political Involvement index (3 components)	-0.035	-0.047	1212	-0.007	0.888

Notes: Columns 1 and 2 report the mean of each baseline characteristic among treatment and control units, Column 3 the number of observations, and Column 4 the coefficient on treatment from a regression of the characteristic on a treatment indicator and strata fixed effects. Column 5 reports the p-value of that coefficient, with standard errors clustered at the Gram Panchayat level for household-level variables (Panels B and C) and heteroskedasticity-robust standard errors for GP-level variables (Panel A). We restrict the sample to Saharsa, the only district where the asset had not been distributed before the baseline survey, and exclude the 5 Saharsa households that received the asset before their baseline interview.

Table S1c: Balance, All districts without imputations

	Treatment	Control	N	$X_i = \alpha + \beta T_i + \epsilon_i$	p-value
Panel A: Stratification variables					
GP poverty index	0.199	0.242	129	-0.006	0.913
SC population share	0.120	0.123	129	-0.004	0.485
SC/ST population share	0.141	0.140	129	-0.000	0.980
Distance to district headquarters	23.855	21.007	129	0.336	0.654
Nearest statutory town distance	21.114	18.720	129	-0.422	0.718
Total households (sum)	2190.540	2224.136	129	-64.170	0.646
Number of villages in GP	4.270	4.242	129	-0.081	0.855
Total geographical area, hectares (sum)	967.638	928.639	129	26.662	0.698
Female share of population (sum female / sum total)	0.486	0.487	129	-0.001	0.537
Share of villages with govt primary school	0.906	0.938	129	-0.026	0.426
Share of villages with govt secondary school	0.149	0.129	129	0.018	0.690
Share of villages with primary health sub-centre	0.346	0.319	129	0.039	0.499
Share of villages with black-topped (pucca) road	0.807	0.826	129	0.001	0.984
Share of villages with power supply for domestic use	0.761	0.777	129	0.007	0.903
Share of villages with tube well / borehole	0.579	0.479	129	0.102	0.146
Share of villages with post office	0.367	0.367	129	-0.008	0.886
Share of villages with mobile phone coverage	0.552	0.598	129	-0.060	0.396
Share of villages with self-help group (SHG)	0.493	0.468	129	0.037	0.610
Share of villages with commercial bank	0.198	0.155	129	0.041	0.473
Panel B: Household level variables					
Last month bank deposit	26.116	27.149	2477	-0.611	0.873
SHG savings balance	49.858	44.149	2477	2.958	0.518
Total amount borrowed in the last year by all members	1222.337	1533.417	2477	-365.168	0.003
Nº of children in school	1.289	1.258	1842	0.067	0.340
Microenterprise revenue	55.430	34.937	2477	23.860	0.016
Livestock revenue	1.990	1.430	2477	0.519	0.221
Agricultural revenue	-0.607	-0.956	2477	0.353	0.095
Total paid labour income	118.530	144.698	2477	-23.741	0.020
Total family income	183.171	209.355	2477	-21.334	0.070
Productive asset index	-0.172	0.001	2146	-0.182	0.000
Household asset index	-0.070	0.000	2477	-0.046	0.451
Minutes spent in agriculture	8.346	13.414	2477	-4.871	0.017
Minutes spent in livestock	55.793	48.682	2477	3.864	0.431

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	Treatment	Control	N	$X_i = \alpha + \beta T_i + \epsilon_i$	p-value
Minutes spent in microenterprise	55.490	11.137	2477	47.510	0.000
Minutes spent in paid labour	46.979	47.769	2477	-1.183	0.852
Per capita food consumption	34.049	34.061	2477	1.280	0.519
Per capita total consumption	68.958	69.513	2477	1.583	0.669
Per capita non food consumption	34.376	35.124	2477	0.039	0.985
Per capita durable goods consumption	3.498	2.901	2477	0.904	0.062
Panel C: Indexed outcomes					
Total per capita consumption, standardized	0.028	0.038	2477	0.029	0.669
Incomes and revenues index	-0.203	-0.086	2477	-0.095	0.070
Asset index	-0.144	0.001	2146	-0.130	0.020
Financial inclusion index (4 components)	-0.102	-0.180	2477	0.039	0.556
Women's empowerment index (4 components)	0.139	-0.000	2477	0.150	0.010
Living conditions index (6 components)	0.040	-0.001	2477	0.070	0.254
Water Security index (5 components)	0.022	0.001	2477	-0.035	0.613
Total time spent working, standardized	0.373	0.043	2477	0.328	0.000
Political Involvement index (3 components)	-0.014	-0.001	2477	-0.032	0.430

Notes: Columns 1 and 2 report the mean of each baseline characteristic among treatment and control units, Column 3 the number of observations, and Column 4 the coefficient on treatment from a regression of the characteristic on a treatment indicator and strata fixed effects. Column 5 reports the p-value of that coefficient, with standard errors clustered at the GP level for household-level variables (Panels B and C) and heteroskedasticity-robust standard errors for GP-level variables (Panel A). We include all households from all districts, with no imputation of baseline values.

Table S1d: Attrition.
Dependent Variable: Completed Survey, OLS

	Baseline	Endline 1	Endline 2
Panel A: Attrition on Treatment			
Treatment Status	-0.020	0.023	0.048
	(0.014)	(0.015)	(0.018)
P-value	0.169	0.126	0.006
N	2743	2743	2743
R-squared	0.001	0.001	0.004
Surveyed mean	0.903	0.868	0.822
Panel B: Attrition on Baseline Variables			
Treatment Status	0.000	0.027	0.051
	(0.000)	(0.013)	(0.016)
Total per capita consumption, standardized	0.000	-0.003	-0.007
	(0.000)	(0.005)	(0.006)
Incomes and revenues index	-0.000	-0.002	-0.018
	(0.000)	(0.006)	(0.008)
Asset index	-0.000	0.016	0.026
	(0.000)	(0.010)	(0.010)
Financial inclusion index (4 components)	-0.000	0.023	0.022
	(0.000)	(0.006)	(0.007)
Women's empowerment index (4 components)	-0.000	-0.008	-0.019
	(0.000)	(0.009)	(0.010)
Living conditions index (6 components)	0.000	-0.002	-0.007
	(0.000)	(0.009)	(0.010)
Water security index (5 components)	0.000	0.006	0.018
	(0.000)	(0.009)	(0.011)
Total time spent working, standardized	0.000	0.012	0.009
	(0.000)	(0.004)	(0.005)
Political Involvement index (3 components)	-0.000	0.016	0.017
	(0.000)	(0.009)	(0.011)
P-value	0.384	0.040	0.002
N	2743	2743	2743
R-squared	1.000	0.193	0.106
Surveyed mean	0.903	0.868	0.822
Panel C: Attrition on Baseline Variables and Interactions			
Treatment Status	-0.000	0.039	0.061
	(0.000)	(0.014)	(0.018)
P-value	0.046	0.004	0.001
Baseline characteristics	Yes	Yes	Yes
Baseline characteristics interacted with Treatment	Yes	Yes	Yes
N	2743	2743	2743
R-squared	1.000	0.195	0.110
Surveyed mean	0.903	0.868	0.822
p-value from test that Treatment and all other variables above interacted with Treatment are jointly 0	.	0.177	0.006

Table S2a: Per Capita Consumption

	(1) Total Consumption per capita, month	(2) Food consumption per capita, month	(3) Nonfood consumption per capita, month	(4) Durable good expenditure per capita, month
Panel A: Endline 1				
Treatment (ITT)	22.836	7.654	15.842	4.756
	(3.302)	(1.632)	(2.123)	(0.663)
3pt] Observations	2381	2381	2381	2381
Control mean	78.010	40.924	36.317	3.456
P-value	0.000	0.000	0.000	0.000
Panel B: Endline 2				
Treatment (ITT)	26.760	10.182	15.813	4.181
	(4.267)	(1.775)	(2.870)	(0.638)
Observations	2255	2255	2255	2255
Control mean	99.956	49.966	48.934	3.421
P-value	0.000	0.000	0.000	0.000

Notes: Results are intent-to-treat estimates including controls and stratification variables. Dummy variables included depending on survey wave. All values reported in 2024 USD PPP terms.

Table S2b: Asset Ownership and Food Security

	(1) Total Asset Index	(2) Durable Goods Index	(3) Household Assets Index	(4) Food Security Index	(5) No household members skipped meals	(6) Everyone in the household regularly eats two meals per day
Panel A: Endline 1						
Treatment (ITT)	1.198	0.749	0.986	0.549	0.630	0.253
	(0.103)	(0.075)	(0.088)	(0.036)	(0.044)	(0.032)
Observations	2381	2381	2381	2381	2381	2381
Control mean	-0.519	-0.277	-0.426	-0.000	0.000	0.000
P-value	0.000	0.000	0.000	0.000	0.000	0.000
Panel B: Endline 2						
Treatment (ITT)	0.840	0.199	0.654	0.459	0.527	0.204
	(0.081)	(0.055)	(0.074)	(0.040)	(0.041)	(0.037)
Observations	2255	2255	2255	2255	2255	2255
Control mean	-0.324	0.018	-0.239	-0.000	-0.000	-0.000
P-value	0.000	0.000	0.000	0.000	0.000	0.000

Notes: Results are intent-to-treat estimates including controls and stratification variables. Dummy variables included depending on survey wave.

Table S2c: Financial Inclusion

	(1)	(2)	(3)	(4)	(5)	(6)
	Total amount borrowed, last 12 months	Amount borrowed from informal sources	Amount borrowed from formal sources	SHG total savings	Total deposited in savings, last month	Has SHG account
Panel A: Endline 1						
Treatment (ITT)	-1037.030	-212.851	-310.058	23.868	184.983	0.139
	(105.880)	(35.734)	(55.643)	(3.579)	(16.878)	(0.014)
Observations	2381	2381	2381	2381	2381	2381
Control mean	1718.578	332.794	564.781	81.460	17.108	0.757
P-value	0.000	0.000	0.000	0.000	0.000	0.000
Panel B: Endline 2						
Treatment (ITT)	-749.700	-93.514	-230.900	52.067	123.891	0.070
	(122.025)	(30.824)	(54.663)	(8.288)	(9.706)	(0.013)
Observations	2255	2255	2255	2255	2255	2255
Control mean	1892.880	287.414	704.186	96.196	21.247	0.861
P-value	0.000	0.001	0.000	0.000	0.000	0.000

Notes: Results are intent-to-treat estimates including controls and stratification variables. Dummy variables included depending on survey wave. All values reported in 2024 USD PPP terms.

Table S2d: Use of Time

	(1)	(2)	(3)	(4)	(5)
	Total minutes spent on productive activities in last day	Minutes spent on agriculture in last day	Minutes spent tending livestock in last day	Minutes spent on own business in last day	Minutes spent on paid labor in last day
Panel A: Endline 1					
Treatment (ITT)	151.667	20.298	41.330	124.602	-32.867
	(10.733)	(3.324)	(4.471)	(7.675)	(6.695)
Observations	2381	2381	2381	2381	2381
P-value	0.000	0.000	0.000	0.000	0.000
Control mean	160.859	17.971	55.247	12.549	75.092

Table S2e: Income and Revenue

	(1) Household livestock revenue, month	(2) Household agricultural revenue, month	(3) Household non-farm microenterprise revenue, month	(4) Household non-farm microenterprise income, month	(5) Household income from paid labor, month	(6) Total family income, month
Panel A: Endline 1						
Treatment (ITT)	97.971	35.875	340.986	-7.871	-20.979	535.614
	(8.712)	(4.113)	(27.464)	(10.524)	(10.383)	(44.687)
Observations	2381	2381	2381	2381	2381	2381
Control mean	9.427	2.839	41.963	5.414	157.329	243.787
P-value	0.000	0.000	0.000	0.455	0.043	0.000
Panel B: Endline 2						
Treatment (ITT)	57.461	26.404	270.130	-41.594	-4.645	315.668
	(5.973)	(2.773)	(26.472)	(15.406)	(15.975)	(25.448)
Observations	2255	2255	2255	2255	2255	2255
Control mean	13.285	3.898	27.525	-8.424	178.946	288.755
P-value	0.000	0.000	0.000	0.007	0.771	0.000

Notes: Results are intent-to-treat estimates including controls and stratification variables. Dummy variables included depending on survey wave. All values reported in 2024 USD PPP terms.

Table S2g: Health

	(1) Mental Health Index	(2) Member has not experienced a period of worry in last year	(3) Perception of Status in Life	(4) Vaccination at Birth	(5) Immunization Coverage Index
Panel A: Endline 1					
Treated HH	1.347	0.692	1.464	0.058	-0.052
	(0.071)	(0.065)	(0.064)	(0.040)	(0.092)
Observations	2262	2262	2262	429	429
Control mean	-0.000	-0.000	0.000	0.777	0.017
P-value	0.000	0.000	0.000	0.119	0.653

Table S2h: Living conditions and Social Indicators

	(1) Living Condition Index	(2) Water Security Index	(3) Children not in school	(4) Women Empowerment Index	(5) Political Involvement Index
Panel A: Endline 1					
Treatment (ITT)	0.360	0.333	0.300	0.163	0.264
	(0.042)	(0.053)	(0.060)	(0.030)	(0.057)
Observations	2381	2381	1644	2381	2381
Control mean	0.608	-0.109	1.232	0.036	0.012
P-value	0.000	0.000	0.000	0.000	0.000
Panel B: Endline 2					
Treatment (ITT)	0.322	0.250	0.273	0.157	
	(0.039)	(0.092)	(0.074)	(0.026)	
Observations	2255	2255	1277	2255	
Control mean	0.660	-0.264	1.364	0.083	
P-value	0.000	0.007	0.000	0.000	

Notes: Results are intent-to-treat estimates including controls and stratification variables. Dummy variables included depending on survey wave.

Table S3: Bounded Attrition

	Endline 1		Endline 2	
	(1)	(2)	(3)	(4)
	Lower Bound, Standardized Mean Treatment Effect	Upper Bound, Standardized Mean Treatment Effect	Lower Bound, Standardized Mean Treatment Effect	Upper Bound, Standardized Mean Treatment Effect
Indexed Outcomes				
Total per capita consumption	0.264***	0.421***	0.125*	0.587***
	(0.059)	(0.067)	(0.075)	(0.093)
Income index	1.964***	2.387***	0.924***	1.520***
	(0.191)	(0.254)	(0.090)	(0.145)
Asset index	1.056***	1.271***	0.610***	0.991***
	(0.117)	(0.129)	(0.107)	(0.105)
Food security index	0.531***	0.608***	0.423***	0.556***
	(0.038)	(0.035)	(0.042)	(0.039)
Financial inclusion index	0.580***	0.765***	0.373***	0.670***
	(0.053)	(0.076)	(0.045)	(0.061)
Women's empowerment index	0.187***	0.232***	0.132***	0.243***
	(0.042)	(0.042)	(0.034)	(0.035)
Living conditions index	0.292***	0.381***	0.181***	0.359***
	(0.066)	(0.070)	(0.052)	(0.055)
Water security index	0.296***	0.453***	0.152	0.633***
	(0.051)	(0.049)	(0.092)	(0.081)
Time use index	0.985***	1.150***	-	-
	(0.075)	(0.080)	-	-
Political involvement index	0.228***	0.342***	-	-
	(0.058)	(0.058)	-	-

Notes: All indexed outcomes are standardized and measured at the household level. Bounds use the Manski-Lee method: the bounded sample trims the highest or lowest observations from the group with the higher survey rate to equalize survey rates across treatment and control. Standard errors clustered at the GP level in parentheses. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table S4: Indexed Family Outcomes, Robustness Across Specifications

	Endline 1				*Endline 2*			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Simple Regression	Baseline Controls	LASSO	LASSO Saharsa	Simple Regression	Baseline Controls	LASSO	LASSO Saharsa
Indexed Outcomes								
Total per capita consumption, STD.	0.441***	0.419***	0.379***	0.326***	0.515***	0.489***	0.442***	0.544***
	(0.064)	(0.059)	(0.060)	(0.099)	(0.078)	(0.079)	(0.078)	(0.158)
Total family income, STD.	2.421***	2.434***	2.132***	1.560***	1.421***	1.449***	1.349***	1.517***
	(0.205)	(0.204)	(0.180)	(0.224)	(0.122)	(0.118)	(0.122)	(0.349)
Asset index	1.190***	1.220***	1.143***	1.283***	0.841***	0.858***	0.806***	0.964***
	(0.113)	(0.105)	(0.104)	(0.203)	(0.089)	(0.083)	(0.082)	(0.132)
Food security index (2 components)	0.543***	0.549***	0.539***	0.380***	0.456***	0.459***	0.458***	0.302***
	(0.037)	(0.036)	(0.036)	(0.055)	(0.041)	(0.041)	(0.041)	(0.053)
Financial inclusion index (4 components)	0.780***	0.775***	0.762***	0.490***	0.614***	0.613***	0.597***	0.582***
	(0.077)	(0.074)	(0.077)	(0.081)	(0.064)	(0.057)	(0.056)	(0.094)
Womens empowerment index (4 components)	0.210***	0.198***	0.156***	0.287***	0.207***	0.195***	0.163***	0.188***
	(0.041)	(0.035)	(0.030)	(0.045)	(0.035)	(0.032)	(0.026)	(0.043)
Living conditions index (6 components)	0.364***	0.352***	0.349***	0.452***	0.327***	0.314***	0.329***	0.411***
	(0.049)	(0.047)	(0.041)	(0.081)	(0.045)	(0.042)	(0.039)	(0.090)
Water security index (5 components)	0.330***	0.330***	0.349***	0.377***	0.252***	0.247***	0.227**	0.156
	(0.057)	(0.055)	(0.052)	(0.106)	(0.096)	(0.094)	(0.088)	(0.185)
Total time spent working, STD.	1.182***	1.134***	1.029***	0.939***				
	(0.082)	(0.079)	(0.077)	(0.096)				
Political involvement index (4 components)	0.283***	0.280***	0.255***	0.457***				
	(0.058)	(0.058)	(0.060)	(0.120)				

Notes: Standardized intent-to-treat estimates are presented in SD units. All indices are standardized with respect to the baseline control group, except for the Food security index which is standardized with respect to the control group in that same time period. Column (1)/(4): simple OLS with strata fixed effects. Column (2)/(5): adds baseline outcome, missing-value indicator, and baseline household and GP controls. Column (3)/(6): PDS-LASSO with strata fixed effects. Column (3)/(6): PDS-LASSO with strata fixed effects, restricting the sample to the households in Saharsa, the unphased district by the delayed baseline. Standard errors clustered at the GP level in parentheses. Endline 2 does not include time-use or political involvement outcomes. *** p<0.01, ** p<0.05, * p<0.10.