

**Promoting Productive Inclusion and Resilience among the Poor:
Multi-country RCT of the Sahel Adaptive Social Protection Program**

Impact Evaluation Design and Pre-Analysis Plan
August 2019

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1 Introduction

1.1 Overview and purpose of the study

The Sahel Adaptive Social Protection Program includes a regional activity that supports country-level safety net programs to design, implement and evaluate productive accompanying measures to promote productive inclusion and resilience among the poor in the Sahel. A large-scale multi-country randomized control trial is being conducted as part of the program. A package of productive measures, including community sensitization on aspirations, life and business skills training, VSLA, a grant, and coaching, will be evaluated in four countries in the Sahel (Burkina Faso, Mauritania, and Niger.)

1.2 Description of the intervention

Existing cash transfer programs

Productive interventions target cash transfer beneficiaries supported by national program in each of the four countries. Features of the national cash transfer programs are described below.

	Niger	Senegal	Mauritania	Burkina Faso
Program Name	Projet Filets Sociaux Adaptatifs (Adaptive Social Safety Net Program)	Programme National de Bourse de Sécurité Familiale (National Program for Family Grants)	Tekavoul	Burkin-Naong-Sa Ya
Managing Office	Cellule Filets Sociaux (CFS), Office of the Prime Minister	Délégation générale à la protection sociale et à la solidarité nationale (DGPSN)	Agence Nationale de Lutte contre les Séquelles de l'Esclavage, l'Insertion et la Lutte contre la Pauvreté (Tadamoun)	Ministère de l'Action Sociale et de la Solidarité Nationale
Start Date	Piloted in 2010, phased roll-out started in 2012	Established 2012, cash transfers in 2013	2016, phased roll-out	2015
Geographic Targeting Method	All regions; high-poverty communes determined by regional workshops taking into account available poverty and vulnerability data; randomization of villages.	All regions; Communes targeted by number of people, poverty rates, rates of children and elders	Nationwide. Progressively rolled out late 2017 – 2018. Roll out order by highest contribution of a moughataa (district) to poverty.	Initial geographic targeting: 3 regions (North, East, and Center East) and 7 provinces with the highest rate of chronic poverty according to ICVM 2009-2010. In the north, By June 2018, recipients in Yatenga, Zondoma provinces will be phased out and coverage will begin in the Passouré, and Loroum regions. Villages within the district were randomly chosen in public lotteries due to budget constraints.

	Niger	Senegal	Mauritania	Burkina Faso
Household Targeting Method	Proxy Means Testing (PMT) is the main household targeting approach. In a phase of the program, three alternative methods were randomized at the village level and tested ¹ On average 40% of households per village were selected as beneficiaries.	Community targeting and creation of National Unique Registry, validated by PMT scoring	Beneficiary households are selected from a social registry of poor and vulnerable households. They are verified via Proxy Means Testing	Proxy Means Testing, community validation and other program criteria. One PMT threshold score by year/region.
Additional Eligibility Criteria			Must meet additional livestock ownership criteria.	Households with children aged 14 and under, households with pregnant and nursing women
Beneficiary in Household	One woman over 20 within the household	Usually wife of head of household	Cash transfer recipient (mother of children in the household or first wife in polygamous household) aged 18-49. Otherwise, one of the daughters living in the household within the above age range will be selected	Women with children. Multiple beneficiaries per household are possible.
Conditionality	No formal conditionality, but the cash transfer is accompanied by behavioral accompanying measures to encourage investments in young children's human capital. ²		Participation in social promotion activities	None
Approximate Total Beneficiaries	100,000 by 2018	300,000 households by 2018 (20% of population)	100,000 households by 2020	40,000 households
Amount of Payment	10 000 XOF monthly (\$16.86, \$45.29 PPP)	25,000 XOF / quarter (\$42.16, \$106.25 PPP)	15,000 Ouguiyas / quarter (\$42.67, \$119.73 PPP)	30,000 XOF / quarter (\$50.58, \$137.36 PPP) 40,000 XOF for women with 5 or more children under age 15
Duration of Payment	2 years	5 years	5 years	3 years

¹ Premand and Schnitzer (2018)

² Premand and Barry (2019)

Productive Accompanying Measures

The productive interventions includes 6 components:

Component 1: Coaching and facilitation

This component includes both the group-based facilitation of all program activities as well as needs-based individualized coaching. Throughout the project period, field agents assure the continuity of all of program components at the village-level, including mobilizing beneficiaries for meetings and coordinating with other service providers. In addition, these agents provide individualized follow-up coaching to beneficiaries on a needs-based basis, with the objective to help households benefit the most from the various accompanying measures.

Beneficiaries' demand for inputs are consolidated and distributed to local and regional suppliers to facilitate group purchases on a single date to reduce transportation costs.

Component 2: Community sensitization on aspirations and social norms

This intervention attempts to address aspirational and psycho-social constraints to diversification and entry into new economic activities. It takes the form of a community-level screening of a video documentary on individuals successful with productive investments in poor communities similar to those targeted by the safety nets programs, complemented by a facilitated group discussion.

Component 3: Facilitation of savings groups for cash transfer beneficiaries (VSLA model)

This intervention facilitates the creation of community savings groups and provides technical support to their management through ongoing support from coaches, using the village savings and loan association model.

Component 4: Micro-entrepreneurship training

A week-long group-based training covers basic business skills. The training focuses on cross-cutting micro-entrepreneurship skills, including basic accounting and management principles, market research, planning and scheduling, saving, and investing. In addition, the training focuses on the choice of livelihood activities, providing risks and opportunities for potential productive activities.

Component 5: Behavioral skills training

This week-long group-based training tackles cognitive and social barriers to decision-making, and addresses topics such as self-esteem and personal initiative, aspirations, social norms, and spousal, gender and generational roles. The training is designed to increase beneficiaries' capacity to orient themselves toward more productive investment in economic activities.

Component 6: One-time lump-sum cash grant

A lump-sum cash-grant of an amount between XOF 80,000 – 160,000 (determined based on the total amount available and fixed at the country-level), or approximately 140-275 USD aims to promote investments in income generating activities. For this reason, the cash injection is significantly higher than the periodic cash transfer. The cash grant is unconditional, and is paid after measures 4 and 5 have been implemented.

1.3 Impact evaluation design

There are four arms in the impact evaluation. All arms receive the regular cash transfer program. T_c , T_s and T_f all include the core package (savings groups, business training, and coaching). T_f receives the life skills and community sensitization *and* the grant in addition to the core package, while T_s only additionally receives the life skills and community sensitization, and T_c only additionally receives the grant.

Table 1a: Treatment Arms

C Control	Regular cash transfer program only
T_s Social package	Regular cash transfer program Core package (saving, business training, coaching) Life skills and community sensitization
T_c Capital package	Regular cash transfer program Core package (saving, business training, coaching) Grant
T_f Full package	Regular cash transfer program Core package (saving, business training, coaching) Life skills and community sensitization Grant

Table 1b: Treatment Arms

		C <i>CONTROL</i>	T_f <i>FULL</i>	T_c <i>CAPITAL</i> <i>no social</i>	T_s <i>SOCIAL</i> <i>no cash</i>
0	Regular cash transfer	•	•	•	•
1	Group formation and coaching		•	•	•
2	Savings groups		•	•	•
3	Community sensitization		•		•
4	Micro-entrepreneurship training		•	•	•
5	Life-skills training		•		•
6	Lump-sum cash grant		•	•	

The impact evaluation is a cluster-randomized controlled trial, with slight design variations in each country as described in table 2. In Niger and Burkina Faso, villages are randomized into each of the four arms. In Mauritania, the unit of randomization is “social promotion area”, which is grouping of close villages.³ In Senegal, where the sample is more urban, the unit of randomization is the neighborhood.

The randomization of geographic units into the four arms takes place in public lotteries and was stratified by commune.⁴

Table 2: Study Design

	Niger	Senegal	Mauritania	Burkina Faso
Sample households, across 4 arms	4608	5634	2682 (Regional study only)	3859
Sample as % of program households in study area	21%	66%	62%	28%
Geographic area	Dosso, Maradi, Tahoua, Tillaberi and Zinder regions	Dakar, Thies and Kaolack regions	Selibaby and Barkewol Moughatas	North Region
Stratification	Commune x household targeting method	Commune d’arrondissement	Commune x Area receives Social Promotion	Province x village size (8)
Unit of randomization	Village	Neighborhood	Social promotion space	Village
Urban/Rural⁵	Rural	Urban	Urban, primarily agricultural	Rural
Randomization units (clusters)	325	279	114	192
Households sampled per randomization unit	Max 15, Average 14	Max 50, Average 20	Max 69, Average 24	Max 24, Average 20

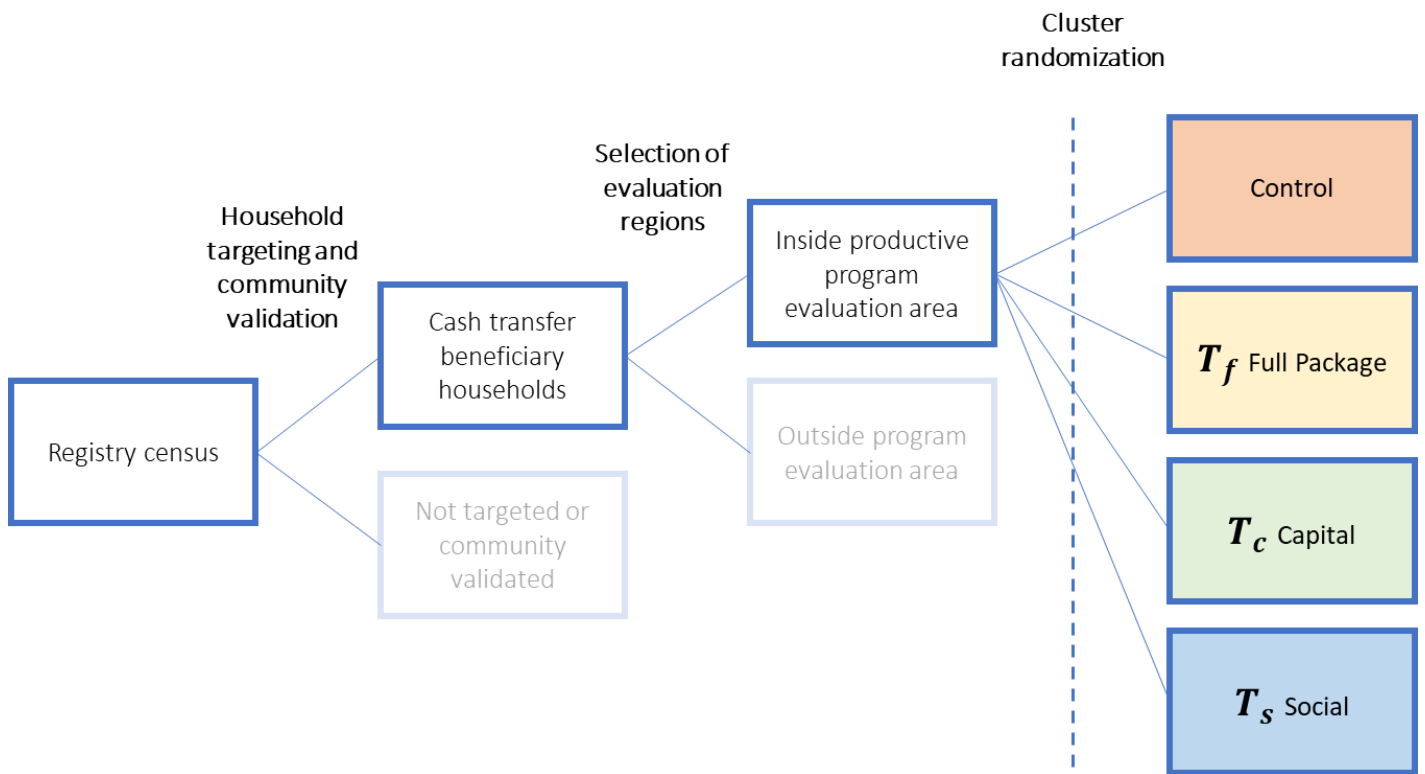
All treatment arms are approximately the same size, and all households with eligible cash transfer beneficiaries in each treatment arm receive the corresponding productive accompanying measures for their arm.

³ In Mauritania, there were not enough eligible cash transfer beneficiaries in each village, so social programming areas were created that grouped some villages.

⁴ As part of a previous study in Niger (Premand and Schnitzer, 2018), the targeting method for cash transfer beneficiaries was randomized at the village-level. Targeting methods tested included: Proxy Means Tests, Community Based Targeting, or a formula designed to identify food insecure households.

⁵While 31% the sample in Burkina Faso are in communes designated as urban, the urban centers in evaluation area are small and primarily agricultural. In Mauritania, 12% of the sample are in rural communes, while the rest are communes designated as urban, but these urban communes are also primarily agricultural and do not include Nouakchott. There are no urban communes in the Niger sample, and no rural communes in the Senegal sample.

Figure 1: Randomization of cash transfer beneficiaries



1.4 Data sources

Survey data:

There are at least two rounds of household surveys: baseline and follow-up.

The baseline survey includes the following sections:

Table 4: Baseline survey sections

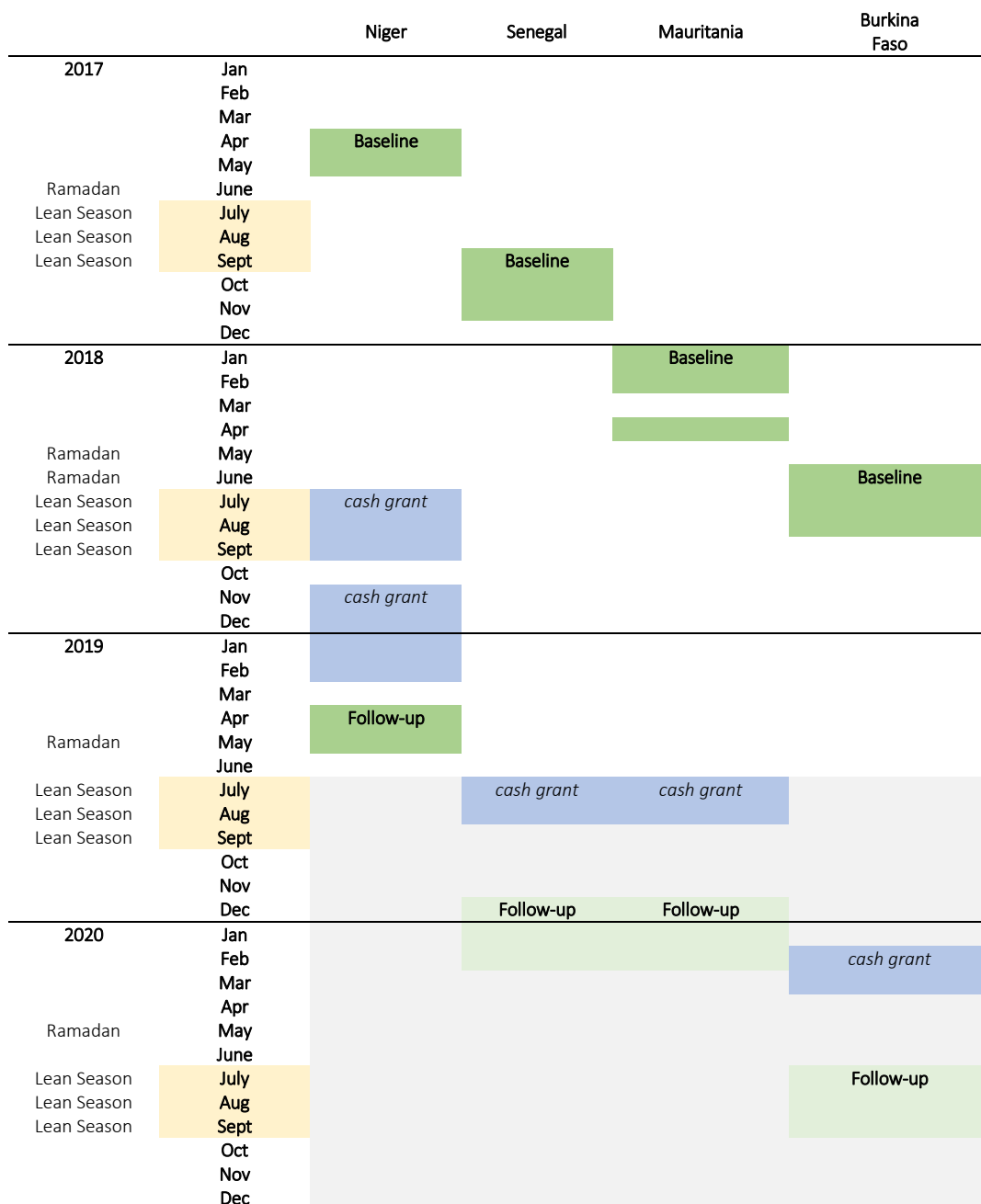
BENEFICIARY SECTION		HOUSEHOLD HEAD SECTION	
0	Introduction	11	Food consumption and spending
1	Household head roster	12	Agriculture
2	Productive activities	13	Livestock
3	Household non-agricultural activities	14	Fishing
4	Finance	15	Assets
5	Housing	16	Education and health spending
6	Food security	17	Non-food spending
7	Cash transfers	18	Social programs
8	Relationships	19	Transfers
9	Program preferences	20	Shocks
10	Psychology and mental Health		

The follow-up surveys include the same sections, with some expanded questions, as well as a section on the intervention, which is only administered to treatment households.

It is expected that follow-up surveys will occur 6 to 12 months after the delivery of the lump-sum cash grant, subject to seasonality constraints (no surveying is expected to occur during Ramadan, or during the lean agricultural season). Further follow-ups will be considered, subject to funding availability.

This pre-analysis plan was prepared and deposited before looking at any follow-up data.

Figure 2: Program and Survey Timeline



Monitoring data:

Household survey and GPS data may be merged with additional monitoring and evaluation data. At minimum, this includes amounts of the cash transfer and lump-sum cash grant received. Additional monitoring data on component receipt and participation is being collected (some at the individual level, some at the group level and some at the village level) and will be merged with the database to assess compliance with treatment assignment.

Additional data:

The survey data will be merged with rainfall and temperature data (Tropical Rainfall Measurement Mission and the Global Precipitation Measurement mission), and the Normalized Difference Vegetation Index (Africa Flood and Drought Monitor) to look at treatment heterogeneity by exposure to shocks. See specification 2.

2 Methodology

2.1 Specifications

2.1.1 Specification 1

In the first specification, we will look at the direct effect of the program on the two primary outcomes described below (food security and consumption per adult equivalent). We also use this specification for secondary outcomes.

The general approach is estimate intent to treat using ANCOVA when the baseline value of the outcome variable is available. We regress outcomes related to each hypothesis above on dummy variables for 3 treatment arms, baseline value of the outcome (when available), and randomization strata fixed effects. Standard errors are clustered at the unit of randomization (village, neighborhood, or social promotion area.)

Recall, this is not a 2x2 design. The capital arm and the social arms have interventions that are subsets of the full arm's components, but are not nested within each other.

In the main analysis, we use the following specification:

(1)

$$Y_1 = \beta_{fe} + \beta_f T_{full} + \beta_c T_{capital} + \beta_s T_{social} + \beta_0 Y_0 + \varepsilon$$

i.e., we estimate separate treatment effects for each treatment group for each outcome variable. The general model will include fixed effects for randomization strata (β_{fe}), and control for the baseline outcome (Y_0), where available.

We present false discovery q-values and Family Wise Error Rates for the 6 tests associated with the primary outcomes: (2 primary outcomes x 3 treatment arms). We do not adjust for tests across treatment arms.

We conduct the following two additional tests, using unadjusted p-values. Based on the results of these tests, we may present pooled specifications for secondary measures *in addition* to the specification above.

Does the social component not matter in the context of full package?

Test 1: If a joint test across the two primary outcome variables fails to reject equality of the **full** and **capital** effects, we will pool the full and capital arms in an *additional* specification. **Social** will remain a separate treatment arm.

Does the cash not matter in the context of the full package?

Test 2: If a joint test across the two primary outcome variables fails to reject equality of **full** and **social** effects, we will pool the full and social outcomes in an *additional* specification. **Capital** will remain a separate treatment arm.

2.1.2 Specification 2

In the second specification, we look at the potential mitigating influence of the program on the effects of shocks on the two primary outcomes (food security and consumption per capita) by adding interactions of treatment arms with shocks. We will select the climatic shock variable that most strongly correlates with self-reported covariate shocks in the control groups.

(2)

$$Y_1 = \beta_{fe} + \beta_s S + \beta_f T_{full} + \beta_{fs} T_{full} S + \beta_c T_{capital} + \beta_{cs} T_{capital} S + \beta_s T_{social} + \beta_{ss} T_{social} S + \varepsilon$$

Candidates for the shock variable include total precipitation during the growing season, number of rainy days during the full/beginning/middle/end of the growing seasons, and duration of the longest dry spell (Fishman, 2016). An additional candidate is the daily average Normalized Difference Vegetation Index-(NDVI) during the growing season, a measure of greenness of the land. The NDVI shows stronger correlations with self-reported drought than do measures of seasonal rainfall in Niger (Gao and Mills, 2018).

We present both FDR q-values and FWERs corrected for the interactions associated with the primary outcomes – 2 primary outcomes x 3 (or 2, depending on the results of Tests 1 and 2) treatment arms.

We also report this specification with self-reported covariate shocks (experienced drought/irregular rain or floods in last 12 month) for presentational purposes. Self-reported idiosyncratic shocks, such as sickness, death, divorce and theft, are not included in this specification, since we cannot preclude that there is a treatment effect.

Urban households in Senegal are excluded from this specification, but may be included as a robustness check.

If the results of either Test 1 or Test 2 in specification 1 results in the pooling of treatment arms, we will also report results with the pooled arms and their interactions with shocks.

2.2 Primary outcomes

Our two **primary outcomes** are the key outcomes that relate directly to program objectives and may be used as success metrics for the intervention. As described in section 2.2, we care about the direct effect of the program on these outcomes (specification 1), as well as the program’s ability to foster resilience, defined as the program’s ability to mitigate the effects of a shock on these outcomes (specification 2).

Primary Outcomes	
Family for MHT (2)	Construction Notes
Food Insecurity Scale	<p>The FIES is constructed by using a Rasch model to determine difficulty (in this context, “severity”) weights on 8 binary measures of food insecurity in each country. We apply the difficulty weights from the baseline scale to construct a standardized scale at follow-up. Each country will have different weights on each item and will be standardized based on their difficulty weights.</p>
Daily consumption per adult equivalent	<p>Sum of adult equivalents of the following components, winsorized at 98p for the country at the smallest component type possible :</p> <ul style="list-style-type: none"> • Weekly home food consumption (value) / 7 , list of food items varies by country, weekly amount divided by 7 • Weekly expenditure on food away from home / 7 • Non-food goods and services (value) scaled to days, list of items and reference period varies by country • Education expenditure scaled to days, list of items varies by country • Health expenditure scaled to days, list of items varies by country • Yearly expenditure on household repairs and improvements / 365 days / 8 years for expected lifetime of improvement/repair, types of repairs/improvements vary across countries • Yearly celebration expenditure / 365 , list of celebrations varies by country <p>(Adult Equivalent Scale: 1st adult = 1, 2nd-n adults = 0.7, children 0-14 =0.5). Household asset purchases are not included in the consumption calculation because their value and purchase is not collected. We do not adjust for meals shared with members outside the household.</p>

2.3 Secondary measures

In order to further understand the impact of the program, we turn to secondary measures. We consider **secondary outcomes**, which have directional hypotheses and are targeted by the program, **downstream outcomes**, which have directional hypotheses but are not specifically targeted by the program, **descriptive measures and mechanisms**, with less clear directional hypotheses, and **other available measures**.

We divide **secondary outcomes**, **downstream outcomes**, and **descriptive measures and mechanisms** into families for hypothesis testing within each family (example: productive revenue family, household structure family). We report both FDR q-values and FWER for the outcomes by 3 tests of the arms against the control. We do not multiple hypothesis test within the families of other available measures.

If the results of tests 1 or 2 indicate the inclusion of an additional pooled specification, we will present the pooled specification in a separate panel and will multiple hypothesis correct for secondary measures within each specification.

<i>Secondary Outcomes</i>
<p><i>Multiple hypothesis testing within 11 families:</i></p> <ol style="list-style-type: none"> 1. Food security 2. Beneficiary productive revenue 3. Household income diversification 4. Psychological well-being 5. Assets 6. Financial engagement 7. Savings goals and behavior 8. Non-agricultural activities 9. Healthy activity practices 10. Decision making and productive agency 11. Coping strategies
<i>Downstream outcomes</i>
<p><i>Multiple hypothesis testing within 3 families:</i></p> <ol style="list-style-type: none"> 1. Gender Perceptions and Norms 2. Social well-being 3. Children
<i>Descriptive measures and mechanisms</i>
<p><i>Multiple hypothesis testing within 5 families:</i></p> <ol style="list-style-type: none"> 1. Household structure 2. Beneficiary time use 3. Beneficiary labor participation 4. Agriculture 5. Livestock 6. Beneficiary lending to household members
<i>Process outcomes and other available measures</i>
<p><i>No multiple hypothesis testing:</i></p> <ol style="list-style-type: none"> 1. The intervention itself 2. Periodic cash transfers 3. Other programs

2.3.1 Secondary outcomes

1. Food Security	
Family for MHT (3)	Construction Notes
Food Insecurity Scale	See primary outcomes.
Beneficiary Food Consumption Score	Weighted sums of days out of last 7 consumed the following items: (cereals + tubers)*2 + pulses*3 + vegetables*1 + fruit*1 + meat/fish/eggs*4 + milk*4 + oil*0.5 + sugar*0.5, (cereals + tubers) are top-coded at 7 days
Child wasting (child level)	WHO definition, based on height for weight, for children ages 3-59 months

2. Beneficiary productive revenue	
Family for MHT (4)	Construction Notes
Non-agricultural activity revenue, beneficiary, last 30 days	Business revenue in last 30 days for all businesses owned or managed by beneficiary. Revenue is divided by number of co-owners.
Wage earnings, beneficiary, 12 months	Direct
Harvest value, plots owned or managed by beneficiary	Harvest value of crops planted on plots owned or managed by beneficiary in the dry or rainy season. If multiple owner/managers, value divided evenly. Since we ask about harvest value at the crop level (not plot level), if crops are grown on more than one plot, value divided in proportion to plot size.
Livestock sale revenue, beneficiary, (last 12 months)	Assigned to the beneficiary if she is listed as controlling the sale proceeds.
Other associated measures : Household productive revenue by the same categories, details on non-agricultural activities, agriculture and livestock	

3. Household income diversification	
Family for MHT (6)	Construction Notes
Count income sources	Sum of sources below
Count of types of crops	rainy season: 1) cereals, 2) legumes and pulses, 3) tubers, 4) other cash crops, 5) horticulture, 6) any counter season crop
Count of business types	Count of household businesses types (5 possible types)
Count of livestock types	Cow/bull, horse/donkey, sheep/goat, poultry, other
Count of wage-earning sources	Count of wages earning sources, head of household and beneficiary only
Beneficiary's primary activity is a non-agricultural activity	

4. Psychological well-being	
Family for MHT (3)	Construction Notes
Mental Health and Wellbeing	<p>Factor z-score index of 5 components :</p> <ul style="list-style-type: none"> • Depression: 4 questions from (CESD-R-10), (0-7, recode to 1-4); sum, reversed • Disability: 4 questions from the SRQ-20 (Self-report questionnaire), (recoded from [1-4] to 0/1), (neurotic, stress-related disorders), reversed • Life Satisfaction: Cantril's ladder of life satisfaction (1-10) • Inner peace: Inner peace (1-10) • One item mental health assessment: Productive beneficiary mental health self-assessment (1-5), standardized
Self and social worth index	<p>Factor z-score index of 2 components:</p> <p>Self-efficacy: 7 questions from GSE-10 and 1 question from Rosenberg Self-Esteem; (1-4); sum of items</p> <p>Social standing:</p> <ul style="list-style-type: none"> • Good person [1-10] • Respected person [1-10] • Opinion followed [1-10] • Social position [1-10]
Future expectations index	<p>Factor z-score index of 3 components:</p> <ul style="list-style-type: none"> • Expected social status in 2 years [1-10] • Expected life satisfaction in 2 years [1-10] • Expected social position of child at age 30 [1-10]

5. Assets	
Family for MHT (4)	Construction Notes
Agricultural asset values	Set of assets for each country, direct report of current value, each asset value winsorized at 98p within each country
Livestock asset values	Set of livestock for each country, direct report or current value, each livestock value winsorized at 98p within each country
Business asset values	Direct asset value by business, winsorized at 98p at household level
Household asset count	Set of household assets asked about varies by country

6. Financial Engagement	
Family for MHT (7)	Construction Notes
Total amount contributed to savings group last 24 months	Total winsorized at 98p (within country)
Savings deposits outside the household (excluding savings groups), last 3 months	Total winsorized at 98p (within country)
Outstanding debt (outside household)	Total winsorized at 98p (within country)
Outstanding loans (outside household)	Total winsorized at 98p (within country)
Gross inter-household transfers	Absolute values of transfers to households winsorized at 98p + absolute value of transfers in winsorized at 98p
Other associated measures: Savings goals, intrahousehold lending, savings groups and other savings locations characteristics	

7. Savings goals and behavior	
Family for MHT (5)	Construction Notes
shares savings amount and location with husband	
has goal for total savings level in 12 months	
savings level goal amount	winsorized at 98p, country level
has specific things saving for	
Is saving for a productive activity	

8. Non-Agricultural Activities	
Family for MHT (6)	Construction Notes
Count of household non-agricultural business in last 12 months	All household members
Abandoned a non-agricultural activity in last 24 months	All household members
Total investments in non-agricultural businesses, beneficiary	Beneficiary businesses only
Estimated business profits, household level	months active in last 12 months * average(profits in highest month, profits in lowest active month)
Estimated business profits, business level	months active in last 12 months * average(profits in highest month, profits in lowest active month)
Other associated measures: Beneficiary-specific business outcomes, including whether intends to expand	

9. Healthy Activity Practices

Family for MHT (2)

Construction Notes

Count of good business practices

Count of following practices in primary activity:

working capital and personal funds kept separate

has ledger

uses ledger or notes

has business plan (written or oral)

knows own production cost

knows which of own offerings are most profitable

sells on credit

keeps registry of products sold on credit

sets goals for following year

over last three months...

investigated competitor's prices

asked clients what they want

advertised

changed supplier

negotiated with supplier over prices

compared supplier's quality or prices

jointly acquired merchandise, inputs or equipment with someone outside the household

10. Decision making and productive agency

Family for MHT (4)

Construction Notes

Decision weight index

Factor z-score index of 10 components,

How much opinion matters [1-3] in decisions related to:

- own earnings
- partner's earnings
- daily spending
- large purchases
- family planning
- own healthcare
- child education
- agriculture
- livestock
- non-agricultural businesses

Decision possibility index

Factor z-score index of 5 components,

Could make decisions if wanted to [1-3] in decisions related to:

- own earnings
- daily spending
- large purchases
- family planning
- own healthcare

Productive agency index

Factor z-score index of 6 components:

- Household has not prevented from working outside the home
- Beneficiary controls any revenue from sale of a crop
- Beneficiary owns or manages a non-agricultural business
- Beneficiary owns livestock
- Beneficiary controls revenue from the sale of livestock
- Beneficiary stayed a night outside the village for a productive purpose, past 12 months

Relationship quality index

Factor z-score index of 3 components:

- Able to tell partner disagree (0-3) never to most of the time
- Partner acts in my interest (0-3) never to most of the time
- Household prevents from visiting friends or family in last 12 months (0-1)

Other associated measures, not expected to be moved by the program and not included in family for purposed of multiple-hypothesis testing).

Task sharing with partner index

Factor z-score index of 4 components:

- Husband spent time on one of 4 chores in last 7 days
- Partner shares food-related tasks at least occasionally
- Partner shares cleaning tasks at least occasionally
- Partner shares child tasks at least occasionally

11. Coping strategies	
Family for MHT (5)	Construction Notes
Shock response: sold livestock	Listed as a response to top 3 of household's most severe shocks in last 12 months
Shock response: sold food stocks	
Shock response: used savings	
Shock response: sold other productive assets	
Shock response: reduced health or education spending	
Other associated measures: Shocks faced, reasons not used strategy	

2.3.2 Downstream outcomes

1. Gender perceptions and norms	
Family for MHT (4)	Construction Notes
<p>Gender attitudes index</p>	<p>Factor z-score index of 5 components:</p> <ul style="list-style-type: none"> • It is not justified if a husband beats his wife if she burns food • It is not justified if a husband beats his wife if she neglects the children • women should tolerate domestic violence to preserve harmony [1-4] • only men should work outside the home [1-4] • girls' schooling is as important as boys' [1-4]
<p>Perceptions of domestic violence and household relations index</p>	<p>Factor z-score index of 4 components:</p> <ul style="list-style-type: none"> • out of 10, women who travel outside the village when they want, • out of 10, women who have tensions in their household, reverse • frequency that domestic violence happens in village (if burned food) (0-3), reverse • frequency that domestic violence happens in village (if neglects children) (0-3), reverse
<p>Perceptions related to productive activities index</p>	<p>Factor z-score index of 3 components:</p> <ul style="list-style-type: none"> • out of 10, women who would be supported by family if wanted to become travelling vendor • out of 10, women who would get a loan for activity if asked • out of 10, women who started a new activity in last 12 months
<p>Other associated measures: Sticking points for when perceived not acceptable for women to start a productive activity</p>	

Family for MHT (5)	2. Social well-being Construction Notes
Social support index	<p>Factor z-score index of 6 components:</p> <ul style="list-style-type: none"> • Count of people know that have succeeded in life (has aspirational role models) • Count of people could ask for activity advice • Count of people who have asked beneficiary for activity advice in last 6 months • Count of people could ask for conflict advice • Count of people who have asked beneficiary for conflict advice in last 6 months • Count of people could ask to sell products for you in a market
Financial support index	<p>Factor z-score index of 3 components:</p> <ul style="list-style-type: none"> • Can count on village community to help you financially [1-4] • Count of people could ask for money • Probability of putting together a small sum of money (0-4)
Social trust and cohesion index	<p>Factor z-score index of 3 components:</p> <p>Trust in village</p> <ul style="list-style-type: none"> • Can count on other women in village [1-4] • Out of ten, how many others in village can trust [0-10] <p>Tensions (reverse)</p> <ul style="list-style-type: none"> • Number of personal enemies [0-3] • Household tensions in last 6 months [0-3] • Community tensions in last 6 months [0-3] <p>Social closeness</p> <ul style="list-style-type: none"> • inclusion of self in (closeness to) household [1-4] • inclusion of self in (closeness to) community [1-4] • inclusion of self in (closeness to) partner [1-4]
Groups and collective action index	<p>Factor z-score index of 4 components:</p> <ul style="list-style-type: none"> • Count of groups or associations that member, last 2 months • Count of positions of responsibility in any group, last 12 months • Amount given for community projects, last 2 months • Days volunteered for community activities, last 2 months • Works with community to achieve common goals [1-4]
<p>Other associated measures, not expected to be moved by the program and not included in family for purpose of multiple-hypothesis testing).</p>	
Collectivism versus individualism	<p>Factor z-score index of 4 components</p> <ul style="list-style-type: none"> • Consider community opinions [1-4] • Likes to be unique in community [1-4], reverse • Duty to take care of people in village [1-4] • Must respect household's decisions [1-4] • Choice of normative over unique mat [1-0] • Choice of normative over new fertilizer [1-0]
Trust in institutions	<p>Factor z-score index of 2 components:</p> <ul style="list-style-type: none"> • Health system [0-1'] • Police [0-1']

3. Children	
Family for MHT (5)	Construction Notes
<i>Child-level outcomes:</i>	
Child attended school last (this) year	From household roster
Child Labor Index	<p>Factor z-score index of 3 components:</p> <ul style="list-style-type: none"> • child level: days spent in household business • child level: days spent in agriculture • child level: hours spent on livestock
Child Household Labor Index	<p>Factor z-score index of 3 components:</p> <ul style="list-style-type: none"> • child level: child got water or firewood in last 7 days • child did washing in last 7 days • child did shopping in last 7 days
Other associated measures: Child mentioned as attending coranique school in last 7 days	

2.3.3 Descriptive measures of interest and mechanisms

1. Household structure	
Family for MHT (5)	Construction Notes
count of household members	
adult equivalents	1st adult = 1, 2nd-n adults = 0.7, children 0-14 =0.5
dependency ratio	(age 0-14 + age 65+) / age 15-64
extended family ratio	not head of household, spouse, children / head of household, spouses, children
births in last 12 months	
nights beneficiary spent outside the home	
nights head of household spent outside the home	
Other associated measures: Beneficiary births and pregnancies	

2. Beneficiary time use	
Family for MHT (8)	Construction Notes
Minutes spent in non-agricultural businesses, last 7 days	days in the last week multiplied by the reported average minutes per day.
Minutes spent in agriculture, last 7 days	
Minutes spent studying for coranique school, last 7 days	
Minutes spent studying for traditional school, last 7 days	
Minutes spent retrieving water, last 7 days	
Minutes spent gathering firewood, last 7 days	
Minutes spent washing/laundry, last 7 days	
Minutes spent shopping, last 7 days	

3. Beneficiary labor participation	
Family for MHT (4)	Construction Notes
Days in past 30, non-agricultural business	sum of days across businesses, top coded at 30
Hours in last month, livestock	
Days in last 30, paid employment (household head and beneficiary only)	
Days in last season, agriculture	sum of days across plots, top coded at 120

4. Agriculture	
Family for MHT (11)	Construction Notes
cultivates annual crops in last 12 months (any plot)	Listed as a response to top 3 of household's most severe shocks in last 12 months
total area of plots owned or cultivated in last 12 months	no double counting for seasons
total harvest value	rainy + dry seasons
total sale value	rainy + dry seasons
harvested at least one annual crop	rainy season
lost at least one full annual crop harvest	rainy season
sold at least one annual crop	rainy season
commercialization % of crops	conditional on harvesting
used chemical fertilizer	any plot, rainy season
use phytosanitaire products	any plot, rainy season
used paid labor	any plot, rainy season
purchased seeds	any plot, rainy season
Other associated measures : area of plots owned, at least one annual crop incomplete (still in field), cultivated in counter-season, values of chemical fertilizer, phytosanitary products, and paid labor	

5. Livestock	
Family for MHT	Construction Notes
Increase/decrease in animal (by type) in the last 12 months ago	
Value of animal purchases over last 12 months	

6. Lending to household members	
Family for MHT (2)	Construction Notes
Times lent money to others in household in last 3 months	
Outstanding debt from others in the household	

2.3.4 Additional measures

The Intervention Itself
Evaluation of the intervention
situation after receiving the program
husband was against the program
experienced tensions in household due to the program
less than complete trust in coach
how many beneficiaries out of 10 are better after the program
husbands out of 10 that were against the program
beneficiaries out of 10 that trusted coach
Compliance with intervention components
participated in group activities
times absent from a group activity
been excluded from the group
saw the film
followed life skills training
days attended life skills training
followed entrepreneurship training
days attended entrepreneurship training
received a coaching visits
times coach visited to discuss productive activities
coach facilitated group purchases
gave money to the coach for any reason
amount given to coach for his salary
amount given to purchase inputs
amount given to buy something else
received capital transfer
amount of capital transfer
date of capital transfer receipt
Use of capital transfer
given part or all of capital transfer to someone else in household
amount given to someone else in the household
amount controlled by the beneficiary
household use of transfer = unknown by beneficiary
household use of transfer = education
household use of transfer = health
household use of transfer = savings
household use of transfer = agricultural inputs
household use of transfer = livestock inputs, livestock
household use of transfer = other productive activity
household use of transfer = transfers to other households
household use of transfer = other expenses

Periodic cash transfers (safety net)	
Construction Notes	
Total cash transfer amount received to date	
Last payment amount	
Used any of cash transfer on food	
Used any of cash transfer on education	
Used any of cash transfer on health	
Used any of cash transfer on savings	
Used any of cash transfer on investments	
Gave any of cash transfer to other households	

Other programs (for contamination)	
Total amount received from other programs, last 12 months	<ul style="list-style-type: none"> Direct cereal aid Food or cash for work Child feeding programs Cash transfers other than the Safety net programs Business entrepreneurship training or support, outside of Safety net programs Agricultural insurance Health programs excluding the Safety net programs Health insurance Other programs

2.4 Methodological considerations

2.4.1 Balance checks

A series of demographic variables and all primary outcome variables (food security and consumption per adult equivalent) are checked for balance.

Demographic variables to be checked for balance include:

same_cb	Beneficiary is household head
pben_handicap	Beneficiary is handicapped

For both the productive beneficiaries (pben*), and household heads (hh*):

*_fem	is female
*_poly	is polygamous
*_age	Age
*_edu	years of education
*_prim	completed primary school
*_lit	Literate
*_health	activities of daily living index, based on answers to ease of doing 3 physical tasks (*_phy_lift, *_phy_walk *_phy_work)
*_phy_lift	activities of daily living: difficulty lifting a 10 kg sac (1-4)
*_phy_walk	activities of daily living: difficulty walking 4-hours (1-4)
*_phy_work	activities of daily living: difficulty working all day in field (1-4)

For all households, we check for balance on:

hou_rooms	Rooms occupied by household
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And for rural households only, we check for balance on:

hou_he_a_min	Minutes to health center
hou_mar_min	Minutes to market (self-report)
hou_wat_min	Minutes to water source
dist_commune	Distance to capital of commune or equivalent

Balance tests across treatment arms are done within a regression framework so that we can include randomization strata, and clustered standard errors (see main specification).

First, we check for balance by country. We report 3 types of tests: pairwise by arm, F-test for equality of arms (each from a regression with dummies for each treatment arm), and a test of pooled treatment (from a regression with a dummy for *any* treatment arm.)

Second, we check for balance in the pooled-sample. We again report the 3 types of tests.

2.4.2 Control variables

We expect that our main specification will not include further control variables. However, to increase precision of the estimates and choose covariates that explain treatment variance, we may also present results from covariates selected by a post double selection lasso (Belloni, Chernozhukov and Hansen, 2014)⁶

Potential variables for analysis in a double-lasso include the demographic variables mentioned in the previous section, as well as the secondary measures available at baseline. Initial data cleaning will include creating indicator variables for all categorical outcomes, standardization, creating indicator variables for missing values and setting missing values to zero

2.4.3 Further heterogeneity

To understand inclusiveness of program impacts across beneficiaries, we will report heterogeneous treatment effects on the two primary outcomes (food security and consumption per adult equivalent) by baseline consumption, a baseline well-being index, a count of income sources at baseline, and distance to the capital of the commune (for which we exclude urban Senegal).

We will consider using machine learning techniques to determine the dimensions of heterogeneity, for instance based on Athey and Wager's 2018 technique using random forests, unless there are other significant advances in the machine learning literature.

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⁶ Alexandre Belloni, Victor Chernozhukov, Christian Hansen, Inference on Treatment Effects after Selection among High-Dimensional Controls, *The Review of Economic Studies*, Volume 81, Issue 2, April 2014, Pages 608–650, <https://doi.org/10.1093/restud/rdt044>

Ahrens, A., Hansen, C.B., Schaffer, M.E. 2018. *pdlasso* and *ivlasso*: Programs for post-selection and post-regularization OLS or IV estimation and inference. <http://ideas.repec.org/c/boc/bocode/s458459.html>

Athey, S. and S. Wagner, (2018) Estimation and Inference of Heterogeneous Treatment Effects using Random Forests, *Journal of the American Statistical Association*.

2.4.4 Variable construction

Factor Index Construction

In order to construct the factor z-score indices, the components are first standardized at the country-level. The factor score on each component is determined by the control group's loading on each component at follow-up. If a component factors in the opposite direction as hypothesized, it is dropped for that country. Then, the factor score weighted mean is standardized again. factor loadings and weight on each of the components can be different in each country.

Winsorizing

All continuous variables are winsorized at the 98th and 2th percentiles within the household survey, at the most disaggregated level feasible. Component variables are not winsorized. For example, the value of per capita consumption of millet over the last 7 days is winsorized, not the household total consumption value.

Cleaning and outliers

In principle, there should be no missing values in the survey datasets. However, some surveyors used missing value codes from other surveys. There is no setting to medians for missing or nonsense values. Where a component variable is missing, the aggregate variable itself is set to missing, except in harvest and consumption values. If the crop or food represents less than 10% of the harvest or consumption value for at least 90% of the households, the crop or food component value is set to 0. If it represents more than 10% of the consumption or harvest value, the total harvest or consumption value is set to missing.

Currency and inflation

All follow-up analysis will be done in 2016 USD PPP, using the World Bank's International Comparison Program database. PPP conversion factor, private consumption (LCU per international \$).

3 Contingencies and robustness checks

3.1 Survey attrition

Based on IPA's experience in rural surveys in Burkina Faso, we expect attrition rates of 3-5%, with up to 10% attrition in Senegal, where the sample is largely urban.

To ensure that there is no significant relationship between attrition and treatment status, we will run the following regression:

$$(1) A = \beta_0 + \beta_f T_f + \beta_c T_c + \beta_s T_s + \gamma C + \varepsilon$$

with A the attrition rate on the pooled dataset.

If treatment status does not affect attrition at the 5% level, then we will not adjust the estimates for attrition.

We will then check balance on baseline primary outcomes for differential attrition, using

$$(2) Y_0 = \beta_0 + \beta_1 A + \beta_2 T_f + \beta_3 T_f A_f + \beta_4 T_c + \beta_5 T_c A_c + \beta_6 T_s + \beta_7 T_s A_s + \varepsilon$$

The coefficients $\beta_2, \beta_4, \beta_6$ indicate balance on baseline variables, and $\beta_3, \beta_5, \beta_7$ indicate the direction of the bias.

In the case of differential attrition, we may reweight the sample using Lee's (2009) bounding method.

3.2 Take-up rate and respect of assignment

If it is found, based on monitoring data within a country, that more than 60% of beneficiary households fail to receive any component associated with their treatment arm, the treatment arm may be dropped from the pooled regional analysis.

If, due to conflict, we expect not to be able to reach a significant number of the respondents, we may drop a region from the analysis.