

EVALUATION OF THE WELFARE IMPACTS OF A
LIVESTOCK TRANSFER PROGRAM IN NEPAL

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BASIS Proposal

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ABSTRACT

Social protection policies and programs have been widely heralded as important for addressing persistent poverty. Productive asset transfer programs, often involving livestock, are a particularly popular form of social protection for vulnerable populations. Such programs are often supplemented with technical trainings that support human (and often social) capital development. This project seeks to disentangle the importance of physical assets relative to human and social capital in the provision of social protection designed to (permanently) increase resiliency and improve the nutritional and economic outcomes for the chronically poor in Nepal. Specifically, we will partner with Heifer International to evaluate the impact of a multifaceted social protection program transferring human, social and physical (livestock) capital. In an RCT, groups of beneficiaries will receive one of two packages. Both packages offer technical training on a variety of topics including savings, but only one package includes an asset transfer (of variable size and timing). For each package, we will consider the dynamic impacts on consumption, nutrition and health outcomes, income and other economic outcomes, female empowerment, aspirations and hope, and risk management capacity.

Introduction

Social protection policies and programs have been widely heralded as important for addressing persistent poverty. The aim of social protection is to enhance the capacity of poor and vulnerable persons to manage economic and social risks. In developing countries, this protection often involves the transfer of cash, in-kind consumption goods such as food or medicine, and/or the development of physical, human or social capital. This project seeks to disentangle the importance of physical assets relative to human and social capital in the provision of social protection designed to improve (and permanently alter) the nutritional and economic outcomes for the chronically poor in Nepal.

To be most effective, social protection must be comprehensive, addressing poverty dynamics and the full range of factors that keep people in poverty (Barrientos and Hulme, 2009). Barrett (2005) usefully defines two targeted forms of social protection programs: “Cargo nets” should be directed toward the structurally poor, and “safety nets” should be targeted to the stochastically poor. Safety net programs, like emergency food aid or insurance, offer protection against adverse shocks so that the consequences suffered are temporary. Cargo net programs emphasize the importance of sustainability, and are designed to improve households’ productive capacity. When successful, cargo net programs overcome structural forces that keep households poor, thereby shifting households onto a pathway out of poverty.

This project analyzes the impact of different facets of a cargo net program implemented by Heifer International (hereafter referred to as Heifer) in Nepal. Programs like Heifer’s typically seek to improve the productive capacity of households through the provision of physical, human or social capital, and often some combination of all three. Productive physical capital can be developed through a variety of mechanisms: conditional or unconditional asset transfers, cash block grants, and improved access to microfinance or savings. Human capital can be developed through both formal (schools) and informal (trainings, social learning, etc.) channels. Social capital is developed through increased connectivity, often achieved through group formation.

An explicit goal of social protection is to improve the ability of households to manage risk. Cargo and safety nets have the potential to improve the nutritional and economic outcomes of structurally and stochastically poor households through higher (and “smoother”) levels of consumption and income. However, it is not only “household” assets that matter, but which individual within the household has control over those assets. For this reason, many development programs target women. Increasing women’s control over assets has been shown to have positive effects on a number of important development outcomes for the household, including food security, child nutrition, and education, as well as for women’s own well-being

and female empowerment (Deere and Doss, 2006, Quisumbing and Maluccio, 2003), which may be an objective in and of itself. However, the extent to which women are able to maintain control of assets is not always clear.

Recent evidence (Beaman, et al., 2012, Bernard, et al., 2011, Laajaj, 2012, Macours and Vakis, 2009) suggests that expectations, aspirations and “hope” also affect poverty dynamics, but little is known about how different types of social protection programs affect an individual or household’s “hope” regarding their future. The links between these objectives are complex, and outcomes may depend on the current asset and income profile of the household, including physical and human capital assets, as well as who currently controls these assets within the household, and who ends up controlling the transferred assets.

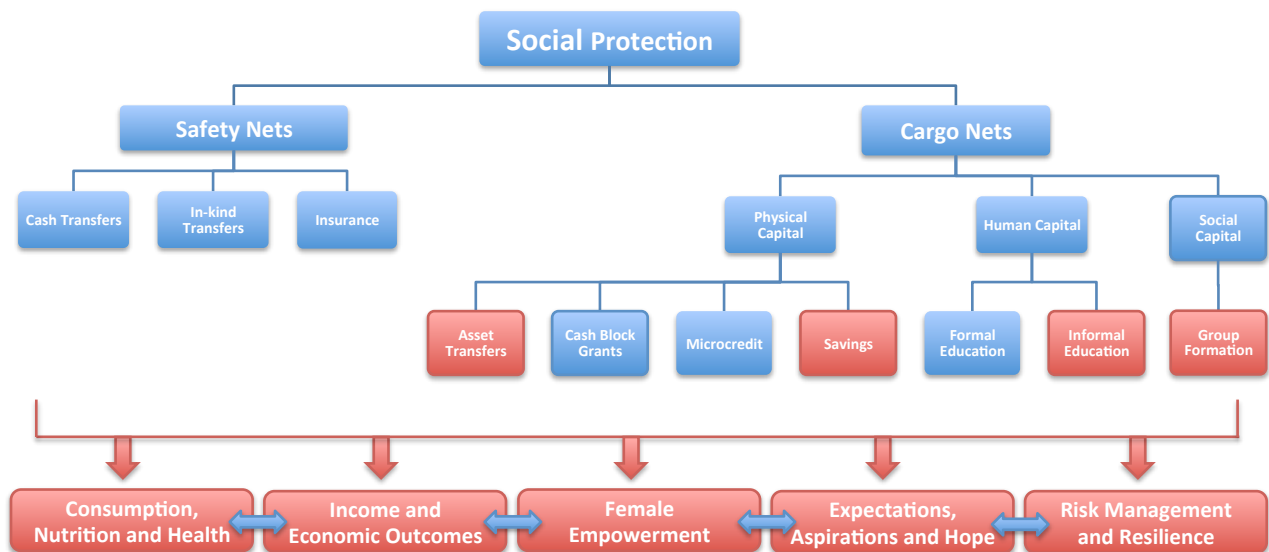


Figure 1: Types of Social Protection and the Anticipated Impacts

Research Objectives

The various types of social protection and their anticipated impacts are summarized in Figure 1. In this project, we focus on four aspects of cargo net social protection interventions (highlighted in red in Figure 1): conditional asset transfers, savings, informal education (through various trainings) and group formation. Although we will not be able to completely disentangle the impacts of all four programs, it is common for asset transfer and savings programs to be “packaged” with some level of informal education and group formation. Through a randomized control trial (RCT), we will be able to compare the average treatment effect of the following two “packages”:

1. Recipients of the first package will benefit from “human capital investments” through participation in trainings covering a wide variety of topics, and “social capital investments” through facilitated group formation with the explicit goal of savings.
2. Recipients of the second package will likewise participate in identical trainings and form savings groups, but in addition, will receive a “physical capital investment” in the form of a productive asset transfer (of variable size and timing) in the form of livestock.

For each package, we will consider the impacts on each of the following as summarized in Figure 1: a) consumption, nutrition and health, b) income and other economic outcomes including asset dynamics, c) female empowerment, d) expectations, aspirations and hope, and e) ability to manage risk.

The RCT we propose includes randomized selection of (1) program and control wards, (2) groups within wards for “early” and “delayed” benefits, and (3) households within groups for receipt of variable sized asset transfers. In this way, we will be able to rigorously quantify the value of various types of social protection programs. Specifically, we will collaborate with Heifer International to:

1. **Measure the impact of all social and human capital transfers provided *in the absence of a livestock transfer*.** This goal is achieved by comparing the groups receiving the first package outlined above to a pure control.
2. **Measure the additional impact of the *physical capital (livestock) transfers*.** This goal is achieved by comparing the groups receiving the second package outlined above to those receiving the first package and a pure control.
3. **Analyze the heterogeneous impacts of *physical capital (livestock) transfers of variable size*.** In order to further unpack the value of asset transfers in particular, an additional level of randomization will take place among households receiving the second package: Households will be randomly selected into a “small”, “medium”, and “large” asset transfer treatment. Those assigned to the “small” treatment group will receive 1 goat, those assigned to the “medium” treatment group will receive 2 goats, and those in the “large” asset transfer group will receive 3 goats. The growing theoretical literature regarding poverty traps (Azariadis and Stachurski, 2005, Barrett, 2005, Barrett and Carter, 2013) suggests that asset shocks (positive or negative) can have permanent consequences. If a poverty trap exists, a positive asset transfer will result in permanent welfare-improving outcomes only if the transfer lifts the household asset levels above a critical asset threshold. By varying the size of asset transfer, we will potentially learn about the necessary size of transfer, which would provide an

important contribution to the literature on poverty traps, and enhance our understanding of asset dynamics in rural Nepal.

4. **Measure the *spillover effects* of Heifer International programming activities.** A critical and unique component of the Heifer International intervention is the “Pass on the Gift” requirement. It is anticipated that this requirement creates spillover effects in the community that we seek to capture.
5. **Measure the *dynamic impacts and the important of expectations* of Heifer International programming activities.** The “Pass on the Gift” requirement also provides interesting intertemporal variation that can be exploited to further our understanding of asset dynamics and the importance of human capital and expectations. Groups selected for the “early” benefits will receive the asset transfer shortly after completion of trainings and formation of savings groups, whereas the “late” (POG) group will receive the asset transfer a year and a half after trainings have been completed and savings groups have been formed. By varying the receipt of asset transfers intertemporally, our study is uniquely positioned to disentangle the differential impacts of receiving an asset, expecting an asset, and expecting no asset transfer.
6. **Where benefits are readily quantified, analyze the *cost effectiveness* of Heifer programming activities.**

De Vries (2008) outlines several observed barriers to success and keys to sustainability that Heifer has identified as critical for its goat programs. Constraints faced by potential goat farmers often include access to good breeding stock, access to veterinary services, and access to markets. Factors leading to success include organized self-help farmers’ groups, improved access to credit, and training, education, and provision of extension services. These factors have all been considered in the design of Heifer Nepal’s current program, though the mechanisms have not been rigorously analyzed.

The variegated nature of the Heifer intervention in Nepal provides a unique setting to build on the existing literature as it relates to both of the current BASIS themes: 1) financial instruments for risk management and resilience and 2) interventions that reduce barriers to adoption of improved agricultural technologies. While goats are not financial instruments in the most conventional sense, smallholders in less developed countries have a tendency to treat livestock, especially more fungible small ruminants, as a form of savings or insurance. In addition, Heifer beneficiaries are required to start saving in groups, even before receiving

the livestock transfer. In this study we will unpack the effects of different aspects Heifer's goat transfer program in Nepal.

Existing Evidence Regarding Asset Transfer Programs

International productive asset transfer programs aim to increase rural households' incomes and resilience to shocks. Livestock transfer and training schemes are especially common, perhaps due to a well-established correlation between livestock ownership and improved welfare outcomes in poor households (Alary, et al., 2011, Machicado, et al., 2012). However, productive asset transfers have not been widely or carefully studied. Of the few programs that have been studied, the impact of livestock transfers seem to depend largely on the type of livestock and the context.

Pimkina et al. (2014) find that a Heifer livestock (goats and cows) transfers (increased meat consumption, but the impact on child nutrition (as measured by wasting and stunting) was inconclusive. Furthermore, the study found that meat-goat beneficiaries had marginally statistically significant reductions in wasting and stunting, but no impact was observed among dairy cattle beneficiaries. Scott and Islam (2007) find that in an asset transfer program in Bangladesh where families could choose to invest in a range of different productive assets, 95% of study households chose to invest in livestock, primarily cattle. Of those who invested in cattle, about 19% had sold at least one cow in the 15 months after receiving it, and the value of cattle herds doubled. In an attempt to analyze the importance of human capital alongside physical capital, Argent et al. (2013) evaluate the impact of livestock asset transfers with and without training. They find that households who receive training are 56% more likely to be producing milk than those who receive asset transfers in the absence of trainings. The study's weakness lies in the absence of a control: they cannot estimate the impact of the asset transfer, only the marginal difference of training. In a related RCT study involving non-livestock assets, Bandiera et al. (2013) show that a simultaneous transfer of skills and (non-livestock) assets in Bangladesh leads to a 38% increase in income, even after assistance is withdrawn.

Unconditional single-occasion cash grants are an alternative to asset transfers, and have recently begun to receive attention among academics and in the popular press. New evidence from an RCT in Kenya suggests that recipients of a single-occasion unconditional cash grant increased investment in small businesses, increased consumption, experienced lower levels of hunger, but did not increase purchases of alcohol and tobacco (Haushofer and Shapiro, 2013). While this study found promising results for individual beneficiaries, it failed to identify any spillovers in the community at large (which is a highly acclaimed benefit of the Heifer program). In contrast to Haushofer and Shapiro (2013), a similar RCT study in Uganda finds no impact of unconditional cash grants, no impact of a loan without training after nine months, but

54% greater profits among men (but not women) when a loan was accompanied with training (Fiala, 2013). Like Bandiera et al. (2013), and Argent et al. (2013), this study suggests the importance of complimentary human capital transfers when seeking to relieve physical capital constraints.

The gap in the literature (of rigorous analyses) regarding livestock and other asset transfers is stark. Many previous studies are based on descriptive statistics from surveys, and do not offer any statistical inference. These studies also commonly have rather small sample sizes of a few hundred beneficiaries. To our knowledge, our study will be one of the most rigorous evaluations to date and fill an important gap literature.

Existing Evidence Regarding the Importance Group Savings

Microcredit has received much attention in recent years as a way in which poor people with nothing to offer as collateral can finance purchase of productive assets. Savings receives less attention, but has been proven in some instances to be an effective way for the poor to raise money to invest in productive assets. The problem, however, is that the poor face many obstacles to saving just as they face obstacles to obtaining credit. Broadly, the poor have little money to save and face great demands for any cash they do manage to earn. Just like innovations in credit have helped the poor borrow, institutional innovations in saving have helped them accumulate wealth. One class of innovations is commitment mechanisms that prevent savers from withdrawing funds until some objective is met (Ashraf, et al., 2006). Another innovation, Rotating Savings and Credit Associations, or Roscas, bring savers together and leverage social pressure and social strength to encourage savings and discourage unnecessary spending (Gugerty, 2007). In a sense, the group savings system also provides a commitment mechanism; individuals are unlikely to be able to withdraw funds for frivolous purchases because the group dictates whom can withdraw from the amassed savings.

Heifer works with beneficiary groups to establish group savings before they receive any livestock. The requirement stems from a philosophy that beneficiaries must learn to help themselves and one another before receiving help (in the form of physical assets) from the outside. One hypothesis is that savings is more important to asset accumulation than receiving a productive asset directly, such as livestock. An important aspect of this study is to estimate the effect that these savings groups combined with trainings have on asset accumulation and consumption, both after 18 and 36 months.

Existing Evidence Regarding the Importance of Aspirations and Hope

Considerable microeconomic evidence suggests that poor households frequently underinvest even when returns are high (Duflo, et al., 2009). This failure to optimize is generally attributed to binding external constraints that impede an agent's utility or profit maximization problem: thin or missing markets for outputs, inadequate vehicles for savings, and asymmetric information are examples. Recently, a new literature has emerged that considers internally manifested attributes of economic agents - issues of identity and psychology - as additional determinants of economic decision-making. Capacity to aspire is one such issue.

According to Appadurai (2004), an individual's capacity to aspire reflects his/her awareness of social structures and constraints that have traditionally inhibited others from transitioning out of poverty. Ray (2006) expands on the concept, describing aspiration "windows" and "gaps" that develop internally by observing the experiences and learning from similar individuals. Inability to bridge aspirations gaps can lead to aspirations failure, where the poor routinely underinvest

Several recent empirical studies investigate the existence and consequences of aspiration failure. Bernard et al. (2011) find evidence of aspiration failure in the fatalism exhibited by Ethiopian farmers. Laajaj (2013) refines this concept describing cause and consequence of aspirations failure, showing that the poor shorten their planning horizons due to the pain of anticipating future poverty. Studies by Macours and Vakis (2008) and Beaman et al. (2012) analyze the heterogeneous formation of aspirational capacity in response to positive exogenous shocks.

This study seeks to disentangle the importance of assets (or expectations of assets) relative to human and social capital development on aspiration formation by varying the magnitude and timing of an asset transfer and comparing to a savings-and-training only treatment group. Previous studies have typically modeled aspirations using ad-hoc indicators. We propose to use a novel instrument developed by Bernard and Taffesse (2012), a composite index summing aspirations across several weighted dimensions. This more refined measure will result in more nuanced results than previous studies have achieved.

The Heifer International Social Protection Program

Heifer is widely recognized as a global leader among organizations providing livestock transfers to poor households. Currently in its 70th year of operation, Heifer claims to have helped lift more than 20 million families worldwide out of hunger and poverty. The basic Heifer program transfers improved livestock to poor and marginalized beneficiaries. Such transfers seek to increase resilience by improving interrelated

nutritional and economic outcomes. Higher purchasing power and increased home consumption of livestock products generates increased household investment in nutrition, which has been shown to improve long-term economic outcomes. Perhaps less known is Heifer's emphasis on providing human and social capital through a series of trainings and, more recently, through facilitation of independent savings group formation. Heifer's primary objective in these activities is to help program beneficiaries build a physical/human/social capital portfolio that will provide both insurance against shocks and an avenue out of persistent poverty.

For this study we will be partnering with Heifer Nepal, the poorest country in South Asia and the 13th poorest country in the world. In recent years, Nepal has made significant strides towards poverty alleviation, but poverty persists, especially in the countryside; 55% of Nepalese earn less than \$1.25 a day, but that number climbs sharply in the rural mountain and hill districts where more than 70% of people rely on agriculture for income generation.¹ The relative importance of livestock to Nepalese smallholders in these areas has grown steadily in recent years. In the rural hill and mountain districts, livestock ownership is highly correlated with consumption of meat and income (Maltsoglou and Taniguchi, 2004), suggesting that livestock transfers may be an effective form of social protection. The largest Heifer project in Nepal is the Smallholders in Livestock Value Chain (SLVC) program, which provides the following package of benefits to rural smallholders in Nepal, consisting of the following 4 components:

1. *Physical Capital:* Beneficiaries receive 2 improved female goats. Goats possess qualities that may make them especially well suited for cargo net social protection. Because they are smaller than cattle and oxen, they offer more flexibility with respect to marketing (Peacock, 2005). Goats consume a wide range of vegetation and survive in relatively harsh conditions. In addition, women often control production and marketing decisions related to small ruminants in subsistence farming households all over the world, meaning that goat programs could especially benefit marginalized women (Valdivia, 2001).
2. *Human Capital:* Beneficiaries participate in a series of trainings, including animal management training. Rural households in Nepal commonly use traditional methods of livestock production that are often inefficient. Beneficiaries participate in a series of trainings on appropriate livestock housing, nutrition, breeding, and veterinary care—a set of simple but rarely adopted improved goat production technologies. Through the trainings, Heifer also supports beneficiaries in implementing value-based business plans that focus on the demonstrably higher quality of the improved goats raised under

¹ <http://www.feedthefuture.gov/country/nepal>

superior production systems. The goals of these trainings are greater productivity per animal, lower livestock mortality, and higher net benefits from goat rearing.

3. *Social Capital*: Beneficiaries form self-help groups and participate in values-based trainings. Through the self-help groups, Heifer aims to create a formal market structure of small-scale beneficiary farmers. Beneficiary groups are encouraged to leverage their collective bargaining power to negotiate better terms from traders, or to use their common resources to cut out intermediaries entirely. The goal is a greater share of profits accruing to the herders.
4. *Access to Savings*: Through the self-help groups, Heifer beneficiaries are required to begin group savings. Savings can be used to invest in productive assets that can then lift households out of poverty, or to mitigate shocks that could send households deeper into poverty. Heifer groups meet once a month to bring together funds and decide who will be allowed to withdraw from the account in order to purchase assets or cope with expected or unexpected costs. Priority expenses include health, education, productive assets, and home improvements that comprise a significant share of household budgets. As has been found in other instances (Gugerty, 2007), Heifer beneficiaries often find that they manage to cut costs they never thought possible in order to meet the requirements of the groups.

Two components of Heifer's program in Nepal are worth highlighting. First, Heifer operates through groups, not individuals. Although property rights over the transferred assets are granted to individuals, assets are only transferred if an individual is an active group member. Second, once capable, individuals are required to "pass on the gift" by establishing and training a new cohort who are granted offspring of the Heifer-granted goats. In this way, the Heifer asset transfer can be considered a conditional asset transfer, or likened to an in-kind zero interest loan.

The "pass on the gift" (POG) component reflects one of Heifer's objectives: sustainability and self-reliance. The concept of "sustainability" is predicated on the idea that external interventions should not incur perpetual costs on the government or donor. The Heifer model aspires to be sustainable both explicitly and implicitly. By requiring beneficiaries to "pass on the gift", Heifer employees are able to leave the community and begin an intervention elsewhere, while the impacts of the Heifer package continue to spread. Therefore, in addition to the direct asset and knowledge transfer, we might expect additional benefits for non-beneficiaries within a Heifer community who do not receive asset transfers, due to indirect positive spillover effects from the human and social capital building components of the program.

Heifer's program presents an opportunity to conduct a novel longitudinal study of how a mixed package of physical, human, and social capital transfers affect consumption, nutrition and health, income and other

economic outcomes including asset dynamics, female empowerment, expectations, aspirations and hope, and the ability to manage risk. This style of combined productive asset transfer and capacity building model is widely practiced all over the world by Heifer and myriad other NGOs. Because this type of cargo net social protection is so common, and because there is limited evidence surrounding its impacts, this study is an important step toward understanding how these asset transfers works, and to whom they are best targeted.

Research Methodology: Quantitative

Rigorously evaluating the impacts of a community-based multi-faceted social protection program like Heifer's is challenging. First, Heifer's programs are implemented at the community (ward) level. Second, within each ward the program benefits are rolled out to self-formed groups of roughly 25 individuals over the course of several years through the POG method. In this way, the program is designed to generate spillovers within and even across wards. Our methodology is designed with these challenges in mind.

The quantitative component of the study will center on a longitudinal survey of direct beneficiaries, secondary (POG) beneficiaries, and non-beneficiaries structured around a randomized control trial (RCT). To deal with the complications discussed above, the RCT will have three levels of randomization, which we describe in detail below.

(1) Randomized selection of program and control wards: Because Heifer provides public goods allocated to entire wards we must first randomize treatment at the ward level. Our study will include 51 wards across the Terai region of Nepal. Under the SLVC, Heifer brings its program to all nine wards within a participating village. To accommodate this study, Heifer has agreed to operate in single wards within a village to avoid spillovers between treatment and control wards. To select wards, Heifer will conduct a feasibility study to assess communities' needs and potential for successful project implementation. Heifer will then provide the research team with a list of acceptable wards to be selected for the program and study.² Wards will be randomly and evenly selected into either one of two primary treatment arms or a control arm. Wards in the first treatment arm will receive technical training and participate in group savings (but not receive goats), and the second group will receive technical training, participate in group savings, and receive goat transfers. To avoid spillovers from treatment wards to control wards, we will geographically stratify to ensure that nearby wards are not selected into the study.

² While Heifer does not typically commit funds multiple years into the future, we have encouraged Heifer to provide benefits to the control group after the life of the study.

From a statistical perspective, randomizing at a lower level than the ward is preferable. However, doing so would disrupt Heifer's community-based approach. Adding additional wards is cost prohibitive; The Heifer program without livestock transfers costs \$15,500 per ward, and \$22,500 per ward with livestock transfers. In the power calculations that follow, we show that clustering treatment at the ward level should yield enough power to detect impacts on outcomes of interest.

(2) Randomized selection of groups within wards for “early” and “delayed” benefits:

Within each treatment ward, all households will self-select into groups. Self-selection is usually done based on pre-existing sub-communities within the ward. Typically one or two groups initially form, and the community determines which group should receive the benefits first (directly from Heifer) based on the principal of “genuine need”. Subsequently more groups form. For our study, we will ensure that two groups form in each ward at the onset of the project. Once these two groups are formed, we will randomly decide in what order they will receive benefits. The first groups will receive benefits directly from Heifer, whereas the others will receive them via POG. Although the POG does not receive an asset immediately, they can anticipate the receipt of a future asset transfer. This random intertemporal variation will be exploited to assess the importance of expectations in altering aspirations and hope. In order to account for self-selection in group formation, during the ward-level feasibility assessment individuals will be told that a trainings and savings program may be coming to their community, making it clear that there is a 2/3 probability of program implementation in the near future. Individuals interested in participating will be asked to form groups of 25 so that self-formed groups exist in all study wards.³

(3) Randomized asset size: In the 17 wards that receive livestock transfers, we will randomly vary the number of livestock received by the direct beneficiaries. One-third of direct beneficiaries will receive one goat, one-third will receive two goats, and one-third will receive three goats. While it is unlikely we will be able to fully measure the impact of these transfers on asset dynamics (at least during the duration of the current proposed study), we are likely to observe whether households are taking initial steps out of poverty.

Table 1 shows the levels of randomization and the breakdown of groups at the three levels.

³ This follows the approach taken by Attanasio et al. (2013) to evaluate the impact of group lending in Mongolia..

Table 1: Hierarchy of the study groups.

Training and savings (T1) [125]			Trainings, savings and goats (T2) [125]				Control (C[125]			
G1 [25]	G2 [25]	G3-G5 [25 each]	G1 [25]			G2 [25]	G3-G5 [25 each]	G1 [25]	G2 [25]	G3-G5 [25 each]
			S1 [8]	S2 [8]	S3 [9]					

Notes: There are 17 sets of treatment groups such as the above. The approximate number of adult individuals in each ward, group, and subgroup is given in [brackets]. Each G1 is a direct beneficiary group and each G2-G5 is a Passing of the Gift group. Individuals in the S1, S2, and S3 subgroup receive 1, 2, and 3 goats, respectively.

In Heifer’s SLVC program, G1 beneficiaries begin technical training and group savings six months prior to receiving their goat transfers. The first POG group—G2— begins receiving group saving and training approximately 12 months after G1 receives goats. Six months later, G1 households are expected to pass some of the offspring of their goats to G2. One year after receiving goats, G2 beneficiaries begin training G3 beneficiaries and six months after that G2 beneficiaries are expected to pass goats onto G3, and so on.

Our study will include three rounds of data collection at critical points in the study timeline: at baseline before any program group starts saving, receives technical training, or receives goats ($t=0$), approximately 18 months after G1 receives trainings and begins saving and (in the case of T2) one year after G1 receives their goats ($t=1$), and approximately 18 months after G2 receives trainings and begins saving and (in the case of T2) one year after G2 receives their goats ($t=2$). Figure 2 depicts the project timeline.

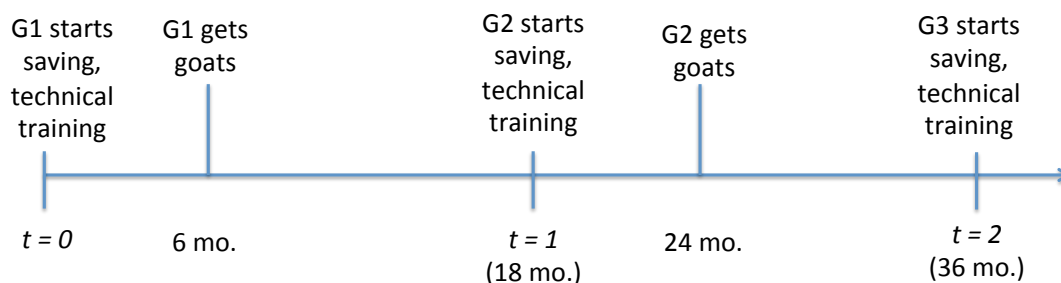


Figure 2: Project timeline

We can use difference in difference with random treatment to estimate impacts on several outcomes of interest, broadly defined: a) consumption, nutrition and health, b) income and other economic outcomes including asset dynamics, c) female empowerment (using USAID’s Women’s Empowerment in Agriculture Index), d) expectations, aspirations and hope (following Bernard and Taffessee, 2012) and e) ability to manage risk through consumption and asset smoothing. First, we can estimate the overall causal effect of being a primary beneficiary (G1) in the treatment arm that includes a goat transfer (T2) one year after receiving (an average of 2) goats as $(\bar{Y}_{T2/G1,1} - \bar{Y}_{T2/G1,0}) - (\bar{Y}_{C/G1,1} - \bar{Y}_{C/G1,0})$ and 2.5 years after receiving

a goat as $(\bar{Y}_{T2/G1,2} - \bar{Y}_{T2/G1,0}) - (\bar{Y}_{C/G1,2} - \bar{Y}_{C/G1,0})$. Second, we expect that technical training, savings, and group formation will impact beneficiaries, even with no physical asset transfer. We can estimate the impacts of the benefits of this package (T1) as we do for T2 as detailed above. The difference between the estimated effects of T1 and T2 represent the marginal effect of the livestock transfer.

The success of Heifer's programs is predicated on non-direct beneficiaries receiving assets, training, and social mobilization from direct beneficiaries through POG. We can estimate the impact of the full program on POG beneficiaries (G2) one year after they have received benefits as $(\bar{Y}_{T2/G2,2} - \bar{Y}_{T2/G2,0}) - (\bar{Y}_{C/G2,2} - \bar{Y}_{C/G2,0})$. The program could also have impacts on POG beneficiaries even before they receive benefits. We expect this to be especially true if the expectation of a transfer (physical, human or social capital) alters aspirations. We can estimate this impact over one year as $(\bar{Y}_{T2/G2,1} - \bar{Y}_{T2/G2,0}) - (\bar{Y}_{C/G2,1} - \bar{Y}_{C/G2,0})$ and over two years as $(\bar{Y}_{T2/G3,2} - \bar{Y}_{T2/G3,0}) - (\bar{Y}_{C/G3,2} - \bar{Y}_{C/G3,0})$.

It's likely that the impact of the asset transfer is nonlinear in the size of the asset transfer. Understanding whether this is true could be particularly important if an asset-based poverty trap with a critical asset threshold exists. It could also be important even in the absence of a poverty trap (or similarly, if the transfer is outside the range of a critical threshold when a poverty trap does exist.) For this reason, we are interested in estimating the relative impact of receiving three goats instead of two goats, or two goats instead of one. This may help us learn about the magnitude of transfer necessary to push a household on a trajectory out of poverty, which likely depends on initial asset levels as well. The marginal benefit of a third goat (relative to two goats) can be measured as $(\bar{Y}_{T2/G1/S3,1} - \bar{Y}_{T2/G1/S3,0}) - (\bar{Y}_{T2/G1/S2,1} - \bar{Y}_{T2/G1/S2,0})$ after one year, and as $(\bar{Y}_{T2/G1/S3,2} - \bar{Y}_{T2/G1/S3,0}) - (\bar{Y}_{T2/G1/S2,2} - \bar{Y}_{T2/G1/S2,0})$ after two years. The relative benefit of two goats instead of one can be estimated similarly. The relative benefit of one goat compared to zero is estimated similarly, but is instead compared to the control as in the estimated impacts for the average livestock transfer (or to T1 if the interest is in the marginal impact beyond basic savings and training). In this way we estimate the marginal effect of 1, 2 or 3 goats.

Sample Size and Power Calculations

As stated earlier, our sample will span 51 wards in the *Terai* region with 17 in each of two primary treatment arms and 17 in the control arm. Within each ward, there are approximately 125 households; 25 are direct beneficiaries and 100 are POG beneficiaries.⁴ This implies that there are $2 \times 17 \times 25 = 850$ direct

⁴ There are 27.5 people in Nepal and 3,915 Village Development Committees, each with nine wards. This works out to be 7.8 people per ward, on average. In the *Terai* region the average household size is 6, so the average number of households per ward by this rough calculation is approximately 130.

beneficiaries in our sample frame, $2 \times 17 \times 100 = 3400$ POG beneficiaries, and $17 \times 125 = 2125$ control households. Our limited budget prevents us from including all of these $850 + 3400 + 2125 = 6375$ households in our sample, so we will select a stratified random sample of 12 households from each group of 25. Our total sample size will therefore be approximately $12/25 \times 6375 = 3060$ households.

Within the treatment arm that receives livestock (T1) we will have $17 \times 25 = 425$ direct beneficiaries. Approximately 142 will receive one goat, 142 will receive two goats, and 143 will receive 3 goats. We can make pairwise comparisons between individuals receiving different goat quantities using 284 households, with treatment assigned at the individual level.

We are looking at a variety of outcomes, and there is sparse documented evidence as to what effects we might expect to find, what the variance in outcomes might be, and what the intra-village (treatment cluster) variation might be. We draw on findings from two other studies of livestock transfer programs to conduct power calculations. Bandiera *et al.* (2013) study the impact of the targeting the BRAC Ultra Poor program (TUP)—an asset transfer and capacity building program in Bangladesh— on occupational choice, labor supply, earnings, asset value, and expenditures using an RCT. The value of the asset transferred under the TUP program is similar to that of the goats transferred by Heifer in Nepal. Pimkina *et al.* (2014), measure the impact of a livestock transfer program in Rwanda on health outcomes using propensity score matching.

Table 2: Power calculations with 17 wards and 1020 households in each arm

Outcome	Mean at baseline	Std. dev.	Treatment effect	MDE $\rho=0$	MDE $\rho=.10$	MDE $\rho=0.25$	MDE $\rho=0.5$
Asset transfer and capacity strengthening program for women in Bangladesh (Bandiera <i>et al.</i> 2013)							
Livestock value (Tk)	940.3	3432	9984 ^a	425.5	1118	1689	2350
Expenditures (Tk)	9921	4411	721 ^a	547	1437	2170	3020
Earnings (Tk/hr)	4.08	4.24	.641 ^b	0.53	1.38	2.09	2.90
Savings (Tk)	121.4	400 ^c	982.7 ^a	49.6	130.3	196/8	273.9
Health outcomes of a livestock transfer program in Rwanda (Pimkina <i>et al.</i> 2014)							
Meat/month (kg)	0.27	0.47	0.2	0.06	0.16	0.23	0.32
Weight for age	-.68	1.08	0.4	0.13	0.35	0.53	0.74
Weight for height	.23	1.04	0.47	0.13	0.34	0.51	0.71

Notes: $\alpha = 0.05$, $\beta = 0.2$. MDE is the minimum detectable effect and ρ is the intra-cluster correlation. For the Bangladesh study ^a signifies 2-year impact, ^b signifies 4-year impact; 80 Tk = \$1 US; ^c Standard deviation for baseline savings is unavailable so we use conservative estimate. For the Rwanda study, means and standard deviations are approximate midpoints between the two study regions in Pimkina *et al.* (2014).

Table 2 shows power calculations for the ward-level randomization of our study. Because treatment is assigned at the ward level, we present calculations based on varying levels of intra-cluster correlation ($\rho = 0, 0.1, 0.25, 0.5$). Based on these calculations, we should be able to detect changes in livestock value and savings even if ρ is high. If $\rho < 0.25$, which is completely reasonable, we should be able to detect impacts on health outcomes. The power calculations suggest that detecting changes in earnings and expenditures will

be difficult. However, because we will have pre- and post- treatment data we view these power calculations as very conservative; within sample noise in outcome variables will diminish when we take differences.

Table 3 shows power calculations for the individual-level randomization of asset size. The results are similar as for the ward-level randomization. Admittedly, we expect for these treatment effects to be smaller than those of a transfer program as a whole. But again, we view these power calculations as conservative considering we will have pre- and post- treatment data.

Table 3: Power calculations with 142 households each randomly assigned one, two, or three goats ($\alpha = 0.05$, $\beta = 0.2$)

Outcome	Mean at baseline	Std. dev.	Treatment effect	MDE $\rho=0$
Asset transfer and capacity strengthening program for women in Bangladesh (Bandiera et al. 2013)				
Livestock value (Tk)	940.3	3432	9984 ^a	1167
Expenditures (Tk)	9921	4411	721 ^a	1498
Earnings (Tk/hr)	4.08	4.24	.641 ^b	1.44
Savings (Tk)	121.4	400 ^c	982.7 ^a	135.8
Health outcomes of a livestock transfer program in Rwanda (Pimkina et al. 2014)				
Meat/month (kg)	0.27	0.47	0.2	0.16
Weight for age	-.68	1.08	0.4	0.37
Weight for height	.23	1.04	0.47	0.35

Notes: MDE is the minimum detectable effect and ρ is the intra-cluster correlation. For the asset transfer program in Bangladesh, ^asignifies 2-year impact, ^bsignifies 4-year impact; 80 Tk = \$1 US; ^cStandard deviation for baseline savings is unavailable so this is a conservative guess. For the livestock transfer program in Rwanda, means and standard deviations are approximate midpoints between the two study regions in Pimkina et al. (2014).

Research Methodology: Qualitative

The qualitative research component of the study will complement the quantitative component to provide a deeper understanding of the impacts of the Heifer program on welfare indicators, especially female empowerment and aspirations. This component of the study will focus on farmers' perceptions—both beneficiaries and non-beneficiaries—of the perceived impacts of the program on individual, household, and community welfare, and on the control of assets within households. While most of the informants will be women, men will also be interviewed. The qualitative research will be conducted in four wards where the Heifer SLVC program has been implemented and one where it has not. These sites will cover diversities in terms of ethnicity/caste as well as ecological regions that may have some bearing on the effectiveness of the program.

One major focus of this study is the intersection of gender and caste/ethnicity, religion, class and other vectors (e.g., generation), and how the intersection affects the aspirations and ability of specific women to benefit from the goat program. A related issue is how the distribution of property rights (in terms of use rights, rights to benefit financially from, and control or decision-making rights) over assets (land, livestock,

etc.) and labor among different members of a household affects the aspirations and ability of women (in their social specificity) to benefit from the asset transfer. The study will also attempt to explore the usefulness of USAID's Women's Empowerment in Agricultural Index in understanding whether and how women are empowered through the goat project, mainly by asking for specific, concrete, actual cases of decision-making concerning participation in the goat program, disposal of income, assets, etc.

The following three instruments will be used for the qualitative data collection: focus group discussions, semi-structured in-depth interviews, and life-histories, as described below:

1. Focus group discussions (FGDs) will be used as a quick way of gaining a broad understanding of the village social structure and power dynamics; the major issues (economic, social, political, etc.) that concern households; and farmer views of and experiences with the Heifer goat program. In particular, FGDs will help researchers provisionally understand the history of development programs in that locality, local power dynamics that help or hinder certain types of women from benefitting—or benefitting more— from the program, and factors affecting inclusion (and exclusion) in the initial and subsequent cohorts of beneficiaries. FGDs will also seek to determine the non-financial benefits of participating in the program, such as a sense of accomplishment, confidence, voice within and outside their households, hope, and other indicators of empowerment.

Because the qualitative study will begin after the first round of quantitative data collection, the FGD instrument will also be used as a preliminary exploration of some issues and puzzles that analysis of the survey data presents. The results will help the research team fine-tune the questions that will be used in the follow-up quantitative survey questionnaire, in-depth interviews and life-histories.

2. To gain a deeper understanding of the dynamics and processes of the goat program and whether and how beneficiaries actually benefit from the program—not only in terms of the objectives of Heifer and other donor agencies, but also other unintended consequences—purposely selected informants will be interviewed in depth, regarding their perceptions of the impact of participating in the program on their lives, especially their economic and social welfare and security, their aspirations, and how they think the program could be improved. The in-depth interview protocol will explore intra-household dynamics between men and women and perceptions of different classes/categories of women that impact how specific women benefit from the project (e.g. control over the transferred assets, income, and labor burdens). Semi-structured, in-depth interviews will also be conducted with project officials.

3. Life-histories of members of several purposively selected families in all five research sites will be collected to record asset accumulation and perceived changes in their lives, over a certain period of time, beginning with a few years before they joined the program until the period of research. One aim of this tool is to see whether and how beneficiaries—mainly women—explain changes, the importance they give to the goat program, or whether they attribute life changes to other causes and programs.

Contribution to USAID Objectives and Initiatives

The primary goals of Heifer directly parallel those of Feed the Future (FTF): to reduce poverty and hunger. USAID and Nepal FTF seek to increase agricultural production by introducing high value crops, providing training and technical support, and linking farmers to markets by creating and strengthening value chains. While Heifer deals primarily with livestock rather than crop agriculture (at least directly), the deeper goals of asset transfer programs are to provide smallholders with the knowledge and tools to rise out of poverty and reduce hunger. These goals fall directly in line with USAID objectives and the following FTF focus areas:

1. Inclusive agricultural sector growth: FTF strives to increase agricultural production and incomes of men and women in rural areas. Livestock, as productive assets, have the potential to increase the economic resilience of vulnerable rural communities. Livestock byproducts can also help improve agricultural productivity. In Nepal, more than 70 percent of the population depends on agriculture for their livelihoods.
2. Gender integration: Gender is a priority of the USAID Nepal Mission, due to historically regressive gender norms in the country. Male migration, especially from hill areas, makes it especially important for women to manage and benefit from new development programs. Asset transfer programs, including Heifer's, often target women with the explicit goal of increasing their status in the household and the community. This project will examine the extent to which women are able to participate in the programs, build and control their assets and income, and how this impacts their aspirations.
3. Improved nutrition: Asset transfer programs seek to increase resilience by improving both nutritional and economic outcomes. Higher purchasing power combined with home consumption of livestock products allows households to make investments in nutrition, and investments in nutrition have been shown to improve long-term economic outcomes.
4. Research and capacity building: This research seeks to add to our understanding of how asset transfers and human and social capacity building programs contribute to each of the focus areas above. Through

this research we also aim to increase the capacity of Nepā School of Social Sciences and Humanities in Nepal, Heifer International and other NGOs, and US-based graduate students.

A more nuanced understanding of the mechanisms driving results of the Heifer project will have direct applications to the development of Feed the Future program in Nepal and elsewhere.

Collaboration and Capacity Building

This collaboration brings together researchers from two U.S. public universities—Montana State University (MSU) and the University of Georgia (UGA)— the International Food Policy Research Institute (IFPRI), and the Nepā School of Social Sciences and Humanities. As the project consists of both a quantitative component and a qualitative component, it requires a team of diverse backgrounds.

Sarah Janzen and Nick Magnan are development economists and Sudhindra Sharma is a development sociologist. Drs. Janzen, Magnan, and Sharma will work together on the quantitative impact evaluation of Heifer’s programs. Together, they will work with Heifer staff in Nepal to design and carry out the experimental evaluation of the Heifer program.

Rajendra Pradhan, an anthropologist, and Ruth Meinzen-Dick, a development sociologist, will lead the qualitative assessment related to welfare outcomes and empowerment. Drs. Pradhan and Meinzen-Dick have been collaborators since 2000, working on projects such as *“Transferring Water Out of Agriculture: Equity, Landscape, and Livelihood Consequences in South Asia”*, and have co-authored many journal articles, book chapters, and policy papers on water and property rights.

A major avenue through which capacity building will take place is through three workshops that will be held at Nepā School of Social Sciences and Humanities. Participants will include Nepā School scientists and students, employees from Heifer International, and other stakeholders. Workshop curricula will reflect the needs of Nepā School, which includes research methodology, proposal writing, and article writing. This project will also help build the capacity of Nepā School students, faculty, and researchers in rigorous quantitative analysis, both through workshops and (primarily) participation in the research project itself.

Several students will be trained through this project. The project will directly support the studies of 4 Nepā students, one Ph.D. student in Agricultural and Applied Economics at UGA, and one M.A. student in Economics at MSU. Efforts will be made to recruit students from developing countries for these positions. In particular we will attempt to recruit qualified Nepalese graduate students from Nepā School or the Institute of Agriculture and Animal Science at Tribhuvan University, from where two recent Ph.D. graduates

of UGA received their undergraduate training. The support from this project will be an important contribution to the training of these students.

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ANTICIPATED OUTPUTS

We anticipate that the results emerging from this study will be of interest to stakeholders in Nepal, to development specialists worldwide, and to a variety of academic and other researchers. We envision several means of disseminating these results to relevant audiences.

1. The results will have direct implications for Heifer International's program design. Before the project completion, we will prepare a report for Heifer International that clearly outlines our findings and presents suggestions for improving operations in Nepal and elsewhere. Similar presentations will be made at other livestock-based organizations, including the International Livestock Research Institute and Global Health Action, an organization who similarly provides goat transfers to poor households in Haiti.
2. We will prepare a series of reports and presentations for the USAID Mission in Nepal throughout the life of the project, highlighting our findings. We will aim to not only report on the impacts of the Heifer program, but also draw larger lessons that can be applied to various poverty alleviation and development programs in the country.
3. Three workshops will be organized and held at Nepā School of Social Sciences and Humanities. These workshops will cover topics such as research methodology, proposal writing, and article writing. Participants will include Nepā School scientists and students, Heifer International employees and other stakeholders.
4. Several students will be trained through this project. The project will directly support the thesis/dissertation research of one University of Georgia PhD Agricultural and Applied Economics students, and one Montana State University M.A. Economics student. These theses will tackle specific questions within the broader scope of the project and the data collected. This support will be an important contribution to the training of these students and their theses will provide another avenue of dissemination. A very important contribution of the grant is that it would support two Nepā School students per year for four months each year of the project. The students would participate in the project as part of their certificate program, working closely with Dr. Pradhan, Dr. Sharma, and other Nepā faculty.
5. We anticipate several academic publications emerging from this project. Potential journals include top economic general interest and field journals (such as the American Economic Review or Journal of Development Economics), World Development, Journal of Development Studies, Agricultural Systems and Gender & Development. In the early stages of these publications, we will present at

various academic conferences in the USA and possibly in Nepal such as the American Agricultural Economics Association Annual Meeting, the Northeast Universities Development Conference, the International Evaluation Association Meeting, and the Annual Social Science Baha organized international conference on Nepal and the Himalayas. As evidence continues to emerge, results will be distributed through IFPRI's discussion paper series and policy briefs series. We also look forward to using the BASIS network as a platform for sharing this evidence.

6. After the project's completion (including publications), the dataset will be made available to the general public on IFPRI's data portal.

ANTICIPATED IMPACTS

The ultimate aim of this project is to learn more about how asset and human capital transfers can be used to improve the livelihoods of the rural poor in Nepal and beyond. Our research conclusions will therefore help improve existing governmental and non-governmental asset transfer programs, as well as contribute to the debate of what types of assets work best, and under what conditionalities, if any.

Through this research, we seek to answer three primary research questions: What is the impact of a standard Heifer program (with livestock transfers) especially with regard to health and wealth, female empowerment, aspirations, and ability to cope with risk? What is the impact of savings and training in the absence of a Heifer goat transfer, especially with regard to health and wealth, female empowerment, aspirations, and ability to cope with risk? What are the spillover effects to the community that arise from a Heifer intervention? By answering these questions, this project will:

1. Inform the program design of Heifer International and other similar asset transfer programs. Heifer is the world leader in livestock transfer programs, and we therefore expect other organizations to learn from the results of this study. This impact will be achieved through clear communication of findings in the form of several briefs, and a final presentation and report.
2. Contribute to the policy-relevant discussion regarding 1) the value of livestock training and transfer programs like Heifer International. This includes comparing the impact, potential for sustainability and costs of productive asset transfer programs to single-occasion cash block grants, regular cash transfers, and other non-livestock asset transfers, 2) the value of savings with training as a financial instrument for risk management and resilience. This impact will be achieved through two primary channels. The first channel works through the academic community in the form of academic journal articles and conference presentations. The second channel works through policy

dissemination and outreach, which will primarily take place through IFPRI and BASIS in the US, and through Nepā School of Social Sciences and Humanities in Nepal.

3. Increase research and evaluation capacity of the Nepā School of Social Sciences and Humanities in Nepal and Heifer International as well as prepare U.S.-based students for careers in international development and program evaluation. This will be achieved through close collaboration among PIs, 3 workshops held at Nepā School, and student training in both the US and Nepal.

Timeline

The timeline allows for three rounds of quantitative data collection and analysis (household surveys), and one round of qualitative data collection and analysis (focus group discussions, in-depth interviews and life-history surveys). The household surveys are planned around three critical points in the Heifer project's timeline: 1) $t=0$: at baseline before any program group starts saving, receives training, or receives goats 2) $t=1$: approximately one year after G1 receives their goats – 18 months after G1 and G2 receive trainings and saving at $t=0$, and 3) $t=2$: approximately one year after G2 receives the “pass on the gift” goats from G1 – 36 months after $t=0$. Qualitative data collection and analysis will take place between the baseline survey and the first follow-up survey so that it may also inform follow-up survey design. Although the project spending will be complete by September 2017, data collected near the conclusion of the study will be analyzed after September 2017 with findings disseminated at a later date.

Fiscal timeline for Heifer evaluation			
FY 2014	Mar 1	2014	Project implementation begins, write project summary for BASIS brief
	March	2014	Initial Scoping visit with PIs and Heifer personnel in Nepal
	April	2014	Finalize methodology, literature review, complete IRB process
	April-May	2014	Finalize survey design, select treatment and control villages
	May-July	2014	Enumerator Training, Sample selection, Baseline survey
	July-Aug	2014	Heifer administers formal training sessions for selected beneficiaries
	July-Sept	2014	Baseline data cleaning
FY 2015	Oct-Dec	2014	Baseline data analysis
	Jan	2015	Group 1 receives goat transfers
	Jan-Sept	2015	Qualitative fieldwork
FY 2016	Oct-Dec	2015	Follow-up survey design
	Jan-Mar	2016	Enumerator Training, First follow-up survey
	Apr-June	2016	First follow-up survey data cleaning
	July	2016	Goats transferred from Group 1 to Group 2
	July-Sept	2016	Data analysis
FY 2017	Oct-Dec	2016	Short run impact papers written and submitted for presentation at academic conferences, Policy briefs written.
	Dec-Mar	2016-2017	Short-run impact papers submitted for publication in academic journals, IFPRI discussion paper published, BASIS Brief written.
	Apr-June	2017	Second follow-up survey design
	July-Aug	2017	Enumerator Training, Second follow-up survey
	Sept	2017	Second follow up survey data cleaning Project spending ends
FY 2018	Oct-Dec	2017	Second follow up survey data cleaning
	Dec	2017	G3 receives goats
	Jan-Sept	2018	Data analysis, including impact of G1 goat transfers vs. impact of G2 goat transfers. Long-run impact papers written and submitted for presentation and publication.