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Evaluation of a Livestock Financing Project in Bangladesh: Navigating Operational, Environmental, and Behavioral Challenges

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Smallholder farmers in low- and middle-income countries have limited access to finance, due to the paucity of banks and other financial institutions in rural areas (e.g. Demirguc-Kunt et al., 2022). As a result, banks and other formal financial institutions tend not to know much about farming as a business, and therefore they hesitate to extend credit to farmers (Barrett et al., 2022). Such reluctance is often attributed to the elevated costs and risks linked with small, geographically dispersed farms, as well as the farmers' lack of collateral (Dorward et al., 2009).

Microfinance has emerged as a crucial intervention in bridging this gap. However, the fixed and rigid repayment structures of microfinance institutions (MFIs) often clash with the seasonal nature of agricultural production. This mismatch creates financial strain for farmers, who must manage cash flows that are inherently unpredictable due to factors like weather variability and market fluctuations (Armendáriz & Morduch, 2010). These challenges underscore the need for more flexible and tailored financial solutions.

In response to these challenges, innovative financial solutions such as profit-sharing models and asset-based financing are being explored. The International Food Policy Research Institute (IFPRI) and the CGIAR Research Initiative on Rethinking Food Markets, in collaboration with WeGro, an ag-/fin-tech start-up in Bangladesh, are evaluating a livestock fattening financing scheme. The scheme works as follows. WeGro offers a contract to farmers in which WeGro lends money to a farmer to purchase a young cow, and the farmer then feeds and fattens the cow until it is ready to sell for meat. WeGro and the farmer

then split the profits from the livestock fattening evenly, after some small, additional costs (e.g. insurance) are paid.

Such livestock financing models hold significant potential for enhancing farmer welfare. By providing essential assets and a share in the profits, these models not only possibly boost the farmers' operational capacity but also shift a portion of the risk from the farmer to the financier. This risk-sharing aspect is crucial, as it alleviates the financial burden on farmers, particularly in times of uncertainty or poor yields.

This model is similar to sharecropping arrangements, in which farmers borrow land from landholders, and split revenue from the harvest. Sharecropping can also be considered a risk sharing agreement between the landowner and the farmer (e.g. Eswaran and Kotwal, 1985; Otsuka, Chuma, & Hayami, 1992). Recent literature continues to explore and validate the dynamics and implications of sharecropping in various contexts (Das, de Janvry, & Sadoulet, 2019). In this context, we can think of the cow as the "land" and the sale of that cow as the "harvest." By aligning incentives and sharing risks between WeGro, the financier, and farmers, the scheme has the potential to improve productivity and financial resilience for smallholder farmers who participate.

In addition to employing a profit-sharing approach in agricultural finance, WeGro's model also represents an innovative form of asset-based financing. Because WeGro purchases livestock directly for the farmers instead of providing cash credit, they align their model with the principles of asset-based microfinance. This approach is advantageous not only for the farmers but also for the financiers, as it is less risky due to the less liquid and fungible nature of the assets relative to cash. Asset-based financing, where investments are tied to specific assets like livestock, offers a more secure form of collateral for financiers. The tangible nature of these assets provides a form of security that cash credits lack, reducing the risk of default and ensuring a more stable investment. This concept is supported by the study of Jack et al. (2016), which discusses the implications of transaction costs and incomplete contracts in the market for technology in Kenya, highlighting the benefits of asset-based approaches in reducing risks associated with lending and investment. Furthermore, the effectiveness of asset-based financing in microfinance contexts is also illustrated in the work of Bari et al. (2021) in Pakistan, which demonstrated how financing tied to specific assets can offer a more flexible and risk-tolerant approach compared to traditional microfinance products, further validating the practicality and benefits of models similar to WeGro's.

Relevant to this work, LightCastle Partners, through their "Patient Capital" initiative, have implemented a model of asset-based equity financing in Bangladesh (LightCastle Partners, 2022). This model involves direct investments in tangible assets, such as livestock, for small and medium-sized enterprises (SMEs). One of the key features of this model is its focus on providing both financial capital and capacity development for entrepreneurs. In the LightCastle model, the initial investment for purchasing assets is made by the investor, while the investees contribute through their labor, time, and resources, such as shed

space for livestock. This collaborative approach ensures a shared commitment to the success of the venture. The returns from the investment are then divided, with a significant portion going to the entrepreneur, thereby incentivizing them to maximize the productivity and profitability of the assets. This model has shown promising results in enhancing the income and growth potential of CMSMEs, demonstrating a sustainable and adaptable approach to agricultural financing.

In Bangladesh, raising the incomes of smallholder farmers, who constitute approximately 40% of the agricultural labor force, plays a pivotal role in poverty alleviation. The ongoing research by IFPRI and CGIAR with WeGro aims to scrutinize the impact of distinct credit models on the income and overall well-being of farming households in Bangladesh through their involvement in the livestock sector. Beyond raising the incomes of smallholders, this study also seeks to address gender disparities in smallholder households, specifically around livestock raising where women are involved in much of the physical labor. The study examines the question of how altering the gender of the contract holder may influence women's empowerment within the household.

In summary, effectively addressing the financial constraints of smallholder farmers requires innovative approaches that extend beyond traditional microfinance. The ongoing research by IFPRI and CGIAR with WeGro, along with studies on asset-based financing, can offer valuable insights into alternative models that could better serve the unique needs of smallholder farmers. These models, by offering more flexibility and risk-sharing, hold the potential to lead to increased household income and empowerment in the agricultural sector.

Context and Baseline Characteristics

We are conducting our study in 105 villages in the northwestern districts of Joypurhat, Bogura, Rangpur, and Gaibandha in Bangladesh. The choice of these districts was driven by their high engagement in dairy farming and cattle rearing, activities that are central to the economic fabric of these regions (Bangladesh Bureau of Statistics, 2019).They are also characterized by a notable presence of smallholder farmers, a demographic that is crucial for examining the impact of innovative financing models on income generation and financial inclusion. The prevalence of poverty and income disparities in these districts further underscores the need for financial solutions that can enhance the economic well-being and resilience of smallholder farmers, particularly in the face of financial and environmental shocks (World Bank, 2020).

The sample for this study comprises 1,517 households, selected based on specific criteria set by WeGro. These criteria included essential prerequisites such as having adequate facilities to shelter a cow and possessing prior experience in livestock rearing. Additionally, these households demonstrated a willingness to engage in a study where various forms of livestock financing could possibly be offered. The

baseline survey, conducted between February and May 2023, shows that the average weekly food expenditure is 1950.39 taka per household, or 508.75 taka per capita. The total per capita weekly consumption expenditure (food and non-food) in the study sample is 138.54 taka. The average adult female has completed 7.77 years of education, and the average male has completed 7.8 years of education.

A key aspect of the study is the involvement in livestock rearing, which is a critical income-generating activity in these districts. On average, females spend about 2.52 hours per day on livestock rearing, while males contribute 1.71 hours daily. This gender disparity in labor contribution is despite the fact that men manage the financial and marketing aspects of livestock rearing, while tasks center on the physical labor. This gender disparity in labor contribution is reflective of the broader socio-economic dynamics in rural Bangladesh. When considering all earning activities, females work an average of 5.59 hours per day, compared to 10.55 hours for males, highlighting the gendered nature of labor distribution in these regions.

Female empowerment

At baseline, female mobility and empowerment in the study sample reveals insightful trends about women's roles in decision-making within households in the northwestern districts of Bangladesh. These findings can be contextualized with broader trends in the country and similar studies.

About 46% of women in the sample have sole decision-making authority over the use of their own earnings, a significant indicator of financial autonomy. However, their control over their husband's earnings is markedly lower, with only 2% having sole decision-making power. These figures rise to 83% and 55% when considering whether women have any influence on these decisions. These disparities highlight a common trend in patriarchal societies where women have less control over family finances, as observed in other studies conducted in South Asia (Kabeer, 2001).

In health care decisions, 10% of women make decisions independently about their own health and children's health, while 43% have at least some influence in their own health care decisions, and 55% have at least some influence into children’s health care. However, this finding is relatively low relative to national averages in Bangladesh, where approximately 30% of women reportedly have full autonomy in health-related decisions (National Institute of Population Research and Training (NIPORT), 2016).

For household purchases, only 4% of women in the sample make major purchasing decisions alone, and 23% make everyday household purchase decisions independently. This is consistent with findings from the Bangladesh Demographic and Health Survey, which indicates limited female autonomy in household financial decisions (NIPORT, 2016). However, we find that 58% and 67% of women have at least some influence into these two types of decisions respectively, suggesting higher levels of consultative agency for women.

In terms of agricultural decisions, women's autonomy is notably low, but highest when it comes to livestock care, with 33% of women reporting they make these decisions independently. However, only 3% make sole decisions on the purchase or sale of livestock. These numbers rise to 81% for the care of livestock and 49% for the purchase/sale of livestock when considering whether women have any influence on the decisions. These differences highlight women's role in caring for livestock while they have less of a say in the actual marketing activities related to livestock. Regarding crops only 1% make sole decisions on crop inputs or the harvest/sale of crops, and these numbers rise to 17% and 19% when considering whether women have any influence. This aligns with other statistics on women's decision making in agriculture in LMICs, which finds that women often have limited decision-making power (FAO, 2011). However, these numbers also highlight that women have a greater in role in livestock than in crops, suggesting that livestock is an area in which empowering women is possible. In summary, while women in the study areas exhibit a degree of autonomy and influence, particularly in financial and health-related decisions, their empowerment levels are still constrained by societal norms and structures, as is common in many parts of rural South Asia.

Experimental Design and Program Implementation

In our study, we have employed a cluster/block randomized controlled trial (RCT) encompassing 105 villages across 15 blocks. These villages have been randomly assigned to one of three groups: a control group (C), a profit-sharing model group (T1), and a loan contract group (T2). The total sample size currently includes 1,517 households, with the control and profit-sharing groups each comprising approximately 650 households, while the loan contract group includes 212 households. The smaller size of the loan contract group is intentional, as the primary focus of this research is to evaluate the impact of a loan product relative to the profit-sharing model, which is the core business model of our implementing partner, WeGro.

At the household level, within both T1 and T2 villages, the offer of credit or profit-sharing is extended to either the husband or the wife, based on a household-level randomization process that is stratified by village. For households in the profit-sharing contract group, the recipient of the offer will have a bank account opened in their name, where proceeds from sales will be deposited. In contrast, for the debt contract group, the individual receiving the contract offer is responsible for repaying the loan.

Eligible households were determined through a village listing survey, and a sample of 10 households per village was drawn from those eligible, with whom the baseline survey was conducted. Following the baseline survey, households in the treatment villages are visited by WeGro representatives to explain the program and confirm final eligibility. For those who choose to participate, the program unfolds as follows: a bank account is opened for the contract holder, who is randomly determined to be either a man or woman. Participants then visit a market with WeGro staff to select a cow for purchase, which WeGro

procures on their behalf. The farmers are responsible for caring for the cow until it is ready for sale, at which point they can sell the cow either back to WeGro at a guaranteed price or in the open market at a potentially higher price, with WeGro representatives accompanying them.

All participating farmers have insurance coverage for cow mortality, with half of the premium cost borne by them. Upon sale of the cow, typically after a 5-month period, farmers in the profit-sharing group receive two-thirds of the profit, calculated as the difference between the purchase and sale price, deposited into their bank accounts. Those in the loan group repay the initial cost of the cow plus a 24% annual interest rate (similar to the annual interest rate in loans offered by MFIs). The cattle rearing cycle usually lasts 5-6 months, and farmers have the option to re-enroll in the program after selling their cows. The evaluation will cover two such cycles, after which WeGro plans to introduce the program in control villages without prior notice, to minimize any anticipation effects.

Operational, Environmental, and Behavioral Challenges faced in this Project

As we progress with our research, it has become increasingly clear that implementing a project of this nature comes with a variety of challenges. These challenges, which affect different aspects of the project, have significant implications for both the research outcomes and the practical application of the financing models being evaluated.

Challenges with Working with Farmers: The engagement with farmers revealed a spectrum of responses and concerns. Some farmers expressed reluctance to agree to the proposed conditions, citing fears such as potential theft of livestock. Others preferred to delay their participation, aligning it with specific agricultural seasons. Health concerns about the livestock, particularly diseases like Lumpy Skin Disease, and eligibility issues like the unavailability of suitable cowsheds, posed significant barriers. Financial constraints, including feed costs and reluctance to incur additional expenses for insurance and medical care, further deterred participation. Additionally, migration plans and prior independent cow purchases led some farmers to opt out of the program.

Challenges Arising from Natural Disasters: Natural disasters significantly disrupted the project. Heavy rainfall created a scarcity of cows in local markets, and a flood in Dhunot Upazila resulted in a shortage of cattle feed, leading to farmers' reluctance to acquire cows from the company. These events not only disrupted the supply chain but also affected the farmers' capacity and willingness to participate in the program, leading to delays and adjustments in the project timeline.

Challenges Due to Political Instability: The political landscape in Bangladesh, especially during the pre-election period, introduced additional complexities. The demands for a free and fair election led to

various forms of political activism, including strikes and blockades by opposition parties. A notable nationwide strike significantly reduced public activities and access to cattle markets, complicating the logistics of the project. This political instability necessitated adaptations in project planning and execution to navigate these unforeseen circumstances.

Challenges with Funding Amid Political and Economic Uncertainty: WeGro is facing significant funding challenges, a common issue for many start-ups in the current global economic downturn. This funding crunch is largely due to increased investor caution, fueled by geopolitical tensions, the lingering impacts of the COVID-19 pandemic, and a general economic slowdown. These factors have led investors to prefer more established businesses over start-ups, which are seen as higher risk. For WeGro, operating in Bangladesh, these challenges are intensified by the uncertainty surrounding the upcoming national elections and ongoing political tensions. This political instability, coupled with concerns about the country's economic prospects, has notably affected WeGro's peer-to-peer (P2P) fundraising model. The platform relies on individual investors choosing specific projects, but the uncertain economic and political climate has led to a marked decrease in P2P investments. This decline in investment is a significant hurdle for WeGro, requiring strategic approaches to funding and efforts to bolster investor confidence amidst a challenging and uncertain market environment.

Operational Challenges with a Newly Established Start-up: Collaborating with a recently established fintech company that is learning about agriculture created some operational challenges that led to some delays that, in retrospect, could have been anticipated. These challenges are related to learning on the ground with the implementation of a large project, such as estimating the number of staff needed to correctly implement such a project. Over time, these difficulties have worked themselves out, but were not expected at the time.

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