Planting, Harvest, and Hope: Agricultural Production, Food Security, and Migration Aspirations*

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Abstract

This paper examines how seasonal variation in agricultural production shapes migration aspirations among rural households in Nigeria. Drawing on rich household panel data from the 2023–2024 wave of the Nigeria General Household Survey Panel (GHS-Panel), we exploit within-season variation in harvest outcomes and migration intentions to estimate the short-run behavioral response to realized agricultural productivity. Our findings reveal a robust inverted U-shaped relationship: migration aspirations initially rise with improvements in harvest value but decline once households reach higher levels of productivity. This non-monotonic pattern reflects the joint influence of rising capability and diminishing incentive to migrate. Further analysis identifies food insecurity as a key moderating mechanism. Households experiencing moderate-to-severe food insecurity are significantly more responsive to agricultural shocks, with migration aspirations rising more steeply following poor harvests. These findings provide new evidence and offer actionable insights for rural development and migration management policies. By linking food security, agricultural outcomes, and migration intentions within the same season, this study highlights the dynamic nature of rural mobility preferences in response to production-based livelihood risks.

Keywords: FIES, Nigeria, Harvest Value, Linear Probability Model.
JEL Codes: O13, O15, Q12, Q18, R23.

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1 Introduction

There is perhaps no decision more fundamental for rural households in low- and middle-income countries than whether to migrate or to remain rooted in their communities. Migration matters. It is one of the most important tools for rural households to mitigate risks, smooth consumption, and improve living standards—particularly in low- and middle-income countries (Bryan, Chowdhury and Mobarak, 2014; Lagakos et al., 2020; Lee, 2021). When families migrate, communities are transformed, local economies shift, and lives are irreversibly reshaped (Carling, 2002; Clemens and Postel, 2018; de Haas, 2021). As a key equilibrium mechanism for reducing spatial disparities, migration also plays a central role in shaping a country's broader economic development (Bryan and Morten, 2019). However, there is a puzzle that remains not fully resolved: What makes rural households aspire to leave in the first place?

A large body of research—beginning with the seminal work of Harris and Todaro (1970)—has sought to answer this question. Growing evidence shows that migration aspirations are sensitive to local economic outcomes, especially in agricultural-dependent communities (Taylor and Martin, 2001; Schewel and Fransen, 2018; Hagen-Zanker et al., 2024). Indeed, agriculture profoundly shapes household decisions in rural economies, acting simultaneously as both an anchor and a catalyst for change, with agricultural productivity being a key driver of migration decisions among agriculture-dependent households (Harris and Todaro, 1970; Taylor and Martin, 2001; Schewel and Fransen, 2018; Hagen-Zanker et al., 2024). Yet, holding other factors constant, the precise effect of agricultural productivity on migration remains an open empirical question (Stark and Bloom, 1985; Stark and Taylor, 1991).

Classic spatial equilibrium models (Rosen, 1986; Roback, 1982) and the seminal rural-urban migration model by Harris and Todaro (1970), highlight that rising rural wages can reduce the incentive to migrate, encouraging households to remain engaged in local agricultural activities (Gray and Bilsborrow, 2013; Benček and Schneiderheinze, 2024; Samui, Mallick and Bailey, 2024). All things considered, migration is not costless (Gollin, Lagakos and Waugh, 2014; Bryan and Morten, 2019; Lagakos, 2020). However, when harvests are plentiful, households are better equipped to overcome migration frictions and afford the upfront costs of relocating, enabling them to pursue improved livelihood opportunities elsewhere (Mendola, 2008; Paudel, Nguyen and Grote, 2024; Geng and Zhang, 2024). This empirical inconsistency highlights the need for more targeted, precise analysis to clarify how agricultural production shapes rural households' migration intentions.

This paper addresses this ambiguity head-on. We pose a simple and clear research question: How does the value of agricultural production influence household migration aspirations? To answer this question, we use a rich household-level survey data collected in 2023/2024 from an agriculture-intensive setting—Nigeria. We leverage the Nigeria General Household Survey Panel (GHS-Panel), which uniquely captures individuals' migration aspirations, or intent to migration, at two key time points: before the agricultural season and after the harvest. This temporal structure enables us to attribute changes in migration aspirations to variations in agricultural outcomes experienced by the same individuals.

Unlike much of the existing literature that focuses on actual migration behavior, this study centers on migration aspirations—a novel lens that reveals latent mobility demand. In developing countries like Nigeria, where over 70% of the population is employed in agriculture and mobility is constrained by poverty, insecure land tenure, and inadequate infrastructure, aspirations may be more responsive to changes in agricultural productivity (World Bank, 2025). Aspirations also capture intention and planning, offering a more accurate reflection of migration preferences and providing valuable insights into household decision-making and policy design (Carling, 2002; de Haas, 2021).[1]

We adopt an empirical strategy that exploits within-household variation in both harvest outcomes and migration intentions. Specifically, we use household-level harvest value as a proxy for agricultural productivity, and we measure migration aspirations by aggregating individual responses into the proportion of household members who express a desire to migrate. Our analysis focuses on how changes in harvest value are associated with changes in migration aspirations, comparing responses before and after the harvest season. To account for potential confounders, we control for a rich set of household characteristics and include district fixed effects to absorb time-invariant local factors and changes in destination attractiveness.

Our findings reveal an inverted U-shaped relationship: at lower levels, increases in agricultural production raise migration aspirations—likely because households acquire the means to overcome migration frictions. However, beyond a certain threshold, further gains in productivity reduce the desire to migrate, suggesting that sustained agricultural success encourages households to stay and invest in their communities.

To explore the mechanisms underlying this relationship, we examine the moderating

[1]The aspiration–capability framework developed by Carling (2002) and extended by de Haas (2021) distinguishes between the desire to migrate and the capacity to do so, emphasizing how aspirations alone can shape present-day economic behavior.

role of food insecurity. Specifically, we test whether the effect of harvest outcomes on migration aspirations varies by households' likelihood of experiencing moderate-to-severe food insecurity, measured using the FAO's Food Insecurity Experience Scale (FIES) (FAO, 2017). Our findings indicate that households facing higher levels of food insecurity are significantly more responsive to poor harvests, with sharper increases in migration aspirations following adverse agricultural outcomes. This interaction highlights the key role of food insecurity in shaping how households interpret and respond to changes in agricultural productivity, highlighting its importance in the broader migration decision-making process.

This paper makes three essential contributions to our understanding of the drivers of internal migration in low-income rural settings, where migration is commonly seen as a strategy to smooth consumption, improve living standards, and escape poverty traps (Stark and Taylor, 1991; Bryan, Chowdhury and Mobarak, 2014; Gollin, Lagakos and Waugh, 2014). First, this study offers a conceptual contribution by redirecting attention from observed migration behavior to migration aspirations—the underlying intent to move, irrespective of whether migration occurs. This perspective is important for two reasons. First, it is particularly relevant in contexts where mobility is constrained by economic or institutional barriers and where migration is infrequent or highly selective, making it difficult to observe all margins of potential mobility (Carling, 2002). Second, understanding preferences is essential for evaluating welfare. A growing body of research has shown that differences in migration costs—stemming from institutional frictions or geographic constraints—can generate substantial productivity and welfare losses (Gollin, Lagakos and Waugh, 2014; Bryan and Morten, 2019; Lagakos, 2020; Hidrobo, Mueller and Roy, 2022). Most of these studies rely on realized migration—measured in diverse ways across settings—and infer underlying motivations from structural models based on assumed utility functions. However, to fully understand the welfare implications of migration and the role of policy and institutional barriers, it is crucial to observe individuals' preference directly.

Second, by offering household-level empirical evidence documenting direct measures of migration aspirations, we complement previous migration studies that have provided valuable insights through macro-level analyses (Clemens and Postel, 2018; Benček and Schneiderheinze, 2024), theoretical frameworks (Stark and Taylor, 1991; Taylor and Martin, 2001), or indirect proxies such as labor allocation and investment behavior (Creighton, 2013; Paudel, Nguyen and Grote, 2024). We focus on agricultural productivity—a central factor shaping rural households' economic decisions (Harris and Todaro, 1970)—and we observe migration aspirations both, before and after agricultural harvests, thus, our analy-

sis captures how seasonal variation in agricultural outcomes influences rural households' migration intentions. In doing so, we also uncover a non-linear relationship—an inverted U-shape—between agricultural productivity and migration aspirations. This finding contributes to a literature that often posits a monotonic relationship, in which improved economic conditions are expected to either consistently encourage or discourage migration (Taylor and Martin, 2001; Mendola, 2008; Böhme, 2015).

Third, we contribute to the literature that examines the role of food insecurity in shaping household decision-making (Clapp et al., 2022; Villacis, Badruddoza and Mishra, 2024). In our paper, we identify food insecurity as a key mechanism driving heterogeneity in responses to agricultural outcomes. While earlier studies have examined food insecurity as an independent driver of migration (Samui, Mallick and Bailey, 2024; Hagen-Zanker et al., 2024), few have explored how it interacts with agricultural productivity in shaping migration decisions. Our results show that the relationship between agricultural output and migration aspirations varies systematically by food security status. This interaction is an important but underexplored pathway and offers actionable insights for designing rural development strategies, agricultural policies, and humanitarian programs aimed at alleviating food insecurity and managing migration pressures more effectively. Policymakers committed to stabilizing rural livelihoods, promoting agricultural productivity, and effectively managing rural migration must recognize that improving farm productivity and food security is not only economically beneficial, it shapes the very fabric of rural communities by directly influencing migration aspirations and decisions.

The paper is structured as follows. Section 3 introduces the Nigerian context. Section 4 describes the empirical strategy. Section 5 presents the main findings and robustness checks. Finally, Section 6 concludes by summarizing key insights, acknowledging limitations—especially regarding causality—and outlining directions for future research and policy.

2 Mechanism

Migration aspirations are forward-looking and reflect a household's assessment of local conditions, opportunities elsewhere, and its capacity to undertake migration. For many rural households, migration is not determined solely by expected income differences across locations. It also depends on whether the household can meet the physical and financial requirements of moving. Migration often involves long-distance travel, temporary hardship, and other adjustment costs, making a minimum level of health and material re-

sources necessary for migration to be viewed as feasible (Hidrobo, Mueller and Roy, 2022). For agriculture-dependent households, decisions are often made in risky production environments, where weather, pests, and other production-related uncertainties matter for household decision-making (Khanal, Mishra and Lien, 2022). Poor harvests can generate food insecurity, which reduces income while also weakening health and physical capacity. Under such conditions, households may desire better opportunities elsewhere but remain too constrained to form realistic migration aspirations. As harvest income rises, however, some food-insecure households may cross the threshold needed to make migration seem attainable, increasing their aspirations to migrate.

At the same time, improved harvests can reduce migration aspirations once households become more secure. For food-secure households, higher harvest value raises farm income and increases the attractiveness of remaining in agriculture, thereby reducing the incentive to migrate (Benček and Schneiderheinze 2024; Samui, Mallick and Bailey 2024). Taken together, these opposing forces suggest a nonlinear relationship between harvest outcomes and migration aspirations. At very low levels of harvest, aspirations may remain limited because households lack the resources to consider migration as a feasible option. As harvests improve from that low base, aspirations may rise because migration becomes more attainable. Beyond a certain point, however, further gains in harvest are likely to reduce migration aspirations by improving economic security at origin and increasing the returns to staying.

3 Definitions and Data

This paper uses nationally representative microdata from Wave 5 (2023/24) of the Nigeria General Household Survey–Panel (GHS-Panel), a longitudinal survey conducted by the National Bureau of Statistics in collaboration with the World Bank's Living Standards Measurement Study (LSMS). Wave 5 offers high-frequency data on household welfare, agricultural production, food security, and migration aspirations and experiences, collected across two agriculturally relevant periods: post-planting (July–September 2023) and post-harvest (January–March 2024), covering 518 enumeration areas (National Bureau of Statistics - Nigeria, 2024). The two-round seasonal design is essential, as it allows us to track changes in migration aspirations within the same production cycle, offering a rare window into forward-looking household decision-making in real time.[2]

[2]Wave 5 of the GHS-Panel employs a rotating panel design with partial sample refreshment to maintain national representativeness (National Bureau of Statistics - Nigeria, 2024).

Although migration-related questions are asked at the individual level, we use the household as our unit of observation because agricultural productivity—measured by harvest value—is reported at the household level. To align the units of analysis, we aggregate migration aspirations, food insecurity indicators, and control variables to the household level. The key variables for our analysis are explained in detail next.

3.1 Key Variables

Migration Aspirations were measured in both survey rounds through the question: *"Would you like to leave this community to go live somewhere else?"*, asked of all individuals aged 15 and older. We construct a household-level measure of migration aspirations as the proportion of household members responding "yes" in each round. Our binary outcome equals 1 if this proportion increased between the post-planting and post-harvest rounds, and 0 otherwise. According to the GHS-Panel, 25% of individuals aged 15 and above nationwide expressed a desire to leave their community, underscoring the policy relevance of this indicator (National Bureau of Statistics - Nigeria, 2024).

Agricultural output is measured in the post-harvest period using self-reported crop yields and local market prices. We calculate the total harvest value as the sum of quantity times price across all crops c produced in household i such that:

$$\text{Harvest Value}_i = \sum_c (\text{Quantity}_{ic} \times \text{Price}_{ic}). \tag{1}$$

Nationally, 71.6% of households reported engaging in crop farming. In our sample, households cultivate an average of 1.86 plots, with a mean plot size of 0.55 hectares. *Food insecurity* is captured using FAO's Food Insecurity Experience Scale FIES (FAO, 2016). The FIES is constructed using responses to eight standardized yes/no questions that capture households' experiences of food-related hardship over a reference period, such as worrying about food, skipping meals, or going hungry. A probabilistic model (typically Rasch or logistic regression) is then used to generate a continuous food insecurity score ranging from 0 to 1, indicating the likelihood of experiencing moderate or severe food insecurity (FAO, 2016). Using FAO's proposed methodology we estimate and report the probability that a household in our sample experience moderate or severe food insecurity. Nationally, 65.8% of households reported being unable to eat preferred foods in the past 30 days, and 36% reported having eaten less than they thought they should (National Bureau of Statistics - Nigeria, 2024).

Our empirical models control for baseline household characteristics measured during the post-planting round. These include household size age, gender, and literacy of the household head; internet access, bank account ownership, and a wealth index. We also include an indicator for rural residence and binary indicators for geopolitical zones to account for regional differences in the attractiveness of migration destinations. These controls capture variation in socioeconomic status, access to information, and location-specific factors known to shape both migration aspirations and food insecurity (Aslany et al., 2021; Hagen-Zanker et al., 2024; Villacis and Badruddoza, 2023). We exclude households missing post-harvest data on crop values or migration aspirations, as well as those with only one adult, to ensure a meaningful denominator in the household-level aspirations measure. The final sample consists of 2,886 households with complete data across both rounds.

In Table 1, we report summary statistics of the main variables we use in our regression analysis, consisting of a sample of 2,886 households. The dependent variable is a binary indicator that takes a value of 1 if the share of household members aspiring to migrate increased between post-planting and post-harvest periods, and a value of 0 otherwise, and it has a mean of 0.27. The main independent variable, harvest value, averages $1,013 USD with considerable variation (SD = 1,524). Control variables show that household heads are, on average, 29 years old; 19% are female; 62% are literate; and households average 6.6 members. Access to internet and banking services is limited (21% and 56%, respectively). Most households (85%) are rural, with the sample covering all five geopolitical zones.

TABLE 1: Summary statistics

Variable	Mean	Std. Dev.	Minimum	Maximum
Household migration aspirations	0.274	(0.446)	0.000	1.000
Harvest value (1,000 USD)	1.032	(1.532)	0.010	18.763
Squared harvest value (1,000 USD)	3.411	(14.220)	0.000	352.060
FIES score	0.554	(0.381)	0.046	0.993
Mean age of household head	29.035	(14.434)	9.286	99.000
Household size	6.672	(3.822)	1.000	29.000
Household head is female	0.181	(0.385)	0.000	1.000
Household head is literate	0.622	(0.485)	0.000	1.000
Internet connection	0.212	(0.409)	0.000	1.000
Access to bank account	0.562	(0.496)	0.000	1.000
Combined wealth index	-0.082	(1.290)	-3.816	5.619
Zone: North East	0.227	(0.419)	0.000	1.000
Zone: North West	0.205	(0.404)	0.000	1.000
Zone: South East	0.168	(0.374)	0.000	1.000
Zone: South South	0.131	(0.338)	0.000	1.000
Zone: South West	0.084	(0.277)	0.000	1.000
Rural	0.847	(0.360)	0.000	1.000
Observations	2,831			

Notes: Household migration aspirations is a binary indicator that takes a value of 1 if the share of household members aspiring to migrate increased between post-planting and post-harvest periods, and a value of 0 otherwise. The FIES score indicates the likelihood of experiencing moderate or severe food insecurity. Combined wealth index was created by first performing PCA on agricultural, consumer, and housing assets to generate three asset scores, then standardizing those scores into z-scores, and finally running PCA again on the standardized scores to extract a single overall wealth measure.

Table 2 presents a covariate balance check comparing baseline characteristics of households that did versus did not increase migration aspirations between the planting and post-harvest periods. Column (1) reports mean values for households whose migration aspirations did not increase, while column (2) shows means for those whose aspirations rose. Households with increased migration aspirations had significantly higher probability of moderate or severe food insecurity at harvest, larger household sizes, younger household heads, and higher rates of internet access and bank account ownership. These differences, while statistically significant, do not compromise the analysis: all regression models incorporate sampling weights, adjust for the complex survey design, and control for baseline covariates and location fixed effects to account for such variation and isolate the effects of interest.

TABLE 2: Balance table

Variable	(1) HH didn't increase migration aspirations	(2) HH increased migration aspirations	(3) Diff	(4) P-value
Harvest value (1,000 USD)	1.03	1.04	0.02	0.78
Squared harvest value (1,000 USD)	3.52	3.11	-0.41	0.50
FIES score	0.52	0.64	0.11	0.00***
Mean age of Household head	29.77	27.09	-2.68	0.00***
Household size	6.45	7.26	0.81	0.00***
Household head head is female	0.18	0.18	-0.01	0.65
Household head is literate	0.61	0.65	0.04	0.07*
Internet connection	0.19	0.28	0.09	0.00***
Access to bank account	0.54	0.61	0.07	0.00***
Combined wealth index	-0.09	-0.06	0.03	0.57
Zone: North East	0.23	0.23	0.00	0.90
Zone: North West	0.20	0.22	0.02	0.24
Zone: South East	0.16	0.18	0.01	0.37
Zone: South South	0.13	0.14	0.01	0.60
Zone: South West	0.08	0.08	-0.00	0.89
Rural	0.85	0.83	-0.03	0.06*
Observations	2,056	775	2,831	

Notes: The p-value in the column (4) refers to the test of equality of outcomes by migration aspirations changes. Household migration aspirations is a binary indicator that takes a value of 1 if the share of household members aspiring to migrate increased between post-planting and post-harvest periods, and a value of 0 otherwise. The FIES score indicates the likelihood of experiencing moderate or severe food insecurity. Combined wealth index was created by first performing PCA on agricultural, consumer, and housing assets to generate three asset scores, then standardizing those scores into z-scores, and finally running PCA again on the standardized scores to extract a single overall wealth measure.

Figure 1 shows the relationship between harvest value and the probability of moderate to severe food insecurity. The LOWESS curve— which fits a smooth, locally weighted line through the data without assuming a specific functional form— reveals a steep decline in food insecurity as harvest value increases, particularly at lower levels of production. This pattern supports the paper's theoretical framework, which posits that food insecurity is closely tied to agricultural outcomes and acts as a key moderator of migration aspirations. Households with limited harvests face greater food-related vulnerability, making them more responsive to production shocks and more likely to develop aspirations to migrate.

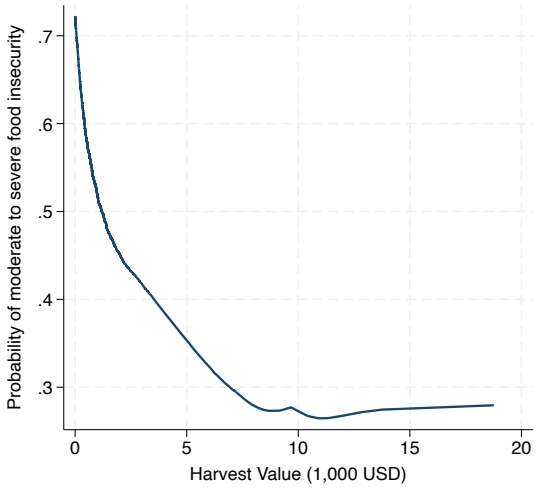

FIGURE 1: Relationship between food insecurity and harvest values

3.2 Contextual Background

Agriculture remains central to the livelihoods of most rural Nigerian households, with over 70% engaged in farming and nearly half also raising livestock (National Bureau of Statistics - Nigeria, 2024).[3] Yet the ability of this sector to ensure food security has been undermined by declining productivity, extreme weather, and worsening climate vulnerability. The food insecurity landscape is not static—it is shaped by the rhythms of the agricultural cycle and by how well harvests align with expectations (Villacis, Mayorga and Mishra, 2022). This underscores the need to treat food insecurity not just as a static condition, but as a forward-looking risk that households manage, respond to, and—in some cases—aspire to escape through migration.

The link between agricultural outcomes and food insecurity is more than anecdotal. Drawing on nationally representative panel data, Villacis, Mayorga and Mishra (2022) find that a 10% increase in agricultural productivity in Nigeria leads to a 3.7% drop in the likelihood of relying on less preferred foods, a 3.9% reduction in limiting dietary variety, and a 1.9% decline in limiting portion sizes. These results are grounded in experience-based food insecurity indicators, which capture not just caloric intake but the behavioral, psychological, and nutritional consequences of food scarcity. This is especially relevant in contexts like rural Nigeria, where formal food markets are limited and farming outcomes are tightly coupled to dietary behavior.

[3] At a broader regional level, evidence from Sub-Saharan Africa emphasizes the central role of crop productivity in shaping agro-food system outcomes and land-use pressures (Kuhn and Britz, 2021).

Importantly, recent work has confirmed that the sensitivity of food insecurity to agricultural shocks is not merely statistical—it is dynamic and predictive. Using machine learning approaches and multiple waves of LSMS-ISA data, Villacis et al. (2023) show that households identified as food insecure using a short 7-day recall period are also highly likely to be food insecure under a 30-day frame. In other words, short-term food stress events—often triggered by seasonal income collapses—can serve as reliable proxies for deeper, more chronic forms of deprivation. These findings legitimize the use of seasonal household data to study migration decisions and reinforce the idea that post-harvest agricultural outcomes are not just reflections of economic performance—they are signals households use to shape their future expectations.

Heat stress further complicates this picture. Mayorga, Villacis and Mishra (2025) show that exposure to high temperatures during Nigeria's growing season leads to significant reductions in yield, even when the overall value of production remains flat. This is not because crops are heat-resistant—but because farmers compensate by expanding land use, adopting mixed-cropping, and increasing dependence on labor and protective inputs like pesticides. These adaptation strategies are necessary but costly. They reflect an agricultural system under pressure and households hedging against risk when productivity-enhancing inputs become ineffective under climate stress. The same study finds that high temperatures reduce fertilizer use and increase reliance on hired labor, both of which strain household budgets and contribute to food insecurity when they fail to offset productivity losses.

Taken together, the evidence from survey and satellite-linked data converges on a core insight: food insecurity in rural Nigeria is deeply responsive to seasonal agricultural shocks, and it is often anticipatory. As agricultural incomes falter, especially under heat and weather stress, rural households adjust both their consumption and their aspirations—including aspirations to migrate. Our study builds on this foundation by asking the next logical question: when harvest outcomes falter and food security deteriorates, how do rural households reshape their migration goals? By linking post-harvest production data to changes in migration aspirations measured within the same agricultural cycle, we provide empirical clarity on this forward-looking behavioral response.

In sum, the GHS-Panel Wave 5 provides a rich empirical foundation for testing how seasonal variation in agricultural income and food insecurity shape rural migration aspirations. It is precisely this combination—longitudinal, nationally representative, and timed to the agricultural calendar—that allows us to move beyond static correlations and into the behavioral core of rural household decision-making.

4 Empirical Framework

Our empirical strategy is designed to directly test the theoretical predictions outlined in the previous sections: namely, that the relationship between household value of harvest and migration aspirations is nonlinear, and that this relationship is moderated by the household's food insecurity status. To do so, we leverage data collected from rural households in Nigeria at two points in the agricultural cycle—during planting and after harvest—allowing us to observe both realized agricultural outcomes and changes in migration aspirations within the same season.

4.1 Main Specification

Our dependent variable captures whether a household increased the proportion of members aspiring to migrate between the planting and post-harvest survey rounds. At each round, migration aspirations were elicited with the direct question: *"Would you like to leave this community to go live somewhere else?"* A household member responding "yes" is considered to have migration aspirations.

We aggregate responses at the household level and define the outcome as a binary variable, equal to one if the proportion of household members expressing a desire to migrate is higher post-harvest than it was during planting, and zero otherwise. This specification captures a discrete increase in migration sentiment following the agricultural season and reflects the forward-looking, responsive behavior discussed previously in the theoretical framework section.[4]

Our central explanatory variable is the total value of agricultural production for the household, observed in the post-harvest round. This is calculated as the reported quantity of each crop harvested, multiplied by local market prices, and summed across all crops grown by the household. This harvest value serves as an ex-post measure of household agricultural performance and directly corresponds to the variable h in our theoretical framework. To test the predicted non-linear relationship between harvest value and migration aspirations, we estimate a quadratic specification that includes both the linear and squared terms of harvest value:

[4]Other theoretical frameworks include the New Economics of Labor Migration (NELM) framework and the aspiration–capability theory (Stark and Taylor, 1991; Carling, 2002; de Haas, 2021). NELM suggests that households make migration decisions by balancing the potential benefits—such as remittances, income diversification, and risk mitigation—against the costs and risks associated with losing labor and disrupting agricultural production (Stark and Taylor, 1991; Taylor and Martin, 2001; Mendola, 2008; Lee, 2021). It also assumes that households act as rational agents pursuing long-term economic optimization strategies(de Haas, 2021).

$$y_{ie} = \beta_0 + \beta_1 h_{ie} + \beta_2 h_{ie}^2 + X_{ie}'\delta + \theta_e + \varepsilon_{ie} \quad (2)$$

In this equation, y_{ie} is the outcome variable of interest for household i in location e (i.e., state). The h_{ie} variable represents the value of agricultural production for the household and h_{ie}^2 represents the squared value of agricultural production. This approach follows the empirical strategy used by Benček and Schneiderheinze (2024); de Haas (2021); Clemens and Postel (2018); Clemens (2014); Henry (2014) and Vogler and Rotte (2000) in testing nonlinear migration responses to income growth, and by Mendola (2008) in modeling labor migration as a function of household agricultural outcomes.

To isolate the effect of agricultural harvest value on migration aspirations, we control for a standard set of household characteristics, represented by the vector X_{ie}', that may also influence migration decisions. These include household size, age and gender of the household head, head's literacy, internet access, bank ownership, a wealth index, rural residence, and geopolitical zone fixed effects. Given the binary nature of the outcome variable, we estimate equation 2 using a linear probability model (LPM). All regressions account for the complex survey design utlized by the World Bank LSMS ISA team and incorporate household sampling weights, stratification at the state level, and clustering at the enumeration area level to produce design-consistent standard errors. To further address systematic regional variation in migration patterns, agro-ecological conditions, and access to infrastructure, we include fixed effects for Nigeria's states (θ_e). Our approach is consistent with best practices in household migration studies that aim to net out structural and demographic confounders (Creighton, 2013; Aslany et al., 2021).

Our identification strategy relies on the timing of measurement: since harvest value is only realized after the first measurement of migration aspirations, and migration does not occur within-season, concerns about reverse causality are minimal. This sequential measurement structure also reduces potential simultaneity bias, a persistent issue in much of the cross-sectional literature on migration and income (Taylor and Martin, 2001). This empirical framework makes a key contribution to the migration literature by providing novel within-season evidence on how realized agricultural production outcomes shape short-run variation in migration aspirations. In doing so, it complements and extends prior research based on cross-sectional data or long-term panel analyses (Paudel, Nguyen and Grote, 2024; Geng and Zhang, 2024).

4.2 Moderating Mechanism: Food Insecurity

To examine the mechanism through which harvest outcomes affect migration aspirations, we estimate a second model that looks at food insecurity as a moderator. Specifically, we interact the linear term of harvest value with the household's probability of moderate-to-severe food insecurity, as measured by the Food Insecurity Experience Scale (FIES). This variable is bounded between 0 and 1. The use of FIES allows for cross-context comparable, continuous measurement of experienced food insecurity, as advocated in recent migration studies (Hagen-Zanker et al., 2024).

Our interaction model takes the following form:

$$Y_{ie} = \gamma_0 + \gamma_1 h_{ie} + \gamma_2 FI_{ie} + \gamma_3 (h_{ie} \times FI_{ie}) + X'_{ie}\delta + \theta_e + \varepsilon_{ie} \tag{3}$$

Here, FI_i denotes the household's probability of being food insecure. The interaction term γ_3 tests whether the effect of harvest value on migration aspirations is stronger among more food-insecure households, as discussed in our theoretical model. A positive interaction term supports the interpretation that food-insecure households are more sensitive to economic shocks in shaping their migration intentions. Importantly, we omit the squared harvest term in this model to preserve the interpretability of the interaction. This reduced-form interaction specification aligns with similar approaches in recent work on migration and livelihood shocks, such as Samui, Mallick and Bailey (2024), who examine how land-use changes and environmental degradation influence migration intentions in Bangladesh.

We estimate equation 3 using a linear probability model (LPM). While nonlinear models such as logit or probit are commonly used for binary outcomes, we opt for the LPM for transparency in interpreting interaction effects and marginal changes, particularly given the small within-household changes in aspirations between survey rounds. Standard errors are computed using Taylor linearized variance estimation, which is robust to heteroskedasticity and accounts for the complex survey design, including clustering at the enumeration area level and stratification by state.

This empirical framework makes another key contribution. By leveraging the interaction between harvest value and food insecurity, we provide evidence of a precise behavioral mechanism: households experiencing food insecurity are more likely to shift toward migration aspirations when faced with poor agricultural outcomes. This mechanism resonates with the "aspiration under constraint" framework discussed by Carling (2002) and Carling and Schewel (2018), and operationalized in recent multi-country migration stud-

ies (Hagen-Zanker et al., 2024; Aslany et al., 2021). In doing so, our study not only tests core predictions of economic migration theory but also deepens our understanding of how vulnerability shapes migration desires under rural uncertainty.

5 Results

We begin our empirical analysis by investigating the relationship between agricultural production and migration aspirations . A growing body of literature suggests that migration decisions are shaped not only by absolute poverty or income levels, but also by forward-looking aspirations and perceptions of mobility constraints. Building on this literature, we hypothesize a non-monotonic relationship between agricultural production and migration aspirations. Specifically, we propose that at very low levels of agricultural output, households lack the necessary financial or social capital to consider migration as a viable option. As agricultural production increases, however, households gain both the resources and confidence to formulate migration plans, leading to a rise in stated aspirations to migrate. Beyond a certain threshold, further increases in agricultural productivity enhance economic security and local opportunity structures, thereby reducing the perceived need or incentive to migrate. The resulting relationship is thus expected to exhibit an inverted U-shape.

This hypothesis finds suggestive support in national survey data. According to a recent report by the World Bank, migration aspirations are widespread in Nigeria, with approximately 25 percent of individuals aged 15 years and older expressing a desire to leave their current place of residence either permanently or temporarily (National Bureau of Statistics - Nigeria, 2024). Notably, these aspirations are more prevalent among men than among women. In terms of intended destinations, Abuja is the most frequently cited urban center, although preferred destinations vary across geopolitical zones (National Bureau of Statistics - Nigeria, 2024). These patterns highlight both the scale and heterogeneity of migration aspirations, motivating a more granular analysis of their economic determinants.

To test our hypothesis, we estimate equation 2 with migration aspirations as the dependent variable. Our key independent variable is the monetary value of the most recent harvest, which serves as a proxy for agricultural production. In Column (1) of Table 3, we report results from a baseline specification that excludes controls for household wealth and network connectivity. The estimated coefficient on the linear term of harvest value is positive and statistically significant, while the coefficient on the squared term is negative and statistically significant, consistent with our expectation of an inverted U-shaped

relationship. A formal U-test corroborates this finding by rejecting the null hypothesis of a monotonic relationship. The turning point of the relationship is estimated at approximately 6,300 USD—located just right of the median value in the observed distribution of harvest incomes.

In Column (2), we augment the baseline model by introducing a control for household internet access. Access to digital information channels is widely recognized as a critical mechanism through which individuals form migration aspirations, as it enables exposure to alternative lifestyles, labor market opportunities, and translocal social networks (Dekker and Engbersen, 2014; Dekker, Engbersen and Faber, 2016). Even after accounting for this important pathway, the relationship between harvest value and migration aspirations remains statistically robust. Both the positive linear and negative quadratic coefficients remain significant at conventional levels, and the U-test once again rejects monotonicity.

Column (3) further extends the specification by including a composite wealth index, constructed from household assets and amenities. This variable captures broader wealth effects that may independently influence the feasibility and desirability of migration (Dustmann and Okatenko, 2014). The inclusion of the wealth index does not alter our core findings. The inverted U-shaped relationship persists, and the associated coefficients remain statistically significant. The U-test continues to reject the null hypothesis of monotonicity.

To assess the sensitivity of these findings to omitted variable bias, we implement the coefficient stability and selection bias framework introduced by Oster (2019). This approach allows us to compute a proportional selection coefficient, or "Oster's delta," by comparing the changes in coefficient estimates and R-squared values between restricted (short) and full (long) regression specifications.[5] In Column (1), the delta values for the harvest value and its square are 43.93 and 71.57, respectively, indicating that any unobserved confounder would need to be over 40 times more predictive of migration aspirations than the included covariates to explain away the observed relationship. Columns (2) and (3) yield even higher delta values—65.26 and 60.06 in Column (2), and 181.26 and 37.54 in Column (3)—providing strong evidence that the estimated relationships are not driven by unobserved heterogeneity.

[5] We calculate Oster's Delta by comparing regression results in a given column to a regression that only includes *Harvest value* and *Squared harvest value* as explanatory variables.

TABLE 3: Effect of Agricultural Production on Migration Aspirations

	(1)	(2)	(3)
Panel A: Regression results			
Harvest value (1,000 USD)	0.0365**	0.0358**	0.0349**
	(0.0151)	(0.0152)	(0.0151)
Squared harvest value (1,000 USD)	-0.0029**	-0.0028**	-0.0028**
	(0.0012)	(0.0012)	(0.0012)
Internet connection	No	0.0869***	0.0914***
	-	(0.0283)	(0.0291)
Combined wealth index	No	No	-0.0078
	-	-	(0.0115)
States Fixed Effects?	Yes	Yes	Yes
Additional Controls?	Yes	Yes	Yes
Observations	2,831	2,831	2,831
R-squared	0.0735	0.0789	0.0791
Panel B: U-test results			
Turning point	6.368	6.283	6.297
Fieller 95% CI	[3.724; 12.667]	[3.536; 12.182]	[3.436; 12.878]
Sasabuchi p-value	0.0157	0.0153	0.0170
Slope at min	0.0365	0.0356	0.0347
Slope at max	-0.0711	-0.0710	-0.0689
Panel C: Sensitivity Analysis			
Exogenous controls: Oster (2019) - $\lvert\delta\rvert$ (delta)			
Harvest value	43.93	65.26	181.26
Squared harvest value	71.57	60.06	37.54

Notes: The dependent variable is an indicator for whether the share of household members aspiring to migrate increased from the post-planting (PP) to post-harvest (PH) round. All regressions are estimated using survey weights and account for complex survey design via the `svy` prefix in Stata. Additional controls include household head age, household size, gender of head, literacy status, bank access, and an indicator for rural areas. Full regression results are reported in table A1 of the Supplemental Appendix. Oster's Delta is calculated using the `psacalc` Stata command.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Turning to the control variables, we find that household internet access is positively and significantly associated with migration aspirations. This result is consistent with prior research emphasizing the role of information access and virtual networks in shaping migration intentions (Dekker and Engbersen, 2014; Dekker, Engbersen and Faber, 2016). Other household-level variables, including household size, the age and gender of the household head, literacy status, rural location, and the asset-based wealth index, do not exhibit statistically significant associations in any of the model specifications.

Overall, our findings offer robust empirical support for a non-monotonic relationship between agricultural production and migration aspirations. This inverted U-shaped pat-

tern shows the importance of economic thresholds in shaping household decision-making. At low levels of agricultural output, households face severe resource constraints that suppress even the formation of migration goals. As production improves, aspirations rise in tandem with the financial means to pursue migration. But once households cross a critical threshold of economic security, the marginal benefit of migration diminishes, leading to a decline in stated aspirations. These findings carry important implications for both development policy and migration forecasting, especially in rural economies where agriculture remains a dominant livelihood source.

We further investigate the robustness of our main finding that migration aspirations and agricultural production follow a non-monotonic relationship. We test robustness by estimating results on the sub-sample of individuals who report having no access to an internet connection. This robustness check is theoretically grounded and empirically important for several reasons. First, a growing body of literature highlights internet access as a major driver of migration aspirations, particularly in rural or resource-constrained contexts (Dekker et al., 2018; Carling and Schewel, 2020). Through the internet, individuals gain exposure to information about jobs, visa requirements, costs of living, migration pathways, and social networks abroad—often forming what scholars describe as an "infrastructure of aspiration" that encourages outward mobility (Massey and Capoferro, 2006; McKenzie and Rapoport, 2010). Thus, access to digital information is itself a pathway through which migration aspirations are shaped.

Second, internet access may introduce confounding and endogeneity concerns. Households with internet connectivity are likely to differ systematically from those without it along dimensions such as wealth, education, youth composition, or geographic proximity to urban centers. Many of these traits are also correlated with both agricultural productivity and migration decision-making. Moreover, access to the internet may not be exogenous to migration aspirations: it is plausible that households with stronger migration intent may adopt internet access to facilitate planning, maintain ties with migrants abroad, or engage with migration brokers and social media platforms. In this context, including internet access as a control may absorb part of the true effect of agricultural production on aspirations or bias estimates through reverse causality (Gelman and Imbens, 2013).

Third, restricting the sample to individuals without internet access allows us to test whether the observed inverted-U shaped relationship between the value of agricultural production and migration aspirations holds even in the absence of digital channels of influence. In doing so, we reduce heterogeneity in aspirational context and remove a potentially powerful moderating variable. This approach provides a conservative test of our

hypothesis by asking whether economic drivers alone—net of global informational exposure—are sufficient to generate variation in migration aspirations. This is particularly important in rural, low-income settings where digital exclusion remains widespread (World Bank, 2016), and where offline mechanisms such as food insecurity, income smoothing, and livelihood diversification may be more salient drivers of migration interest.

TABLE 4: Robustness Test: Sub-sample with no access to internet connection

	(1)	(2)
Panel A: Regression results		
Harvest value (1,000 USD)	0.0374**	0.0374**
	(0.0178)	(0.0178)
Squared harvest value (1,000 USD)	-0.0033**	-0.0033**
	(0.0015)	(0.0015)
Combined wealth index	No	-0.0004
	-	(0.0142)
States Fixed Effects?	Yes	Yes
Additional Controls?	Yes	Yes
Observations	2,231	2,231
R-squared	0.0784	0.0784
Panel B: U-test results		
Turning point	5.657	5.656
Fieller 95% CI	[1.684; 10.734]	[1.750; 10.750]
Sasabuchi p-value	0.0184	0.0181
Slope at min	0.0373	0.0373
Slope at max	-0.0866	-0.0866
Panel C: Sensitivity Analysis		
Exogenous controls: Oster (2019) - $\lvert\delta\rvert$ (delta)		
Harvest value	44.13	41.50
Squared harvest value	21.83	21.57

Notes: The dependent variable is an indicator for whether the share of household members aspiring to migrate increased from the post-planting (PP) to post-harvest (PH) round. All regressions are estimated using survey weights and account for complex survey design via the `svy` prefix in Stata. Additional controls include household head age, household size, gender of head, literacy status, bank access, and an indicator for rural areas. Full regression results are reported in table A2 of the Supplemental Appendix. Oster's Delta is calculated using the `psacalc` Stata command.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

In Table 4, we report results from estimating equation 2 using the sub-sample of individuals who report having no access to an internet connection. Similar to the previous table in this paper, Column (1) serves as a baseline regression that estimates the relationship

between migration aspirations and agricultural production without controls for household wealth, and in Column (2), we augment the baseline model by introducing a control for household wealth. Results from this restricted subsample are consistent with the full-sample model: the coefficient on the value of agricultural production remains positive and significant, while the squared term is negative and significant, confirming the inverted-U shape. The robustness of this pattern among respondents without internet access reinforces our interpretation that the relationship is not solely attributable to online exposure or aspirational contagion. Rather, it suggests that production-related livelihood dynamics exert a meaningful influence on migration aspirations, even in digitally disconnected households. This finding enhances both the internal validity of our core model and its external relevance to similarly underserved or infrastructurally excluded populations.

5.1 Moderating Role of Food Insecurity

Table 5 presents the results of the moderating influence of food insecurity on the relationship between agricultural productivity and migration aspirations. Following our previous approach, in Column (1) we report results from a baseline specification that excludes controls for household wealth and network connectivity. Column (2), augments the baseline model by introducing a control for household internet access, and Column (3) further extends the specification by including a composite wealth index constructed from household assets and amenities.

The results in table 5 show a notable shift: the direct effect of harvest value is no longer statistically significant, while both the coefficient on food insecurity and the interaction term are positive and statistically significant at conventional levels. This implies that the influence of harvest value on migration aspirations is contingent upon the probability of being food insecure. Specifically, among households that perceive a low risk of food insecurity, harvest value has little to no effect on migration aspirations. In contrast, for households facing a high probability of food insecurity, higher harvest value is associated with significantly greater migration aspirations.

TABLE 5: Moderating role of food insecurity on migration aspirations

	(1)	(2)	(3)
Harvest value (1,000 USD)	0.0034	0.0047	0.0047
	(0.0082)	(0.0082)	(0.0082)
FIES score	0.0912**	0.0989**	0.0986**
	(0.0398)	(0.0392)	(0.0396)
Harvest value×FIES score	0.0417**	0.0367**	0.0366**
	(0.01873)	(0.0185)	(0.0184)
Internet connection	No	0.0867***	0.0871***
	-	(0.0284)	(0.0293)
Combined wealth index	No	No	-0.0007
	-	-	(0.0118)
States Fixed Effects?	Yes	Yes	Yes
Additional Controls?	Yes	Yes	Yes
Observations	2,831	2,831	2,831
R-squared	0.0843	0.0896	0.0896

Notes: The dependent variable is an indicator for whether the share of household members aspiring to migrate increased from the post-planting (PP) to post-harvest (PH) round. All regressions are estimated using survey weights and account for complex survey design via the `svy` prefix in Stata. Additional controls include household head age, household size, gender of head, literacy status, bank access, and an indicator for rural areas. Full regression results are reported in table A3 of the Supplemental Appendix.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

To interpret the magnitude and implications of this interaction, we calculate and plot the marginal effect of harvest value on migration aspirations at different levels of food insecurity (Figure 2). The marginal effect is negligible when the food insecurity probability is near zero, but becomes strongly positive when the food insecurity probability exceeds 30%. This pattern suggests that agricultural production facilitates migration aspirations primarily under conditions of food-related vulnerability. In other words, households appear more likely to translate production gains into migration plans when those gains are not sufficient to ensure food security — highlighting a risk-responsive channel of migration decision-making.

Importantly, this finding complements rather than replaces the nonlinear relationship identified in our main specification. The inverted-U shape observed in the baseline model indicates that migration aspirations peak at intermediate levels of agricultural production, consistent with theories of "stepwise" migration or liquidity thresholds (De Haas, 2010; Clemens, 2014; Angelucci, 2015; Bazzi, 2017). The interaction model refines this insight by

showing that the position and intensity of that nonlinearity depend in part on food insecurity. Rather than diminishing the main result, the interaction analysis provides additional insights: it reveals that migration aspirations respond most strongly to agricultural production when food-related risks are salient. Together, these findings highlight that migration aspirations are shaped not only by economic endowments but also by the household's perceived ability to convert those endowments into security and opportunity.

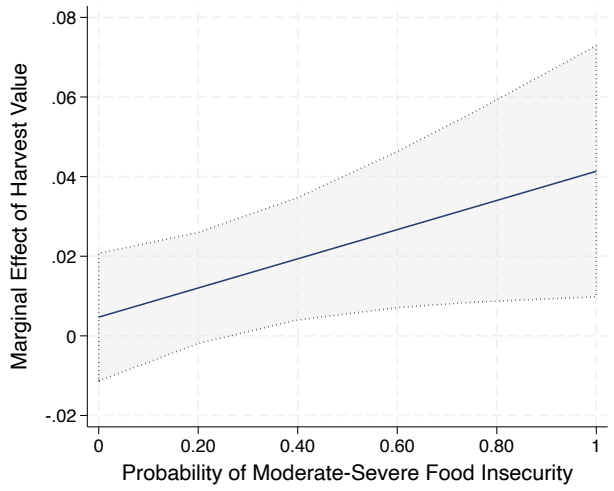

FIGURE 2: Marginal effect of harvest value on migration aspirations at different probabilities of being food insecure.

6 Discussion and Policy implications

The findings in this paper provide new evidence to the complex relationship between agricultural productivity and migration aspirations in rural contexts. We leverage within-season variation in agricultural outcomes and migration intentions, and provide evidence that the relationship is non-monotonic: as agricultural production increases, migration aspirations first rise and then fall. This inverted U-shaped relationship is consistent with our theoretical framework and predictions from spatial equilibrium and aspiration–capability frameworks, wherein migration becomes feasible as constraints loosen, but less desirable as local conditions improve (Carling, 2002; de Haas, 2021; Stark and Taylor, 1991).

Three key insights emerge from the analysis. First, migration aspirations among rural households do not respond linearly to improvements in agricultural conditions. Rather, they reflect a threshold dynamic in which increased harvests enable households to consider migration—likely by relaxing financial or health-based constraints—but sustained

productivity diminishes the perceived benefit of relocating. These results suggest that aspirations are not solely a function of poverty or deprivation, but also of capacity and perceived opportunity, echoing earlier theoretical contributions that distinguish between the desire and ability to migrate (Carling, 2002; Carling and Schewel, 2018).

Second, our analysis highlights the critical role of food insecurity in moderating how agricultural gains translate into migration intentions. Among food-insecure households, increases in harvest value are associated with higher migration aspirations, suggesting that when production is insufficient to ensure basic nutritional security, households may interpret even modest gains as an opportunity to pursue alternative livelihoods elsewhere. This dynamic resonates with recent empirical work emphasizing that food insecurity—especially when tied to seasonality and climate shocks—plays a central role in shaping mobility preferences (Samui, Mallick and Bailey, 2024; Hagen-Zanker et al., 2024; Villacis and Badruddoza, 2023). Importantly, our interaction analysis reveals that the harvest–migration relationship is contingent on households' perceived ability to meet food needs, suggesting that policies aimed at reducing food insecurity can dampen the volatility of migration intentions in response to agricultural shocks.

Third, the robustness of our results among households without internet access affirms that agricultural shocks are meaningful drivers of migration aspirations even in the absence of digital information flows. While digital connectivity has been shown to amplify aspirations by exposing individuals to migration narratives and destination-specific information (Dekker, Engbersen and Faber, 2016; Dekker et al., 2018), our findings suggest that production-related constraints and food-related risks alone are sufficient to induce shifts in migration sentiment. This is particularly relevant in settings where digital infrastructure remains limited and where migration remains shaped by direct livelihood considerations rather than aspirational contagion.

From a policy perspective, these findings offer actionable insights. First, interventions aimed at increasing agricultural productivity—such as improved seed distribution, extension services, or investments in irrigation—may have heterogeneous effects on migration aspirations, depending on where households fall along the food security and productivity distribution. Among food-insecure households, such gains may initially spur migration intent as families gain the capacity to consider relocation. Among food-secure households, however, sustained agricultural success may reduce mobility by reinforcing the value of staying. Policymakers should therefore avoid assuming that rural development will uniformly reduce migration pressures. Instead, they should anticipate that rising productivity can generate both stability and out-migration, depending on local conditions and house-

hold vulnerability.

Second, targeted food security interventions may offer a dual benefit—strengthening rural livelihoods while stabilizing migration dynamics. Programs that buffer households against seasonal food shortages, such as food reserves, conditional transfers, or nutrition-sensitive safety nets, may not only reduce the immediate risks of hunger, but also lower the likelihood that temporary production shocks translate into heightened migration aspirations. These programs may be especially valuable in regions where agriculture is rainfed and highly sensitive to climate variability, such as much of northern Nigeria (Mayorga, Villacis and Mishra, 2025).

Third, our findings have implications for migration management and labor mobility policy. In contexts where out-migration is likely to increase in response to mild gains in agricultural productivity, investments in migration infrastructure—such as safe recruitment systems, pre-departure training, or remittance-linked financial services—can reduce the risks and increase the developmental returns of migration. Conversely, in contexts where the goal is to retain labor in agriculture, complementary policies that promote local non-farm employment or rural value chains may be needed to absorb productivity-induced labor surpluses without triggering excessive outflows.

Finally, our results point to the need for more granular, temporally sensitive migration forecasting tools. Migration aspirations are dynamic and responsive to seasonal variation in agricultural outcomes. Forecasting systems that rely exclusively on annual data or lagged variables may miss these short-run fluctuations, especially in environments marked by climatic volatility and food insecurity. High-frequency monitoring of both agricultural production and migration intent—such as that enabled by the GHS-Panel—can serve as an early-warning system for identifying mobility pressures before they manifest in large-scale movements.

Taken together, this study hihglights that migration aspirations in low-income settings are shaped by both opportunity and constraint. Agricultural production plays a central role in determining whether households see a future in their current communities or imagine a life elsewhere. But the effect of production is not linear, nor is it uniform: it depends critically on household vulnerability, local context, and seasonal timing. Development strategies that aim to promote rural welfare, manage migration, or build climate resilience must therefore consider not just how to raise incomes, but how to stabilize aspirations.

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Supplemental Appendix to "Planting, Harvest, and Hope: Agricultural Production and Migration Aspirations"

This supplemental appendix includes the full results of the regression estimations presented in the main paper.

- Table A1 reports the results related to the effect of Agricultural Production on Migration Aspirations using our full sample.
- Table A2 reports the results related to the effect of Agricultural Production on Migration Aspirations using a restricted subsample including only individuals with no access to internet connection.
- Table A3 reports the results related to the role of food insecurity on migration aspirations using our full sample.

TABLE A1: Effect of Agricultural Production on Migration Aspirations

	(1)	(2)	(3)
Harvest value (1,000 USD)	0.0365**	0.0358**	0.0349**
	(0.0152)	(0.0152)	(0.0151)
Squared harvest value (1,000 USD)	-0.0029**	-0.0028**	-0.0028**
	(0.0012)	(0.0012)	(0.0012)
HH head's age	-0.0003	-0.0003	-0.0003
	(0.0009)	(0.0009)	(0.0009)
Household size	0.0072	0.0063	0.0062
	(0.0045)	(0.0044)	(0.0044)
HH head is female	0.0325	0.0305	0.0297
	(0.0299)	(0.0297)	(0.0296)
HH head is literate	0.0279	0.0181	0.0202
	(0.0213)	(0.0214)	(0.0219)
Bank account	0.0191	0.0029	0.0080
	(0.0246)	(0.0244)	(0.0242)
Rural	-0.0242	-0.0125	-0.0177
	(0.0316)	(0.0313)	(0.0326)
Internet connection	No	0.0869***	0.0914***
	-	(0.0283)	(0.0291)
Combined wealth index	No	No	-0.0078
	-	-	(0.0115)
State Fixed Effects:	Yes	Yes	Yes
Observations	2,831	2,831	2,831
R-squared	0.0735	0.0789	0.0791

Notes: The dependent variable is an indicator for whether the share of household members aspiring to migrate increased from the post-planting (PP) to post-harvest (PH) round. All regressions are estimated using survey weights and account for the survey design.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE A2: Robustness Test: Sub-sample with no access to internet connection

	(1) Without Wealth	(2) With Wealth
Harvest value (1,000 USD)	0.0374**	0.0374**
	(0.0178)	(0.0178)
Squared harvest value (1,000 USD)	-0.0033**	-0.0033**
	(0.0015)	(0.0015)
HH head's age	-0.0010	-0.0010
	(0.0009)	(0.0009)
Household size	0.0048	0.0048
	(0.0048)	(0.0048)
HH head is female	0.0299	0.0299
	(0.0334)	(0.0334)
HH head is literate	0.0188	0.0189
	(0.0243)	(0.0248)
Bank account	-0.0014	-0.0012
	(0.0263)	(0.0269)
Rural	-0.0070	-0.0073
	(0.0347)	(0.0363)
Wealth index	No-	-0.0004
	–	(0.0142)
State Fixed Effects:	Yes	Yes
Observations	2,231	2,231
R-squared	0.0784	0.0784

Notes: The dependent variable is an indicator for whether the share of household members aspiring to migrate increased from the post-planting (PP) to post-harvest (PH) round. All regressions are estimated using survey weights and account for the survey design. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE A3: Moderating role of food insecurity on migration aspirations

	(1)	(2)	(3)
Harvest value (1,000 USD)	0.0034	0.0047	0.0047
	(0.0082)	(0.0082)	(0.0082)
FIES score	0.0912**	0.0989**	0.0986**
	(0.0398)	(0.0392)	(0.0396)
Harvest value × FIES score	0.0417**	0.0367**	0.0366**
	(0.0187)	(0.0185)	(0.0184)
HH head's age	0.000080	0.000100	0.000100
	(0.00088)	(0.00087)	(0.00087)
Household size	0.00766	0.00683	0.00682
	(0.00451)	(0.00437)	(0.00437)
HH head is female	0.02467	0.02243	0.02238
	(0.02996)	(0.02968)	(0.02968)
HH head is literate	0.03269	0.02326	0.02344
	(0.02078)	(0.02094)	(0.02144)
Bank account	0.02415	0.00813	0.00859
	(0.02409)	(0.02399)	(0.02394)
Rural	-0.01349	-0.00141	-0.00192
	(0.03112)	(0.03073)	(0.03191)
Wealth index	No	No	-0.00073
	-	-	(0.01180)
Internet connection	No	0.0867***	0.0871***
	-	(0.02837)	(0.02934)
State Fixed Effects:	Yes	Yes	Yes
Observations	2,831	2,831	2,831
R-squared	0.0843	0.0896	0.0896

Notes: The dependent variable is an indicator for whether the share of household members aspiring to migrate increased from the post-planting (PP) to post-harvest (PH) round. All regressions are estimated using sur- vey weights and account for the survey design. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.