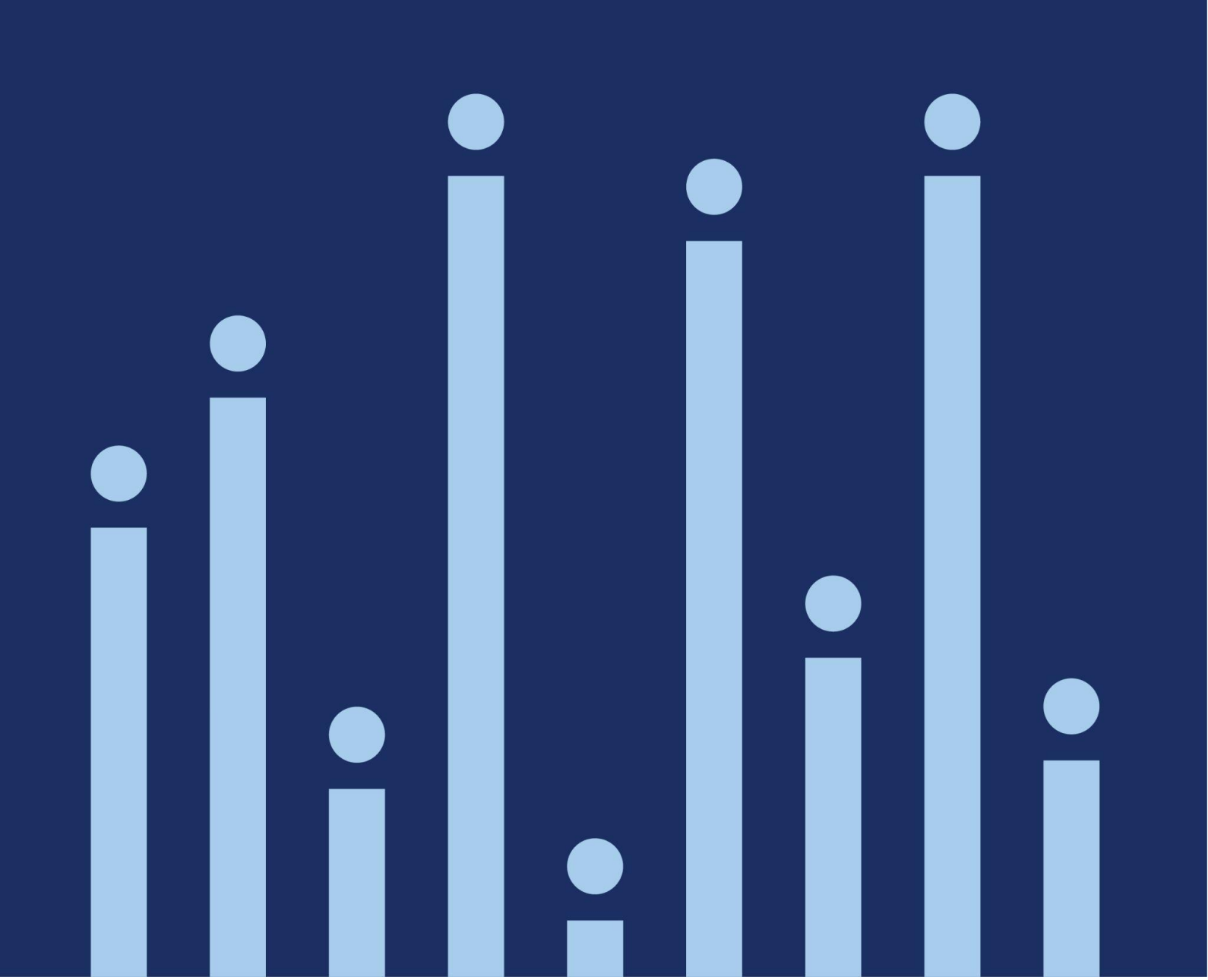

Africa Poultry Multiplication Initiative (APMI)

Qualitative assessment of dual-purpose poultry rearing in Nigeria

IDinsight

Africa Poultry Multiplication Initiative (APMI)—Qualitative assessment of dual-purpose poultry rearing in Nigeria

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About IDinsight

IDinsight uses data and evidence to help leaders combat poverty worldwide. Our collaborations deploy a large analytical toolkit to help clients design better policies, rigorously test what works, and use evidence to implement effectively at scale. We place special emphasis on using the right tool for the right question, and tailor our rigorous methods to the real-world constraints of decision-makers.

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Acronyms and Abbreviations

AFSH	Amo Farm Sieberer Hatchery Limited
APMI	Africa Poultry Multiplication Initiative
BMGF	Bill and Melinda Gates Foundation
DOC	Day-old chick
FSR	Farmer Satisfaction Representative
LGA	Local Government Area
MOC	Month-old chick
MU	Mother Unit
NHREC	National Health Research Ethics Committee of Nigeria
SBCC	Social and behavior change communication
SHF	Smallholder farmer
TOC	Theory of change
WPF	World Poultry Foundation

Executive Summary

Introduction and Methodology

The Bill and Melinda Gates Foundation (BMGF) is funding the Africa Poultry Multiplication Initiative (APMI), under which the World Poultry Foundation (WPF) received a grant to support private sector poultry companies to produce and sell low-input dual-purpose chickens. Through a brooder unit model, the poultry companies sell these chickens to rural households in countries including Nigeria and Tanzania. These chickens are hypothesized to be more productive than local breeds: they gain weight more quickly and produce more eggs, yet they exhibit lower rates of mortality while requiring minimal resources for daily upkeep.

The APMI model in Nigeria conceived by WPF involves Amo Farm Sieberer Hatchery Limited (AFSH) selling day-old "Noiler" chicks (DOCs) to "Mother Units" (MUs) who rear the chicks for approximately five weeks before selling them to smallholder farmers (SHFs). These SHFs then rear the chicks to maturity for sale and/or household consumption. To ensure that MUs can provide adequate care to the DOCs, Amo provides in-person training and support through their Farmer Satisfaction Representatives (FSRs).

The purpose of this study was to qualitatively understand the motivations and experiences with the APMI model of various stakeholders involved in the program at crucial junctions, namely FSRs, MUs, and SHFs. Using their experiences and perspectives, we explore determinants of supply and demand for dual-purpose chickens across the study areas, assumed pathways to impact for smallholder farmers (and drivers and obstacles thereto), disparate experiences with the model across geographies and respondent types, and perceptions of the model among its key actors and target beneficiaries.

Qualitative data for this study were collected between June and August 2022 from stakeholders in Ekiti, Kano, Katsina, Kebbi, Kwara, and Ondo states in Nigeria. This included 77 semi-structured interviews with SHFs (n=36), MUs (n=35), and FSRs (n=6).

Findings

The high-level takeaways from this report are as follows:

The Business of Mother Units

- **MUs do not just sell Noiler to SHFs.** While all MUs sell to SHFs, most also sell Noiler, to a lesser extent, to middlemen (third-parties who resell to SHFs). Most MUs do not know to whom the middlemen then sell, but some noted that they sell to SHFs in more rural and remote communities that are difficult for MUs to access.
- **MUs generally do not find customer retention to be a challenge.** Active customer retention strategies include alerting upon restocking, following up with SHFs after purchase, and providing assistance with chick care.
- **MUs say their input costs have increased substantially in recent years**, though revenues have also increased due to higher selling prices. **Most MUs said that their business has been affected negatively by rising input costs**, whether by reducing the quantity of DOCs they can stock, reducing the quantity of MOCs an average customer demands, or by eroding profits per bird.
- However, MUs and FSRs perceive that **profitable cycles are the norm** rather than the exception, and a third of MUs say they've never had an unprofitable cycle.
- **A slim majority of the MUs we spoke to said that being a Mother Unit was a full-time job for them.** Nearly all low-volume MUs reported that this was a part-time job, while most high-volume MUs reported that it was their full-time job.

Drivers and Barriers to MU Success

- MUs and FSRs both stressed the **importance of access to capital in determining an MU's success.** Respondents suggested that being a Mother Unit, though perceived to be profitable, is an expensive business to both start up and continually run.
- **Most MUs follow up with SHFs after purchase**, but FSRs say the most successful ones follow up more frequently and intently.
- FSRs in the North say **an MU's location and the types of SHFs around them can drive or hinder their success.** FSRs in the South say these are not important factors and that individual characteristics of MUs are more important determinants of success.

SHF Experiences with Noiler

- MUs and FSRs indicate that, in their experience, most SHFs who purchase Noiler become repeat purchasers.
- SHFs who have stopped rearing Noiler were somewhat less experienced in poultry-rearing than those who have continued. **MUs suggested an SHF's level of previous experience with poultry plays a role** in whether they become a repeat purchaser.
- **Perceptions of poultry vary across regions.** Chickens owned by households were seen more as a source of income in the North and more as a source of food in the South, which respondents suggested may be driven by regional wealth disparities. Perceptions of poultry and intentions with Noiler did not differ between repeat and one-time purchasers.
- **An SHF's level of wealth is an important factor in terms of propensity to purchase Noiler**, with respondents suggesting that better-off SHFs are more likely to try out—and stick with—Noiler.
- It appears that the purchasing prices of month-old chicks faced by SHFs in our sample have risen disproportionately compared to the selling prices of mature Noiler, which may **undermine the potential profit margin SHFs can expect from rearing Noiler**.
- **SHFs do not consider Noiler to be as low-input and low-maintenance as local chickens**, though this does not seem to drive dissatisfaction with Noiler nor stand in the way of repeat purchase.
- **Female SHFs constitute more frequent and reliable customers in MUs' eyes**, though they may buy fewer birds at a time and request more support compared to male customers.
- **SHFs do not consider Noiler to be as low-input and low-maintenance as local chickens**, though, for most Noiler owners, this does not seem to drive dissatisfaction with the breed nor stand in the way of repeat purchase.
- **One-time purchasers in our sample faced higher levels of flock loss on average than repeat purchasers**. According to MUs, this is in part because they have less knowledge of appropriate poultry management practices.
- SHFs who stop rearing Noiler may do so because of an experience of **high flock loss, the cost of Noiler chicks and feed, or inconsistent supply**, rather than dissatisfaction with the bird itself or negative experiences with an MU.
- Among those SHFs who stop rearing Noiler, most tend to do so because of an **experience of high flock loss, the cost of Noiler chicks and feed, or inconsistent supply**, rather than dissatisfaction with the bird itself or negative experiences with an MU.

- **SHFs overwhelmingly raise Noiler at least partially on commercial feed, and a majority report using exclusively commercial feed**. Some prefer it for fast growth, while others believe Noilers need it to survive. SHFs hear **conflicting messages on feed** from MUs.

Supply and Demand for Noiler

- Respondents of all types say **demand for Noiler has increased significantly** over the last few years. MUs most frequently cited increased familiarity with the breed and corresponding word of mouth promotion among SHFs as contributing to this growth in demand.
- The key remaining barriers to further demand in respondents' eyes are **cost—of both Noiler chicks and feed—and inconsistency in supply.**
- **Supply challenges—particularly delays in receiving Noiler—are prominent** for MUs and SHFs in both northern and southern states, though supply challenges may be more pronounced in northern states.
- MUs, SHFs, and FSRs pointed to **problems during transport of day-old chicks** arising from long distances, inappropriately equipped vehicles, and commercial drivers with little accountability.
- Respondents suggested that Amo's **current production capacity may no longer be sufficient to meet demand** for Noiler across the country.

Recommendations

Based on these findings, we recommend the following in order to further improve the APMI MU model, continue to increase and stabilize demand and SHF satisfaction, and further investigate potential supply-side factors.

Recommendations to Further Improve the APMI Model

1. **<u>APMI Stakeholders:</u> Study opportunities to facilitate access to financing or in-kind credit for MUs.** Increased access to financing for MUs could allow for both larger and more frequent restockings, while also lowering the barriers to becoming an MU for capital-constrained but interested farmers.[1]

2. **<u>Amo Farm:</u> Target extra marketing and sales support to MUs in poor communities in northern states.** As it may be comparatively more difficult to sell Noiler in poorer communities in the North, MUs in these communities may struggle to progressively increase their volumes

[1] Amo Farm is presently exploring the feasibility of this.

relative to their peers in more conducive locations.

3. Amo Farm: **Consider formally folding middlemen into the APMI structure.** Selling to middlemen may allow for wider propagation of Noiler than would be possible otherwise, but can limit the follow-up support and access to information received by SHF customers. Folding middlemen into the structure could improve SHFs' success with Noiler. This could involve MUs simply requesting that the middlemen give their customers the phone numbers of the MU and FSR in case of any queries on chick care.[2]

Recommendations to Increase Demand and SHF Satisfaction

1. **Amo Farm and APMI Stakeholders: Expand Amo-Tanager social behavior change communication (SBCC) campaign to other states.** Respondents pointed to these advertisements as a boon for demand in Kebbi, where the campaign has already been launched, so expansion to other states may bear similar results.[3]

2. **Amo Farm: Use region-specific messaging to SHFs on the benefits of eating and selling Noiler.** As there are regional differences in views of poultry and intentions with Noiler, there may be an opportunity for stronger and more targeted messaging as to the benefits of eating Noiler in the North and of selling Noiler in the South.

3. **Amo Farm: Test out messaging that underscores higher selling prices for mature Noiler.** This could help to contextualize the Noiler price increases within the general inflation Nigeria is experiencing.

4. **Amo Farm and APMI Stakeholders: Explore opportunities for cost savings that may allow for lower selling prices of Noiler.** This could encourage poorer SHFs to purchase and repurchase, allowing them to realize the potential benefits of the bird.

5. **Amo Farm: Better sensitize farmers as to the type of feed Noiler requires.** This messaging should emphasize that Noiler does not necessarily require commercial feed if the birds are able to forage and are given adequate quantities of kitchen scraps or grain chaff.

6. **Amo Farm: Target extra support to SHFs who are less experienced in poultry-rearing.** This may help to prevent flock loss and encourage repurchase of Noiler.

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[2] As middlemen may be concerned about their customers being poached by MUs, this recommendation may be better suited to cases where middlemen's customers are located far from the MU.
[3] However, this should exclude the impact evaluation states (Ekiti, Katsina, Kano, Kwara, and Ondo) until after endline data collection has been conducted. Amo Farm is already preparing to expand the SBCC campaign to 15 states.

7. **<u>Amo Farm:</u> Establish a system to compensate SHFs who experience high flock loss during their first purchase.** This may prevent high flock loss from discouraging first-time purchasers from repurchasing.

Recommendations Related to Supply of Noiler

1. **<u>Amo Farm and APMI Stakeholders:</u> Quantitatively investigate supply factors and potential avenues to further optimize production.** This will allow WPF and Amo to identify opportunities to further increase efficiencies in production and distribution.
2. **<u>Amo Farm:</u> Explore opportunities to reduce transportation-related chick mortality.** Suggestions offered by respondents, as well as other possible ways to reduce transportation-related mortality, should be explored with respect to effectiveness and cost implications.
3. **<u>Amo Farm:</u> Compensate MUs who do not receive their full order due to transportation-related mortality.** This could help to maintain MU satisfaction while ensuring that FSRs do not incur personal expenses when transportation-related mortality occurs.

1. Introduction

1.1 Background on the Intervention

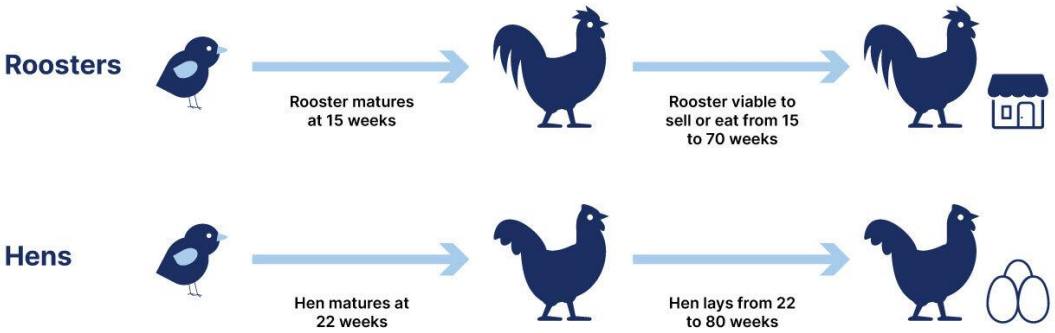
1.1.1 Description of Intervention

In many low-income countries, rural households engage in poultry farming (Padhi, 2016). A number of studies, both quantitative and qualitative, have shown that poultry farming can play a significant role with respect to increasing household income, improving nutritional outcomes, and promoting gender equality, thereby helping to alleviate poverty (Gueye, 2000; FAO, 2010).

The Bill and Melinda Gates Foundation (BMGF) is funding the Africa Poultry Multiplication Initiative (APMI). Under this program, the World Poultry Foundation (WPF) received a multi-year grant to support private sector poultry companies to produce and sell low-input dual-purpose chickens, which are sold to rural households in countries including Nigeria and Tanzania.[4] These chickens are hypothesized to be more productive than local breeds: they gain weight more quickly and produce more eggs, yet they exhibit lower rates of mortality while requiring minimal resources for daily upkeep. Figure 1 below shows the maturity timeline of these dual-purpose chickens.

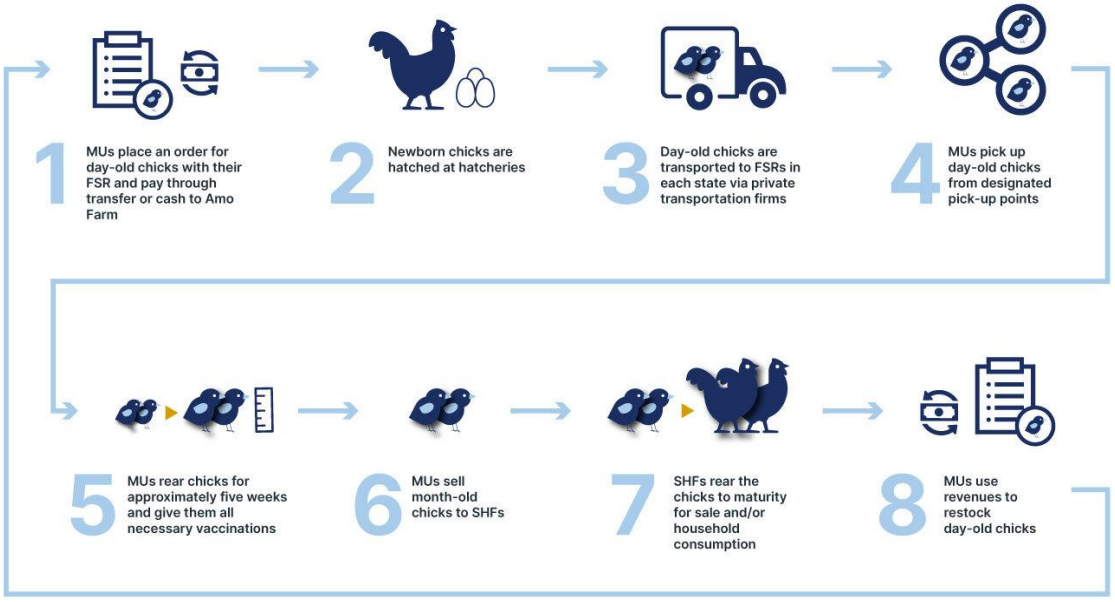
[4] IDinsight's evaluation of APMI only focuses on Nigeria and Tanzania. However, since the inception of the program in 2018, APMI has expanded to countries including Zimbabwe and Zambia.

Figure 1: Maturity timeline of dual-purpose chickens



The primary APMI implementer in Nigeria is Amo Farm Sieberer Hatchery Limited (AFSH), which first introduced the dual-purpose Noiler program in 2016-2017. Under the APMI model conceived by WPF, Amo Farm sells day-old "Noiler" chicks (DOCs) to "Mother Units" (MUs)—small enterprises that rear the chicks for approximately five weeks, ensuring they are properly fed and vaccinated, before selling them to nearby smallholder farmers (SHFs). These SHFs then rear the chicks to maturity for sale and/or household consumption. At 12-13 weeks, but under 15-17 weeks, the cocks weigh between two to three kilograms on average and Amo recommends them to be sold or consumed. The hens begin to lay eggs when they are five to six months old and can lay almost 160-170 eggs/year.

Figure 2: The APMI MU model



This model is designed to both reduce the chick mortality risk for SHFs and to provide intermediating MUs with economic opportunities. To ensure that MUs can provide adequate care to the DOCs, thereby reducing chick mortality, Amo provides in-person training and support through their Farmer Satisfaction Representatives (FSRs) in each state. This support includes ensuring that all the chicks receive the necessary vaccinations.

1.1.2 Theory of Change

The Theory of Change (TOC) for APMI outlines the expected pathways to impact for the program (see diagram in Appendix A). Highlighted in the diagram are the roles of various stakeholders, pathways, and assumptions necessary for the program to lead to improved outcomes, as well as key indicators by which to measure program success.

The TOC begins when a poultry company, such as Amo Farm, establishes MUs in communities to sell Noiler chickens to SHFs. Purchasing Noiler chickens allows SHFs to sell, consume, or gift more meat and eggs than would be possible with local chickens. SHFs can use their additional income from sales to increase spending on nutrient-rich foods for themselves and their children; the extra consumption of chicken also increases the share of protein in their and their families' diets. As SHFs accrue benefits from chickens, they can increase the size of their flocks and multiply their outcomes. Over time, these channels lead to measurable impacts in household income, female decision-making, and women and children's nutrition.

The qualitative study investigates some of the assumptions underpinning the linkages between activities and outputs. These include, but are not limited to: the extent to which MUs sell Noiler to SHFs, how SHFs use Noiler, whether SHFs consume more chicken and eggs as a result of owning Noiler, and what SHFs do with the income they earn from selling Noiler. It is crucial that these assumptions hold true in order for the program to achieve its intended impacts.

1.1.3 Quantitative Impact Evaluations

As part of a supporting grant, IDinsight has been commissioned to conduct quantitative impact evaluations of the APMI program in Nigeria and Tanzania. The evaluation in Nigeria will assess the flock performance of the Noiler breed and quantify the causal effect of owning Noiler birds on SHFs' livelihoods, with a particular focus on income, nutrition, and women's empowerment. Thus far, IDinsight has conducted baseline data collection with subsequent rounds of monitoring, a process evaluation, and endline data collection in Tanzania; endline data collection in Nigeria is expected to be conducted in 2023.

Whereas the ongoing impact evaluations focus on the smallholder farming household as the unit of analysis and aim to quantify the impact of owning the birds once they are purchased, the qualitative study will take a more holistic look at the background dynamics surrounding the project. This is elaborated upon further in Section 1.2.

1.2 Study Objectives

The purpose of this study is to understand the motivations and experiences with the APMI model of various stakeholders involved in the program at crucial junctions. This includes sales representatives from Amo Farm, MU operators who act as intermediaries between Amo Farm and smallholder farmers, and smallholder farmers themselves, including those who have purchased dual-purpose chickens multiple times and those who have purchased only once. As these are all critical players in the TOC, their interactions with the model can help APMI stakeholders better understand key dynamics and linkages in the model. Using their experiences and perspectives, we explore determinants of supply and demand for dual-purpose chickens across the study areas, assumed pathways to impact for smallholder farmers (and drivers and obstacles thereto), disparate experiences with the model across geographies and respondent types, and perceptions of the model among its key actors and target beneficiaries.

The qualitative work has three key objectives:

1. to provide context for findings of the broader APMI impact evaluation;
2. to aid Amo Farm in better understanding the dynamics that surround its business model, how the model has functioned in practice, and how it can be further improved; and,
3. to aid BMGF and WPF in further refining the APMI model, with an eye toward scaling up this and other dual-purpose poultry projects across sub-Saharan Africa.

The research questions are structured as follows:

Topic	Research Questions
The Business of Mother Units	• Who do Mother Units sell to, and what strategies do they employ to attract and retain customers? • Do they perceive their business as profitable, and do they pursue this as a full-time business?
Drivers and Barriers to MU Success	• What makes an MU "successful" (as perceived by MUs and FSRs), and what are the barriers to success? • To what extent is this related to the MU's own operations and characteristics versus the context in which the MU operates?
SHF Experiences with APMI	• How do experiences of repeat and one-time buyers differ, and what differentiates these two types of farmers? • How is uptake among women impacted by gendered social norms, access to productive resources, and time poverty? • Among Noiler owners, how do perceptions of and satisfaction with the birds vary across different types of farmers? • How do perceptions of Noiler meat and eggs compare to perceptions of local chicken meat and eggs? • How do feeding and general poultry management practices differ across different types of smallholder farmers? What messaging do farmers hear around these and what contributes to differences both over time and among farmers?
Supply and Demand	• How do participants in the APMI program perceive the supply of and demand for Noiler? • What are the drivers and barriers of uptake (first-time and repeat purchase) of dual-purpose chickens? Are there differences across types of community and by region? • How have these changed over time, what undergirds those changes, and what opportunities for improvement do participants see?

2. Methodology and Deviations

To answer our study's research questions, we conducted one-on-one, semi-structured interviews with three categories of respondents: 1) Farmer Satisfaction Representatives (FSRs); 2) Mother Units (MUs); and, 3) Smallholder farmers (SHFs). Our sample breakdown, sampling procedures, deviations therefrom, and data collection procedures are detailed in this section.

2.1 Sampling

Our sample consists of 36 SHFs, 35 MUs, and six FSRs across six states in Nigeria: Ekiti, Kano, Katsina, Kebbi, Kwara, and Ondo. For the purposes of this study, we have classified Kano, Katsina, and Kebbi as "northern states" and Ekiti, Kwara, and Ondo as "southern states," the same classifications used in the impact evaluation. The breakdown of respondents is outlined in Table 1 below.

Table 1: Respondent Sample by Category and State

		Northern States			Southern States		
	Total	**Kano**	**Katsina**	**Kebbi**	**Ekiti**	**Kwara**	**Ondo**
One-time purchaser SHFs	**16**	3	3	3	2	3	2
Repeat purchaser SHFs	**20**	3	3	3	4	3	4
Total SHFs	**36**	**6**	**6**	**6**	**6**	**6**	**6**
High-volume MUs	**17**	3	2	3	3	3	3
Low-volume MUs	**18**	3	3	3	3	3	3
Total MUs	**35**	**6**	**5**	**6**	**6**	**6**	**6**
FSRs	**6**	**1**	**1**	**1**	**1**	**1**	**1**

As this research sought in part to identify: 1) barriers to and drivers of success for MUs, and 2) barriers to and drivers of purchase and repeat purchase among SHFs, we split both MUs and SHFs into subcategories. Among MUs, we aimed to interview an equal number of "struggling" MUs and "thriving" MUs, though we ultimately moved away from this nomenclature, as explained in section 2.1.1.[5] Among SHFs, we aimed to interview an equal number of repeat purchasers and one-time purchasers of Noiler.[6]

With these subcategories in mind, we determined that within each state, we would aim to interview three "struggling" MUs, three "thriving" MUs, three repeat purchasers, and three one-time purchasers to arrive at a target sample size of 36 MUs and 36 SHFs.[7] This sample size would allow us to achieve thematic saturation within each sub-category, while also being able to make conclusions across regional groupings (with nine respondents of each subcategory in the North and nine respondents of each subcategory in the South).[8]

The sample size for FSRs was fixed at six—one FSR per state—as Amo Farm only employs one FSR in most states. The sampling procedures for MUs and SHFs, respectively, are outlined in more detail below.

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[5] We had initially intended to focus on sales volume by community (i.e. high-sales communities versus low-sales communities) but, after conversations with stakeholders, shifted toward MUs themselves as the focal point (i.e. catchment areas of high-sales or "thriving" MUs versus catchment areas of low-sales or "struggling" MUs).
[6] The reason why we did not end up with an equal number of one-time and repeat purchasers is explained in section 2.2.
[7] We were only able to interview five MUs in Katsina. This is explained further in section 2.2.
[8] Thematic saturation is reached when adding more respondents does not produce new themes and insights. Between six and twelve interviews for a given subgroup of interest has been empirically validated as the number of interviews needed to reach response saturation (Guest et al., 2006).

2.1.1. MU Sampling

To establish a sampling frame for MUs, we requested from AFSH a list of their 10 highest-performing and 10 lowest-performing active MUs in each state. The information requested included the number of cycles completed by the MU in the preceding 12 months, the total volume of day-old chicks purchased during the preceding 12 months, and the percentage of month-old chicks sold off, as well as the MUs' location and contact details. We then contacted MUs by phone to verify the information we had received from Amo and inquire whether they would be willing to participate in the study. From this exercise, it became clear that the percentage of month-old chicks sold off was not a meaningful metric by which to differentiate MUs, as both "high-performers" and "low-performers" were managing to sell nearly all their brooded chicks. The key difference, then, became volume, and we thus shifted our terminology from "thriving" and "struggling" MUs to "high-volume" and "low-volume" MUs.

We purposively sampled MUs for inclusion in the study by selecting the three highest-volume and three lowest-volume MUs in each state that had confirmed availability and willingness to participate. In order to avoid interviewing APMI impact evaluation treatment farmers (due to concerns over respondent fatigue and over-surveying), we aimed to avoid MUs based in treatment communities of the APMI impact evaluation. In a few cases, however, target MUs were unavailable during the data collection period, so we replaced them with MUs based in treatment communities, which was the case in seven instances. In these communities, we ensured that we avoided treatment farmers by filtering them out of the customer lists we received from MUs. Treatment farmers ended up representing fewer than 3% of customers.

2.1.2 SHF Sampling

We sampled SHFs in-field using a random selection method based on MU characteristics and MUs' reported customers lists. At the end of each MU interview, we requested a list of the MU's customers, including their genders and their purchasing status (one-time or repeat). We intended to interview one SHF customer per MU using the following procedure:

1. Each of the six states was randomly assigned to A, B, C, D, E, or F, without replacement.
2. Within each state, each low-volume (previously "struggling") MU was randomly assigned to S1, S2, or S3, without replacement.
3. Within each state, each high-volume (previously "thriving") MU was randomly assigned to T1, T2, or T3, without replacement.
4. The MU designation (e.g. AS1, BT2, ET3, FS2, etc.) determined the type and gender of the target customer, according to the table below.

STATE A			
MU designation	**MU Type**	**Customer type**	**Customer gender**
AS1	Struggling	One-time	Female
AS2	Struggling	Repeat	Female
AS3	Struggling	One-time	Male
AT1	Thriving	Repeat	Male
AT2	Thriving	One-time	Female
AT3	Thriving	Repeat	Male
STATE B			
MU designation	**MU Type**	**Customer type**	**Customer gender**
BS1	Struggling	One-time	Male
BS2	Struggling	Repeat	Male
BS3	Struggling	One-time	Female
BT1	Thriving	Repeat	Female
BT2	Thriving	One-time	Male
BT3	Thriving	Repeat	Female
STATE C			
MU designation	**MU Type**	**Customer type**	**Customer gender**
CS1	Struggling	One-time	Female
CS2	Struggling	Repeat	Male
CS3	Struggling	One-time	Male
CT1	Thriving	Repeat	Female
CT2	Thriving	One-time	Female
CT3	Thriving	Repeat	Male

STATE D			
MU designation	**MU Type**	**Customer type**	**Customer gender**
DS1	Struggling	Repeat	Female
DS2	Struggling	One-time	Female
DS3	Struggling	Repeat	Male
DT1	Thriving	One-time	Male
DT2	Thriving	Repeat	Female
DT3	Thriving	One-time	Male
STATE E			
MU designation	**MU Type**	**Customer type**	**Customer gender**
ES1	Struggling	Repeat	Male
ES2	Struggling	One-time	Male
ES3	Struggling	Repeat	Female
ET1	Thriving	One-time	Female
ET2	Thriving	Repeat	Male
ET3	Thriving	One-time	Female
STATE F			
MU designation	**MU Type**	**Customer type**	**Customer gender**
FS1	Struggling	Repeat	Female
FS2	Struggling	One-time	Male
FS3	Struggling	Repeat	Female
FT1	Thriving	One-time	Female
FT2	Thriving	Repeat	Male
FT3	Thriving	One-time	Male

From each MU, the customer to be interviewed was randomly selected from among those in the customer list of the designated gender and purchasing status. SHFs were then called, and a brief verification questionnaire was administered to: a) verify the eligibility information; b) ensure that the SHF was not an impact evaluation respondent; and, c) request permission—and, if granted, coordinate timing—for an in-person interview.

2.2 Deviations

Once data collection began, the research team was met with realities that required deviating from the intended sampling protocol. These changes were communicated to and agreed upon by APMI stakeholders during data collection and are outlined in this section.

2.2.1 Identifying One-Time Customers

The principal deviation stemmed from difficulty in finding one-time customers. We initially defined these as SHFs who purchased Noiler once and subsequently stopped rearing the breed. Upon receiving customer lists from MUs, we frequently found few or no one-time customers listed. When prompted, MUs pointed to several reasons for this, principal among them being that the phenomenon of one-time purchase was, in their experience, rare. Indeed, this was corroborated in interviews with both MUs and FSRs, as detailed in section 3. Second, MUs often did not have records going back significant amounts of

time. This meant that on multiple occasions, an SHF would be listed as a one-time purchaser, but upon calling them to confirm, it would be revealed that the SHF had only purchased for the first time recently, still had their birds, and planned to purchase again in the future. From customer lists, we were able to identify only three one-time customers out of the 18 desired.

As finding one-time customers from MUs' customer lists proved difficult, we expanded our sampling approach to include snowball sampling. This entailed having field teams call MUs' customers and ask whether they knew of any friends or neighbors who fit the profile. The vast majority of respondents said they did not, and most of the SHFs who they did point to, upon calling to confirm, turned out to actually be repeat purchasers. From extensive snowballing efforts, we were able to find only five new one-time customers.

For this reason, we expanded the definition of a "one-time" customer. Whereas originally we intended this group to comprise SHFs who purchased Noiler once and then stopped, the definition was expanded to include those who purchased multiple times and then stopped—this allowed us to find an additional eight "one-time" customers. During further snowballing with this expanded definition, we also relaxed the condition that one SHF be interviewed per MU. This was because on several occasions, we were able to find a "one-time" customer (under the expanded definition) of an MU for whom we had already interviewed a repeat customer. So as not to discard "one-timers" who had been difficult to find in the first place, we allowed for interviewing two SHFs from the same MU. This was ultimately the case in seven instances.

Even with this expanded definition of "one-time" purchaser, relaxation of the one-customer-per-MU condition, and incorporation of snowball sampling, achieving an 18-18 split of "one-time" and repeat customers still proved difficult. In order to proceed with the study, we ultimately accepted a split of 16 "one-time" customers and 20 repeat customers.

2.2.2 MUs in Katsina State

The other deviation stems from the smaller number of MUs in Katsina state. While Amo Farm was able to provide a list of their 10 largest and 10 smallest MUs by volume in each of the other states, the list in Katsina comprised 11 MUs in total, as there are fewer MUs in Katsina than in the other study states. Of these 11, only five MUs were available for an interview, leaving us with five MUs in Katsina rather than six, and 35 total MUs rather than the intended 36.

2.3 Data Collection and Analysis

The research team prepared semi-structured interview guides for each type of respondent, which field teams used to guide their interviews. The interview guides were informed by our research questions as well as our hypotheses with respect to the research questions. The table below outlines the interview guide sections for each respondent type.

Table 2: Interview Guide Sections for Each Respondent Type

Section #	SHFs	MUs	FSRs
1	Poultry background	Becoming an MU/training	MUs
2	First deciding to purchase Noiler	Customer base/spread	Training and support
3	First purchase	Finding customers	Successful MUs
4	Purchasing since then (repeat purchasers only)	Selling to first-time customers	Struggling MUs
5	Experience with Noiler	Selling to repeat customers	Supply
6	Poultry management knowledge/practices	Quantifying new versus repeat customers	Demand
7	Chicken/egg usage	Comparing one-time and repeat customers	Bandwidth/FSR role
8	Reflections on experience	Gender	Conclusion
9	Reflections on other farmers	Demand and Supply	
10	Conclusion	Perception of their business	
11		Support from Amo	
12		Conclusion	

The field team consisted of six interviewers, three Yoruba-speaking and three Hausa-speaking. All interviewers had previously worked on the APMI Nigeria impact evaluation as either enumerators or community mobilizers, giving them a degree of prior familiarity with the APMI intervention and the Amo Farm model. Field teams participated in a three-day classroom training in Abuja and one-day pilot data collection in Nasarawa state in June 2022; data collection took place in the six study states between June and August 2022.

Interviewers were instructed to interview respondents in private whenever possible and to maintain two meters' distance between themselves and the interviewee in line with COVID-19 prevention protocols. Interviews were conducted in person and recorded with the respondent's permission, with the exception of FSR interviews, which were conducted over Zoom by an IDinsight Senior Associate. MU and SHF interviews were conducted in either Yoruba or Hausa, while FSR interviews were conducted in English. All interviews began with an informed consent process approved by the National Health Research Ethics Committee of Nigeria (NHREC), the local Institutional Review Board with which this study is registered.

Interview recordings were transcribed and translated verbatim by the interviewer. One Yoruba-speaking field manager and one Hausa-speaking field manager reviewed transcriptions together with recordings to audit fidelity and refresh field teams on transcription best practices as necessary.

English transcripts were coded in a spreadsheet for thematic analysis by the IDinsight research team using a combination of deductive and inductive coding, whereby codes were both informed by theory undergirding the APMI program (the TOC and our hypotheses for each research question) and developed and refined in the process of reviewing data. We identified core ideas in the responses and distilled them into descriptive codes, repeatedly re-examining the codes to identify any gaps in the codebook that warranted additional review, as well as any opportunities for consolidation of codes without losing nuance.

As more transcripts were coded, we periodically reorganized codes, creating parent codes that corresponded to broader themes—both those we anticipated and those that emerged during data collection—and branching child codes that expanded on those themes in more detail. This process was conducted iteratively in order to ensure codes were relevant, mutually exclusive, and collectively exhaustive.

After coding was completed, we imported our codes into an analysis spreadsheet to assess frequencies of each code, in aggregate as well as by respondent sub-type (low-volume vs. high-volume for MUs and one-time vs. repeat purchaser for SHFs), region, and gender. This allowed us to distill and organize our findings and gave us direction on where and when to return to interview transcripts for deeper context.

Findings in section 3 are reported using frequency markers. The frequency markers and conditions used in this report are stated in Table 3.

Table 3: Frequency Markers and Conditions for Reporting Findings

Frequency Marker	Frequency Condition (F)
All	F = 100%
Vast majority | almost all	80% ≤ F < 100%
A majority | most	60% < F < 80%
Slim majority | over half | more than half	50% < F ≤ 60%
Half	F = 50%
Almost half | under half	40% ≤ F < 50%
Many | a minority	30% < F < 40%
Some | a few | a handful	0% < F ≤ 30%
None	F = 0%

2.4 Limitations

This study has two key limitations in generalizability which should be taken into account when interpreting findings.

2.4.1 Potential Over-Representation of One-Time Customers

The first limitation stems from a potential over-representation of one-time customers in our sample. As outlined in the Deviations section above, finding these respondents was an arduous process that involved a considerable amount of active searching, as both MUs and SHFs struggled to identify people who fit this profile. Had we randomly selected SHFs from within our sampling frame, we would have heard few, if any, insights from this group. While this fact alone bodes well for the APMI program, we did set out with the aim of hearing a broad set of experiences with Noiler, and we eventually managed to find 16 respondents who had stopped rearing the breed. Therefore, it should be noted that this likely means negative experiences with Noiler are over-represented within our SHF sample.

2.4.2 Bias Toward Active MUs

The second limitation works largely in the opposite direction and pertains to survivorship bias among sampled MUs. For this research, we set out to hear from active Mother Units in the study states, with the understanding that these would be best-placed to provide insights on the APMI model as it currently functions, as well as changes in the model to date. This does mean, however, that we did not hear from any former MUs that have ceased operations, and we are thus unable to comment on what may have led those to do so.

3. Findings and Discussion

3.1. The Business of Mother Units

Key Findings

- MUs we spoke to **do not just sell to SHFs.** While all MUs sell to SHFs, most also sell Noiler, to a lesser extent, to middlemen (third-party resellers). Most MUs do not know to whom the middlemen then sell, but some noted that they sell to SHFs in more rural and remote communities that are difficult for MUs to access.
- Very few MUs sell only in their own community. **Most sell Noiler across a larger area, including outside of their LGA.** Most MUs attribute the expansion of their sales area to increasing familiarity with Noiler.
- MUs primarily get new customers through **word of mouth** from other customers, though FSRs do help in active customer acquisition, particularly for female MUs.
- MUs generally **do not find customer retention to be a challenge.** Active customer retention strategies include alerting upon restocking, following up with SHFs after purchase, and providing assistance with chick care.
- MUs say their input **costs have increased** substantially in recent years, though **revenues have also increased**. Asked about the effect of input prices on their business, **most MUs said that their business has been affected negatively**, whether by reducing the quantity of DOCs they can stock, reducing the quantity of MOCs an average customer demands, or by eroding profits per bird.
- However, MUs and FSRs perceive that **profitable cycles are the norm** rather than the exception, and a third of MUs say they've *never* had an unprofitable cycle.
- Part-timers, full-timers and FSRs generally believe being an MU is feasible as a part-time job. **Part-timers generally seemed satisfied** being part-time, though some said they'd consider going full-time if they had more capital or could be assured of more consistent supply.
- Almost all MUs we spoke to receive help in their business, and most said it would not be feasible without this help. **Male MUs can count on help from their spouses, while female MUs were more likely to hire help.**

Recommendations

- Middlemen propagate Noiler to more SHFs than would be possible otherwise, but without the benefits of MU support or instruction that come from buying from an MU. To capitalize on their potential to amplify impact, **consider folding middlemen into the APMI structure more formally**, such as by having MUs request middlemen to give their customers the phone numbers of the MU and FSR in case of any queries on chick care.
- In the face of price increases and general inflation, avoid SHF sticker shock: **test out messaging that acknowledges the increase in price of month-old chicks**, while underscoring the higher price that mature Noiler now fetches.

3.1.1 Customer base

Most MUs we spoke to sell to a variety of customer types, not just SHFs. First, all MUs reported selling at least part of their flock to SHFs, and for the majority of MUs, SHFs make up at least 60% of their customer share by volume. However, only a few MUs reported selling exclusively to SHFs. **A majority of MUs also sell to middlemen (third-party resellers).** For most of this sub-group, middlemen make up 30% or less of their customer share by purchasing volume, but a few MUs reported that middlemen make up 80% or more of their customer share by volume.

The act of selling to middlemen did not vary appreciably between high-volume and low-volume MUs or between MUs in the North and in the South, though it was more common among male MUs than among female MUs. However, when looking at the *extent* of sales to middlemen, differences did appear. **Among those who reported that a majority of their chicks go to middlemen, nearly all were located in the South, and two-thirds were high-volume MUs.** When asked, FSRs all acknowledged that MUs regularly sell to middlemen. Asked whether they notice differences in this regard between high-volume and low-volume MUs, FSRs said that both types of MUs sell to middlemen in about equal measure.

The potential implications of this are mixed. On the one hand, most MUs who sell to middlemen reported that they do not receive customer information on those to whom the middlemen then sell, though a few explicitly stated that middlemen do sell to SHFs. This suggests that SHFs who purchase Noiler through middlemen generally do not receive the sort of follow-up support and access to information that come from having purchased from an MU. On the other hand, a common theme that emerged from interviews with both MUs and FSRs was that middlemen sometimes allow for wider propagation of Noiler than would be possible otherwise, particularly into rural and remote areas:

> *I prefer selling to SHFs, they make me happy. See my customer who came just now, I prefer having an interaction with my customers to ask about the well-being of the birds. But if not for the middle men, as a female, how do I get the birds to the reserves? Both are good, but without the middlemen, it will be impossible to get my birds to the reserves, the reserve areas are far from here, the distance is more than distance from here to Lagos.* **- MU**

> *The difference is that the middlemen pack them in bulk, it is mutual as it brings money to them and money to me as well, they will be the one to sell it, they know all the farmsteads and village markets and where to sell it to. Most of my SHFs are from the city here and civil servants. I cover those ones, while they help me with the villages.* **- MU**

> *Hawkers, those will buy more than 100 five-week chicks, they will go and take it to another village that's very far that rural women can't reach there to go and sell her birds. And if the SHF customer is getting the brooded Noiler for 700, then the hawker is getting for 600-650, then he will go to the other village and sell to SHF for 750, so he too is getting something.* **- FSR**

These insights suggest that, in allowing for Noiler to reach populations that may be inaccessible or inconvenient for MUs to sell to, the sale of chicks to middlemen and hawkers could in fact be beneficial for APMI's bottom-of-the-pyramid impact. It should be noted as well that while most MUs do not receive customer information from middlemen, a few said they do, and one FSR mentioned working with MUs to request this information from middlemen.

Recommendation: Folding middlemen into the APMI structure more formally could capitalize on their potential to amplify impact. This could take the form of simply requesting them to give their customers the phone numbers of the MU and FSR in case of any queries on chick care. This can benefit the middlemen as well by ensuring that their customers have greater success with Noiler.

Many MUs also sell to commercial poultry farmers, and most of this subgroup reported commercial farmers making up 10-25% of their customer share by volume. In contrast to sales to middlemen, which was a common phenomenon across the board, sales to commercial farmers varied substantially across dimensions. Male MUs, northern MUs, and high-volume MUs were considerably more likely to sell to commercial farmers than female, southern, and low-volume MUs, respectively. Other MU customer types include stores, markets, and restaurants, but only a few MUs reported selling to these customer types and they generally do not make up a substantial share of MUs' volumes.

Of all of these customer types, **the plurality of MUs said that they prefer selling to SHFs** because they buy frequently, they pay immediately whereas some middlemen may purchase on credit, they buy at a higher price, and there is a higher social impact in selling directly to SHFs as opposed to other customer types. However, some MUs said they prefer selling to middlemen or commercial farmers because they purchase larger orders than SHFs.

Most MUs reported pricing Noiler differently for different customer types. **Almost all of them noted that they give discounts to third-party vendors and commercial farmers**, given that they purchase in larger quantities and that middlemen must be able to turn a profit in order to keep buying. MUs do not appear to consciously use different messaging to appeal to different customer types.

When asked where their customers are located, **very few MUs reported selling Noiler only within their own community**. Most reported that they sell even outside of their LGA, and some even sell to customers in other states. Regardless of the current geographic scope of their business, almost all MUs said that their sales area has expanded in recent years and indicated that this has been good for their business. MUs primarily attribute this expansion to word of mouth and to the quality of Noiler.

3.1.2 Finding and retaining customers

Finding new customers

Similarly, **with respect to finding new customers, most MUs noted that this often happens simply through word of mouth**—satisfied customers will tell their friends, family, and neighbors about Noiler, bringing more business to the MU. Of those who pointed to word of mouth as a key driver of new sales, most were low-volume MUs rather than high-volume MUs, and men rather than women.

By contrast, **more women than men reported that the FSR helps them in finding new customers**, while high-volume and low-volume MUs reported this in equal measure. More women than men also reported offering first-time discounts to attract new customers: half of female MUs regularly use this strategy compared to several male MUs, while high-volume and low-volume MUs do so in equal measure. Overall, though, **most MUs do not provide discounts for the first purchase**. A few MUs reported finding new customers through advertising on the internet and social media, though this was not mentioned frequently and an equal number of MUs reported not actively looking

for new customers at all, instead letting customers find them. MUs, be they high- or low-volume, did not report trouble in selling off their flocks.

Retaining customers

The most frequently cited customer retention strategy was simply to provide high quality birds. Indeed, **MUs generally indicated that customer retention was not a challenge**, with a strong majority reporting that in a typical cycle, they sell mostly or almost entirely to repeat customers. This did not differ between high-volume and low-volume MUs.

In terms of active customer retention strategies, **nearly all MUs reported contacting their customers to alert them that they have restocked**. Most do this once their brooded chicks are ready for sale, while some alert customers a couple weeks before, and others alert customers upon receiving day-old chicks. A few MUs reported not doing this, either because their customers take it upon themselves to inquire, or to prevent demand from exceeding supply.

Most MUs also cited follow-ups with SHFs as a retention strategy. High-volume and low-volume MUs reported doing so at the same rate, while female MUs were more likely to report doing so than male MUs (though most men still reported doing so). MUs said they typically call SHFs to check on how the purchased chicks are doing, with some traveling to SHFs to inspect their coops or even administer medication themselves when requested. This underscores the importance of the MU role beyond that of a mere distributor—and the fact that while middlemen may increase the breadth of APMI's impact, this may come at the expense of depth of impact.

3.1.3 Perceived profitability

Nearly all MUs reported making a profit in their most recent cycle, with no difference seen between high-volume and low-volume MUs, nor across regional groupings. When asked about all cycles to date, a majority of MUs said that most but not all cycles have been profitable, while a further third said that they have never experienced an unprofitable cycle.[9] FSRs corroborated this, with half reporting that all MUs in their state are profitable, and the other half reporting that almost all are profitable. When asked whether they've seen changes in the share of MUs that are profitable over the years, most FSRs said no, pointing to the fact that, while demand for Noiler was lower in years past, so too was the number of MUs serving the market.

[9] It should be noted here that we only spoke to active MUs as part of this study, as highlighted in the Methodology and Deviations section. There are limitations in generalizability due to possible survivorship bias, which would be the case if unprofitable MUs have ceased operations.

While we did not attempt to quantify MU profit in this study, we did ask MUs about their key costs and revenues—namely about how these have changed over their years of operation. **All MUs reported that the price of a day-old chick has increased since they started**, with a majority reporting that the price they last paid (between 340 and 380 naira for most) is more than triple what they paid in their first cycle.[10]

Asked about the effect of rising DOC prices on their business, most MUs said that their business has been affected negatively, whether by reducing the quantity of DOCs they can stock, reducing the quantity of MOCs an average customer demands, or by eroding profits per bird. A few said their business hasn't been hurt since Noiler price increases have been commensurate with general price increases in the country. There was no appreciable difference in these regards between high- and low-volume MUs, nor across regional groupings.

Aside from DOC prices, **all MUs we spoke to pointed to a rise in input costs**, with feed, vaccines, medication, and transport prices increasing across the board. Some MUs reported responding to these input cost changes by increasing prices of brooded chicks, while a majority reported that input cost changes have simply eroded their profits.

FSRs were more mixed on the impacts of price increases. Some noted that they have not seen effects on purchasing volumes, given that sales prices have increased in kind—most MUs now sell MOCs for 1000-1200 naira each—and that price increases are in line with general inflation in Nigeria. Others, however, noted that MUs and SHFs do sometimes respond to price increases by purchasing fewer birds. SHFs purchasing fewer birds would have negative implications for the social impact potential of the program. One FSR mentioned that this can be mitigated by targeted messaging that acknowledges the increase in cost while underscoring that revenues increase commensurately:

> *People are saying 'oh how can I buy just a five weeks Noiler 1000 naira, and I will have to continue raising it?' Because back then they used to buy mature Noiler at 1500, so they are thinking how can I buy this for 1000? But we are still enlightening them that if you buy it 1000 and raise it the next three to four weeks, you can sell it 3000 again. Everybody knows that the mature Noiler that you used to buy 1500 now you must buy it 5000.* ***- FSR***

[10] This, of course, must be put in the context of high general inflation in Nigeria in recent years, with the overall price level in the country at the beginning of 2022 standing at nearly double what it was in 2017: https://www.worlddata.info/africa/nigeria/inflation-rates.php

Recommendation: Given a marked increase in the price of Noiler chicks, a prudent messaging strategy may start with acknowledging this fact, and then emphasizing the higher prices that mature Noiler now fetch. This could help to contextualize the Noiler price increases within the general inflation Nigeria is experiencing and remind potential customers that while Noiler has indeed become more expensive in nominal terms, it may not be so in real terms.

3.1.4 Full-time vs. part-time

A slim majority of the MUs we spoke to said that being a Mother Unit was a full-time job for them. It was in this aspect that we found some of the starkest differences between high-volume and low-volume MUs. **Nearly all low-volume MUs reported that this was a part-time job, while most high-volume MUs reported that it was their full-time job.**

FSRs pointed to this same dynamic, noting that a key differentiating factor between high- and low-volume MUs in their states was simply whether they hold this as a full- or part-time job. FSRs noted, however, that given the hardy, lower-maintenance nature of Noiler relative to commercial breeds, being full-time is not a prerequisite for being successful as an MU, though being a part-time MU does naturally place a limit on the volume of business one can do. When asked whether they thought being a Mother Unit was feasible as a part-time business, most MUs agreed with FSRs in saying that it is, including many high-volume MUs for whom it is not part-time. This points to a recurring theme that arose from both MU and FSR interviews: **desired sales volume—rather than ability to attract and retain customers—being the principal limiting factor for MUs.**[11]

When asked whether anything could change to make them consider going full-time, part-time MUs gave a wide range of answers. Some indicated that they simply enjoy their other jobs and had no desire to leave them, some others mentioned intending to transition to Noiler full-time only after retiring from their other jobs, and a few mentioned the importance of diverse income streams given the economic situation in Nigeria. Some others mentioned that they may consider going full-time if they had more capital or if they could be assured of more consistent supply. **In general, it did not appear that part-time MUs were striving to go full-time but were facing obstacles to doing so.**

[11] This distinction is the reason why this study shifted to using the terms “high-volume” and “low-volume” rather than “thriving” and “struggling” (as noted in section 2).

3.1.5 Family and hired help in the business

While most MUs indicated that this line of business is feasible part-time, **nearly all reported that they receive help in running their Mother Unit, including high- and low-volume MUs in equal measure**. Family help was most common, be it from spouses, children, or other family members. Differences appeared in this regard between male and female MUs. **Women were more likely to report receiving help from their children, but far less likely to report receiving help from their husbands. Male MUs, meanwhile, were more likely to receive help from their wives**, particularly in the more laborious, chicken-related tasks like cleaning coops and feeding birds.

Given the overall gendered nature of poultry-rearing in Nigeria, it follows that female MUs may be less likely to be able to count on help from their husbands, while male MUs are more likely to expect and receive help from their wives. One FSR mentioned the importance of sensitizing the husbands of female MUs, though this was framed more in terms of a supervisory role than in terms of assistance:

> *You should train them and then train the husband - this is what your wife needs to do, to be profitable, to enhance her business. She shouldn't allow litter to be wet, should be changing the water every day. You won't only be talking to a wife, even a father or husband you will need to give him that advice.* ***- FSR***

Women, accordingly, were more likely than men to rely on hired help in running their Mother Unit, with two-thirds of women hiring paid laborers compared to just under half of men. While this did not appear to negatively affect whether or not the MU was profitable (as even more female MUs than male MUs reported profiting in the last cycle), it is possible that having to hire help could negatively affect the level of profit achieved by these female MUs, which was outside the scope of this research. That said, it is also possible that a female MU hiring help represents the optimal decision at her household level and is not solely done because of a lack of help from her husband.

Most MUs who receive help indicated that running their business would not be feasible without said help. Those who suggested that they could manage without the help they currently receive were overwhelmingly men, which could stem from the different perceived value of family vs. hired labor. Overall, though, respondents indicated that brooding Noiler, even if not full-time, is rarely a one-person operation.

3.2. Drivers and Barriers to MU Success

Key Findings

- MUs and FSRs say an MU needs **persistence, determination, and entrepreneurial spirit** to be successful.
- Prior poultry knowledge is important, though **openness to learning new methods** perhaps more so.
- MUs and FSRs both stressed the **role of capital in determining an MU's success.** Respondents suggested that being a Mother Unit, though perceived to be profitable, is an expensive business to run.
- Most MUs financed their initial investment themselves, and most do not have access to credit on reasonable terms. MUs and FSRs both pointed to a **potential role for external financing** to help bolster MU success.
- Most MUs follow up with SHFs after purchase, but FSRs say the most successful ones **follow up more frequently and intently.**
- **Relationship-building** with SHFs and **pricing fairly** set top-performing MUs apart from the rest, according to FSRs. High-volume MUs in our sample report selling to SHFs for lower prices than low-volume MUs.
- FSRs in the North say an **MU's location and the types of SHFs around them** can drive or hinder their success. FSRs in the South say these are not important factors.

Recommendations

- **Facilitating access to financing or in-kind credit** could allow for both larger and more frequent re-stockings among MUs. It would also lower barriers to becoming an MU for capital-constrained but interested farmers.
- Consider providing more **targeted marketing and sales support**—and more active monitoring and follow-up—for **new and prospective MUs located in particularly poor communities in northern states.**

3.2.1 MU qualities

To understand perceived drivers and barriers to MU success, we first asked MUs and FSRs what qualities an MU needs to have to be successful in this business.

The most common responses from MUs mentioned persistence, determination, and patience, as well as poultry knowledge. These were discussed in various contexts including, on the one hand, dealing with unexpected bouts of bird illness or mortality, and on the other, dealing with middlemen and drivers, as well as customers. While responses did not vary greatly between high- and low-volume MUs nor between male and female MUs, we found that many more MUs in northern states emphasized the value of patience, persistence, and determination than their southern counterparts. It was not possible to ascertain from their responses, however, whether this was

due to northern MUs facing more obstacles in their work, or due merely to cultural differences influencing framing.

While MUs emphasized the importance of knowing how to rear and brood poultry before starting as a Mother Unit, a few also mentioned willingness to adhere to Amo Farm guidelines, learn, and adopt new methods. We also heard references to this when speaking to FSRs, suggesting that prior experience, while important, does not guarantee that an MU will thrive in this business:

> *Truthfully, one must be patient and open to learning. No matter how experienced one claims he or she is one needs to be open to learning. There are cases the chicks will refuse to eat, cases where some terminal disease will refuse to be cured no matter the medication. Because we don't know it all and we are open to learning so when faced with something that seems bigger than one's knowledge or experience then you shouldn't be too proud to seek for help and learn more in order to save the lives of the chicks and save your money from being a loss.* ***- MU***

> *[Experience] is a two-way street. Some of them that are low performing, I know they have spent 20, 25 years in poultry business. It's not because they don't have experience, they have the most experience, they should be best performing in the state, but they might not accommodate any advice on improvement. They'll tell you they prefer their way. Some of them are late adopters, maybe not of technology but of ideas. Some still have the old ideas they were using. The world is changing and going globally, increasing knowledge. Some still believe the way they were doing things 20 years ago is okay.* ***- FSR***

> *The best performing ones, one thing that is peculiar to them...whatever you tell them, they adopt. They are not far away from the information and knowledge from the FSR. And in fact every part of the brooding cycle, FSR is always involved. Call them in the middle of the night, they will pick your call. They never have hostility to adopting your methods and things you have researched on and have seen.* ***- FSR***

These responses alluded to another, more abstract factor that seemed important for MU success: **entrepreneurial spirit**. This drive to learn, improve, and grow the business was, according to one FSR, even more important than previous experience with poultry:

> *The interest in being an entrepreneur. Because even if you don't have that skill of raising birds, you're not so knowledgeable about raising birds, we train you. And by the time you do two cycles...you know, Noiler doesn't require much technical know-how. By the time you've done two cycles you've learned as much as you want. Just that passion for being an entrepreneur is what you need...once you show your interest, we can build on it.* ***- FSR***

While we did not directly try to measure entrepreneurial spirit among MUs, we did ask about motivations for starting and how they started, where we did not find substantial differences in responses between high-volume and low-volume MUs. **MUs of both types were motivated by the prospects for profit, the popularity of Noiler, and most commonly by the quality of the bird and its hardiness vis-à-vis commercial breeds.** We also asked whether MUs took it upon themselves to reach out to the FSR, or whether they were approached first. Answers to this question were split evenly, again with no differences between high- and low-volume MUs. Willingness to take risks, another potential marker of entrepreneurial spirit, was similarly mentioned by high- and low-volume MUs in equal measure.

3.2.2 Capital and access to capital

Capital or access to capital can be an important factor in determining an MU's degree of success in the business, so much so that some respondents, when asked for qualities and skills that MUs need to be successful, responded that capital was crucial, despite this being neither a quality nor a skill. This was a recurrent theme through interviews with both MUs and FSRs. While both types of respondents perceived the MU model to be profitable and conducive to growth, proper feeding, medication, housing, and biosecurity practices require a degree of upfront and continual investment that poorer farmers may be less able to absorb, particularly if they have other pressing uses for their MU profits.

We explored this in more depth in interviews with both MUs and FSRs. **Just under half of MUs indicated that a lack of capital prevents them from restocking more frequently, with high- and low-volume MUs reporting this in equal measure.**

When discussing differences between the higher- and lower-volume MUs in their states, FSRs overwhelmingly pointed to capital as a key determinant. In general, FSRs pointed to three main functions of capital: first, an MU's available capital and access to capital naturally determine the volume of chicks that they may stock, as beyond the cost of chicks, the costs of feed, vaccines, and medication all scale together with volume. Second, an MU's level of capital influences both her appetite for risk and her resiliency to potential shocks; while respondents nearly universally touted Noiler's hardiness and lower mortality vis-à-vis commercial breeds, sudden disease outbreaks and extreme weather events remain an ever-present possibility in any livestock venture. Third, an MU's level of capital determines the share of her profits that she can afford to re-invest in the business—and, accordingly, in increasing her volumes—given competing financial obligations.

> *Money, money is a major factor. If I have more money, I would have demanded for more. There is space but there is no money...this trade needs money, whoever wants to be a poultry farmer must have lots of money. Without money you can't call yourself a Mother Unit. Birds will eat, their drugs, you must even have money for eventuality, in case they fall sick. Even if you have money for feed and drugs, you must still get money ready for eventuality.* ***- MU***

> *It is on the basis of money. If I have money to get frequent cycles of birds, people will keep buying. Imagine if I have 2 weeks old birds and I've made demand for another set, with this continuous flow, it is easy to keep existing customers. If I have money for 500 birds alone, I won't be able to get another batch of chicks until I have sold off the birds I bought.* ***- MU***

Among the MUs we spoke to, **most financed their initial investment in the business themselves, using their own savings or previous earnings**. A few mentioned taking out a loan in order to finance their first flock (all of whom were high-volume MUs), while several others received money from a friend or family member (all of whom were low-volume MUs). **The use of formal external financing in general appeared very limited among MUs we spoke to**, with only a few respondents mentioning having ever taken out a loan for their business.

FSRs also pointed to a low prevalence of external financing and suggested that increased access to financing could allow for both larger and more frequent restockings among MUs, while also lowering the barriers to becoming an MU for capital-constrained but interested farmers:

> *What we can do to encourage them, if they can be given a loan so they will pay back. I think that will encourage them. Because there are a lot that they want to get into this business, but the issue is they don't have money.* ***- FSR***

> *We have a lot of youth who want to enter this business - I have some youths among my MUs, they want to but they don't have capital. Most of them during the planting season will stop the rearing of poultry for now, they'll go into farming and spend their money on buying seeds and fertilizer. So when it's dry season they can come back to poultry. So the season affects the access to poultry, but if they had access to loans, that would help them, they could finance poultry even during the planting season.* ***- FSR***

However, one FSR noted the importance of the terms of financing available to MUs:

> *The credit facilitators, there are those that if you go to them and apply for a loan for your farm, they'll give you but the interest rate and the payback period is always very brutal. So I think I've only heard of one MU who took a loan but he didn't do it again.* ***- FSR***

This FSR went on to suggest that access to financing would help spur lower-volume MUs to take on larger flocks, conditional on reasonable interest rates and less onerous repayment terms. For their part, several MUs—when asked at the end of the interview if they have any suggestions for Amo Farm to improve its model—also indicated that Amo's help in accessing cheaper credit would help them to grow their businesses:

> *Amo should identify good MUs, support them just the way they do this offtaker thing with the broiler market, it will go a long way ... I still want to expand my farm, if Amo can support and identify their old customers, support them by way of maybe giving them birds or loan or find a way a modality where they can get more birds, raise more birds and sell with good monitoring I think it will help.* ***- MU***

> *Amo should give us access to loans, subsidize the money or rate at which we buy, helping us with farm equipments, basket for transporting birds most especially for long distance buyers.* ***- MU***

> *We cannot say they should give us birds on loan, but if there are credit facilities that can be used to assist Mother Unit, whatever they know will be useful for us and for the benefit of the business should be done for us.* ***- MU***

Recommendation: In all, FSRs and MUs indicated that capital and access to capital are particularly consequential in determining MU volumes, and by extension, availability of Noiler to SHFs. To avoid a situation whereby the MU business is closed off to those without a significant level of existing wealth or assets, **APMI stakeholders could study the possibility of facilitating access to affordable credit**, either through partnerships with financial institutions or through in-kind credit provision. This could lower the barriers to becoming an MU and allow this node of the program to exert its own impact by expanding to poorer MUs, in addition to the main impact channel centered around SHFs. Doing so could also help to bolster supply of Noiler in the face of increasing demand, explored in more depth in section 3.4.

3.2.3 Business practices and sales strategies

In exploring further determinants of MU success, we looked at business practices as a key factor within each MU's control. We asked FSRs whether they notice any differences in business practices between high-volume and low-volume MUs, and to what extent they believe any such differences contribute to an MU's relative success.

One frequently mentioned difference was in the level of active follow-up that MUs do with their SHF customers. While it seemed from FSRs' responses that most MUs do follow up with their SHFs after purchase, they reported that the extent of follow up tended to vary, with one FSR noting that the most successful MUs will often visit their customers' plots in person to check on the birds.

When we asked MUs about whether they follow up with customers after purchase, nearly all said they did, and about a third said this includes in-person visits, including high- and low-volume MUs in about equal measure. Only a few MUs reported that they do not actively follow up with customers after purchase, with most of these being low-volume MUs.

Recordkeeping was another difference that stood out to FSRs, with most mentioning that more successful MUs keep more thorough records of their sales, their costs and revenues, and their customers. A few mentioned that their top MUs will proactively send their records to the FSR. When we spoke to MUs, however, we found an interesting split in the opposite direction: **considerably more low-volume MUs reported actively keeping customer records than high-volume MUs**. Among the high-volume MUs who reported not keeping records, they offered justifications including being experienced enough that they can keep track mentally, knowing their customers already, or simply not seeing any point as they have done fine without recordkeeping. Despite these different perceptions of MUs and FSRs, the tenor of most FSR responses suggested that thorough recordkeeping is indeed important and should be continually emphasized to present and prospective MUs.

One less tangible factor that FSRs cited as important was **relationship-building with SHFs**, part of which stems naturally from active follow-up and making oneself available for inquiries, but another part of which, they suggested, revolves around sales practices. These may include transporting birds for SHFs, allowing SHFs to pay in installments, or even helping SHFs procure birds from other MUs if not currently stocked. FSRs indicated that these practices have allowed successful MUs to build their reputation, and accordingly their customer base.

> *If they don't have birds stocked but they have SHFs wanting, they work together as well. If they don't have birds, they will reach out to another MU so that their customer can get birds.* ***- FSR***

> *I've seen MUs who will go to the community, before the birds are 5 weeks old, she will be going to the community to advertise the birds ... and the villagers they will be saving their money, when they have 100 naira they will drop, when they have 50 naira they will drop. And then the MU when the birds are ready will transport the birds from her own farm to the community, where she distributes to everyone and collects. So that relationship will make her keep her customers and they will also want to go for her later. While some will say you have to come to me to pick up your birds.* ***- FSR***

Beyond sales practices like these, we heard mentions of a key pricing practice that some FSRs said helps MUs find success in this business: **profit-seeking through maximizing volume rather than price**. This, they indicated, entails keeping SHF prices lower than they theoretically could, and benefiting in turn from a larger customer base such that they see greater overall profits. This could partially stem from relatively elastic demand for Noiler—as a non-essential product with available substitutes—though FSR responses suggested part stems as well from building goodwill and a reputation among SHFs:

> *They should ensure their price is something that can attract their customers, the SHFs. Once they're making good profits, there is no need or no point in getting extra profit at the expense of the SHFS. So they can expand their business and grow more.* ***- FSR***

> *One of the things I think contributes to their performance is the relationship and the price they sell to their SHFs. It's not that they want to sell at the market prevailing price and "oh if this one is selling at 900 naira I want to sell at 1000 naira." So the best performing MUs, I think these are the things that make them perform well, the relationship with the customers and the less love of money - that "I have to make a lot of profit," no. Those are the ones that are even buying more! The best performing MUs. And before you know it they are increasing - because they are getting more customers.* ***- FSR***

The practice described above bodes well for APMI's bottom-of-the-pyramid impact by limiting upward pressure on prices for SHFs and allowing for wider propagation of Noiler. If it can also contribute to an MU's success, as suggested here, this may present an opportunity for stronger messaging. This could take the form of sensitizing MUs around keeping prices for SHFs reasonable, perhaps below what they could potentially charge, and in turn profiting more as a function of higher volume, reconciling the APMI goal to increase access to Noiler

and the MU need to do so in a financially sustainable manner. As a caveat, however, this observation is anecdotal as we did not attempt to estimate or thoroughly explore elasticity of demand for Noiler in these interviews.

For their part, there did appear to be a difference in selling price between the high-volume and low-volume MUs we spoke to. **Over a quarter of low-volume MUs reported selling brooded chicks for more than 1200 naira, while only one high-volume MU sold chicks for this much.** We are unable to determine, however, the extent to which these lower prices contribute to their higher volumes—as surmised by some FSRs—or stem from their higher volumes.

> *The prices I sell to the SHFs are different. You know this business, at times, you consider people's pocket. Those that are not financially buoyant, you pity them and reduce the price for them so that they will be able to buy.* - ***MU***

3.2.4 Flock loss

In investigating factors that drive or hinder MU success, we considered whether bird loss could be a contributor, or at least a useful indicator. Bird loss in this sense can be thought of as a risk: the more this risk is perceived, the lower the demand to be an MU, and the more this risk materializes, the less successful an MU will be. However, from conversations with MUs and FSRs, **this did not seem to be a consequential factor at present**. While both types of respondents did mention mortality, this was typically done in two contexts: that of Noiler mortality once in the hands of SHFs (explored in detail in section 3.3.2), and that of Noiler mortality in transit from the hatchery to MUs (explored in detail in section 3.4.2). For purposes of this section, we were interested in mortality of chicks under the care of MUs. Conversations with MUs and FSRs both suggested that this was a relatively rare phenomenon in their experience and did not vary appreciably across more and less successful MUs.

When asked specifically about it, there was consensus among FSRs that flock loss was quite low across the board and was not a reliable indicator of an MU's performance:

> *Their mortality rate of Noilers is generally very low. And even the less successful ones we're getting a very low mortality, so that one will not be a very considerable issue.* - ***FSR***

> *There is not really much difference in the mortality rate. You being experienced or being a best performing MU doesn't really affect the mortality we see.* - ***FSR***

> *You know for Noiler, there is nothing like a record of high mortality. So for both top performers and others the mortality rate is always the same, there's no variation there.* - ***FSR***

A few FSRs did mention that historically this was not always the case and that mortality among MUs used to be considerably higher in the past. This was attributed to a lack of understanding around proper care for Noiler in the early years, before the introduction of the "potential MU" model, whereby MUs begin with two small cycles and closer attention from the FSR before graduating to full MU and being allowed to purchase larger flocks.

Interviews with MUs similarly indicated that chick mortality during brooding is not presently a common problem. MUs did speak about mortality and the challenges that it poses for them, but almost invariably in terms of receiving day-old chicks that have either died or been severely weakened in transport. This was mentioned by high-volume and low-volume MUs in roughly equal measure. As mortality of these chicks is not due to an MU's own practices during brooding and is experienced by MUs of all types, we reserve discussion of this phenomenon for section 3.4.2, where we explore general supply challenges.

3.2.5 Community context

Finally, after exploring MU-specific qualities and practices that drive or hinder their success, we looked at contextual, market-level factors in the communities in which MUs operate and the extent to which they may exert influence. Specifically, we looked at the importance of an MU's location and the types of residents and general level of wealth in the surrounding community.

On these points, **FSRs were decidedly mixed**. Half indicated that, in their experience, the context in which an MU operates can greatly influence their success. However, the other half disagreed, discounting contextual factors and suggesting that differences they observe are instead due to factors within each MU's control. It is worth noting that viewpoints on this were split clearly along regional lines, with **all northern FSRs firmly in the former camp, and all southern FSRs in the latter**. We explore possible explanations for this further below.

Among the FSRs who pointed to location and profile of the surrounding SHFs as an important factor in MU success (all northern), **FSRs were split on whether a**

more urban or more rural location was most conducive to high sales. One FSR said that MUs have an easier time selling in rural areas than in urban or peri-urban areas, one FSR said urban areas are more conducive than generally poorer rural areas, and one FSR said that urban or rural did not matter on its own, but rather the general level of wealth in the community.

> *Their community also determines that. The community also adds to their performance. Someone in the city cannot perform like someone in the rural community, you understand? Although there are some MUs in the city that are also successful.* - ***FSR***

> *Some MUs that are struggling, to be sincere their village is those critical villages that are not developed. They are not close to people that are developed. Even if you go there and give them training that eating egg is good, if you tell them about nutrition, and 'if you rear this Noiler it will help you to do this and send your children to school, and even if your husband didn't buy detergent for you, you will have money to do it, and you can eat the egg and chicken.' Those MU that are struggling, in their location even if you give people these advices, they won't go with it. ... In these villages they don't have money, to be sincere. There is no money to buy birds. Because he will spend the whole day working for somebody on his farm, and at the end that person will pay him maybe 400 or 500 naira. So it's difficult. ... [Success] it's more around urban areas.* - ***FSR***

> *Sometimes the community, when you look at the economic wealth of the particular community, it also helps businesses to thrive. So some of these MUs are in more wealthy communities than the others so they have a lot of buyers who can afford it. Whether close to urban or rural. Because we also have successful MUs that are in rural places. It depends on the economical and financial capabilities of those communities. Whether they are close to urban or rural that does not dictate. It depends on the community. You know, communities have their own different economic capabilities.* - ***FSR***

These FSRs' responses in aggregate seemed to suggest that, while there may be benefits and drawbacks to each, **an urban or rural location may be less influential to an MU's success than the economic health of the community**. We saw suggestions to the same effect when speaking to MUs about the differences they see between repeat and one-time customers, with many noting that, in their experience, the more consistent customers are simply those who are financially better-off. This is explored in more detail in section 3.3.1.

However, **not all FSRs agreed that the wealth of the surrounding community is an important factor in an MU's success**. Southern FSRs noted that from what they've observed, this did not differ appreciably between their highest and lowest performers:

> *[Wealth of the community] doesn't determine it. Honestly I can't really point to differences coming from this. Hard work and being smart is what makes those that are high performing to be better off.* - ***FSR***

> *No. Because even rural people, in the poor rural places, the demand is there, it's sometimes even higher there than in urban areas.* - ***FSR***

> *Irrespective of wherever they raise their birds, it depends on exactly what they want. I have some MUs, I have one MU that where she stays, you have to go all the way out. In spite of it she stays in the business. We will give it to you wherever you are. And a MU does not just sell in a particular community, they sell outside their community. So irrespective of wherever they are, it's not about who surrounds them, it's about what they actually want.* - ***FSR***

The fact that **southern FSRs tended to emphasize that an MU can find success independent of their location, while northern FSRs tended to emphasize the handicap or advantage that location can confer**, warrants closer examination. We saw two possible reasons for this: that the nature of the northern and southern states may be different or that the sales practices of northern and southern MUs may be different.

On the latter point, the possible explanation that southern MUs are more likely to sell outside of their own community, and are thus less bound by that community's characteristics, did not clearly appear to be the case among our interviewees. On the one hand, northern MUs reported selling in only their own community and nearby communities (as opposed to across their LGA, in other LGAs, or in other states) at roughly double the proportion of southern MUs. On the other hand, this was rare enough among both types that conclusions could not be drawn; **selling to a geographically broad area was clearly the norm across MUs in both regions**.

We did not, however, ask MUs about the share of their customers that were located nearby. It could be the case, then, that northern MUs have relatively fewer customers outside of their immediate vicinity than southern MUs, and are thus more highly impacted by the profile of SHFs near them. However, we are unable to determine this based on the interviews conducted.

Another possible explanation for southern and northern FSRs disagreeing on the importance of location could stem from greater disparities in level of wealth, infrastructure and access, and security between 'good' and 'bad' locations in the North than in the South. If this is the case, it follows that a seemingly disadvantageous location in the South may present obstacles that an

enterprising MU can overcome, while in the North a disadvantageous location is more likely to hamper an MU's success relative to her better-located peers. Again, this is speculative, as in our interviews we did not specifically discuss this in terms of a regional comparison.

Recommendation: In all, these responses suggest that an MU's location and the wealth of the surrounding community may be important factors to consider in the North. This could warrant more marketing and sales support from the company, and more active monitoring and follow-up, for new and prospective MUs located in poorer communities in northern states. In southern states, meanwhile, relatively more weight could be given to factors within an MU's control, discussed previously in this section.

3.3. SHF Characteristics and Experiences

Key Findings

- MUs and FSRs indicate that, in their experience, **most SHFs who purchase Noiler become repeat purchasers**.
- SHFs who have stopped rearing Noiler were somewhat less experienced in poultry-rearing than those who have continued. MUs suggested an **SHF's level of previous experience with poultry plays a role** in whether they become a repeat purchaser.
- **Most SHFs view chickens primarily as a source of regular income for the household**, while some others view them primarily as food, and others as a store of wealth. These perceptions of poultry and intentions with Noiler did not differ between repeat and one-time purchasers.
- **Perceptions of poultry vary across regions**. Chickens owned by households were seen more as a source of income in the North and more as a source of food in the South, which respondents suggested may be driven by regional wealth disparities.
- An SHF's level of wealth is an important factor in terms of propensity to purchase Noiler, with respondents suggesting that **better-off SHFs are more likely to try out—and stick with—Noiler**.
- It appears that the purchasing prices of month-old chicks faced by SHFs in our sample have risen disproportionately compared to the selling prices of mature Noiler, which may **undermine the potential profit margin SHFs can expect from rearing Noiler**.
- **Female SHFs constitute more frequent and reliable customers** in MUs' eyes, though they may buy fewer birds at a time and request more support.
- In line with their expectations, **SHFs do not consider Noiler to be as low-input and low-maintenance as local chickens**, though this does not seem to drive dissatisfaction with Noiler nor stand in the way of repeat purchase.
- **One-time purchasers in our sample faced higher levels of flock loss on average than repeat purchasers.** According to MUs, this is in part because they have less knowledge of appropriate feeding and other poultry management practices.
- SHFs who stop rearing Noiler may do so because of **an experience of high flock loss, the cost of Noiler chicks and feed, or inconsistent supply**, rather than dissatisfaction with the bird itself or negative experiences with an MU.
- **SHFs overwhelmingly raise Noiler at least partially on commercial feed**, with some preferring it for fast growth, and others believing Noilers need it to survive. They hear conflicting messages on feed from MUs.

Recommendations

- Focus messaging to SHFs on the **benefits of eating Noiler in the North and of selling Noiler in the South**, while using MUs to ensure this is repeated messaging instead of just during initial sensitization.
- **Study any opportunities for cost-savings** that may allow for lower Noiler prices in order to keep the bird accessible for the poorest households.
- To reduce chances of bird loss and discouragement arising from it, gauge previous levels of poultry knowledge among new customers and **target extra support—including more active follow-up from the MU or even training—to less experienced SHFs.**
- Sensitize farmers that commercial feed can be beneficial in some circumstances, but that **exclusive feeding with commercial feed is not necessary**, and ensure consistency in messaging among MUs in this respect. Ensure also that messaging around proper housing and medicine is consistent among MUs.

3.3.1 SHF characteristics

In seeking to understand the SHFs that make up the customer base for Noiler, we spoke to SHF customers of MUs in the six study states.[12] As mentioned in section 2, we intended to have an even split of ongoing, repeat purchasers of Noiler and SHFs who tried Noiler and stopped rearing, but ended up with a greater number of repeat purchasers than one-time purchasers. The SHF characteristics we investigate in this section are: 1) previous poultry experience; 2) views of poultry and intentions with Noiler; 3) levels of wealth; and, 4) gender.

Previous poultry experience

The SHFs we spoke to were generally experienced in poultry keeping, with all having reared chickens for at least one year. **Repeat purchasers of Noiler appeared to have more experience with poultry than one-time purchasers**, with most repeat customers having reared chickens for over a decade and most one-timers having less than a decade's experience. It should be noted, however, that most of the one-time customers we spoke to had been rearing poultry for at least five years.

To understand whether a customer's level of previous poultry experience may contribute to their propensity to repurchase Noiler, we asked MUs for their insights. MUs indicated that this was an important factor, with most explaining

[12] While most SHFs interviewed were customers of the MUs interviewed, difficulty in finding one-time purchasers meant that we ultimately had to relax this criterion, as explained in the Methodology and Deviations section. As a result, two of the interviewed SHFs are customers of other MUs not interviewed.

that, from what they've observed, **those who try Noiler and give up on the bird tend to have less experience and overall knowledge of chicken care than those who purchase repeatedly**.

MUs pointed to two main pathways through which this happens. First, they suggested that less experienced poultry farmers may have less adequate facilities for their chickens or be less prepared to recognize and respond to disease outbreaks when they occur. These may contribute to higher chick mortality—which MUs highlighted as the biggest difference between one-time and repeat purchasers. Second, when an SHF does experience mortality in the flock, several MUs suggested that less experienced poultry farmers are more likely to respond to that mortality by getting discouraged and ceasing to rear Noiler.[13]

Views of poultry and intentions with Noiler

Most farmers we spoke to indicated that they view chickens primarily as a source of regular household income. Some others instead saw their birds more as a store of wealth to turn to when needed; these SHFs mentioned keeping birds in order to sell or trade for specific expenses rather than as a steady income stream. Several others said they view household chickens first and foremost as food for the family.

Table 4: Quotations from SHFs who view poultry as a source of regular income versus a store of wealth

Regular Income	Store of Wealth
"Farm animals are no longer what one family can raise for their needs alone, they are what one can use as business to get money constantly, and anyone that wants to make money can make money through poultry. Farm animal are beyond subsistence use." **- SHF** "I do a lot of business but since I started this one, the chicken rearing, that is how I abandoned the rest. I did not really abandon all of them, but you see this one it brought me more gains, because I am rearing them and I am gaining on it." **- SHF** "Strictly business. All of them in this community see it as business. For example you see that house? This house has chickens, the other one too has. This boy that just stepped out is my brother. I taught him chicken rearing. Behind this house also, they have chickens. They were	"I raise this chicken and they do well. If my children are in need of money, I can sell 2 or 5 and give them the money." **- SHF** "I think most of the people around here who rears chickens see it as something to look at when you have an immediate problem at hand. It is what you have that you will use." **- SHF** "A time when I am not financially buoyant, at that instance, I take one of them to the market and sell to feed my children." **- SHF** "We are rearing these chickens so that when any need arises we can take them to sell. That's why we always keep chickens." **- SHF** "I've seen the importance of rearing chickens for instance if there is an event I sell my chickens

[13] These themes will be explored in depth in section 3.3.2.

motivated because they saw it's a good business. They sell in good time, collect their money, restock and get their profit. They keep about 50." **- SHF**	and thereby saving me unwanted expenses." **- SHF**

We explored the possibility that an SHF's perception of and intention with chickens may influence their propensity to continually purchase Noiler. Among our interviewees, however, **we did not find any appreciable difference in these regards between one-time and repeat purchasers**. For both types of customers, the majority indicated that they view chickens as a source of regular income, with smaller numbers viewing them primarily as a store of wealth or as food for the family.

We did, however, find strong differences when looking across regions. **Poultry-keeping seemed to be viewed much more as an income-generating activity among the northern SHFs we interviewed than among the southern SHFs.** Conversely, **far more southern SHFs viewed their chickens primarily as a source of food than did northern SHFs**.

MU interviews corroborated this finding: when we asked MUs whether poultry-rearing households view chickens primarily as a source of food or income, nearly all those who said income were northern, while nearly all those who said food were southern. **FSRs, when asked about Noiler owners specifically, gave responses that mirrored this same pattern.** All northern FSRs said that SHFs rear Noiler primarily to sell, and may eat the surplus, while all southern FSRs said that SHFs rear Noiler primarily to eat, and may sell the surplus.

A regional divide this stark—and supported by all three respondent types—warranted closer examination. From conversations with FSRs, **the key factor appeared to be lower overall wealth levels in the North compared to the South**, with the effect being that chickens—and as one FSR noted, other livestock as well—may commonly be seen as too valuable to eat:

> *In the North they purchase to sell. To get something, send their children to school, something - you know the women don't have money of their own. There is money in the South. In the North they take it to the market.* ***- Northern FSR***

> *You know, the North they have a lot of cows, cattle, but they don't even eat cow meat. ... Their SHFs they prefer to sell, and what's remaining they will eat for themselves. Here we prefer to eat first.* ***- Southern FSR***

> *To be sincere, it's because Southwest they are more civilized than here. The Southern part is more civilized than our Northern part here. [Q: Almost like they have the luxury of being able to eat their own Noiler?] Yes, yes.* **- Northern FSR**

> *If you are buoyant enough to see it as something to eat at home then one can view the chickens as food for the home, but if you're not capable enough, it's not OK to use it as food for the household. ... if you can afford it you can do whatever you like with it.* **- Northern SHF**

> *Those that are well-to-do, from time to time you will see them buying it to eat, but for someone who doesn't have the capacity? They see this as a means of getting income.* **- Northern MU**

> *They are rearing it to get income. They don't eat, they only rear and sell. Because I see how people do it, it's income, even if their Noiler starts laying they will sell it.* **- Northern MU**

There are mixed implications of this dynamic in the northern states. On the one hand, when asked how this impacts demand, MUs indicated that this view of Noiler as strictly business is good for demand in that it keeps orders flowing in as SHFs profit from selling their mature birds. On the other hand, this may stand as an obstacle, in the North, to the APMI program's goal of increasing animal protein consumption through Noiler propagation.

If indeed a key driver of this hesitation to consume one's Noiler stems from a general lack of wealth in the North, then this is outside of the scope of APMI program to address. APMI stakeholders can, however, influence personal decision-making among Noiler-owning households through messaging. One northern FSR stressed that this is already happening with some success, that Amo is explicitly encouraging SHFs to eat a portion of their Noiler and the eggs they produce, even if income generation remains the primary goal:

> *It's with the intention to sell it, most of them. But we are still enlightening them, we're still sensitizing them not only to sell, even you too you need to eat egg, you need to eat meat. Because of the advantages, we are telling them about nutrition. But their intention is just to take it as a business, just to raise, grow, and sell. But now on our recommendation they are now starting to not be selling all, they are at least leaving something to eat, the male. And they are even leaving some female to lay egg for them.* **- Northern FSR**

A southern FSR, meanwhile, said the same regarding selling:

> *SHFs, they consume the males of course, they have family, instead of looking around that they need money to buy chicken, they kill the males, and they leave the females to lay egg for the children to eat, and eventually they slaughter the females when they need something to eat as well. It's primarily consumption. And sale, we encourage it, that it's not just about consuming. We are advising them to leave some males to sell.* ***- Southern FSR***

Recommendation: This stark regional split—noted by FSRs, MUs, and SHFs alike—could point to an opportunity for **stronger and more targeted messaging**. While Noiler is marketed as a bird for both sale and household consumption, there may be room to stress the former component more explicitly in the South, and the latter component in the North. This could take place during initial community sensitization, but also through repeated messaging during MUs' interactions with SHFs—sale, pickup/delivery, and follow-up.

Other intentions with Noiler included hatching and giving as gifts, both of which were mentioned by exceedingly few respondents, indicating that messaging discouraging hatching of Noiler eggs is sticking.

We found differences in the intended use of revenue from SHFs' first earnings from selling Noiler. Interviewees generally pointed to two main uses for this revenue: 1) to address their own or their family's financial needs, or 2) to reinvest the revenue into buying more Noiler. **Among one-time purchasers, more respondents indicated that they would use Noiler revenue to address financial needs than to grow their flocks. Among repeat purchasers, we saw the opposite, with more respondents purchasing Noiler with the intention of reinvesting their earnings.**

One explanation for this could be that those who purchase Noiler intending to turn it into a business are, naturally, more likely to return and purchase again. Meanwhile, those who aim, for example, to address a household expense with their Noiler earnings may not come back to repurchase after covering said expense. Indeed, some MUs did indicate that they saw a difference in propensity for repeat purchase between SHFs who do versus do not intend to turn Noiler into a business. However, it could also be the case that those SHFs who intend to use Noiler earnings to address household financial needs are poorer than those who are able to reinvest their earnings, and that this in itself influences their propensity to repurchase. We explore this in more detail below.

Level of wealth

Just under half of MUs pointed to SHFs' levels of wealth as a factor determining repeat purchase. Some MUs pointed explicitly to the nexus between intentions with Noiler—explored above—and wealth:

> *Some [SHFs] differ in terms of affordability due to the high cost of livelihood and cost of living, they might use the money to take care of themselves and family ... they don't invest back but rather they spend both their gain and cost of production on personal things.* - ***MU***

> *There are differences, those that buy again are richer than those that didn't and one reason that makes them not to buy again is lack of money, then poor management of finance when they sell their first stock; that made them to stop the poultry business.* - ***MU***

Indeed, level of wealth was among the most frequently cited differences between one-time and repeat customers. Further, when asked how SHFs who stop rearing Noiler could best be encouraged to come back, MUs mentioned reducing the price of chicks above all else.

SHFs seemed to corroborate this. While we did not attempt to gauge SHFs' level of wealth, most of the SHFs who had stopped rearing Noiler cited the cost of the chicks and feed as the reasons they did so. When we asked repeat purchasers about why other SHFs may stop rearing Noiler, most also pointed to cost.[14]

The evolution of month-old chick versus mature Noiler prices since the inception of the APMI program is instructive here. In the initial APMI Nigeria Theory of Change developed as part of the impact evaluation design in 2018, we assumed that SHFs would purchase brooded chicks from MUs at 450-500 naira each and then sell mature birds for 3000-5000 naira each.[15] While this qualitative study does not necessarily provide representative prices in the study regions, it appears that the purchasing prices of month-old chicks faced by SHFs in our sample have risen disproportionately from those in the Theory of Change compared to the selling prices of mature Noiler. While most SHFs we spoke to said that they sell mature Noiler for between 2000-5000 naira—depending on the size of the bird—most MUs told us they now sell MOCs for more than 1000 naira each. **This disproportionate rise in prices for month-old chicks versus mature Noiler may undermine the potential margin SHFs can expect from rearing Noiler.**

Taken together, these factors—unequal evolution in prices, one-time customers likely being lower-income, and costs being mentioned as a key factor for stopping to rear Noiler —suggest **a potential skewing of the Noiler customer base towards better-off SHFs.**

[14] We explore this theme in more detail in section 3.3.3.
[15] However, there is some evidence that mature birds were selling for less than this.

Recommendation: While we understand that APMI stakeholders may have limited leeway to address the cost of Noiler, we recommend to assess opportunities for cost-savings that may allow for lower Noiler prices to keep the bird accessible for the poorest households.

Gender

Finally, we investigated gender as a dimension that may impact how SHFs interact with and experience the APMI program and poultry-rearing in general.

With respect to motivations to rear chickens—not just Noiler—**almost half of male SHFs reported rearing chickens as a regular business**, while this was only reported by a few female SHFs. **The plurality of female SHFs reported rearing chickens to slaughter and eat**, while only a couple of male SHFs reported this. A greater number of women than men also reported keeping chickens as something to sell when the need arises.

We also asked SHFs about the perceptions of women rearing poultry and being involved in business in their communities. **Nearly all respondents, regardless of gender, said that it is common in their community for women to rear chickens, and also for women to be involved in business.** There did appear to be a regional difference in *perceptions* of women being involved in business, however. **Most respondents said this was viewed favorably in their community, while the few who said otherwise were all from the northern states.** Reasons they gave for why women being involved in business may be viewed unfavorably included fears that these women may leave their husbands if they earn their own income, or that they may be unable to spend enough time with their children.

According to SHFs, **the primary barriers for women rearing Noiler are a lack of funds (especially for feed), a lack of space, and a fear of high flock loss**. While both men and women mentioned the lack of funds and lack of space, almost only women mentioned the fear of high flock loss.[16]

Almost all MUs noted differences between their male and female customers. Majorities of MUs cited differences with respect to purchasing volume, purchasing frequency, and tendencies to need or request support. In terms of purchasing volume, there was no consensus among MUs as to whether male or female SHFs tend to purchase greater volumes; equal numbers of MUs stated that male and female customers purchase more Noiler. There was, however, a regional difference, with most northern MUs reporting that male customers purchase more birds and most southern MUs reporting that female customers purchase more birds.

[16] Differences among SHFs with respect to flock loss are discussed further in section 3.3.2, while demand for Noiler among women, including barriers to further demand, are discussed in more detail in section 3.4.

However, **with respect to purchasing frequency, almost all MUs who cited this difference said that women tend to purchase Noiler more frequently than men**. A couple of northern MUs noted that women buy more frequently because they buy smaller quantities at a time, while one southern MU claimed that women buy more frequently because they have more time to return to the MU to purchase.

Among MUs who noticed gender differences in one's tendency to need or request support, almost all said that women seek more support. An equal number of MUs in northern and southern states noted this difference. MUs gave a variety of reasons for this, chiefly that women are the ones in the household that typically rear chickens and often do not have any other sources of income, so they are more committed to poultry rearing. A handful of other MUs mentioned that women require more support because they may be less experienced, especially as it relates to rearing poultry as a business. A couple of MUs also said that women may be seeking support on behalf of their husbands or households and may be more comfortable asking for help than men as a result of gender norms in their communities. One MU perceived women to be better at listening to instructions than men.

Minorities of MUs also cited differences in poultry experience, business experience, and willingness or ability to pay between male and female SHF customers. With respect to poultry experience, a majority of MUs who noted this difference said that women generally had more experience, though a few MUs—all in northern states—said that men had more experience. All MUs who noted a gender difference in business experience believed that men have more experience. In terms of willingness or ability to pay, the consensus among MUs who cited this difference was that men have more income and that women are more frugal and more likely to ask for discounts.

Finally, a few MUs explained that women generally have more time to rear poultry than men and that women enjoy rearing chickens more than men do.

We also asked MUs about whether they thought there were gender differences in terms of likelihood of becoming a repeat purchaser of Noiler. The majority of MUs responded that there was a difference, with **almost all of these MUs noting that women were more likely to repeatedly purchase**. Reasons cited by MUs include the tendency for women to be the household members responsible for rearing animals, women being at home more than men, women continually rearing Noiler as food for their families, and women having fewer business opportunities available to them.

3.3.2 SHF experiences with Noiler

We also explored SHFs' varying *experiences* with Noiler, particularly with respect to bird loss, uses of Noiler, and experiences with their MU and the purchasing process.

Flock loss

The APMI Theory of Change asserts that dual-purpose birds such as Noiler are less susceptible to disease than local chickens, with the flock loss rate for month-old chicks expected to be not higher than 10-15% (between five weeks and 75 weeks). For this reason, we hypothesized that a flock loss rate higher than expectations may discourage SHFs from repurchasing.

When asked about their flock loss between purchasing from the MU and birds' maturity, **the majority of SHFs interviewed reported experiencing a flock loss rate below 15%**. However, we found stark differences between one-time and repeat purchasers: **while almost all repeat purchasers experienced flock loss below 15% in their first Noiler flock, a majority of one-time purchasers reported experiencing flock loss of more than half of their birds**.[17] In contrast, no repeat purchasers reported experiencing this. By far the most common cause of flock loss was disease, particularly for those who reported a flock loss rate greater than 15%.[18]

The differences in experience between one-time and repeat purchasers with respect to Noiler flock loss can also be observed in SHFs' differing perceptions of Noiler mortality with respect to other breeds. When asked how Noiler mortality fares in comparison to other breeds, **almost all repeat purchasers said that Noiler mortality is lower than other breeds, while fewer than half of one-time purchasers said this**. Likewise, half of one-time purchasers said that Noiler mortality is higher than other breeds, while very few repeat purchasers said the same. SHFs compared Noiler mortality to that of Broilers more often than to any other breed; the majority of those who reported that Noiler mortality is lower than other breeds specifically noted this in comparison to Broiler.[19]

According to MUs, **one-time purchasers face higher levels of flock loss on average because they have less knowledge of appropriate feeding and other poultry management practices**, discussed in more detail in section 3.3.4. Given the stark differences between one-time and repeat purchasers with respect to both perceived susceptibility to mortality and actual flock loss, we would expect experiences of flock loss to greatly influence one's propensity to repurchase Noiler. Indeed, when we asked one-time purchasers why they chose to stop

[17] A handful of one-time purchasers even reported their entire flock dying before reaching maturity.
[18] Less commonly reported reasons were weather and accidents.
[19] Only one SHF claimed that Noiler mortality is higher than that of Broiler.

rearing Noiler, high mortality was one of the most cited reasons. However, it should be noted that this was only cited by under half of one-time purchasers, which implies that, though high flock loss actively discourages some SHFs from repurchasing Noiler, there are also other factors at play.[20]

While almost half of MUs said that one-time purchasers tend to experience greater flock loss than repeat purchasers, a few of them also noted that the difference between one-time and repeat purchasers in terms of flock loss is not just in actual flock loss experienced, but in the way that they perceive this flock loss when it occurs. Specifically, they noted that **while experienced repeat purchasers understand that flock loss is an inherent risk of the poultry-rearing business, less-experienced one-time purchasers may not understand this and therefore be more discouraged from repurchasing Noiler when they experience flock loss**.

> *[Repeat] buyers have more experience and have come to accept and expect some level of mortality unlike [a] first time buyer. - **MU***

> *There are some with these cases that when the one-timers buy and get mortality they don't come back. Those that buy often can handle mortality better than the one-timers. Because of their continuous buying they get used to certain things. - **MU***

Recommendation: To both minimize flock loss and encourage repurchase of Noiler when SHFs experience flock loss, Amo Farm and/or WPF (via MUs) could provide **more instructions or a structured training to less experienced farmers** who purchase Noiler. This should include both poultry-rearing best practices as well as information regarding the inherent mortality risk in poultry-rearing. Amo Farm could also consider **compensating SHFs who experience high flock loss at first purchase**.

Though the dimension on which we observed the greatest differences in flock loss among SHFs is that of one-time vs. repeat purchasers, there were also slight differences by SHF gender. **A majority of both male and female SHFs reported a flock loss rate of 15% or less, but a greater proportion of female SHFs reported losing more than 50% of their flock.** A slightly larger proportion of male SHFs than female SHFs perceived Noiler's susceptibility to mortality to be lower than that of other breeds. We did not observe any substantial differences in flock loss between northern and southern states.

[20] We explore these other factors in more detail in section 3.3.3.

Uses of Noiler

We inquired from respondents how they used their mature Noiler birds. **The majority of SHFs responded with two main uses: 1) as a source of food; and, 2) as a source of income.** Several respondents reported both eating and selling Noiler. Consumption and sale of Noiler eggs both appeared to be less common, respectively, than consumption and sale of Noiler birds.

There were stark differences in Noiler usage between one-time and repeat purchasers, particularly with respect to selling Noiler. **Majorities of both one-time and repeat purchasers reported consuming Noiler. However, a majority of repeat purchasers also reported selling Noiler while only a handful of one-time purchasers sold Noiler.** Given that strong majorities of both repeat and one-time purchasers *intended* to sell Noiler before purchasing for the first time, we explored why those who intended to sell ultimately did not.

Multiple one-time purchasers mentioned flock loss as a reason why they did not end up selling Noiler they had initially intended to sell because they no longer had enough quantity to sell. Therefore, it appears that **flock loss is a significant reason why certain one-time purchasers who intended to sell Noiler were unable to do so**.

However, with respect to ease of finding buyers, we found the majority of those who reported selling Noiler stated that it was quite easy to find buyers, that they tend to sell to people in their community, and that their customers prefer to buy Noiler over other breeds. **Difficulty finding buyers does not appear to be a common reason why SHFs who intended to sell Noiler were unable to do so.**

With regards to consumption, to better understand how ownership of Noiler impacted eating habits, we asked SHFs how their consumption of chicken and eggs changed once they owned Noiler. **Almost half of respondents stated that the frequency of their chicken and egg consumption did not change**, while some said there was an increase in their household's chicken consumption. Few SHFs mentioned eating more eggs than before as a result of rearing Noiler.

SHF perceptions of Noiler meat compared to that of other breeds were largely positive, both among repeat purchasers and among one-time purchasers. Of those who reported eating Noiler meat, half said that it tastes the same as local chicken while slightly fewer than half said it tastes better than local chicken. A handful seemed to dislike Noiler meat compared to local chicken, preferring the tougher texture of local chicken meat. When asked how people in their community generally find Noiler meat, however, SHFs most commonly said that people appreciate that Noilers are meatier, but find local chickens to be tastier. **We found no considerable differences in this regard across regions**, with SHFs in both the North and the South personally preferring Noiler meat but saying their community has more mixed feelings.

Experiences with MUs

We also asked SHFs about their experiences with their MU and with the purchasing process.

We first explored SHFs' initial Noiler purchase, focusing on questions SHFs had about Noiler and care instructions they were given. The majority of SHFs had questions for their MU when they first purchased Noiler. The most common questions SHFs had for their MU were related to the quality of the breed and how to feed Noiler. Of those who had questions for their MU, **almost all reported that their MU was helpful in answering their questions, including both one-time and repeat purchasers**.

Whether or not they had questions, **most SHFs reported receiving care instructions from their MU during their initial purchase**. Of those who received instructions, almost all recollect receiving medical instructions, including on which medications and supplements to give their Noiler and how to administer these.[21] A majority of those who received instructions also reported being told about housing and feeding.[22] **Among those who reported receiving care instructions, all were satisfied with them and indicated that they found the MU's advice helpful.** Of the minority who did not receive care instructions, almost all said that this was because they did not need them.

When asked to rate the overall purchasing process from their MU out of 10, almost all SHFs rated the purchasing process as 7 or higher, with the majority giving a score of 9 or 10. Reasons for giving high scores included experiencing good customer service from their MU, the MU giving good advice for caring for Noiler, and not experiencing any issues with the purchasing process or with Noiler. Two SHFs cited problems with the purchasing process, which consisted of slow delivery and bird loss. In this respect as well, both one-time and repeat purchasers overwhelmingly approved of the purchasing process with their MU, suggesting that experiences with the MU are not typically a reason why one-time purchasers fail to come back.

When we asked SHFs if they had reached out to their MUs for advice after their initial purchase, a majority stated that they had done so. Half of those who reached out specified doing so when their chicks were not eating properly or were sick; the majority of the SHFs who reached out for this reason said that the advice they received from their MU was helpful.[23] There were, however, differences in this respect between one-time and repeat purchasers: **a majority of repeat purchasers reached out to their MU for advice, while only a minority**

[21] The types of medications and supplements most commonly mentioned by SHFs include antibiotics, glucose, multivitamins, calcium, and medications for specific ailments such as lice, catarrh, or diarrhea. SHFs were instructed to administer medications by adding them to their chickens' water or feed or through injections.
[22] We explore the care instructions MUs gave and how SHFs ultimately cared for the birds in section 3.3.4.
[23] A couple of SHFs specifically noted that they felt the advice they received prevented flock loss.

of one-time purchasers did so. Along with relative levels of poultry-rearing experience, this finding may also help to explain why one-time purchasers experienced greater flock loss than repeat purchasers.

Recommendation: It may be beneficial for MUs to make a greater effort in following up with their first-time purchasers, particularly if they are relatively inexperienced with poultry-rearing, in order to help prevent flock loss.

3.3.3 Perceptions of and satisfaction with Noiler

We also explored SHFs' perceptions of the bird itself and, for one-time purchasers, their reasons for stopping.

Satisfaction with Noiler

When asked to rate their satisfaction with Noiler on a scale from 1-10, most SHFs gave the bird a score of 7 or above, with a plurality giving it a score of 9 or 10.

There was a difference in this respect between repeat purchasers and one-time purchasers, with all repeat purchasers giving a score of 7 or above. Accordingly, **all those who gave a score below 7 were one-time purchasers**, and all of them, when asked to explain their score, **cited the flock loss they experienced as the sole reason**. Still, it should be noted that half of the one-time purchasers interviewed gave Noiler a score of 7 or above. There were similar levels of satisfaction with the bird between customers of high-volume vs low-volume MUs and between SHFs in northern and southern states.

Of those SHFs who rated Noiler with a score of 7 or above, respondents cited low flock loss, profitability of Noiler, fast growth, good egg yield, good taste, nice appearance, and ease of rearing as reasons for their satisfaction, while citing price of Noiler, supply delays, and flock loss as barriers to their giving a perfect score. Responses to this question suggest that **the majority of SHFs interviewed were highly satisfied with the bird itself**, as the only negative points cited were either flock loss or constraints that make it harder to acquire Noiler (price and supply delays).

Reasons for stopping

We investigated these points further in asking one-time purchasers why they stopped rearing Noiler. As touched on in section 3.3.1, **the majority of these SHFs said cost—be it of the birds themselves or of feed—caused them to stop**

rearing Noiler. This finding provides further context for the surprisingly high number of one-time purchasers who rated the bird highly. **After cost of birds or feed, high flock loss was the next most frequently cited reason for stopping.** There was no difference in stopping due to cost vs due to flock loss between customers of high-sales or low-sales MUs or between SHFs in northern and southern states. **After cost and flock loss, supply challenges were the next most frequently cited reason for stopping.**[24]

Those SHFs who mentioned the cost of feed as a reason for stopping were asked whether they had ever tried letting their Noiler forage for food. Almost all said they had not, and most of these further said that they would not be willing to for fear that Noilers would get sick or not return if left uncaged. This was indicative of attitudes toward Noiler that seemed commonly held across SHFs of all types, as discussed further below.

Perceptions of labor-intensiveness

To assess whether Noilers were perceived as low-maintenance—and what effect this might have on SHFs' satisfaction with the bird—we asked SHFs how, in their experience, rearing Noiler compares to rearing local chickens. **Nearly all SHFs said rearing Noiler is more labor-intensive than rearing local chickens.** It is important to note, however, that from the tenor of responses, **this was generally not framed negatively**. Respondents indicated that Noiler is simply viewed differently than local chickens, suggesting that Noiler is perceived as a more significant investment or asset than local chickens; rearing them like local chickens would constitute improper care in SHFs' minds:

> *Noiler care is more special than the local, the local is more convenient and easy to rear because you can do them as you like, they can be left to forage for feed anywhere they like. - SHF*

> *Local chicken can be left to forage but Noilers cannot be reared like that, after taking care of them you have to lock them back in their coop, not that you free range them. If you free range them then you are not ready to rear chickens. - SHF*

> *Local birds are more hardy than Noiler, I allow them to roam freely, they roost on trees, I don't feed them like the Noiler, they depend on leftover food. One can't treat Noiler this way. - SHF*

[24] Repeat purchasers were also asked for their thoughts on why other SHFs may have given up on rearing Noiler, and their responses were in line with what one-time purchasers themselves said. Repeat purchasers pointed most frequently to the high cost of chicks and feed, and then to flock loss, as reasons for their peers stopping.

> *Noilers need adequate care, one needs to have money before they can rear Noilers because they are different from local chickens. Local chickens can be left to roam and forage for food, but Noilers cannot be treated that way, you have to cage them, give them feed, vaccines and medication but local breeds do not require all of this.* ***- SHF***

> *There is the difference between local chickens and merger, for merger if they get to 4 month and you give them good care and do what is required you can sell them for ₦3000 and above, but for the local chickens no matter how much care you give to them at 4 month you can't sell them beyond ₦800.* ***- SHF***

There were differences in perceptions of labor-intensiveness between one-time and repeat purchasers: t**he few SHFs who said rearing Noiler is no more laborious than rearing local chickens were all repeat purchasers**. Still, the vast majority of even repeat purchasers called Noiler more labor-intensive, indicating that this is not a major impediment to satisfaction with the bird or willingness to repurchase.

Among those who found Noilers to be more laborious than local chickens, almost all cited that Noilers need to be fed at least partially with commercial feed, and most also cited that they must be caged. Other less frequently cited differences were Noilers needing more medication, vitamins, vaccines, and temperature control.[25] There was no appreciable difference with regard to perceived labor-intensiveness of Noiler between customers of high-volume and low-volume MUs or SHFs in northern and southern states.

Speaking to MUs, we found that **while SHFs overwhelmingly viewed Noilers as more labor-intensive than local chickens, MUs seemed largely unaware of this**. Most MUs said that SHFs consider Noiler to be just as low-input and low-maintenance as local birds. This disconnect between what SHFs think and what MUs think SHFs think did not vary appreciably between high-volume and low-volume MUs or between MUs in northern and southern states.

MUs who said SHFs see Noiler as low-maintenance most frequently cited that Noilers do not need commercial feed. These MUs said SHFs know Noilers can subsist on foraging, kitchen scraps, and grain chaff. At the same time, those MUs who said SHFs do *not* see Noilers as low-maintenance most frequently cited that they do require commercial feed. This points to inconsistency in messaging around feed across MUs, explored in more detail in section 3.3.4.

It should be noted, however, that even among those MUs who recognize that SHFs view Noiler as higher-maintenance than local chickens, only a couple of them believe this hinders demand. This is in line with SHF responses, which indicated that **SHFs view Noilers as higher-maintenance compared to local chickens, but that this generally does not impact their satisfaction with the**

[25] SHFs' poultry managment practices will be explored further in section 3.3.4.

bird nor their propensity to repurchase. This may be due in large part to the fact that most SHFs did not expect Noiler to be particularly low-maintenance in the first place, as explored further below.

SHF expectations versus reality

SHFs were asked how Noiler, in their experience, lived up to their expectations and the messaging they heard before purchasing. **The vast majority of SHFs said the bird lived up to this messaging.** When asked about specific messages the bird lived up to, respondents most frequently cited its hardiness and low susceptibility to disease, its fast growth, and its higher egg production. Only a few SHFs reported that Noiler failed to live up to the messaging, with most of these citing high flock loss as the cause for their disappointment. The few respondents that claimed that Noiler did not live up to their expectations were mostly the same subset that rated their satisfaction with Noiler lower than 7 out of 10.[26]

There was a difference between one-time and repeat purchasers, with **repeat purchasers, unsurprisingly, more likely to feel that Noiler lived up to the messaging**. Still, a majority of even one-time purchasers reported that the bird performed in line with the messaging, underscoring that for many of these farmers, financial or supply challenges—rather than dissatisfaction with the bird itself—drove them to stop rearing Noiler, as evidenced previously in this section.

3.3.4 Poultry management and messaging

In this section, we explore SHFs' poultry management practices for Noiler with respect to feeding, health, and housing. We were specifically interested in the messaging that farmers hear about these practices from MUs and other sources, whether and how this contributes to actual poultry management practices as reported by SHFs, and any notable differences in poultry management practices among SHF sub-groups.

The APMI model emphasizes that Noilers need about 25-50 grams of supplemental feed (e.g. beyond foraging) per bird per day, which could be in the form of table waste, crop spoilage, or commercial feed. Depending on farmers' foraging capacity in their yard, a greater quantity of supplement may be required. Noiler may also grow bigger and lay more eggs when fed with commercial feed. However, commercial feed is not absolutely necessary for Noiler to grow properly. Noiler should also be given appropriate medical

[26] With regard to SHFs' experiences compared to their expectations, there was no appreciable difference between customers of high-volume and low-volume MUs or between SHFs in northern and southern states.

care—including vitamins, vaccinations, and antibiotics when necessary—and spend the night in an enclosed shelter outside (but can free range during the day).

Feeding practices

As mentioned in section 3.3.3, **a key theme that has emerged from this research with respect to feeding practices is the inconsistency in messaging received by SHFs around the necessity of commercial feed for Noiler**. Almost half of SHFs reported receiving instructions related to feeding from their MU the first time they purchased Noiler; the majority of this subgroup mentioned being specifically instructed to purchase commercial feed for Noiler. In terms of the messaging SHFs heard from all sources (not just their MU) prior to purchasing, a handful of SHFs said they heard that Noiler do not need commercial feed, but a couple of others said that they heard that Noiler only grow quickly if given commercial feed and that giving commercial feed increases their egg productivity. Very few SHFs report being told that Noiler can forage for food.

The MU instructions on feeding practices that MUs themselves report generally align with what was reported by SHFs. **Almost all MUs said that they give their first-time customers instructions on feeding and the majority of them said that they specifically instruct their customers to purchase commercial feed.**[27] Similar to what SHFs reported, a few MUs said that they tell their customers that Noiler will grow stronger when given commercial feed. A few MUs also reported that they tell first-time customers that they can give food scraps to Noiler, while no MUs reported instructing customers to let Noiler forage.

These messages strongly align with actual feeding practices as reported by SHFs. **Almost all SHFs report giving commercial feed to their Noiler and a majority indicated that they exclusively feed Noiler with commercial feed.** A greater proportion of one-time purchasers than repeat purchasers and a greater proportion of SHFs in southern states than northern states reported exclusively feeding with commercial feed.

When SHFs were asked why they feed Noiler with commercial feed, the most cited responses were that Noiler will grow faster and stronger on commercial feed or that Noiler won't grow properly if they are not given commercial feed.

> *I want them to have strength and was told with this kind of feed their appearance would be. - SHF*

[27] Specific types of commercial feed mentioned by MUs and SHFs include Ultima, Chickun, Vital, and Topfeed super-starter, starter, grower, and finisher for Broilers, Broiler concentrate, and Layers feed.

> *It makes them grow fast and makes them look good. We sell them fast when they are fed with these. They grow evenly.* ***- SHF***

> *It is because that is what they ought to be fed with. I cannot feed them with maize and moreover if you give them maize, they will not accept it.* ***- SHF***

> *That's the only thing I know they can eat, or do they eat other things?* ***- SHF***

This finding points to a **crucial difference in motivations among SHFs for feeding Noiler with commercial feed**—while some erroneously believe that Noiler can only consume commercial feed, others believe, in line with WPF messaging, that Noiler will grow faster when fed this feed. Concerns about the speed of Noiler's growth are more pertinent when one is raising the birds to sell; we found that, among SHFs who said they give Noiler commercial feed in order to make them grow faster, almost all raise Noiler with the intention of selling. Therefore, though there may be concerns about the expense of commercial feed eating into SHFs' profits from selling Noiler—particularly for those who exclusively feed Noiler with commercial feed—these SHFs may have determined that the increase in revenues they earn from selling larger birds at a faster turnaround exceeds the cost of commercial feed.[28]

Recommendation: For those who believe that commercial feed is necessary for Noiler to grow properly, or that Noiler must be fed exclusively with commercial feed, there is opportunity for Amo Farm and MUs to sensitize farmers as to the types of feed that Noiler actually requires.

While almost all SHFs reported that they give commercial feed to their Noiler, a few SHFs also mentioned supplementing commercial feed with home-grown grains or giving home-grown grains when they cannot afford to purchase commercial feed. Only one SHF mentioned giving table scraps to their Noiler and one other allowed their Noiler to forage when they were unable to afford commercial feed.

Health and medical practices

The majority of SHFs also reported receiving instructions from their MU related to health and medical practices the first time they purchased Noiler.

[28] Reliably determining SHFs' profitability from Noiler purchases was outside the scope of this study.

As mentioned in section 3.3.2, these include which medications to give their Noiler, how to administer this medication, and the importance of providing clean water. **A higher proportion of one-time purchasers versus repeat purchasers said they received these instructions.**

Likewise, **a majority of MUs reported giving health and medicine-related instructions to their first-time customers**. Specifically, they said they give instructions pertaining to providing clean water, giving vitamins, vaccines, glucose, and antibiotics, and taking birds to a clinic or contacting the MU if they are sick. An equal number of MUs in the northern and southern regions reported giving health-related instructions to SHFs.

Almost half of SHFs also reported receiving medical advice from other sources. While one-time and repeat purchasers reported this in equal proportions, **a higher proportion of one-time purchasers versus repeat purchasers said that they receive this advice from family or friends, while a higher proportion of repeat purchasers versus one-time purchasers received this advice from a veterinarian or feed sales representative**. This may be related to the differences in flock loss between one-time and repeat purchasers as explained in section 3.3.2; one-time purchasers may be receiving less reliable health and medical information from family and friends, which could contribute to flock loss. Again, it is important that first-time Noiler customers be provided with comprehensive and reliable medical instructions prior to purchase, as well as throughout Noiler's life-cycle, in order to help mitigate flock loss.

Housing practices

Fewer than half of SHFs reported receiving instructions related to housing, including similar proportions of one-time and repeat purchasers. The SHFs that did receive these instructions said that they were primarily told to keep their chicks warm and to clean their coops/cages.

MUs, on the other hand, nearly unanimously reported giving housing-related instructions to their first-time customers. Most recommended an enclosed coop for Noiler, while a couple advised their SHFs that Noiler can be free-ranged, and a few others said not to let the birds roam at all. Other common instructions were to keep coops clean, ensure proper ventilation and temperature control, and to house Noilers separately from other breeds.

When SHFs were asked where they keep their Noiler, a slim majority reported keeping them indoors, in either a dedicated room in their house or in an indoor coop. This housing method appears to be more common in the northern regions versus southern regions and among one-time purchasers versus repeat purchasers. Only a couple said that they were instructed to keep their Noiler indoors by their MU.

The rest of the SHFs reported keeping their Noiler in a coop outside.[29] SHFs commonly mentioned keeping their Noiler separate from other breeds, regardless of whether they were kept indoors or outdoors. There did not appear to be a difference between repeat and one-time purchasers with regard to whether SHFs already had the enclosure before purchasing, or whether they built it specifically for their Noilers. Most SHFs of both types already had the shelter before deciding to purchase Noiler.

[29] No SHFs reported keeping Noilers outside without a coop.

3.4 Supply and Demand for Noiler

Key Findings

- Respondents of all types say **demand for Noiler has increased significantly** over the last few years.
- **Demand is perceived to have grown disproportionately among women**, which MUs and FSRs attribute to easier word-of-mouth advertising among women. MUs also note, however, that women are more price sensitive than men.
- The key remaining barriers to further demand in respondents' eyes are **cost—of both Noiler chicks and feed—and inconsistency in supply**.
- While respondents say demand for Noiler is high overall, they also point to **marked peaks in demand for the bird, both seasonal and ahead of festive periods**.
- Supply challenges—particularly delays in receiving Noiler—are prominent for MUs and SHFs in both northern and southern states, though there is some indication that these **supply challenges may be more pronounced in northern states**.
- MUs, SHFs, and FSRs pointed to **problems during transport of day-old chicks** arising from long distances, inappropriately equipped vehicles, and commercial drivers with little accountability.
- Respondents suggested that **Amo's current production capacity may no longer be sufficient to meet demand for Noiler across the country.**

Recommendations

- **Roll-out of the Amo-Tanager SBCC advertising beyond the initial implementation states** (excluding the impact evaluation states until the evaluation concludes) could further increase demand for Noiler across Nigeria. Given existing supply constraints, however, this might need to be accompanied by an increase in production capacity.
- With MUs noting that women are more price-sensitive than men, but also better brand ambassadors once they own, **assessing any opportunities for price reductions** could have an outsized impact on demand by allowing more women to purchase.
- **Formally explore the extent to which supply challenges could be mitigated** by increasing production at hatcheries, having hatcheries better align production to forecasted demand, establishing an additional hatchery in the North, using transport vehicles that are better ventilated or air-conditioned, and directly employing drivers.

3.4.1 Demand for Noiler

Change in demand to date

We asked MUs how, from their experience, demand for Noiler has changed since they began selling the breed. **MUs almost universally said that demand has increased, irrespective of region and whether high-volume or low-volume.** When asked for their thoughts on what may have caused the change, **the most**

frequently cited reason was increased familiarity with the breed and corresponding word of mouth promotion among SHFs.

This points to an idea of self-perpetuating spread of Noiler, which MUs, SHFs, and FSRs alike alluded to throughout their interviews. Indeed, the majority of SHFs we spoke to in this study say that they first heard about Noiler through a friend or neighbor, rather than through sensitization events or traditional advertising. Almost all SHFs similarly indicated that it is important for prospective customers to see neighbors rearing Noiler, as it removes an element of risk, or perception thereof, in trying a new product. Further supporting this view is the fact that, as noted in section 3.1, most MUs we spoke to said they get new customers principally through word of mouth. In line with this, the majority of MUs also credited the qualities of the breed itself as a factor leading to the increase in demand.

> *The SHFs also contribute to increased demand as they have been able to prove some doubters wrong by the way they keep progressing in the business. There is more familiarity with Noiler because now people know them and love them a lot.* ***- MU***

> *You know, word of mouth, there's a way they quickly spread the news. 'Ah mummy how did you get these birds, please I'd also love to have it.' Especially when they see it grow, walk about scavenging the neighborhood. It's helping to grow the demand because once they see Noiler scavenging around they love the features of the bird. They ask their neighbors to connect them to the supplier or to the source so that they can also buy. Word of mouth is big.* ***- FSR***

> *[Demand] has increased, because I was discussing with a colleague, this is our own prediction: that Noiler is a promising bird. It is going to be the major bird very soon in this community. This is my thinking you know, because it isn't prone to diseases like the broiler. It is more disease resistant. It is more rugged. ... Demand for Noiler has improved because it grows very big. People are beginning to like it. The palatability of the meat is completely different from the broiler chickens.* ***- MU***

While MUs almost all pointed to increased familiarity with the breed and word of mouth as reasons for the rise in demand, **some also pointed to advertising and a few pointed to community sensitization events**. Advertising, they said, has taken the form of posters and flyers, social media, and radio or TV advertisements. This has been particularly prominent in Kebbi, where Amo has launched advertisements on local channel Arewa24 as part of a social behavior change communication (SBCC) campaign in collaboration with Tanager.[30] **Half of**

[30] It is worth noting that Kebbi is also one of the study states for IDinsight's impact evaluation; the SBCC campaign may have implications for contamination in Kebbi if control communities are exposed to the campaign and become motivated to seek out Noiler as a result.

the SHFs we spoke to in Kebbi said that they first learned about Noiler through Arewa24, while MUs and FSRs similarly pointed to this as a boon for demand in the state:

> *Word of mouth has made Noiler known by people, but what made it well known is the advert placed on Arewa24, it created a lot of awareness. Amo Farm placed an advert on Arewa24 channel, it is a television advert and many people make reference to that advert whenever they want to buy. They ask if it is the chicken that was advertised about on Arewa24.* ***- MU***

> *Kebbi is among the states used for that program of advertising Noiler. Since that time, demand has increased. It has multiplied, now we have high demand for Kebbi, everywhere there is Noiler. Every LGA there is Noiler. With Tanager, they used radio program and TV, and that helped a lot. ... Since that Tanager training it has increased every day, because more people are hearing about Noiler, more villages are hearing about Noiler.* ***- FSR***

Recommendation: The apparent success of formal advertising in Kebbi—attested to by SHFs, MUs, and FSRs alike—suggests that expansion of this SBCC campaign beyond the initial implementation states of Benue, Enugu, Kebbi, and Osun could further boost demand for the breed around Nigeria. Given existing supply constraints, however, this might need to be accompanied by an increase in production capacity, as explored further in section 3.4.2.

With regard to how demand has changed, we did not find appreciable differences between respondents in the North and the South; consensus in both regions was that demand for Noiler has grown significantly.

We further asked MUs whether they noticed any differential growth in demand among women versus men. To start, MUs across both regions indicated that women currently make up either most or almost all of their customer base. Very few MUs indicated having mostly male customers. When asked how, if at all, this represents a change from the past, **most MUs said their customer base today is more heavily female than it was in the past**. Reasons given for this mainly consisted of a perceived higher propensity of female Noiler owners to tell friends about the breed, and of female prospective customers to inquire with their Noiler-owning friends. This, in MUs' eyes, has allowed for easier spread through word of mouth among women relative to men.

> *It's because if a female buys, she will tell her neighbor. Women discuss a lot and they inform one another about their experience.* ***- MU***

> *In terms of number of female purchasers, it has increased and they are eager and open to learning and asking many questions. I attribute the change to quest for knowledge and financial freedom, or being able to sort family needs. Most women tend to want to do what gives their fellow women financial freedom so they tend to want to join what they see their friends doing so as to gain.* - ***MU***

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> *[The share of women] has changed over time. Most females who come to buy on a regular basis make instance of how they saw chicks from their fellow women and asked where she got it from, this then makes the number of female customers increase more compared to men. Women are chatty in nature and are easily accessible to each other in terms of asking questions and getting answers, so this change is attributed to them asking themselves questions on poultry and wanting to know where to buy from especially when they visit each other.* - ***MU***

The fact that MUs point to women as natural brand ambassadors bodes well for the APMI program's aims to target female SHFs. Further, as mentioned in section 3.3, most MUs also noted that women constitute more reliable and frequent customers, who are more likely to continually renew their flocks. It follows, then, that any actions taken to further increase Noiler uptake among women, in particular, could have an outsized benefit for Amo and the MUs with whom the company partners. We explore SHF, MU, and FSR recommendations to this effect later in this section.

Fluctuations in demand

MUs, FSRs, and SHFs generally agreed that demand fluctuates by season, though this was more frequently mentioned by MUs and FSRs than by SHFs.

Of the MUs who noted seasonal fluctuations in demand, most elaborated that demand tends to increase in the months leading up to festive seasons, e.g. Sallah and Ramadan in Muslim-majority regions and Christmas and Easter in Christian-majority regions. **A few MUs also noted that demand is higher around January to April and lower around October to December**; one of these MUs explained that the relatively lower demand in the winter months can be attributed to SHFs' beliefs that flock loss is higher in colder weather. The majority of MUs, particularly in southern states, reported forecasting demand based on these trends and attempting to stock Noiler accordingly.

Similarly, **half of the FSRs interviewed said that demand is higher leading up to festive seasons, while a couple of FSRs also reported that demand is higher during the dry season/harmattan (around January to March) and lower during the rainy season (around May to October)**, when SHFs turn their attention to farming. One of these FSRs explained that they lower the price of Noiler during the rainy season to encourage customers to continue purchasing during this time.

Only a couple of SHFs mentioned seasonal variations in demand for Noiler, but those who did had perspectives that aligned with MUs and FSRs. One repeat purchaser said that they tend to purchase Noiler chicks in September so that they can sell the mature birds right before Christmas, while another repeat purchaser said that they purchase greater quantities of Noiler around the festive season because they like to give chickens as gifts. A couple of other SHFs mentioned that it is typically easiest to find buyers for Noiler around Sallah or Christmas.

Barriers to further demand and suggestions to mitigate

While respondents resoundingly indicated that demand for Noiler has grown, we set out to identify any remaining barriers that may exist in their eyes to even further demand and suggestions they may have to address these barriers.

Some MUs said that they could not point to any remaining barriers to demand, with most FSRs echoing this same sentiment. **Among respondents who did point to areas for improvement, the overwhelming themes among MUs and SHFs alike were the cost of Noiler and feed and the consistency of supply, in that order.**

Cost of Noiler and feed

Among those respondents who did identify barriers to further demand for Noiler, most pointed to high prices, both of the chicks themselves and of chicken feed:

> *The cost of feeding the birds is a main inhibitor. At times, people tell me that they would have bought more birds but the cost of feeding is very high. - **MU***

> *Money, if people don't have enough money buying birds is more difficult for them, or they might be able to buy but not be able to feed them properly. - **MU***

> *Lack of money stops them from coming to buy. Some people tell me they want the chickens but don't have money. - **MU***

> *It's the feed that most of them keep complaining about it, some will say the rising cost of feed is affecting how much and how many they can keep. - **MU***

> *What I think is that they all at Amo should meet to ensure the price of feed and birds reduces. Once it is reduced, people will buy more. As for the MU, I want her to buy cheaper batches—if her birds are expensive, fewer people will buy. - **SHF***

As discussed in section 3.3.4, SHFs we spoke to almost unanimously reported feeding their Noilers with commercial feed, the price of which respondents say has increased substantially over the past years. While reducing the price of commercial feed itself may not be possible, there is, again, an opportunity to mitigate this barrier to demand by stressing to SHFs that Noiler can thrive on a combination of foraging, table scraps, home-grown grains, and commercial feed, and do not need to be fed in the same way as more exigent commercial breeds. Several MUs specifically recommended strengthening this messaging in an effort to mitigate the impact of rising commercial feed prices.

The price of Noiler chicks themselves was also an oft-repeated barrier to further demand, as discussed in section 3.3.3. While against the backdrop of high overall sales, it seems the price of Noiler may not be suppressing demand in aggregate, it bears examining whether the current prices may be shifting the composition of the SHF customer base toward better-off customers.[31]

While a full customer base analysis was beyond the scope of this qualitative study, Amo and APMI stakeholders could consider light-touch actions to get a better sense of what kinds of customers are buying Noiler. One such method could be to instruct MUs to inquire and record their customers' professions, when possible. This could provide valuable, if rough, data on the share of birds going to small-scale producers, tradespeople, or white collar workers and civil servants.

Asked for their ideas on how Amo could further increase demand for Noiler, MUs were nearly unanimous with their principal recommendation: to reduce the price of Noiler. SHFs, when asked the same question, echoed MUs' sentiments and overwhelmingly suggested reducing the price of chicks. Given that, as discussed in section 3.3.1, MUs suggested female SHFs are more price sensitive than male SHFs, it is possible that any measures taken to reduce the price of Noiler could disproportionately increase demand among women. This could then bring about knock-on benefits given women's greater propensity—in the eyes of MUs and FSRs—for word-of-mouth promotion.

With regard to how Amo could address the rising price of Noiler chicks, FSRs

[31] As mentioned in section 3.3.1, many MUs identified SHFs' wealth levels as a factor determining propensity to purchase Noiler.

were split, with some pointing to this being outside of the company's control and stressing that sensitization as to the current economic situation would be key:

> *The negative [feedback] that I'm getting is the issue of price, but that one I think is the country situation now, it's a general problem, everything has changed.* **- FSR**

> *I don't think we have any other option. Those that are complaining about the price, we don't have control over the price. The way things are moving in this country, you can't have control over it. You try explaining to them - even if you buy it at a high rate, you also sell it at a high rate. So I don't think we have anything more than trying to convince them and educate them on how the market works, that if you buy it high you can also sell it high.* **- FSR**

Another FSR, however, saw a potential path forward in increasing production capacity, taking advantage of greater economies of scale, and in doing so lowering the unit price of Noiler:

> *Maybe if the unit prices reduced or purchasing power improved, it would bring about more. If production would step up and people have better price, that will determine what volume they are able to demand. If the unit price is somehow favorable. [Q: As in expanding production at the hatchery so the unit price per chick comes down?] Yes exactly.* **- FSR**

One opportunity to lower costs—and accordingly temper the upward pressure on Noiler prices—could thus lie in scaling up operations. While assessing the feasibility of decreasing unit price through increasing production remains outside the scope of this research, it is worth highlighting that this recommendation—to increase the number of DOCs produced—was ubiquitous in interviews with FSRs and MUs. This was mostly mentioned in the context of supply challenges, the other key hindrance to demand that respondents identified.

Consistency of supply

Aside from the price of Noiler chicks and feed, the other frequently cited barrier to further demand was insufficient or inconsistent supply. MUs pointed to delays in receiving their orders and having to queue for chicks, noting that this can have a negative impact on demand if SHFs come to see Noiler as a product that is only available sporadically rather than on demand.[32]

[32] While MUs spoke about delays in a qualitative sense, we did not ask MUs to quantify expected average delivery times versus actual average delivery times.

> *Supply is [a barrier to demand]. Supply is always delayed and this can make buyers that are on ground waiting to buy spend their money on another thing, so if we can have instant supply it will be helpful.* **- MU**

> *Inability of MU to have birds due to demand issues have caused a lot of people not to demand for them as they ought.* **- MU**

> *[Supply] is the problem we are getting, because people want the chickens and almost every 1-2 days they must ask me and I will call the company and they will say no chickens. And you see the chickens are supposed to be plenty and everywhere because people want it.* **- MU**

> *The problem is that when one places an order and they say they will bring chicks next week. You would tell your customers chickens will come next week. ... That very next week the company will say chicks haven't arrived. They will move the date to another week or 2 more weeks. The customers that keep calling me to find out if they have arrived will get frustrated because they have tied money down for these chicks.* **- MU**

> *The biggest challenge is delivery, the company doesn't supply the chick when we need it, so if a customer comes today and comes tomorrow to hear the same story you will definitely lose such customer.* **- MU**

Just as MUs lamented the impact of inconsistent supply from the hatchery, so too did SHFs regarding supply from MUs:

> *I don't know if maybe demand is too much for them, because we face a lot of delay. ... Amo should reduce this delay. They should make chickens available.* **- SHF**

> *The advice I have is for them to work on the delay in supplying the chicks to their customers, it should be readily available for we the buyers so that we don't go out of stock as being out of stock can chase buyers and potential farmers away; it could make them eat the capital they want to use in investing and that is financially not responsible so they should work on their delay with supply.* **- SHF**

In line with this was the finding that, as mentioned in section 3.3.3, the most frequently cited reason for ceasing to rear Noiler among one-time purchasers, after cost of chicks or feed and experiences of bird loss, was inconsistency of supply. A few one-time purchasers even reported telling their friends and neighbors who may have been prospective customers that supply of Noiler was unsatisfactory.

Recommendation: MUs' and SHFs' insights suggest that addressing supply issues could go a long way not just in making the Noiler-rearing experience better for repeat customers, but also in bringing in new customers and retaining existing ones. We reserve further discussion of supply issues and respondents' suggestions to address them for section 3.4.2.

3.4.2 Supply of Noiler

While demand for Noiler did not appear to be a challenge as of the time of the study, **the consensus among all three respondent types was that procuring adequate supply of Noiler can be a significant bottleneck**. The nature of these supply challenges as well as respondents' suggestions to mitigate them are explored in this section.

Supply challenges

Almost all MUs reported experiencing supply challenges, including majorities of both northern and southern MUs. Of these MUs, almost half said the supply challenges are seasonal, and a few noted that they are more prominent around festive times. Likewise, a couple of SHFs noted that they usually don't experience supply challenges except before Ramadan or Sallah.

Delays and insufficient production

A key supply challenge that respondents identified was overall insufficient production of Noiler and corresponding delays, as touched on in the previous section. When asked whether they thought that the supply of Noiler is enough to meet demand, most MUs responded that it is not. Some indicated that this insufficiency in the number of chicks produced is constant throughout the year, while most said it mainly is during peak periods that Amo is unable to keep up with orders. Among those who pointed to peak periods, most said that January to April is the period when the supply:demand ratio is lowest.

Both MUs and SHFs reported experiencing delays in receiving batches of Noiler. Of those MUs who said they've experienced supply challenges, almost all said this includes delays in shipments, with MUs most frequently reporting experiencing delays of 4 weeks or more.

> *Maybe they will not supply on time, and you might pay and [wait] for 2-3 weeks. Your customers will keep calling: 'Do you have birds? Do you have birds?' You will keep telling them, 'No.' You can book for 2-3 weeks and they will not supply you.* - ***MU***

> *The problem I have [is], if I say I want like 10 cartons, they will tell me that [I won't receive them] until the next week, and when that week comes and I call, they will tell me, I still can't get it. You see, you will spend 5 weeks following up with the company to get and you will not get, so that is the complaints we are getting.* **- MU**

> *There are times when you have low production and you have a very high demand. So even the MUs have to follow a queue. Sometimes they might wait for up to a month.* **- FSR**

When repeat-purchasing SHFs were asked whether they had experienced delivery delays, half of them reported that they had. However, there was a notable regional variation; **almost all repeat purchasers in northern states said they had experienced delivery delays while almost all repeat purchasers in southern states said they had not**. SHFs who experienced delivery delays noted that these can typically range from three days to one month. Half of them said that these delays negatively impact their business.

> *It affects [my business]. People come to ask for chickens and I keep telling them I don't have. When I keep telling them I don't have, it isn't cool anymore.* **- SHF**

> *I don't like when it happens. When someone books, for example on Friday, you know it's a promise you made to the person. The person will lose faith in you that you didn't keep the promise.* **- SHF**

> *It has an effect because what I am [supposed] to do at the right time [I] couldn't do. Sometimes it makes me lose customers as some of them might go ahead to buy Broiler from others instead of buying Noiler from me.* **- SHF**

Damage in transport

Some MUs also mentioned issues with not receiving as many chicks as they had ordered or chicks being dead or in a poor condition when they arrive. These issues, as well as delays in receiving supply, were attributed principally to problems with transportation of chicks from the hatcheries and the distances the chicks have to travel. Several FSRs also pointed to this as the key supply challenge they face.

> *Well the only challenge is transporting the birds. You know we are very far away from the hatchery so sometimes the birds, especially during the sunny season when they're having a lot of heat, it's very challenging transporting the birds. The hatchery is located in Ibadan.* ***- FSR***

> *We don't have much challenges, it's just between us and drivers, but not with the company. Sometimes if they didn't pick birds in time, and there's a hold-up or traffic on the road, by the time the birds reach, there is mortality. And in the end it's on my head as the FSR. Because what MUs receive is what you service him. So if the driver picked 300 birds from Ibadan, and when he reached here 50 birds died, well the company knows that it gave him 300 birds, and the MU knows that he received 250 birds, so in the end it is me, the FSR, who will compensate the MU, if I want to maintain him. Because if I didn't compensate him maybe tomorrow he won't come back, he will just leave. [Q: So you compensate him from your own money?] Yes, yes that's the challenge.* ***- FSR***

Transportation problems cited included poor ventilation and a lack of air conditioning in vehicles, vehicles getting into accidents, vehicles taking long and indirect routes to their destinations, and drivers not knowing or not caring about how to properly handle newborn chicks. All of these factors, respondents indicated, can stress the chicks and lead to mortality in transit. Suggestions to mitigate these issues will be discussed in the following sub-section.

Suggestions to mitigate supply challenges

FSRs and MUs offered a number of suggestions related to production and transportation of chicks to ease the supply challenges outlined above.

Production of chicks

A suggestion we heard frequently was for Amo Farm to simply produce more Noiler. When asked for their suggestions on how Amo could improve supply, this was by far the most common recommendation MUs gave.

> *They should increase their production chain, try to meet up with demand which they are aware of.* ***- MU***

> *They should increase their capacity, I know they can because their capacity right now cannot service the whole of Nigeria.* ***- MU***

> *There is nothing they can do other than to produce day-old chick in larger quantity for people to buy.* - ***MU***

> *You know I am an agriculturalist too, now they have to expand their hatchery. Maybe their hatchery capacity is X or so, by the time they expand their facility maybe that would help them.* - ***MU***

> *What I think can be done is for them to increase the number of their parent stock so that they can meet up with their customers' demand.* - ***MU***

> *If they can just increase their brooder or parent stock. Though they might have issues with how to supply during off-peak, but this should not be a problem to them; after all, people know Noiler and they do demand for them. These birds are even exported, so I believe they can increase their capacity.* - ***MU***

MUs suggest that Amo Farm should consider expanding its overall production capacity for Noiler. With demand for the breed having increased markedly in respondents' eyes, and supply not having increased commensurately, Noiler's principal distributors seem confident that there is a market for increased production.

Beyond increasing overall production levels, the primary suggestion from FSRs with respect to chick production was for hatcheries to better time production to meet forecasted demand. Since demand typically fluctuates according to festive seasons and weather, as discussed in the previous section, demand forecasting should be state or region-specific to account for different festive seasons and weather patterns in different regions.

Recommendation: Amo and WPF may consider conducting a thorough assessment to identify these trends and seasonalities and compare with overall production capacities and utilization of hatcheries. This may further optimize production and logistical processes in light of increased demand and orders.

> *I can't really fathom what is happening, why. They should know by now when there will be demand! Oh Christmas is forthcoming, they should know in August there will be high demand because of it. So it shouldn't be that there's low production in August. When there is lower demand there's high production, when there's high demand there's low production. It shouldn't be like that.* - ***FSR***

> *November, December, then January to May, the supply is always lower [than demand]. If there's a way to go about increasing more at that time, so that MUs won't be waiting, customers won't be waiting, we would really appreciate that.* ***- FSR***

> *We in the North, we focus on two major festivals, big Sallah and small Sallah. So four months to the festival, there will be high demand. And if you look at the demand for the Christian states, there will be more demand for Noiler than in the North at times, and there are times that the North has more demand than the South. ... They should know when there is market.* ***- FSR***

Some FSRs and MUs also mentioned establishing additional hatcheries or pickup points and suggested having one in every region.

> *They should get more hatcheries, people are demanding, you know they only have one hatchery in Oyo state... since we have six regions, let them have six, let them have more... so that they can meet the supply.* ***- MU***

> *They should increase the scale of production and have hatcheries in the six geopolitical zones, they should expand more.* ***- MU***

> *Even if it's not a hatchery, even if it's like a pickup station where they'll use their own vehicles. ... So they could bring them to that location, sort them out, and then we could pick from there.* ***- FSR***

This, combined with the complaints outlined previously about long transport times and corresponding chick mortality, particularly in the North, suggests that geographically diversifying production of Noiler might be beneficial. Given that respondents overwhelmingly recommended increasing the supply of Noiler, it is possible that expanding production by opening a new hatchery in the North could do more to ease supply constraints compared to expanding capacity at existing hatcheries. However, it is worth noting that this recommendation comes from a small subset of actors in just a few of the states in which Amo operates and any such decisions would require a more thorough company-wide assessment (outside the scope of this study).

Transportation of chicks

With respect to how chicks are transported from the hatchery to communities, **one of FSRs' primary recommendations was that chicks should be transported**

in higher-quality vehicles that have air conditioning or proper ventilation in order to prevent them from overheating, with several MUs echoing this same sentiment.

> *You know the weather here is very hot so if we can get a suitable van with air conditioning so that we don't have too much mortality.* - ***MU***

> *In the aspect of transportation, they should have good vehicles to move these chickens so we stop hearing that vehicle got spoilt and that affected the chickens.* - ***MU***

> *[Air conditioned vehicles] will help, it will. Because I've seen one company using that, a company that uses that to transport birds, air conditioned vehicles. There was a day, I saw it with my eyes, the air conditioner broke and the driver didn't know. On the three hours journey, the 30,000 birds, they all died.* - ***FSR***

> *They need natural air to prevent pneumonia. The heat contributes to mortality though. But as an animal scientist, I will suggest there should be air conditioning only if there is a traffic jam and the chicks aren't getting air, but the best thing they need is natural air.* - ***FSR***

Several FSRs also suggested that, in order to increase accountability for chick stress and mortality in transit, Amo could directly hire drivers and purchase its own vehicles as opposed to relying on commercial transportation firms. MUs and FSRs repeatedly pointed to drivers who seemed unsuited or untrained to handle livestock and indicated that outsourcing transport may not be worth the cost savings.

> *If [the drivers] are employed by Amo, you'd be able to report any misbehavior to the company directly. Any careless handling of the birds. That one would be very, very good. The drivers now mismanage the birds, there are casualties and lots of mortalities. But if they were employed by Amo, there would be a manager they report to, and it would be better.* - ***FSR***

> *Let's say if the company could have its own vehicles. Because these drivers are all commercial drivers that we're giving these birds. If the company could have specific vehicles for transporting these birds, I know the challenges that we're facing on that side would reduce, because the driver would know that he's purposely employed for this purpose, and this vehicle is for this purpose, for picking Noiler, so he must take it seriously and do the job right.* - ***FSR***

Other suggestions mentioned by FSRs included: more direct transportation from hatcheries so that vehicles do not have to stop in other states before arriving at their final destination, consolidating orders so that fewer trips from the hatchery are required, and establishing a redressal system to compensate MUs who do not receive their full order due to transportation-related mortality—currently, the MU bears this cost, though one FSR mentioned compensating MUs out of pocket.

MUs largely echoed these recommendations and indicated that investing in improving the transportation process could go a long way in increasing their satisfaction and improving supply. As a caveat to all recommendations in this section, assessing the feasibility or cost-effectiveness of these recommendations was outside the scope of this study. Respondents' perspectives did suggest, however, that undertaking such an assessment could be of value.

4. Recommendations and Conclusion

4.1 Recommendations

4.1.1 Recommendations to Further Improve the APMI Model

APMI Stakeholders: Study opportunities to facilitate access to financing or in-kind credit for MUs

Effort: High **Priority:** Medium

Some MUs reported that access to capital is an important factor in determining an MU's degree of success in the business. This is because proper feeding, medication, housing, and biosecurity practices require both upfront and continual investment that some MUs may be unable to afford without credit. Just under half of MUs indicated that a lack of credit or capital prevents them from restocking more frequently.

Interviewees suggested that increased access to financing for MUs could allow for both larger and more frequent restockings, while also lowering the barriers to becoming an MU for capital-constrained but interested farmers. Given the limited prevalence of external financing in interviewed MUs' communities, APMI stakeholders could study the possibility of facilitating access to affordable credit for MUs, either through partnerships with financial institutions or through in-kind credit provision. This could lead to greater social impact by incorporating relatively poorer MUs in the APMI program, while enabling MUs to stock greater

quantities of Noiler could also help to bolster supply in light of increasing demand.[33] IDinsight is aware that Amo is currently exploring the possibility of partnering with a microfinance institution to provide low-interest financing to MUs.

Amo Farm: Target extra marketing and sales support to MUs in poor communities in northern states

Effort: Medium **Priority:** Medium

Northern FSRs were unanimous in their assertion that an MU's location and the profile of surrounding SHFs are important factors in determining an MU's sales volume. The majority of these FSRs noted that it is comparatively more difficult to sell Noiler in the poorer communities, meaning MUs in these communities may struggle to progressively increase their volumes relative to their peers in more conducive locations.

To address this issue, Amo could consider assisting MUs in particularly poor communities in northern states by providing additional marketing and sales support and more actively monitoring and following up with them. However, before doing so, we recommend conducting further research as to the specific challenges faced by MUs in these types of communities and the ways in which they feel they would be best supported. Given that establishing and supporting MUs in these sorts of communities may entail more effort per sale on the company's side, APMI stakeholders could explore ways to incentivize or facilitate this given its potential for bottom-of-the-pyramid impact.

Amo Farm: Consider formally folding middlemen into the APMI structure

Effort: Low **Priority:** Medium

This study has found that a majority of MUs sell Noiler not just to SHFs directly, but also to middlemen or hawkers who then resell to SHFs. While MUs selling to middlemen can limit the follow-up support and access to information received by SHF customers who purchase from middlemen, it can also allow for wider propagation of Noiler than would be possible otherwise, particularly in more remote and rural areas. Several MUs and FSRs specifically pointed to middlemen as a means of distributing Noiler to more remote or harder to reach areas.

To capitalize on the potential of middlemen to amplify impact, Amo could

[33] Previous research (e.g. Banerjee et al., 2019; Meager, 2019) has found that microcredit given to existing business owners who have access to high fixed cost-high return technologies can have positive effects on household business and consumption variables. We also understand that WPF may have explored such opportunities at an earlier stage in the APMI program and we would be keen to learn more about the takeaways from that undertaking.

consider folding them into the APMI program structure more formally. This could involve MUs requesting middlemen to give their customers the phone numbers of the MU and FSR in case of any queries on chick care. Doing so may also benefit the middlemen by ensuring that their buyers have greater success with Noiler. However, MUs and FSRs would need to ensure that middlemen do not fear that their customers could be poached by MUs, as several MUs pointed to this as a challenge in requesting communication with middlemen's customers. This approach may thus be better suited to cases where middlemen's customers are located far from the MU, as poaching of customers would be perceived as less of a risk.

4.1.2 Recommendations to Increase Demand and SHF Satisfaction

Amo Farm and APMI Stakeholders: Expand social behavior change communication (SBCC) to other states

Effort: High **Priority:** Medium

Television advertisements of Noiler have been particularly prominent in Kebbi as compared to other study states; Amo launched these advertisements in Kebbi on local channel Arewa24 as part of a social behavior change communication (SBCC) campaign designed and implemented in collaboration with Tanager. SHFs, MUs, and FSRs all pointed to these advertisements as a boon for demand in the state.

The apparent success of this formal advertising in Kebbi suggests that expansion of this SBCC campaign beyond the initial implementation states of Kebbi, Enugu, Osun, and Benue could further boost demand for the breed across Nigeria. Given existing supply constraints, however, this might need to be accompanied by an increase in production capacity. Beyond boosting demand for Noiler, these advertisements can help to encourage consumption and sale of mature birds, respectively, in the areas where this encouragement is most needed, as discussed below.

Amo has informed IDinsight that plans to expand the SBCC campaign to 15 additional states are already underway. Two of these states—Kano and Kwara—are states in which IDinsight's impact evaluation is being conducted. As this advertising may encourage contamination in control communities and lead to selection bias in the study, Amo has agreed to postpone SBCC implementation in these two states until July 2023 at the earliest so endline data collection can be conducted prior to SBCC expansion.

Amo Farm: Use region-specific messaging to SHFs on the benefits of eating and selling Noiler

Effort: Low **Priority:** Medium

A key finding from this study pertains to the regional differences in views of poultry and intentions with Noiler; more SHFs in northern states reported rearing chickens to sell and generate income, while more SHFs in southern states reported rearing chickens for consumption. This regional difference—corroborated by MUs and FSRs—implies that there may be an opportunity for stronger and more targeted messaging as to the benefits of eating Noiler in the North and of selling Noiler in the South. These messages should address the respective contexts and pre-existing perceptions that hinder the respectively desired behaviors and outcomes in each region. This could take place during initial community sensitization, but should also be repeated by MUs at all interaction points with SHFs—sale, pickup/delivery, and follow-up.

Amo Farm: Test out messaging that underscores higher selling prices for mature Noiler

Effort: Low **Priority:** Low

There was consensus among all respondent types that the price of Noiler at all ages—day-old, month-old, and mature—has increased considerably over the last few years. Though perspectives as to whether these price increases have been commensurate with the overall inflation rate in Nigeria were mixed, a number of MUs and SHFs noted that some SHFs have responded to these price increases by purchasing smaller quantities of Noiler than they did previously or ceasing to repurchase entirely.

To mitigate the negative impact of higher prices for month-old Noiler on SHF demand, Amo could test messaging that acknowledges this increase in price of month-old chicks but underscores the higher price that mature Noiler now fetches. This could help to contextualize the Noiler price increases within the general inflation Nigeria is experiencing and remind potential customers that while Noiler has indeed become more expensive in nominal terms, it may not be so in real terms.

However, this messaging is likely to be more effective for SHFs who intend to sell Noiler versus those who only intend to consume or gift the birds, as only the former group could potentially realize the gains of higher prices for mature Noiler. Therefore, this messaging strategy could be combined with one that emphasizes the benefits of selling Noiler—particularly in the southern states—as explained in the previous recommendation.

Amo Farm and APMI Stakeholders: Explore opportunities for cost savings that may allow for lower selling prices of Noiler

Effort: High **Priority:** High

Respondents of all types pointed to level of wealth as an important factor contributing to an SHF's propensity to purchase and repurchase Noiler. MUs frequently cited this as a key difference between one-time and repeat purchasers, while SHFs who have stopped rearing Noiler often pointed to cost as a reason why they stopped. If the Noiler customer base is skewed towards relatively better-off SHFs, this may limit the degree of social impact the APMI program can achieve.

Therefore, Amo should explore opportunities for cost savings that may allow the company to lower the selling price of both day-old chicks and month-old chicks, thereby encouraging poorer SHFs to purchase and repurchase, allowing them to realize the potential benefits of the bird. One possible way to achieve this—while also addressing the supply constraints discussed in section 3.4—could be to scale up production at hatcheries if this may allow for a unit price decrease through greater economies of scale. However, more research is necessary to both quantitatively determine the wealth composition of the Noiler customer base and to assess the feasibility of—and actual cost savings expected from—various options to decrease costs.

Amo Farm: Better sensitize farmers as to the type of feed Noiler requires

Effort: Low **Priority:** High

Though almost all SHFs reported feeding their Noiler at least partially with commercial feed, and a majority reported feeding exclusively with commercial feed, their reasons for doing so varied. Some thought that Noiler would grow faster and stronger on commercial feed, while others thought that Noiler would not grow properly if not given commercial feed. While WPF acknowledges that the former can be a valid reason to feed Noiler with commercial feed—especially if one's intention is to sell mature Noiler or eggs—it is not true that Noiler will not grow properly if not fed commercial feed; it is possible for the birds to subsist on a combination of foraging, kitchen scraps, and grain chaff.

As there is a risk that exclusive usage of commercial feed may eat into SHFs' profits from selling Noiler or have negative overall effects on households' disposable income, MUs should better sensitize farmers as to when and how commercial feed can be beneficial. This messaging should emphasize that Noiler does not necessarily require commercial feed if the birds are able to forage and are given adequate quantities of kitchen scraps or grain chaff. However, Noiler may grow bigger and lay more eggs when given commercial feed, so it is

ultimately the personal decision of each Noiler owner as to whether they feel the benefits of feeding with commercial feed outweigh the expense of the feed. While it appears that some MUs express these messages to their customers, Amo should ensure that this messaging is consistent among all MUs.

Amo Farm: Target extra support to SHFs who are less experienced in poultry-rearing

Effort: Medium **Priority:** Medium

Respondents point to a number of differences between one-time and repeat purchasers with respect to poultry-rearing experience, flock loss, and interactions with their MU. The one-time purchasers we interviewed—in comparison to repeat purchasers—had fewer years of poultry-rearing experience, experienced higher rates of flock loss, were more discouraged from repurchasing Noiler when they experienced flock loss (according to MUs), and fewer of them reported reaching out to their MU for advice after purchase.

Based on these insights, it stands to reason that first-time purchasers who are less experienced in poultry-rearing could benefit from additional support from MUs or FSRs. This could include more comprehensive instructions from MUs during purchasing, a structured training delivered by either MUs or FSRs, pre-recorded audio instructions that can be forwarded on Whatsapp, or more frequent follow-ups by MUs after purchase—especially in-person follow-ups to allow MUs to directly observe the health and wellbeing of chicks and poultry management practices employed by SHFs. These instructions or training should include poultry-rearing best practices with respect to feeding, health, and housing, in addition to Noiler-specific guidance. Respondents also suggested that sensitizing these farmers that episodes of flock loss can occasionally occur could help to prevent SHFs who experience flock loss from becoming discouraged with Noiler.

Amo Farm: Establish a system to compensate SHFs who experience high flock loss during their first purchase

Effort: High **Priority:** High

Even if MUs or FSRs target extra support to less experienced SHFs as recommended above, there is still a risk that some of these SHFs may experience high flock loss in their first purchase. Next to the cost of birds and feed, high bird loss in the first flock was the most frequently cited reason for non-repurchase. To prevent high flock loss from discouraging first-time purchasers from repurchasing, Amo could consider compensating SHFs who experience high mortality during their first purchase. This could take the form of

free or subsidized replacement birds rather than monetary reimbursement.

While a few MUs reported doing this on their own, instituting this as a company policy could build goodwill among new customers, increase orders, and prevent MUs from eating into their own profits.[34] Additional data and continuous monitoring would be required to determine the percentage of flock loss that should qualify an SHF to receive compensation, any conditions around the nature of that flock loss, and the optimal amount of compensation disbursed given the extent to which this compensation may increase one's propensity to repurchase Noiler. Given that each MU is an independent business owner, it will also be important for Amo to consider how they can ensure that funds dedicated to compensation are actually used for this purpose. A/B testing of such a policy could provide preliminary insights into some of these questions.

4.1.3 Recommendations Related to Supply of Noiler

Amo Farm and APMI Stakeholders: Quantitatively investigate supply factors and potential avenues to further optimize production

Effort: High **Priority:** High

While they overwhelmingly pointed to improvements in demand for Noiler to date, FSRs, MUs, and SHFs all agreed that Noiler supply and the logistics of procuring supply often present challenges. Respondents offered a number of suggestions to address these supply challenges—including, but not limited to, increasing production at hatcheries, establishing new hatcheries and pickup points (especially in the North), and aiming to better align production to meet forecasted demand. Given that many of these topics are beyond the scope of this study, however, further research is required to assess the feasibility and cost-effectiveness of such suggestions.

Therefore, we recommend that WPF and Amo quantitatively investigate supply challenges to identify opportunities to further increase efficiencies in production and distribution. While a thorough supply chain analysis may present a large undertaking, insights from respondents point to the potential value of such an exercise. Specifically, responses suggest it will be important to map out trends and seasonalities in demand in comparison with overall production capacity and utilization of hatcheries. This investigation should take place across all of Amo's markets rather than just the six states chosen for this study. One output of such an exercise could include developing a dynamic optimization algorithm to further optimize supply logistical processes.

[34] As a caveat, any such insurance mechanism should be designed so as to minimize the risk from adverse selection (more inexperienced SHFs selecting in) as well as moral hazard (SHFs taking less care of their chickens). As such, it may be helpful to not communicate this practice to SHFs in advance.

Amo Farm: Explore opportunities to reduce transportation-related chick mortality

FSRs and MUs also reported that transportation-related chick mortality can be a significant problem. Suggestions mentioned by respondents include using better quality vehicles that are ventilated or air-conditioned and directly hiring drivers that are trained in newborn chick care and accountable to Amo. These suggestions, as well as other possible ways to reduce transportation-related mortality, should be explored with respect to effectiveness and cost implications; it is possible that implementing these solutions could result in greater costs to Amo, which may lead to increased prices of day-old chicks. The potential costs of these solutions will need to be balanced with the potential benefits of the reduced risk from lower transportation-related chick mortality.

Amo Farm: Compensate MUs who do not receive their full order due to transportation-related mortality

Effort: Medium **Priority:** Medium

It appears that Amo does not currently have a redressal system for MUs who do not receive their full order of day-old chicks due to transportation-related mortality; one FSR mentioned that they personally compensate these MUs out of pocket. In order to maintain MU satisfaction while ensuring that FSRs do not incur personal expenses when transportation-related mortality occurs, Amo could consider implementing a policy to compensate MUs in these situations and including this in their pricing structure. This could involve having hatcheries confirm the number of day-old chicks supplied in each order and FSRs confirming the number of live day-old chicks received, possibly using photographic evidence.

4.2 Conclusion

IDinsight's aim in this study was: 1) to provide context for the eventual findings of the broader APMI impact evaluation; 2) to aid Amo Farm in better understanding the dynamics that surround its business model, how the model has functioned in practice, and how it can be further improved; and, 3) to aid BMGF and WPF in further refining the APMI model, with an eye toward scaling up this and other dual-purpose poultry projects across sub-Saharan Africa.

Overall, our findings bode well for the success of the APMI program. Respondents suggest that demand for Noiler has increased substantially in recent years, customer satisfaction with the breed is generally quite high, and MUs perceive their businesses as profitable. The concerns surrounding demand and uptake that partially motivated this study appear to be relatively less pressing compared to the challenge of ensuring adequate supply of Noiler.

We have proposed a number of recommendations to improve the APMI model, increase demand and SHF satisfaction, and further explore and address supply challenges. Integrating these recommendations into the APMI model—in Nigeria and in other countries in which APMI has been or will be implemented—may further improve MU and SHF satisfaction with the model, increase demand for Noiler, and mitigate supply constraints, thereby leading to greater social impact of the program.

References

Banerjee, A., Breza, E., Duflo, E., & Kinnan, C. (2019). Can microfinance unlock a poverty trap for some entrepreneurs? *National Bureau of Economic Research*, Working Paper 26346.

Guest, G., Bunce, A., & Johnson, L. (2006). How Many Interviews Are Enough: An Experiment with Data Saturation and Variability. *Field Methods, 18*(1), 59-82.

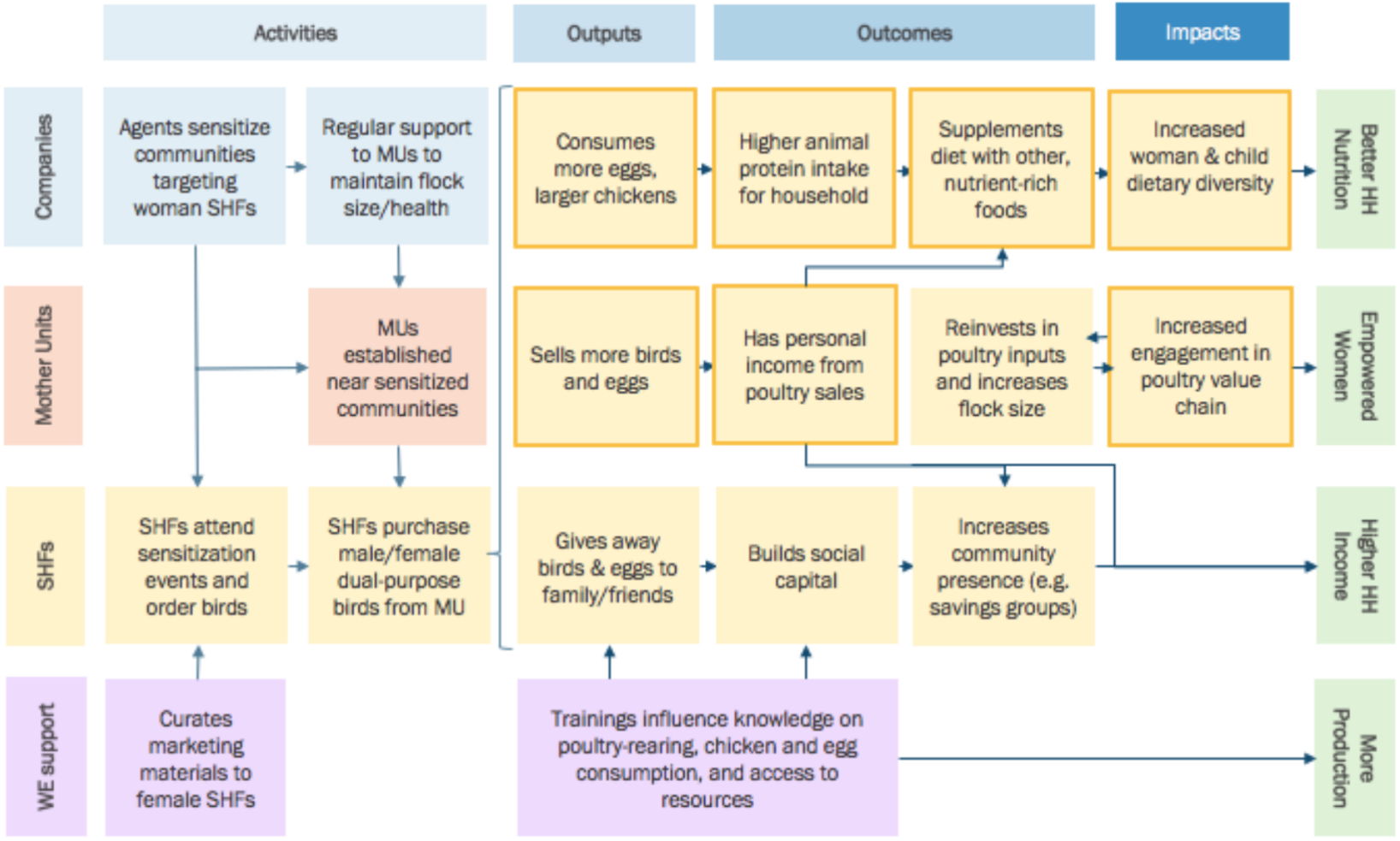
Gueye, E. F. (2000). The Role of Family Poultry in Poverty Alleviation, Food Security and the Promotion of Gender Equality in Rural Africa. *Outlook on Agriculture, 29*(2), 129-136.

FAO. (2010). *Smallholder poultry production – livelihoods, food security and sociocultural significance*, by K. N. Kryger, K. A. Thomsen, M. A. Whyte and M. Dissing. FAO Smallholder Poultry Production Paper No. 4. Rome.

Meager, R. (2019). Understanding the Average Impact of Microcredit Expansions: A Bayesian Hierarchical Analysis of Seven Randomized Experiments. *American Economic Journal: Applied Economics, 11*(1), 57-91.

Padhi, M. K. (2016). Importance of Indigenous Breeds of Chicken for Rural Economy and Their Improvements for Higher Production Performance. *Scientifica.*

Appendix A: Theory of Change for APMI



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