

A market led approach to develop a sustainable and scalable wheat value chain in Nigeria

Flour Milling Association of Nigeria (FMAN)
Nigeria

Inclusive Business Analysis – Public Report

December 2023



Disclaimer

This study examines the projected (financial) performance of FMAN's Inclusive Business Model and explores and recommends potential improvements and opportunity pathways. The findings in this report have been used by IDH, FMAN, and involved value chain players to shape their strategy, project design, and future business models, but these organizations cannot be held accountable for meeting any targets included in the report.

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Introduction

Smallholder livelihoods

Agriculture plays a key role in the wellbeing of people and planet. 70% of the rural poor rely on the sector for income and employment. Agriculture also contributes to and is affected by climate change, which threatens the long-term viability of global food supply. To earn adequate livelihoods without contributing to environmental degradation, farmers need access to affordable high-quality goods, services, and technologies.

Inclusive Business Models

Inclusive Business Models are supply chain structures which provide farmers with services such as training, access to inputs, finance and information in addition to sourcing products from these farmers. Inclusive Business Models can sustainably increase the performance of farms while providing a business opportunity for the service provider. Using IDH's data-driven Inclusive Business Model methodology, IDH analyzes these models to create a solid understanding of the relation between impact on the farmer and impact on the service provider's business.

Insights & Innovations

Our data and insights enable businesses to formulate new strategies for operating and funding service delivery, making the model more sustainable, less dependent on external funding and more commercially viable. By further prototyping efficiency improvements in service delivery and gathering aggregate insights across sectors and geographies, IDH aims to inform the agricultural sector and catalyze innovations and investment in service delivery that positively impact people, planet, and profit.

Abbreviations

EBIT	Earnings Before Interest and Taxes
FAO	Food and Agriculture Organization
FMAN	Flour Milling Association of Nigeria
FMN	Flour Mills of Nigeria
GAP	Good Agricultural Practices
LTD	Limited
NGN	Nigeria Naira
PLC	Public Limited Company
P&L	Profit and Loss
RWH	Rainwater harvesting
USD	United States Dollar

Report outline

To navigate between the different chapters, simply click on the corresponding name in the reading guide on the right of each page, and you will be taken to the first page of that chapter

1 Executive summary

2 The Business Model

3 Business case

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1

Executive summary



Introduction | Comprised of six major wheat millers in Nigeria, FMAN was established to improve local wheat production making the country self sufficient and combating food insecurity



Overview of FMAN

- The Flour Milling Association of Nigeria (FMAN) is a partnership of leading flour millers in Nigeria, working together to develop the wheat value chain. FMAN actively participates in finding solutions beyond offtaking produce to support the government's objective of enhancing the Nigerian wheat value chain.
- Members of the association are Flour Mills of Nigeria PLC, Northern Nigeria Flour Mills (NNFM), OLAM-Crown Flour Mill Ltd, Honeywell Flour Mills PLC, Dufil-Pure Flour Mills LTD, and Life Flour Mills Ltd.
- Many of FMAN's programs are focussed on backward integration of the wheat value chain, to become less dependent on import. The association's core focus has been on research and development, seed production, agronomic and input support and purchase of local wheat. To achieve this, it has invested in aggregation centres, warehouses and machinery.
- Over the past 5 years, the association has facilitated the purchase of 51,500 tonnes of wheat, trained 150,000+ farmers and provided input loans to 8,196 farmers.¹

Sources: 1) [FMAN proposal](#) 2) [World Grain \(2023\)](#); 3) [Business Day \(2022\)](#); 4) [OEC \(2021\)](#); 5) [Premium times \(2021\)](#) 6) [USDA \(2023\)](#)



Nigeria's Wheat value chain

- The wheat processing sector is quite advanced in Nigeria. Yet for produce and inputs, the sector relies heavily on global trade. With the Ukraine-Russia war and devaluating Naira, the country has been impacted, facing higher import prices.²
- While annual production volume is +/- 420,000 MT,³ domestic demand is 5,7 million MT, making Nigeria the 2nd largest importer of wheat in the world.⁴ The average yield is about 1.5-2 MT/ha, while in other African countries like Ethiopia and Egypt, the yield can reach up to 4-5 MT/ha.
- Wheat grown in Nigeria mostly comes from Borno, Bauchi, Yobe, Kano, Jigawa, and Zamfara States. The number of farmers involved in wheat production is unclear. The government has been intervening to boost productivity e.g., provided seeds, agrochemical and farm equipment to 5,600 farmers to boost production in 2023.²
- The sector is challenged by high dependency on the world market for imports, low productivity due to low yielding seed use and lack of access to high yielding varieties, high cost of production, low access to mechanized services, and reduced sales caused by eroding consumer purchasing power.⁵



Recommendations (1/4): Services provided by FMAN result in higher yield improvements consequently increasing the income of outgrower farmers compared to the baseline

Question	Key findings/observations	Recommendations
<p>What is the business case for smallholder farmers in wheat production in Nigeria and with which services can this case be enhanced?</p>	<ul style="list-style-type: none"> FMAN has currently not segmented its farmers making it challenging to customize the services to the needs of different segments Services provided by FMAN are expected to support <u>farmers to attain and maintain an average yield of 3.75 MT/Ha</u>, increasing the net income of farmers by 40% in the second year. While both outgrower and non-outgrower farmers are profitable from the onset, outgrowers <u>are more profitable (USD 205 more). The income gap is expected to increase to USD 393</u> by year 2 driven by the yield improvements Although the cost of production is <u>35% higher for outgrowers, the higher net income recorded far outweighs the costs. Net income also grows</u> overtime as the inputs are used efficiently Only 30% of the outgrower farmers currently have access to mechanization services (facilitated through third parties). 	<ul style="list-style-type: none"> Explore segmentation of farmers based on characteristics such as gender, land size etc., to better tailor services to the needs of the farmers Leverage the data collected through the FMAN data app to understand the performance of the different farmer segments and inform farmer rewards and incentivization Increase access to mechanization services which have the potential to reduce post-harvest loss and enhance efficiency in the harvesting process. Further, continue to partner with research institutions to develop higher yielding seeds to achieve the projected yields Continue the provision of training and extension services to ensure that farmers can reap the full benefits of the inputs provided

These learning questions were formulated up front in collaboration with FMAN and the Nigeria Program Team



Recommendations (2/4): FMAN should consider engaging with other stakeholders to facilitate service provision in a commercially viable manner

Question	Key findings/observations	Recommendations
<p>How can FMAN structure services delivery to farmers to ensure they are commercially viable and how can loyalty be enhanced?</p>	<ul style="list-style-type: none"> FMAN currently employs temporary staff annually to facilitate the delivery of services and to aggregate produce. The cost of employing these staff accounts for <u>87% of the total service cost.</u> FMAN also works with individual farmers with no requirement for farmers to be organized into groups which makes it costly to provide services With the projected increase in the number of farmers by <u>+180% to reach 11,420 by 2027,</u> the financing <u>requirement/working capital to finance the inputs supplied is expected to grow five-fold</u> by 2027. There are <u>also no direct revenues from service</u> provision exposing FMAN to capital erosion from input loans default (though this is currently low) FMAN estimates the loyalty of farmers to be 85% with only 1% of the farmers defaulting on their input loans. The low default and high loyalty rates can be attributed to the appreciation of services delivered, timely payment (within 48 hours), and the model of having community leaders sign off on the loans. 	<ul style="list-style-type: none"> To reduce the service costs, FMAN can consider working with <u>commission-based agents</u> (who are considered more cost effective than own staff) to mobilize and train farmers and aggregate produce. FMAN can determine and communicate the farmgate prices to prevent the agents from undercutting the farmers. Further (non) financial mechanisms for incentivizing these agents need to be designed Encouraging farmer organization can also potentially reduce the operating costs. Farmer groups can be encouraged to set up demonstration farms for their members reducing the current costs incurred on demonstration and outgrower assistants. Additionally, creating partnerships with service providers such as financial service and input providers in a <u>tripartite financing agreement</u> would reduce the working capital strain for FMAN and its members Loyalty rates can be further enhanced by continued timely payment (explore reducing further to 24 hours), and timely availability of the inputs and mechanization services. Point-of-sale agents can be leveraged in the villages to ensure farmers have easy access to cash

These learning questions were formulated up front in collaboration with FMAN and the Nigeria Program Team



Recommendations (3/4): FMAN is currently not able to recoup its operational costs and heavily relies on financing from the members; working with other players is key in reducing the costs

Question	Key findings/observations	Recommendations
<p>What is the business case for FMAN in wheat sourcing and what support is required from FMAN members to develop supplier capacities?</p>	<ul style="list-style-type: none"> The objective of FMAN is not to make profits but to implement interventions that enhance the productivity of farmers to ensure a sustainable supply of raw materials for its members. FMAN thus intends to exit the program down the line. Activities of the company are currently financed by the members As it is currently set up, FMAN is not able to recoup all the operational costs from the volumes of wheat sourced and continues to rely on financing from the members with an average of <u>-1.6% earnings before interest and tax</u> margin over the five years. Sourcing more volumes from vendors is key in recouping the costs as <u>FMAN generates positive (1%) margins from the vendor channel compared to the outgrower channel (-2%)</u> To break even, FMAN requires to reduce to <u>cut service provision and overhead costs by an average of 53%</u> over the five-year period which can be achieved by through working with commission-based agents and well-structured farmer groups/cooperatives 	<ul style="list-style-type: none"> To ensure the sustainability of the interventions implemented over time, there is a need for FMAN and its members to support farmer group/cooperatives formation and professionalization. These entities would then function as business partners for the millers and would be responsible for training, and extension services, input facilitation (working with input providers), and aggregation thereby lowering these costs. Even as FMAN plans to exit the space, the members (millers) need to guarantee good prices and ready market to the established entities Explore opportunities to increase revenue, for instance, reevaluate the price paid by millers for aggregated wheat while reducing the service provision and overhead costs, for instance, replace part of the temporary salaried staff with commission-based agents.

These learning questions were formulated up front in collaboration with FMAN and the Nigeria Program Team



Recommendations (4/4): Gender inclusion in the program is significantly low necessitating deliberate interventions to address underlying gender issues

Question	Key findings/observations	Recommendations
<p><i>What factors will improve gender equality in the supply chain?</i></p>	<ul style="list-style-type: none"> Female farmers currently account for less than 5% of the total farmers although slight improvements have been observed in absolute terms – increase from 15 to 123 female farmers in the last two years The low number is due to cultural/religious norms in the region such as limited access to land, lack of involvement in decision making, the perceived role of women etc., that hinder women’s participation FMAN has been undertaking some interventions such as employing more female extension officers, with increase from 0 to 16 in the last two years. They, however, still account for less than 10% of all field agents 	<ul style="list-style-type: none"> FMAN could become more intentional in supporting female farmers by defining clear targets and generating more sex-disaggregated insights from the data collected. Further engaging women in focus groups could identify additional challenges in access to land, labor, inputs and decision-making power. It is critical to also ensure that husbands are also brought on board for buy-in on any interventions that are implemented

These learning questions were formulated up front in collaboration with FMAN and the Nigeria Program Team



Prioritization of recommendations: Recommendations have been prioritized based on relevance, priority and effort

#	Summary of recommendations	Relevance*	Priority*	Effort**	Timelines
1.	Leverage data collected through the FMAN app to segment farmers, tailor service provision and develop rewards/incentive structures				<1 year
2.	Increase access to mechanization services through third party providers ensuring more farmers have access				1-3 years
3.	Continue to partner with research institutions to develop higher-yielding seeds inorder to achieve the projected yields				Continuous
4.	Establish a network of commission-based agents to facilitate provision of services to the farmers				<1 year
5.	Promote farmer group formation and professionalization				1-3 years
6.	Develop tripartite financing agreement with finance and input providers that can finance and directly supply inputs to the farmer groups				1-3 years
8.	Develop and implement gender transformative interventions to enhance inclusion of women in the value chain				<1 year
9.	Explore opportunities to reduce costs and increase revenues				1-3 years

High Medium Low

* The high-level priority and effort scoring is based on the envisioned impact of the recommendation on the company and the farmers as well as the resources needed to implement the recommendation. Relevance to the IDH TA program. **Effort ranking is green when the effort is low and red when the effort is high



2

The Inclusive Business Model



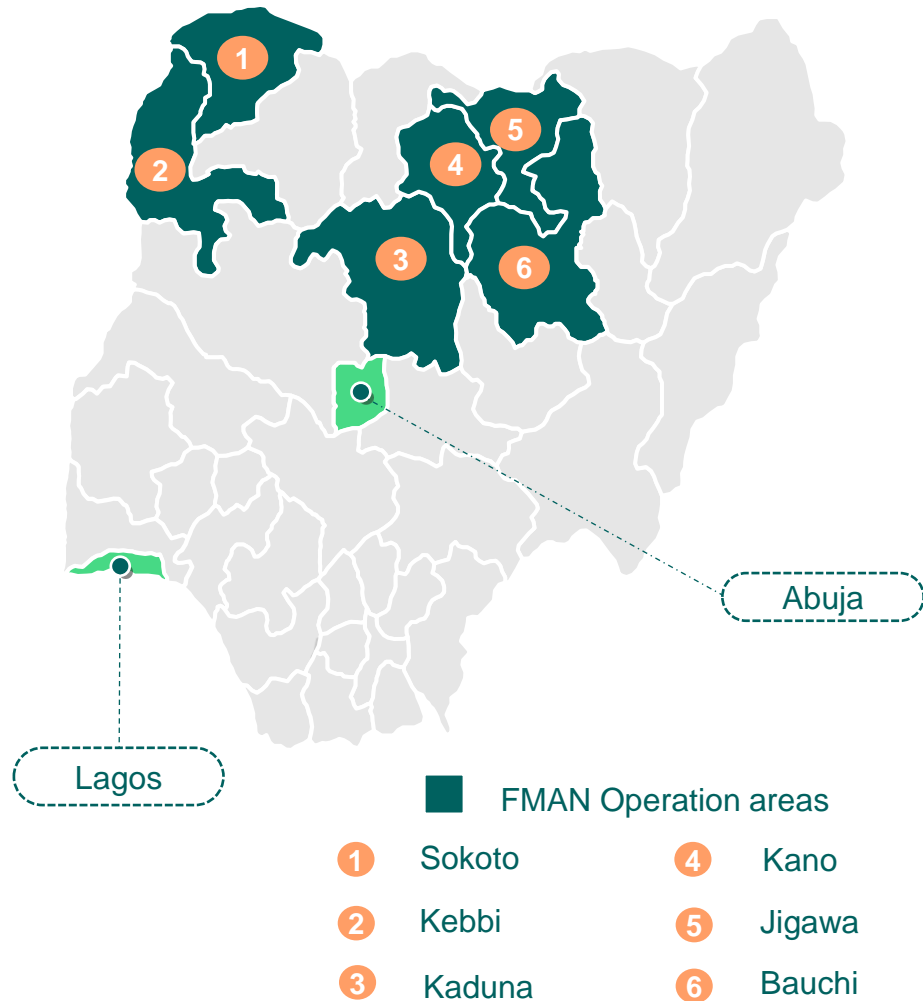
Objectives | FMAN seeks to catalyze the development of the wheat value chain in Nigeria while establishing an inclusive business model for smallholder farmers

	Objective	Farmers	FMAN	IDH
Core objective	Increase wheat import substitution in Nigeria by scaling local production capacity	<ul style="list-style-type: none"> Establish a business case for smallholder wheat farming Enhance the food security of smallholder farmers 	<ul style="list-style-type: none"> Catalyze the development of the wheat value chain in Nigeria and secure raw materials for the members 	<ul style="list-style-type: none"> Sustainably transform the wheat value chain in Nigeria to create commercially viable markets for all the stakeholders
Secondary objectives	Set up wheat farmer service centers and aggregation centers in the wheat producing areas. Aggregate 10,000 MT and 40,000 MT of wheat from smallholders and vendors respectively in the 2023/24 season	<ul style="list-style-type: none"> Better access to markets. Increase farmer incomes 	<ul style="list-style-type: none"> Secure wheat sourcing for FMAN members Increase procurement of farmer harvests 	<ul style="list-style-type: none"> Contribute to smallholder impact
	Provide access to inputs and input loans, training and extension services to farmers in 14 states by 2023/24 season	<ul style="list-style-type: none"> Improved access to quality inputs and credit Improved yields 	<ul style="list-style-type: none"> Increase the raw materials/wheat available for offtake 	<ul style="list-style-type: none"> Establish the business case of smallholder wheat farming.
	Partner with a research institute and contract seed producing companies to provide improved variety of seed	<ul style="list-style-type: none"> Access to quality seed. Improved yields 	<ul style="list-style-type: none"> Improve the yield of wheat farmers 	<ul style="list-style-type: none"> Gather knowledge and insights

Sources: Company documents and Interviews (2023)



Location | FMAN currently provides extensive input services to farmers in six northern states with demonstration farms in 15 states across the wider Northern Nigeria region



Overview of FMAN locations

- FMAN has offices and operations in Lagos and Abuja. The locations of the association is strategic enabling it to access both farmers and the member organizations
- FMAN has been serving and sourcing from 4,000+ farmers in 6 northern states of Sokoto, Kaduna, Kebbi, Kano, Jigawa and Bauchi. FMAN has also established 500+ demonstration farms in 15 states across the wider Northern Nigeria region.¹

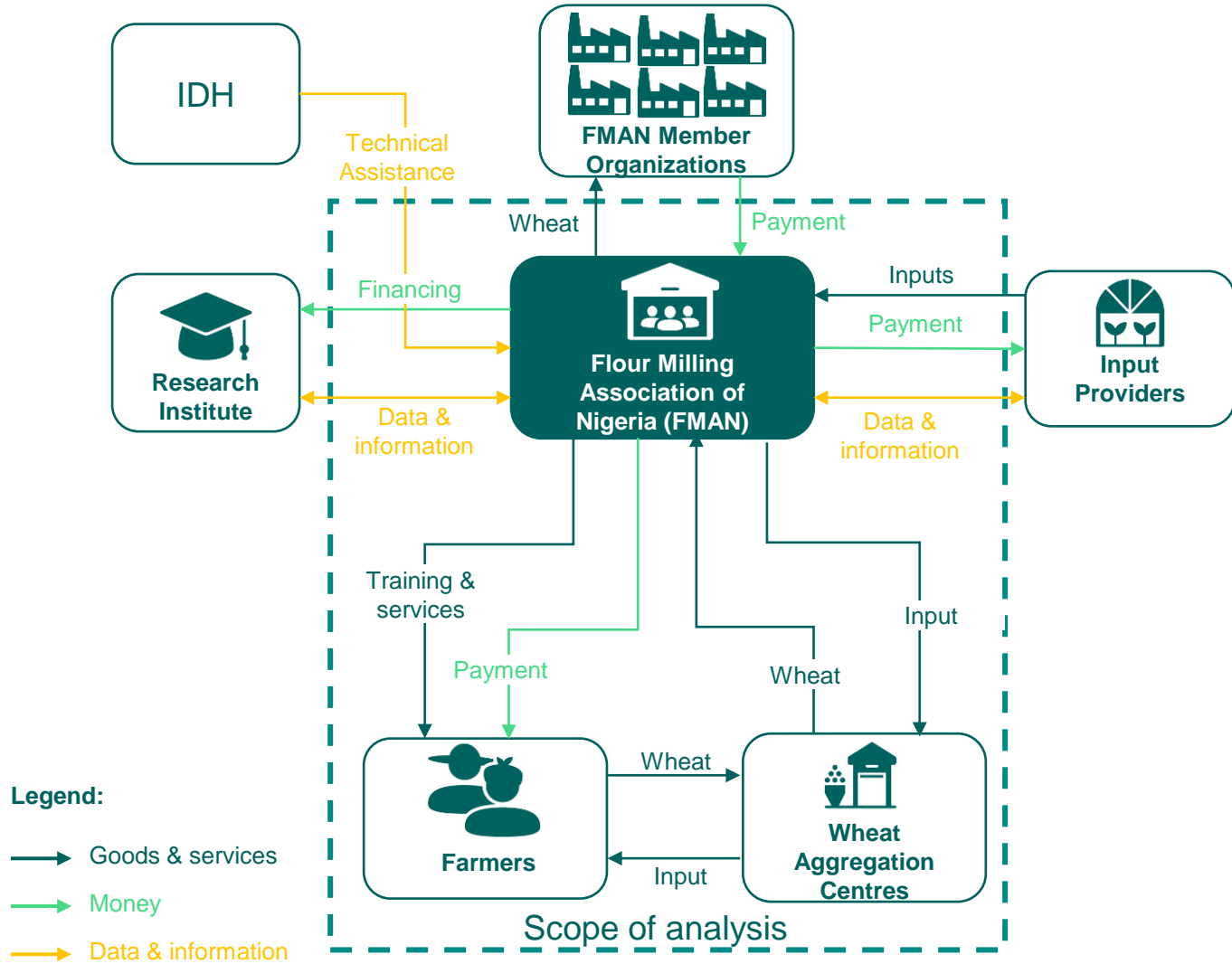
Wheat production areas and systems

- Wheat is predominantly grown in Northern Nigeria in the states that experience Sahel/dry tropical climatic conditions². In 2021 wheat cultivation covered an estimated 80,000 ha with an estimated production of 90,000 MT.³
- With a water requirement of 450 mm per season², cultivation requires moderate rainfall ranging 500-1,300 mm per season⁶, with warm temperatures ranging 15-24 °C. Wheat is cultivated during the dry season (between November and March) when precipitation ranges from 150-300 mm⁴ thus necessitating irrigation in some parts
- Other crops cultivated in Northern Nigeria include sorghum, millet, peanuts and corn which are grown during the wet season (between April and November).⁵

Sources: 1) Company documents and Interviews (2023) 2) [TAAT \(2023\)](#) 3) [FAOSTAT \(2023\)](#) 4) [World Bank \(2023\)](#) 5) [Ochuko \(2014\)](#) 6) [Greenlife \(2023\)](#)



Business model | FMAN plays a central role in the model, linking the farmers to the market while also ensuring they have access to quality inputs, extension and post-harvest services



- FMAN procures all the inputs (seeds, fertilizer and agrochemicals) and provides them to contracted (outgrower) farmers. Inputs are provided in form of loans to 80% of the contracted farmers. Guaranteed offtake arrangements ensures FMAN recovers the loans given to farmers
- Non-outgrower farmers only benefit from the training provided by FMAN (at zero cost) with no obligation to deliver their produce to FMAN
- Wheat aggregation centers are temporarily set up during the production period to facilitate the provision of services and the aggregation of wheat during the harvest season
- FMAN is engaging Lake Chad Research Institute to develop improved wheat varieties and establishing guaranteed offtake arrangements with seed production companies for wheat seed
- The wheat produce aggregated by FMAN is distributed to its member organizations for processing and milling
- IDH provides technical assistance to FMAN to support the implementation of the program

Sources: Company documents and Interviews (2023)



Stakeholders | Catalyzing local wheat production requires the concerted collaboration of multi-stakeholders in the sector including research institutes, input providers and processors

Actor	Legal status	Function (within this Inclusive Model)	Revenue model (within this Inclusive Model)	Incentive to participate (Within this Inclusive Model)
FMAN members	Limited companies	Process and mill wheat aggregated by FMAN and fund FMAN's operations	Margins from the sale of wheat flour and wheat by products	Sustainably secure the supply of raw materials leading to increased sales revenues
Wheat Farmers Association of Nigeria (WFAN)	Association	Farmer organization. Lobby for the interests of farmers. Aggregate wheat from members	Fees paid by Members. Margins on volumes sold	Secure decent earnings for their members
Lake Chad Research Institute	Research organization	Research and development of improved wheat seed varieties	Financing from FMAN and government of Nigeria	Contribute to the development of improved wheat varieties
Input providers	Limited companies	Supply of inputs (seed, fertilizer and agrochemicals)	Margins from the sale of inputs	Increased sales revenues
Smallholder farmers	Individuals	Cultivate wheat	Margins from the sale of wheat	Improved yields leading to higher incomes
IDH	Foundation	Provide technical assistance to FMAN	None	Influence the growth and transformation of the wheat value chain in Nigeria

Sources: Company documents and interviews (2023)



Sourcing channels | Wheat is majorly sourced from vendors with volumes from the outgrower scheme currently accounting for about 15% of the total volumes



	Outgrowers	Non Outgrowers	Vendors
General	FMAN has an established outgrower scheme with wheat farmers spread across 15 states in Northern Nigeria. Outgrowers receive services from FMAN, in return they supply wheat directly to FMAN through the established wheat aggregation centers	FMAN provides training support to other farmers not in the scheme. These farmers have the option to supply their grain to FMAN	About 85% of all the wheat that FMAN sources is delivered directly to the warehouses by vendors. They aggregate wheat at farmgate through village aggregators and other middlemen
Challenges/benefits	<ul style="list-style-type: none"> + High control over quality of grain supplied + FMAN can directly influence farming practices - Incur service provision costs 	<ul style="list-style-type: none"> + Increases the reach of FMAN to farmers + FMAN can directly influence farming practices - Training costs 	<ul style="list-style-type: none"> + Flexibility + No cost to serve - Low control over quality and primary production process
Scale	<p>Farmer number: FMAN projects scaling the number of farmers by 305 each year from the current 4,000 farmers</p> <p>Sourcing target: Volumes sourced directly from farmers are projected to grow from the current 6,000 MT/year to 52,000 MT/Year by 2027</p>	About 38,000 farmers were trained in 2022	Sourcing target: FMAN expects to source 40,000 MT in the 2023/24 season with the number projected to increase to 80,000 MT in 2027



Farmer relationships | FMAN has collaborated with local community leaders to select, onboard, train, conduct outreach activities and provide services to farmers



Outreach

- Outreach activities are conducted by state coordinators, outgrower assistants and demonstration assistants, extension officers together with local leaders
- Key outreach activities include training on good agricultural practices (GAPs), demonstrations on farms operated by FMAN and provision of on farm technical assistance



Selection

- Farmers should be known to local community leaders who are required to sign off on their input package loans
- Farmers should demonstrate commitment to farming including fully paying off the input loans advanced to them before they can be re-contracted for a new planting season by FMAN



Contracting

- Outgrower farmers are contracted by FMAN every year and subjected to re-evaluation to ensure they meet the set criteria
- Local community leaders act as guarantors to farmers for the input package loans



Segmentation

- Farmers are currently not segmented. For the purposes of this analysis, we have segmented farmers as either outgrowers or non-outgrowers. outgrowers receive the full-service package, whereas non-outgrowers receive only training and market access.



Graduation

A graduation approach encourages farmers to achieve certain performance criteria, making them eligible for a more elaborate service package.¹ FMAN does not manage a strategical graduation approach that is engrained in its business model. The association does host events where farmers can receive rewards and recognition.



Data collection

- Partnership with technical providers to ensure adequate and smooth collection of field data for apt decision making
- There is the intention to collect data as a service provider for the National Wheat Survey
- A mobile app is used for both data collection and remote farmer management.

1. [Insights Report \(2022\)](#)

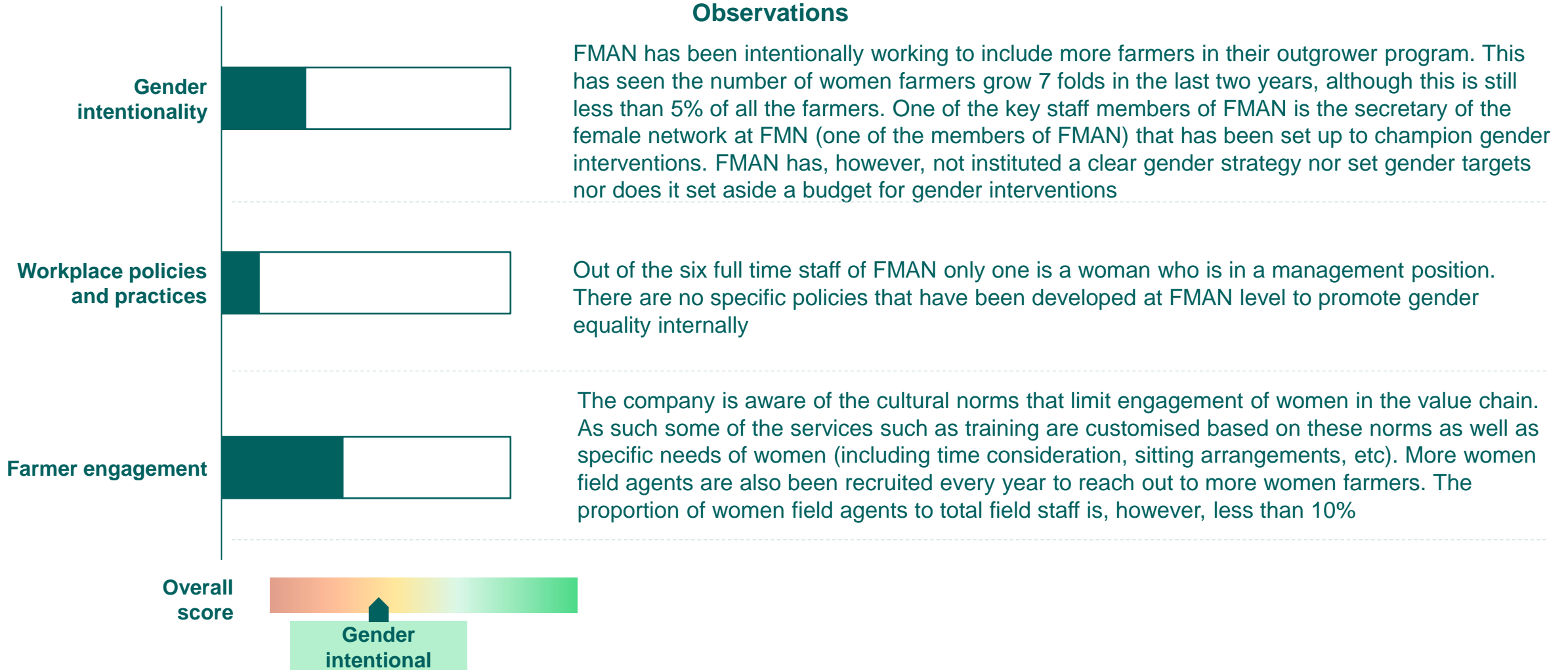


Services | FMAN aims to catalyze wheat production in the country by providing smallholder farmers with access to critical inputs and services

Category	Service	Impact	Implementation	Revenue model
Training & information	GAP training	Adoption of better practices e.g., planting higher yielding varieties leading to higher productivity	Training is facilitated by field agents on farmer farms and through FMAN run demo farms	Indirect revenue from higher volumes of wheat sourced
Inputs	Fertilizer	Higher productivity leading to improved incomes	Delivered by FMAN to collection centers where farmers pick	No Revenues. Cost of input is recovered as grain at harvest
	Seed	Higher productivity leading to improved incomes	FMAN works with seed companies to improve seed variety. Farmers pick seeds from collection centers	No Revenues. Cost of input is recovered as grain at harvest
	Agrochemicals	Higher productivity leading to improved incomes	Delivered by FMAN to collection centers where farmers pick	No Revenues. Cost of input is recovered as grain at harvest
Equipment & labor	Mechanized harvesting and threshing	Lower post-harvest losses. Less drudgery work	Delivered through third party service providers	No Revenues. Cost of service is recovered as grain at harvest
Market access	Aggregation	Decrease transport cos	Seasonal aggregation centres set up near the farmers by FMAN	Indirect revenue from higher volumes of wheat sourced



Gender assessment | Although FMAN has made some steps to enhance inclusion, progress can be further achieved by defining a gender strategy and outlining measurable targets



Note: This gender assessment focused specifically on FMAN and not on the member companies. Some of the member companies such as FMN have a target driven inclusion agenda with documented relevant workplace policies and practices.



Enabling environment (1/2) | The wheat sector is challenged by a changing environment, lack of infrastructure, financing and the opportunity cost for farmers to grow other crops

Category	Situation	Impact on business model
Technology	<ul style="list-style-type: none"> Mechanization is limited in many areas.¹ Tractor density stands at 0.27 hp/ha, far below FAO's recommended density of 1.5 hp/hectare² 29.5% of rural population has a smartphone³ while internet penetration stands at 35.5%⁴ If investment is mobilized, there are major opportunities in this area 	<ul style="list-style-type: none"> The cost and limited resources make it challenging for farmers to access mechanisation services. FMAN works with 5 mechanization providers to facilitate access for farmers <i>Impact anticipation:</i> unite a large pool of mechanization service providers and connect to impact investors. Involve the government, engage local tech investors and international partnerships and grants
Natural environment	<ul style="list-style-type: none"> Rainfall variation is projected to continue to increase. Droughts have also become a constant in Nigeria. Additionally, desertification and water depletion are current pressing challenges⁵ 	<ul style="list-style-type: none"> Heat waves impaired FMAN farmers' last year's yields <i>Impact anticipation:</i> training and application of tools are required to mitigate consequences of climate change for wheat farming. Look into crop insurance, rainwater harvesting (RwH), drip irrigation, drought-resistant varieties, mulching and reduced tillage to retain moisture
Infrastructure	<ul style="list-style-type: none"> Nigeria has poor transport infrastructure and services (road and rail), particularly in the rural areas² 	<ul style="list-style-type: none"> Poor infrastructure raises logistic costs of wheat transport <i>Impact anticipation:</i> FMAN to set up temporary aggregation centres near farmers
Labor and workforce	<ul style="list-style-type: none"> 35% of total employment is in agriculture;⁶ this has been declining due to rural-urban migration 	<ul style="list-style-type: none"> Inadequate labor can be a hindrance to agricultural activities <i>Impact anticipation:</i> reward farmers for onboarding other SHFs
Inputs & financing	<ul style="list-style-type: none"> Although the government has provided facilities such as the Anchor Borrower's Programme for farmer financing, the industry still lacks adequate financing² The lack of high yielding varieties, leads to lower productivity 	<ul style="list-style-type: none"> FMAN currently supports the farmers on ensuring timely access to quality inputs, tied to a credit facility that allows farmers to repay their loans with harvest grains <i>Impact anticipation:</i> continue collaboration with seed companies to produce high yielding seed varieties

1) [Takeshima \(2019\)](#); 2) [PwC \(2020\)](#); 3) [Punch \(2022\)](#); 4) [Our world in data \(2020\)](#); 5) [Haider \(2019\)](#); 6) [World bank \(2021\)](#); 6) [NBS\(2021\)](#)

Opportunity Neutral Risk



Enabling environment (2/2) | Insecurity, which is a common occurrence in the Northern states hinders farmers from working productively on their farms

Category	Situation	Impact on business model
Trading system	<ul style="list-style-type: none"> Middlemen contribute to price fluctuations, artificial scarcity, and unfair trade practices in the sector. Yet, whenever farmers are cash restraint, they are forced to sell their produce to middlemen for direct payout¹ 	<ul style="list-style-type: none"> <i>Impact anticipation:</i> To omit middlemen that abstract value from the chain, FMAN sets up aggregation centres throughout the season. With a guaranteed market, farmers are assured of selling their produce
Pricing and competition	<ul style="list-style-type: none"> The global scarcity of wheat due to the Russian-Ukraine war, scarcity of foreign exchange in the country to import and the devaluation of the naira have led to increase in prices 	<ul style="list-style-type: none"> The price of wheat continually fluctuates, which triggers hoarding amongst farmers FMAN works with, as supply is usually lower than demand <i>Impact anticipation:</i> enter long term contracts that turn out beneficial for farmers and FMAN over time, omitting fluctuations
Institutional stability	<ul style="list-style-type: none"> Unstable political environment with incidences of insecurity affecting farming activities especially for farms in remote areas The change of the Naira design resulted in a cash crunch causing social unrest in the country 	<ul style="list-style-type: none"> Insecurity hinders farmers from working on their farms productively leading to low output <i>Impact anticipation:</i> collaborate with local law enforcement agencies, educate on emergency response plans, have farmer cooperatives provide collective security arrangements
Land tenure	<ul style="list-style-type: none"> Cultural norms limit land ownership by women and their ability to participate in farm activities Nigeria has 70.8 million ha of agricultural land³ and only about 0.2% is used for wheat production⁴ 	<ul style="list-style-type: none"> The farmers FMAN work with have small and scattered plots which lead to increased cost of service provision as more field agents need to be engaged <i>Impact anticipation:</i> encourage land consolidation and nucleus lead farmers, lease land on behalf of women
Social norms	<ul style="list-style-type: none"> Women are underrepresented along the value chain 	<ul style="list-style-type: none"> Of the 4,000 farmers FMAN works with, about 100 are women, signaling the need for a more gender intentional approach <i>Impact anticipation:</i> launch awareness campaigns, establish community land sharing initiatives, be intentional with service provision

¹) [Naira metrics \(2023\)](#); ²) [Guardian \(2017\)](#); ³) [FAO \(2021\)](#); ⁴) [USDA \(2023\)](#)

Opportunity

Neutral

Risk



3

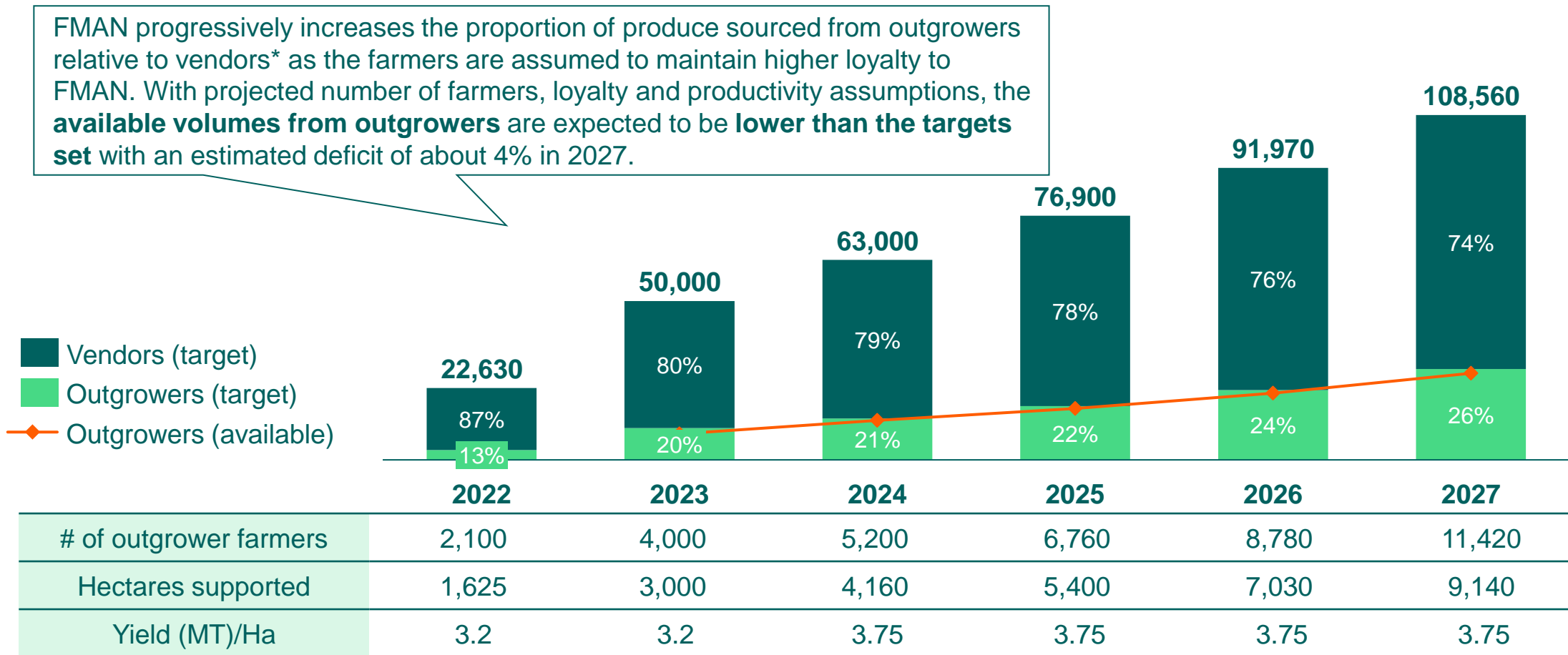
Business Case



Scale | FMAN seeks to grow the total volumes of wheat sourced by almost 5 times driven by the increased number of farmers (+180%)

Total target and projected wheat volumes aggregated (MT) per channel

FMAN progressively increases the proportion of produce sourced from outgrowers relative to vendors* as the farmers are assumed to maintain higher loyalty to FMAN. With projected number of farmers, loyalty and productivity assumptions, the **available volumes from outgrowers** are expected to be **lower than the targets set** with an estimated deficit of about 4% in 2027.



	2022	2023	2024	2025	2026	2027
# of outgrower farmers	2,100	4,000	5,200	6,760	8,780	11,420
Hectares supported	1,625	3,000	4,160	5,400	7,030	9,140
Yield (MT)/Ha	3.2	3.2	3.75	3.75	3.75	3.75

*Vendors represent other entities that supply FMAN with Grain including traders and village merchants

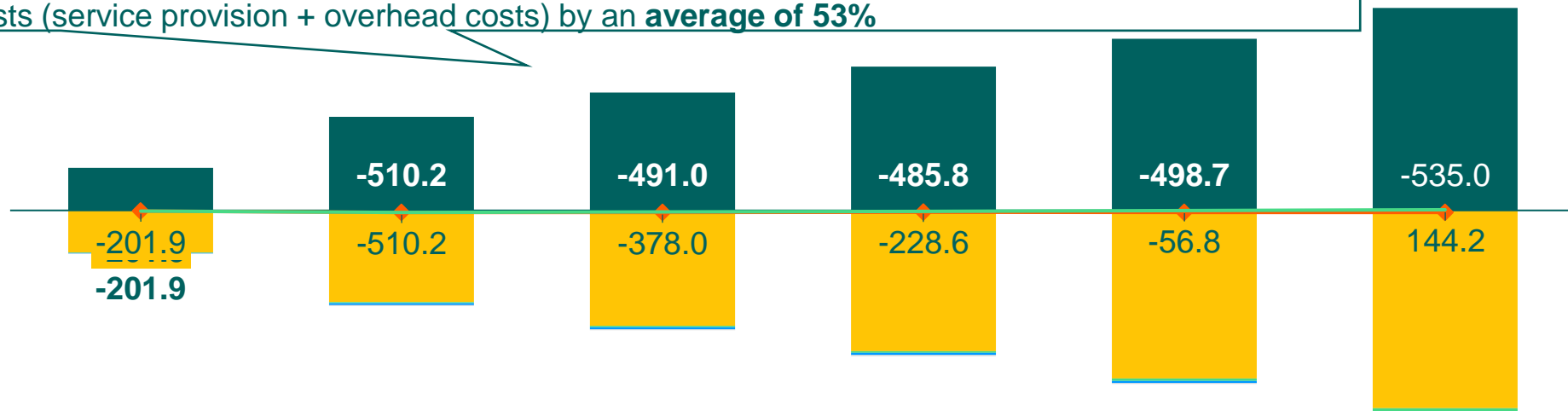


P&L over time | The business model is not profitable, and margins are only expected to improve with increased sourcing volumes accompanied with marginal change in the operational costs

Profit and loss for 2022-2027 ('000 USD)



Volumes sourced from vendors are important to accelerate the business model to commercial viability. If FMAN were to source from outgrowers only, the EBIT margin would be on **average -14.3% compared to the current average of -1.6%** when they source from both channels. To break even, FMAN needs to cut its operating costs (service provision + overhead costs) by an **average of 53%**



	2022	2023	2024	2025	2026	2027
EBIT margin	-1.8%	-2.3%	-1.6%	-1.3%	-1.1%	-1.0%
% Reduction in opex*	70%	69%	56%	47%	41%	37%

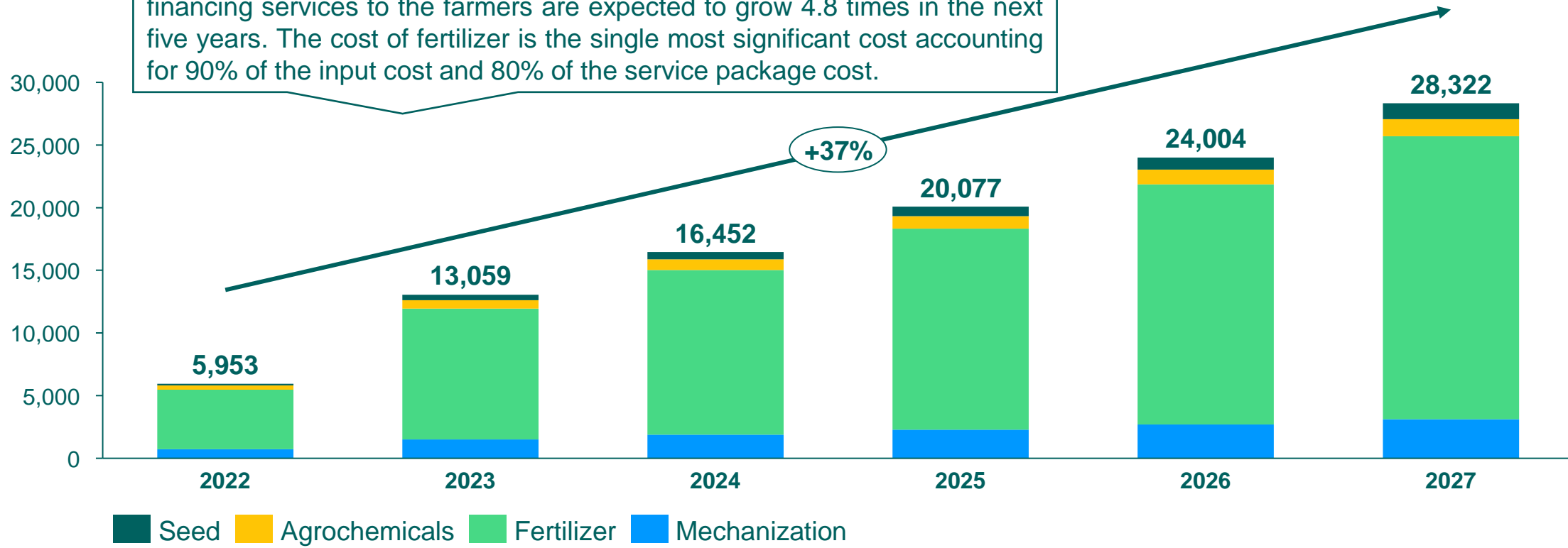
1) EBIT 2 represents the earnings when costs are assumed to be constant across the forecasted period. In this scenario, FMAN breaks even in five years.
 2) FMAN is not structured to be profit-making. Sales prices to millers are set to enable the program to recoup program costs and overhead costs are covered by contributions from millers.
 3) P&L is based on the projected volumes from the projected growth in the number of farmers and the projected volumes delivered by the vendors.
 4) * Annual reduction in operating costs required to break even.



Working capital needs | With increasing financing requirements for service provision, there is need to explore partnerships to reduce the potential capital strain on FMAN and its members

Working Capital Needs for 2022-2027 ('000 USD)

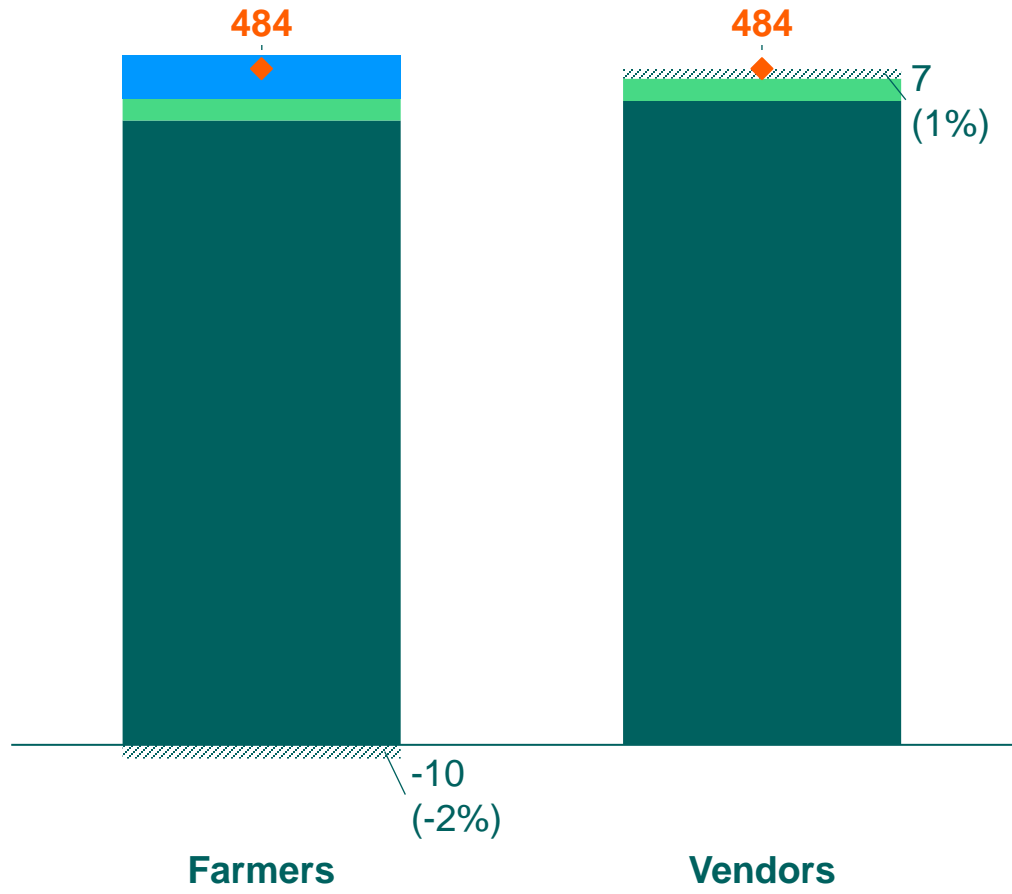
The **cost of the service package** per farmer is estimated to be **\$500**. With a **compound annual growth of 37%**, working capital requirements for financing services to the farmers are expected to grow 4.8 times in the next five years. The cost of fertilizer is the single most significant cost accounting for 90% of the input cost and 80% of the service package cost.





Sourcing unit economics | While the structure of business model is designed to only recoup operational costs, FMAN currently makes minimal losses by sourcing directly from farmers. This is informed by the high costs of service provision per MT sourced.

Sourcing channel gross margin (USD/MT)



Final products from the two channels are sold at the same price to millers after processing (cleaning). Processing costs are the same for both channels (**\$16/MT**). **The cost of materials is \$447/MT and \$461/MT for farmers and vendors, respectively.** The difference in costs is mostly to cater for the cost of logistics on the part of vendors who deliver grain to FMAN's warehouses in bulk. The average cost of providing services to outgrowers is estimated to be **\$31/MT sourced from the farmers.**

- ◆ Sales price
- Raw Materials
- Processing
- Farm Services
- ▨ Gross margin

Sales price is the price paid by the millers for the raw materials supplied to them



4

Impact Case



Farmer segments | The farmer segments assessed only differ in the type of services provided by the association where outgrowers receive a broader package service than Non-outgrowers



Characteristics	Non-outgrowers	Outgrowers
Current yield	2 MT/Ha	3.75 MT/Ha
Maximum yield	7.2 MT/Ha	7.2 MT/Ha
Farm size	0.8 Ha	0.8 Ha
Farm-gate price	0.46 \$/kg	0.45 \$/kg
Premium received	0	0
Services		
Training	GAP Training	GAP Training
Inputs		Seed, fertilizer, and agrochemicals
Equipment & labor		Mechanization (planting, harvesting)
Market access	Produce off-take	Produce off-take
Scale		
# of farmers	FMAN has provided training and offtake services to ~150,000 farmers across 15 northern states	Number of farmer has grown from 400 in 2019 to 4,000 in 2022 and projected to 11,400 by 2027

Outgrowers are observed to have higher yields owing to the interventions implemented by FMAN.

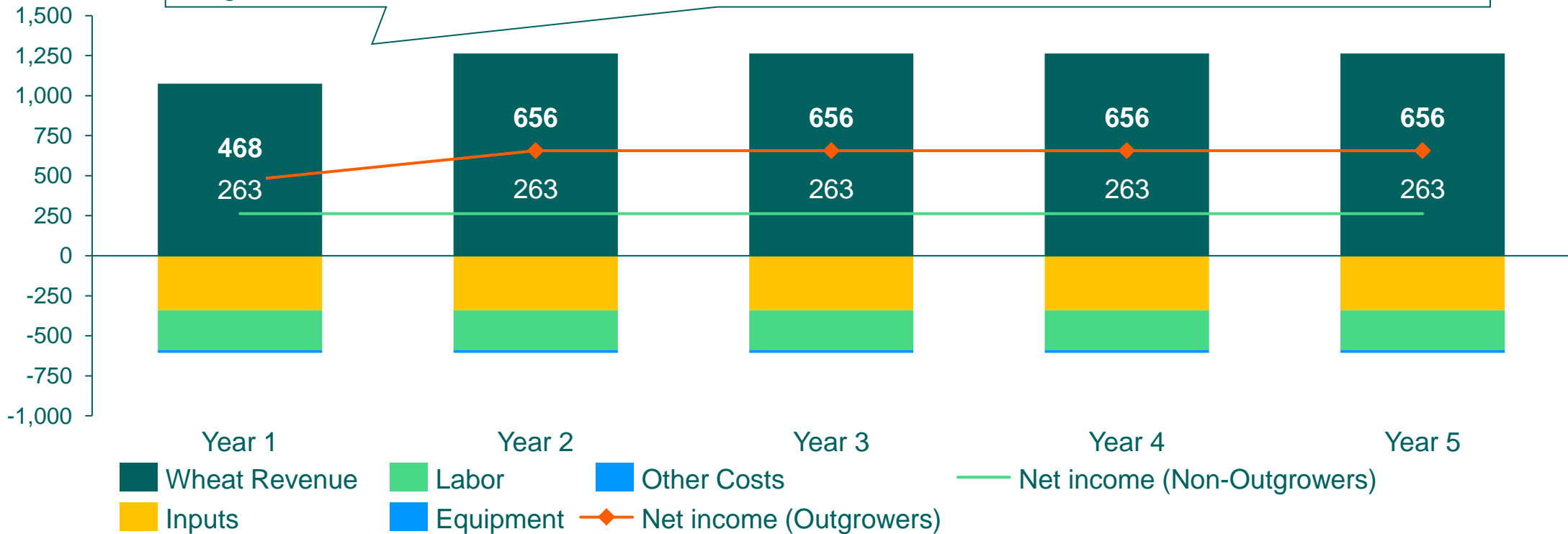
Non outgrowers are observed to **fetch slightly higher farmgate prices** selling their produce to village traders who then supply to FMAN. These traders, however, are **unreliable and unable to collect large volumes** from the farmers. They also tend to take advantage of the farmers e.g.; wheat may be sold to these traders on a per bag basis rather than a per kg basis.



Farm P&L | Both farmer segments are profitable from the 1st year with outgrowers being on average 135% more profitable compared to non outgrowers.

Profit and loss for a five-year period (USD)

From the onset, outgrowers are **more profitable (USD 205 more)** compared to non outgrowers, with the difference increasing to **USD 393** in the second year. FMAN provides support to farmers in terms of training on GAP, extension services, and access to quality inputs. These are pivotal for driving higher yields among outgrowers

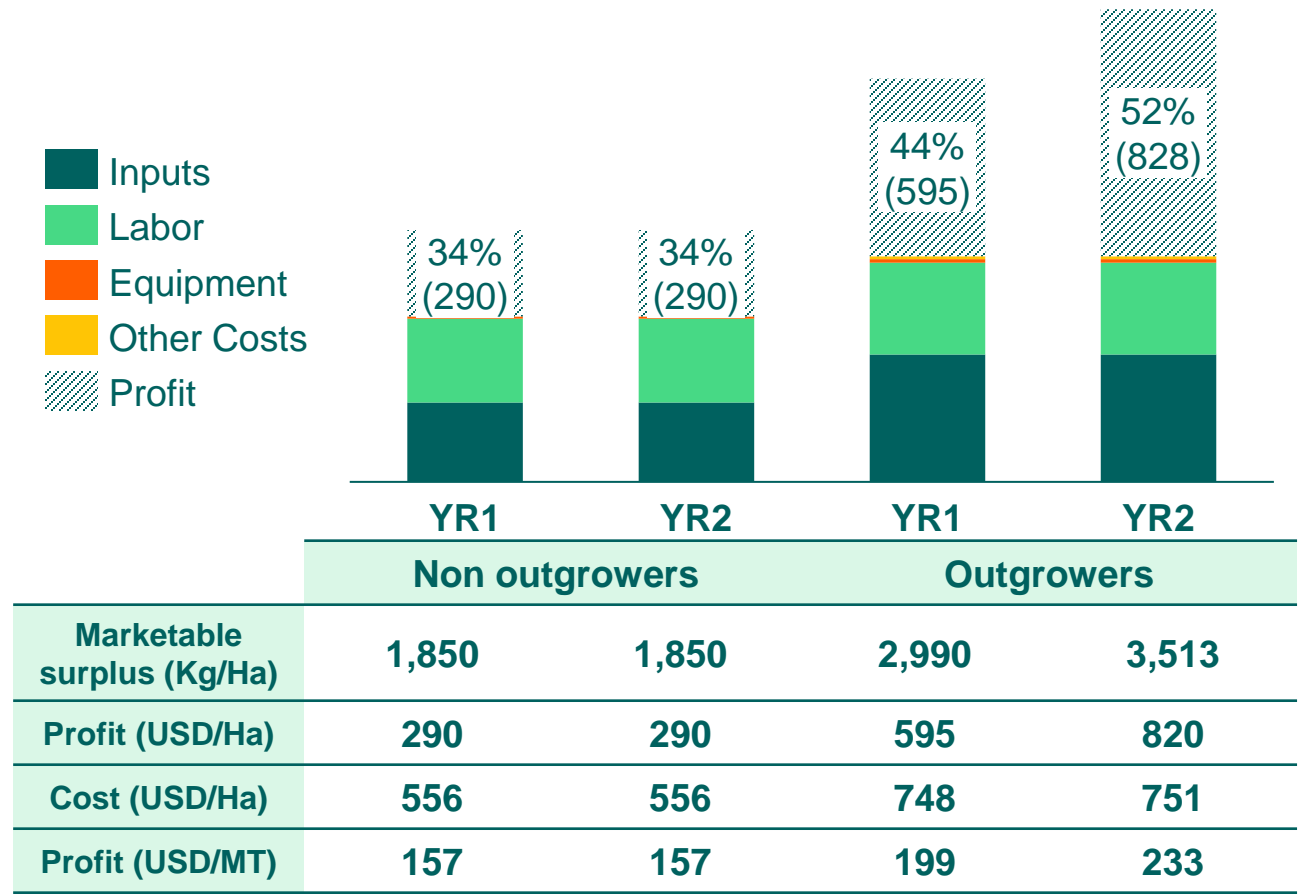


Note) Farmers have an average land size of 0.8Hectares



Profitability per hectare | While the cost of production is 35% higher for outgrowers, the higher profits recorded far outweigh the costs. Profits grow over time as the inputs are used efficiently

Profit and cost of production (USD/Ha), YR 1



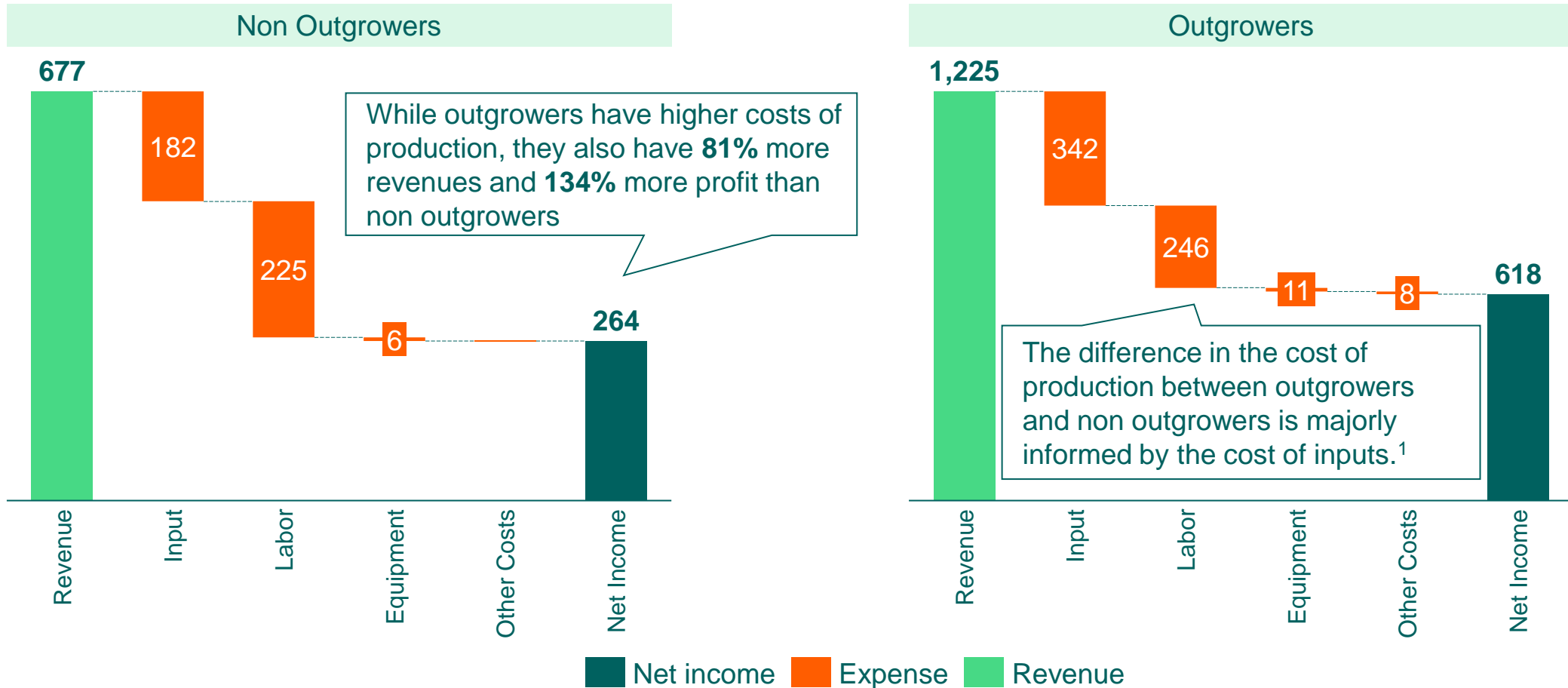
- The cost of production is 37% higher for outgrowers compared to non outgrowers. This is driven by the cost of inputs with non outgrowers observed to be insufficiently using inputs.¹
- Outgrowers are up to **105% and 185% more profitable in Yr 1 and Yr 2** respectively compared to non outgrowers. Profitability is mainly linked to higher yields with the marketable surplus of outgrowers being **1.6 times and 1.9 times that of non outgrowers in Yr 1 and Yr 2** respectively.
- With the current costs of production and yield, outgrowers are more efficient **with 27% higher margins per MT** compared to non outgrowers.
- Due to the limited capacity of service providers, only about 30% of FMAN farmers utilize combine harvesters for harvesting, with most of the farmers using manual threshing.²

1) With the lack of concrete data on input usage by non-outgrowers, we assumed they use 2/3 of the inputs used by outgrowers 2) The assumption used in the calculation is farmers only use mechanical labor for land preparation with the rest of the labor activities being performed manually. For Farmers that use combined harvesters, the cost of production is 13% higher for outgrowers and 21% higher for non outgrowers.



Income build-up | High production costs are offset by the high revenues from the sale of wheat, ensuring that outgrowers are more profitable compared to non outgrowers

Drivers of Income Improvement (USD/Farm -0.8 Ha) 5-Year Average



1) Input usage by non outgrowers is assumed to be 63% of the usage by outgrowers. Labor costs and equipment (bags) costs are assumed to be the same per unit for both segments.
 2) outgrowers incur additional costs for logistics and transportation of inputs by FMAN to the nearest collection center.



Sensitivity Analysis | Net farmer incomes are very sensitive to movement in both farmgate prices and yield

Net Income Sensitivity to Farmgate price and Yield/Hectare Year 1

At the current farmgate price (\$0.45/kg) and cost of production (\$748), outgrowers require a marketable surplus of at least 1.7 MT/ha to break even

Farm gate prices tend to be lower at the harvest time and increase towards the beginning of the new cropping season.¹

Farmgate price (\$/kg)

	0.297	0.347	0.397	0.447	0.497	0.547	0.597
1,950	-420	-350	-280	-210	-140	-70	0
2,550	-240	-140	-40	60	160	260	360
3,150	-60	70	200	330	460	590	720
3,750	120	280	440	600	760	920	1,080
4,350	290	480	670	860	1,050	1,240	1,430
4,950	470	690	910	1,130	1,350	1,570	1,790
5,550	650	900	1,150	1,400	1,650	1,900	2,150

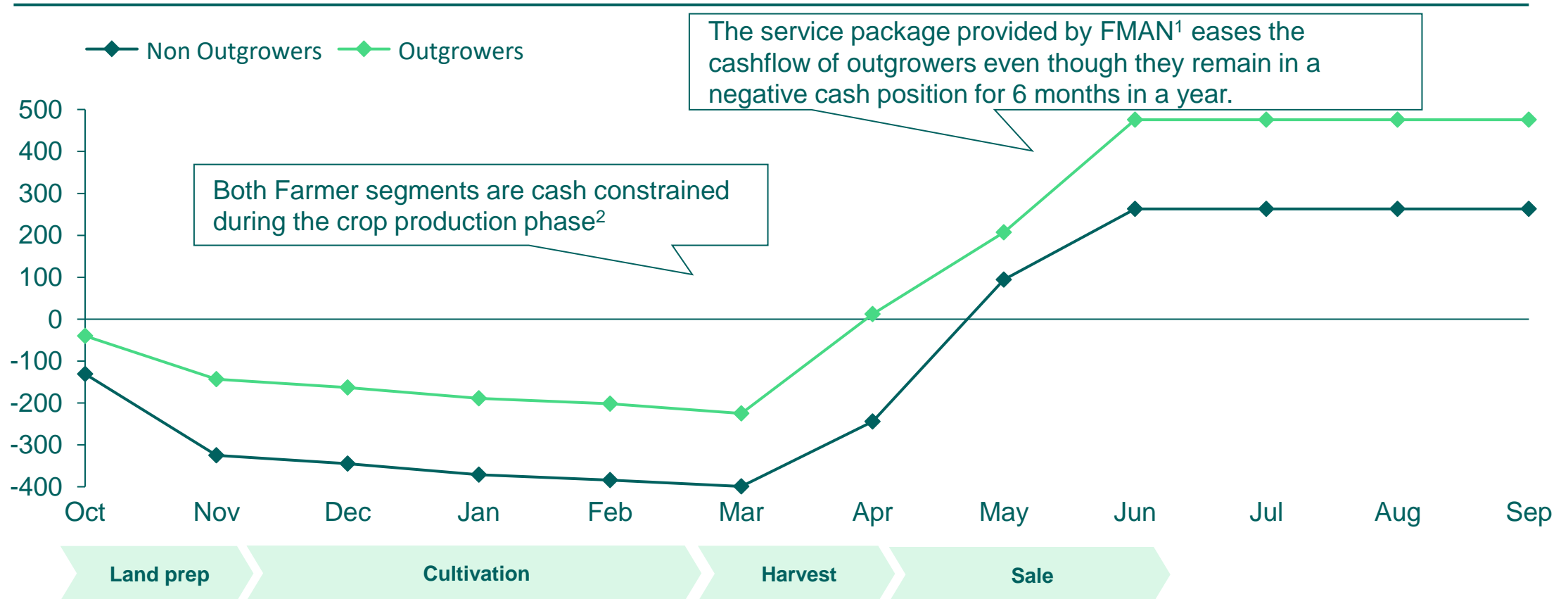
Current Situation

1) In the previous season the farmgate price paid by FMAN at the beginning of the season was \$0.42 per kg. This increased by approximately 16% in the subsequent months.
 2) While some farmers may be inclined to wait for prices to increase, most farmers sell their produce immediately after harvest.



Monthly cash flow | Farmers have significant cash outlays during the production phase of the crop, possibly exposing them to cash constraints for half a year

Cumulative net cash flow (USD) Year 1



1) FMAN provides farmers with input on credit and the cost recovered from the farmers at harvest. The costs incurred by farmers during the production phase are majorly labor costs.
 2) Our analysis had no visibility of the other farm activities and only focused on the wheat growing activities. It is possible that farmers have other sources of income which they invest in wheat farming and therefore not at all cash constrained during the wheat production phase.

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Thanks

IDH would like to express its sincere thanks to FMAN for their openness and willingness to partner through this study. By providing insight into their model and critical feedback on our approach FMAN is helping to pave the way for service delivery that is beneficial and sustainable for farmers and providers



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5

Annex

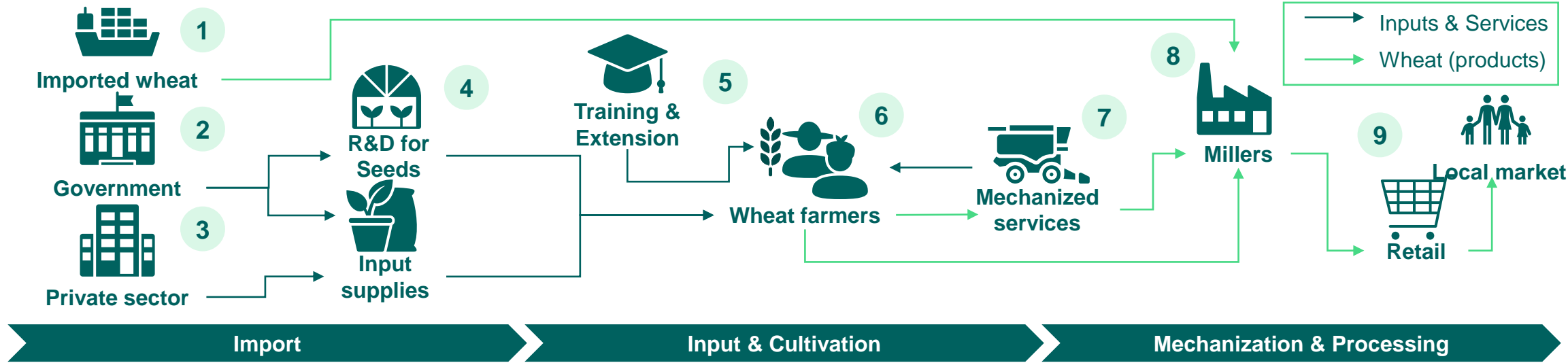


5.1

Context



Value chain | the rapid desired shift to produce more wheat locally in Nigeria entails value chain development needs at farm-level regarding inputs, training and mechanized harvesting



1. Wheat demand is 5,7M Mt while production is 420k.¹ Nigeria is challenged with an increasing import bill due to the Ukraine-Russia war.
2. To reduce the 93% imported wheat, the Agriculture Promotion Policy (APP), focuses on meeting domestic food demand. The government pushes for elimination of taxes and levies on wheat, implements initiatives/programs to improve wheat self-sufficiency, and promises to facilitate supply of fertilizers, chemicals and certified seeds.²
3. The private sector is investing in fertilizer plants (Nigeria is self-sufficient in Urea) and oil refineries, to decrease global dependence.³

4. To promote higher production, innovation is directed to improved seed varieties that suit Nigeria's difficult growing conditions (e.g., *Seeds for the Future* initiative).
5. Outgrower schemes are starting to develop to decrease import dependencies. Extension services are crucial to support farmers and increase in particular wheat productivity, a novel crop for many, but their availability is limited.⁴
6. Average yield is about 1.5-2 Mt/ha, while in other African countries like Ethiopia and Egypt, the yield can reach up to 4-5 Mt/ha.

7. In Nigeria, growth in the non-agricultural sector increased the reliance on food importation, rather than domestic production intensity, and agricultural mechanization (tractor use in particular) has remained low despite the declining share of the workforce engaged in the agricultural sector.
8. Nigeria's milling industry is dominated by a few large companies that have consolidated into FMAN. Together 5 millers control +/- 96% of the market share.⁵
9. Wheat is the 3rd most consumed grain in Nigeria, the country's population growth is driving consumption.⁶

1) [Business Day \(2022\)](#); 2) [World Grain \(2019\)](#); 3) [CNN \(2022\)](#); 4) [Daily Trust \(2023\)](#); 5) [World Grain \(2022\)](#); 6) [World Grain \(2022\)](#);



5.2

**Underlying
data &
information**



Inclusive Business Model operator assumptions

Farmer numbers	Unit	2022	2023	2024	2025	2026	2027
Outgrowers	# of farmers	2,100	4,000	5,200	6,760	8,788	11,424
Hectarage							
Outgrowers	Hectares	1,625	3,000	4,160	5,408	7,030	9,140
Sourcing volumes							
Outgrowers	MT	3,051	9,554	12,420	16,146	20,990	27,287
Vendors	MT	19,575	40,000	50,000	60,000	70,000	80,000
TOTAL	MT	22,626	49,554	62,420	76,146	90,990	107,287
Other Assumptions							
Exchange Rate	Currency	1 USD ~ 760 NGN					
Default Rate	%	1%					



Farmer assumptions

Variable	Unit	Outgrowers	Non-outgrowers
Farm size main crop	Hectares	0.8	0.8
Share of farmers increasing their farm size	%	0	0
Average Yield	MT/ha	3.75	2.0
Post-harvest losses	%	5	5
Home consumption	Kg	40	40
Volume sold to FMAN	% of harvest	85	25
Farm-gate price	USD/Kg	0.447	0.461
Cost of service package	USD/farmer	500	0
Input package	Yes/No	Yes	No
Training	Yes/No	Yes	Yes
Seeds	Yes/No	Yes	Yes
NPK	Yes/No	Yes	Yes
Urea	Yes/No	Yes	Yes
Herbicides	Yes/No	Yes	Yes
Irrigation	Yes/No	Yes	Yes
Mechanization	Yes/No	No	No