FACILITATING LAST MILE DISTRIBUTION OF AGRO-INPUTS:

An analysis of models for scale, outreach and sustainability

GATSBY AFRICA

SCALE
OUTREACH
SUSTAINABILITY

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Photo above by Rob Beechey

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EXECUTIVE SUMMARY

This study attempts to move past *'good news stories'* to understand where development actors and commercial entities have gone in developing inputs distribution pathways that:

1. Are operating to some degree of scale;
2. Are reaching smallholders (1 – 3 acres);
3. Either are functioning without subsidy – or have the potential to.

Particular focus is paid to business models that have addressed key constraints such as trust in products, cost for smallholders, and access to products, services and knowledge.

After summarising some of the relevant available research, the study categorises models into:

- Specialised service companies
- Inputs driven solutions

The study explores models and highlights some key lessons and promising opportunities.

KEY TAKE-AWAYS

- Most specialised service companies operating at scale utilise a 'package' model – where they offer farmers seeds, fertiliser etc that pertain to a certain crop – rather than offer a menu of products/services for farmers to choose from.
- Likewise, most have sought to be profitable by selling other retail goods or purchasing produce from farmers. Some, such as Babban Gona, do both.
- There are a few examples of inputs suppliers – such as Meridian in Malawi – that have attempted to pursue their own private extension models. In most other cases of success in sub-Saharan Africa, an external facilitator has built capacity at the retail or wholesale level before making the case to suppliers to invest downstream.

2 METHODOLOGY

The study combines a desk review with key informant interviews.

- The brief desk review synthesises what others have done, with a view to categorising examples into business models (e.g. franchise models, social enterprise models such as One Acre Fund, outgrower models, evolving IT platforms, etc).
- Based from findings, Gatsby held key informant interviews with relevant businesses and projects that were subjectively deemed to be successful – judged in terms of sustainability, scale and results (e.g. via yield increases). A list of key informants is included in the Annexes.

For purposes of analysis, the study differentiates between development programmes and commercial models with the understanding that there is overlap between what development programmes have tried to facilitate and how markets have responded.

A NOTE ON TERMINOLOGY

The study refers to 'services' and 'inputs' in general terms as different models involved different value propositions. However, these terms refer specifically to agricultural inputs such as seed/fertiliser/pest control products as well as services that are relevant to farming – such as credit to purchase equipment/inputs, advice on good agricultural practises, insurance, or specialised services such as spraying/vaccinations.

Photo: Hailey Tucker | One Acre Fund

3 SUMMARY OF AVAILABLE LITERATURE

As an initial port of call, this study relied on three previous reports that focused to some degree on identifying and assessing approaches to offering smallholders access to relevant agricultural goods and services on a commercial basis.

REPORT 1

The first was a 2015 report by Hystra – a consulting firm specialising in approaches to inclusive business. This report, entitled *Smallholder Farmers & Business*[1], involved an analysis of 270 organisations that were *"providing services and goods to farmers sustainably and at scale"*. These were chosen through experts, donors and research institutions. Of these 270, the authors cut down to 160 – based on those working with more than 15,000 farmers and those that were less reliant on grants. These were clustered into:

1. Models that provided inputs, assets and services – with or without credit;
2. Contract farming, outgrower and buyer schemes;
3. Large-scale training and certification programmes;
4. Value chain dis-intermediation (i.e. cutting out middlemen);
5. Efforts to improve pricing, transparency and efficiency.

15 were chosen for in-depth case studies, of which six were operating in East Africa (One Acre Fund, Honey Care, Kenya Tea Development Authority, Juhidi Kilimo, East Africa Dairy Development and Cotton Made in Africa). The report is broken into three sections: strategies for **creating value**; how to do it **cost efficiently**; and **capturing value** and sharing it **sustainably** for everyone in the chain.

REPORT 2

A more recent report by the Sustainable Trade Initiative (IDH), entitled *Driving Innovations in Smallholder Engagement*[2], was less expansive but much more comprehensive. The authors analysed 30 models of smallholder service delivery and sought to identify best practices and the key drivers of farmer resilience and business sustainability. Similar to the Hystra report, they focused on farmer costs, profitability and financial sustainability. These 30 are clustered into four models:

1. Global sourcing models
   Commercial in focus, these models offer a range of services (from training only to complete packages for renovation), which are run by large global traders and processors;
2. Local trader/processor models
   These are models that offer packages similar to global sourcing but with a more limited budget and resources;
3. Specialised models
   These offer complete service packages tailored to farmers' needs, and are led by specialised service providers; and,
4. Farmer-led models
   These models are run by farmers (cooperatives, farmer associations, etc.) and are mostly small-scale.

Photo: Hailey Tucker | One Acre Fund

REPORT 3

Lastly, Ben Fowler of MarketShare Associates and Dan White of ACDI/VOCA undertook a study of Market Systems Development (MSD) programmes that have sought to facilitate markets for inputs access. Entitled *Scaling Impact: Extending Inputs Delivery to Smallholder Farmers*[3], the report looked at 9 MSD projects that attempted to extend input delivery models to farmers. The focus of the study was on **outreach** (i.e. number of farmers reached), **outcomes** (i.e. yields & income), **sustainability** (beyond project timeline) and **equity** (referring to the inclusion of excluded groups). This was undertaken from the lens of donor-funded initiatives as opposed to service delivery models per se but is relevant for this study in identifying which projects and models have been successful based on the aforementioned criteria.

The authors similarly clustered project strategies, this time into five areas:

1. Input supplier-driven models
   All worked through intermediaries, e.g. agro-dealers or agents;
2. Microentrepreneur-driven models
   In both cases here, emphasis was placed on encouraging individual lead farmers to play the role of input retailer and extension officer;
3. Lender-driven models
   Focused exclusively on One Acre Fund's inputs lending package, which is discussed in more detail below;
4. Producer collective-driven models
   Involving working with cooperatives and producer groups;
5. Buyer-driven models
   As with the IDH study, focus was on outgrower models.

The following sections borrow from and refine these categories – while also using them as the basis for comparing different business models. They also draw to a lesser extent on available literature regarding good practice in reaching ***Bottom of the Pyramid*** (BoP) customers (e.g. HYSTRA 2013[4], MIT[5]). Aspects of this literature are included where relevant, but are limited as the focus of this literature generally is on fast-moving consumer goods in urban or peri-urban settings.

4 SPECIALISED SERVICE COMPANIES

These companies tend to be social enterprises or not-for-profit entities that exist for the sole purpose of addressing a market gap in smallholder farmers' ability to access relevant products and information.

Prominent examples include One Acre Fund, myAgro, Farm Input Promotions Africa (FIPS), and Babban Gona. They tend to require grant funding for initial roll-out but have the goal of operating at scale without subsidy. IDH helpfully categorised these companies into those that offered a 'menu' of support to smallholders and those that offered a complete package:

MENU

A good example of this is ITC Spices in India, whose menu encompasses a broad range of technological, knowledge, and input-related services. For the more expensive services, ITC offers financial support in initial years, mobilises institutional credit and builds community models, which allows farmers to familiarise themselves with the system.

PACKAGE

The most widely known example is One Acre Fund, which offers a range of agricultural and non-agricultural products, packaged with what they deem to be critical services. The package – which includes training, asset-based loans, and delivery within walking distance of farmers' homes – is standardised each season to enable consistent delivery of outcomes at scale within the local agronomic context.

While a menu makes sense for pure input supply-driven models, offering a service package was the primary model pursued by the companies listed below. This was likely due to the necessity of achieving economies of scale around certain products, the need for standardisation to ensure effectiveness or, as in the case of Babban Gona, because the company is also involved in a specific output market. The following covers these models in further detail.

> A SERVICE PACKAGE WAS THE PRIMARY MODEL PURSUED BY THESE COMPANIES

4.1 FARM INPUT PROMOTIONS AFRICA

Farm Input Promotions Africa (FIPS)'s mission is to *"improve on-farm agricultural productivity through provision and promotion of appropriate farm inputs, services and advice to large numbers of smallholder farmers"*.

FIPS is a non-profit company that operates through the use of self-employed Village-Based Advisors (VBAs). It is now operational in both Kenya and Tanzania

HOW IT OPERATES FINANCIALLY

FIPS utilises donor-funding for the initial roll-out of its model in a given district or region, with the idea being that individual VBAs will continue to provide advice and input sales to farmers after donor support has ended. VBAs earn an income in two ways:

1. Through the sale of inputs such as seed, fertiliser and crop protection products;

2. Through the sale of other services, such as poultry vaccinations or cocoa pruning.

THE MODEL IN DETAIL

FIPS operates on the principle that inputs supply is low because of limited demand and that farmers believe what they see on their own land. Therefore, they promote the use of small, promotional packs to all farmers in target villages to enable them to learn-by-doing on their own land, see the results, and make decisions to invest in scaling up (or not). The small promotional packs (which can be for use on as little as 10 square metres of land) are generally provided by partners (from within their marketing activities) to farmers. If farmers want to use packs on a larger area, then they must pay. These are often small packs of seeds, as in FIPS's partnership with Jambe Agro for tree seeds in Tanzania. These are often distributed at demonstration sites to all interested farmers so that they can see how the products work when applied properly and to provide them with an initial training in proper use.

VBAs will then check in on individual farmers to make sure that they are planting correctly and utilising good agricultural practises. This forms the basis for subsequent sale in larger packs. VBAs have an incentive to ensure demonstrations go well – to maximise sales. In the off-season, FIPS has promoted a range of services through VBAs as another means of earning income. These include: poultry vaccination services; pruning of trees; spraying of crops; feeds, animal health products and breeding services for livestock.

Further up the chain, FIPS has strong relationships with input suppliers as it has access to a vast network of localised retailers. They act as an honest broker for multiple input companies simultaneously and allow farmers to choose the best option. In some cases, private companies have made cash donations (in addition to input donations) to FIPS to support its work in the knowledge that they will benefit from increased demand. They recognise that in these circumstances, their products may still be compared against competitors.

In this model, the initial selection of the VBA/contact farmer is crucial to success. FIPS has developed strategies for identifying farmers that are most likely to share knowledge and inputs with farmers in their village for maximum demand.

RISKS/CHALLENGES

FIPS's model tends to rely, although not exclusively, on donor subsidy for initial roll-out. This limits:

- Continued innovation – VBAs have limited ability to introduce further innovations; to do so they would need to stay connected to a larger research and extension system;
- Sustaining recruitment – Although VBA turnover is low, over time those recruited will discontinue; long-term sustainability depends on someone finding new VBAs to replace them or for VBAs to expand into more permanent retailers;
- Scaling up – FIPS's donor funding is tied to particular regions.

RESPONDING TO RISKS THROUGH MARKET-SYSTEMS APPROACHES

FIPS has recently begun to engage market systems approaches to support VBAs and field staff to develop as market actors. This is easier in geographies and value chains that are considered more lucrative, such as dairy or potato. For example, under an ongoing potato project, VBAs are currently working as decentralised seed multipliers. Similarly, under a dairy project, two farmer organisations have requested to pilot models where the cooperative pays for the cost of the extension system through margins on increased productivity and sales. If successful, then these have the potential to scale without subsidy.

FIPS's partnership with Notore in Nigeria

Facilitated by Propcom (now Propcom Mai-Karfi), this involved a relationship between FIPS and Nigerian fertiliser company Notore, where Propcom paid FIPS to show Notore how to use its model. In this arrangement, Notore recruited and trained Village Promoters (VPs) as its last mile network. It is worth mentioning as this partnership built on the FIPS model in two ways:

- Firstly, Notore offered a competition to VPs that were able to sell the most stock;
- Since that time, Notore has made several other innovations on the model by including, for example, the use of video education and phone-based management systems to standardise information sharing as well as improve the efficiency of individual VPs.

4.2 BABBAN GONA

In the Babban Gona (BG) model, thousands of mini maize and rice farmer cooperatives (called *"Trust Groups"*) are the medium through which inputs and services are delivered.

Trust Group leaders receive extensive training and are responsible for picking up a bespoke package of inputs (on credit) on behalf of their Trust Group at the beginning of the season. The package is calculated based on individual field size and recommended inputs on a per hectare basis. Throughout the season, Babban Gona also delivers field extension services to its members to ensure the success of their crop. At harvest, the company offers a warehouse receipt model, where collected grains are assessed, stored and collaterised to raise cash for a harvest loan advance. Finally, Babban Gona offers sales and marketing services, and any additional profits are remitted to the farmer net of a small commission and storage fees.

BG has been expanding (from 102 farmers in 2012 to 17,500 in 2017) and appears to be a rare example of a model that operates profitably at scale. The company was able to attain a positive EBITDA margin for the first time in FY 2015 (3 years after inception) and achieved a positive net income margin in FY 2016. They believe that this success is tied to the holistic nature of the business.

THE MODEL IN DETAIL

BG works on a lead farmer basis. This involves organising farmers into groups of 4 – 5, where one Trust Group *"Leader"* identifies and appoints 3 – 4 other farmer members for the group. All Trust Group Leaders need to undergo a rigorous psychometric test which essentially acts as a *"credit score"*, as well as an intensive one-on-one interview with a Babban Gona staff member.

Babban Gona field extension officers, known as MIKs (*Mailura da Ingatacen Kungiya*, which means Caretaker of the Trust Group in Hausa), are an integral part of the Babban Gona model. They show farmers how to use inputs optimally (e.g. proper proportions, timing, associated GAPs) and continue to check in on them and their fields' progress throughout the season.

Babban Gona MIKs are trained professionals, who receive a base compensation as well as a motorbike, along with a strong financial incentive tied to the success of their assigned Trust Groups. This is based on averaging the yields of their farmers, which BG is able to determine during the threshing process at harvest conducted by the MIKs, which forms a mandatory part of their services package.

Recognising the need to recruit MIKs from the communities in which they operate, coupled with the education gaps that exist within these communities, BG's MIK development programme is designed to identify high performing individuals with a basic educational background. This programme, within Babban Gona's Farm University, builds upon MIKs' basic secondary school education and is designed to develop capabilities further. In addition, MIKs benefit from mobile farm management applications that reduce the complexity of their role, further enabling individuals with basic education to succeed.

Babban Gona continues to scale by providing value to its farmer members (they argue through doubling the yield and trebling the net income of an average Nigerian farmer) as well as continuous innovation. High-performing farmer members can eventually access additional credit and services, such as harrowing services provided by an external provider/partner.

HOW IT OPERATES FINANCIALLY

A critical measure of BG's long-term success is to ensure the alignment of interests between the company and its smallholder member farmers. This is accomplished first and foremost through a dispersed ownership structure in which individual farmer members have a stake in the success of the company. The model is currently operating in profit and makes money principally in four ways:

> A RARE EXAMPLE OF A MODEL THAT OPERATES PROFITABLY AT SCALE

BABBAN GONA'S FRANCHISE MODEL

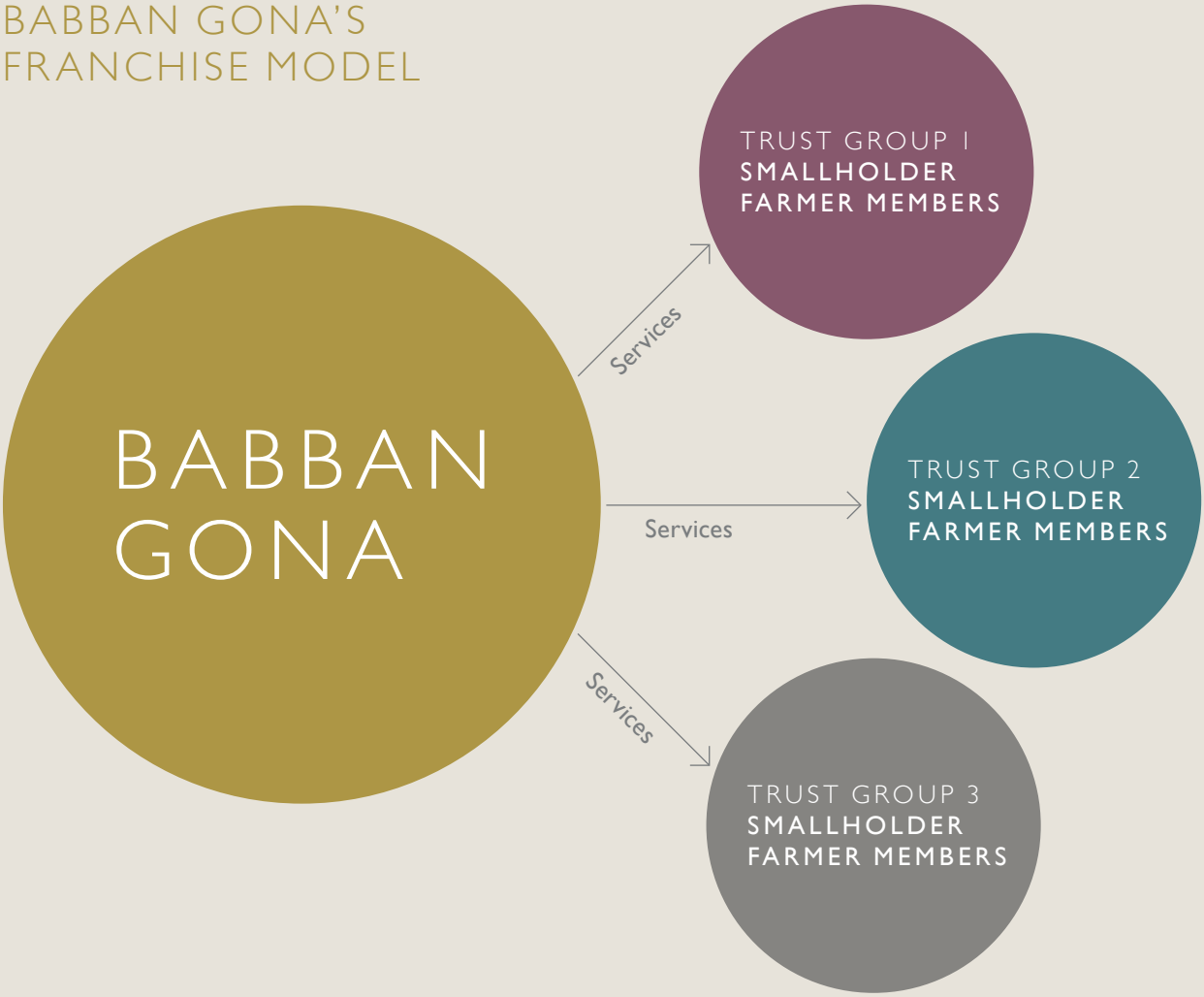

Diagram adapted from www.babbangona.com

1. Input margin

By leveraging economies of scale and buying inputs on a wholesale basis directly from suppliers, Babban Gona is able to optimise pricing for its members even when taking a margin. For example, during the 2016 input distribution process, Babban Gona was able to offer its members urea fertiliser at a price of ₦5,295 ($15 USD) per bag, as opposed to the prevailing retail price at the time of over ₦9,000 ($25 USD) per bag.

2. Credit margin

BG applies a margin on the credit offered while maintaining competitive rates. While a farmer approaching a bank directly may be offered rates between 30% and 60% APR, Babban Gona's average financing rate has averaged <20% APR since inception.

3. Sales margin

BG sells the maize to premium markets or waits until later in the season when prices are higher (delayed pricing). The company then remits the profits to their members on a quarterly basis, on top of which a 5% commission is collected.

4. Sale of other products

This is a business line extension where Babban Gona selects their top performing Trust Group Leaders in strategic communities and provides them products (cement, fertilisers) on credit to sell to non-BG members in their community. Similar to Babban Gona's input procurement, they are able to optimise pricing so that both Babban Gona and the leader are able to make a margin on the products.

RISKS/CHALLENGES

The Babban Gona model is very cash intensive. The company estimates that each season, they require $750 – $1000 per hectare to finance all inputs and services provided to their farmer members, in addition to the normal running costs of the company. This is compounded by an extended sales cycle, which can be 18 – 24 months.

4.3 ONE ACRE FUND

OAF is the mostly widely known example of a specialised service company and has arguably gone the furthest in operating at scale (600K+ smallholders served).

As with others above, its model is predicated on delivering a package of goods to its farmers every season. This varies by country context, with Kenya and Rwanda being the largest country programmes. The following outlines how operations work in Kenya and, where relevant, indicates key differences with the Rwandan model.

THE MODEL IN DETAIL

OAF's model contains four key components that overlap with elements of myAgro (spin off venture from former OAF staff) and Babban Gona's. These are:

1. Asset-based loans

Farmers receive a package of seeds and fertiliser on credit. In 2019 in Kenya, loan package values range from 4,000 to 17,000 Kenyan shillings ($29 to $168.82 USD) for new clients and up to 27,500 shillings ($260 USD) for returning clients. In Rwanda, no minimum or maximum loan requirements exist. For determining how much financial risk a farmer can absorb, the team relies on farmer group dynamics.

2. Transport/logistics

As with both BG and myAgro, inputs are delivered to locations within close proximity (OAF argues 'walking distance') of farmers they service.

3. Training

Farmers receive training throughout the season on GAPs.

4. Market facilitation

Like BG, OAF offers crop storage solutions and informs farmers about market fluctuations, so that they can time crop sales to maximise profits.

To roll-out, field officers recruit new farmers via groups, train them, and collect money (their daily targets are to attend two group meetings, check farmers' progress in their farms, and recoup 0.5% of their total loan portfolio). This was originally done directly but has now transferred over to mobile money, where farmers pay directly. Each field officer oversees between 60 and 200 farmers with an organisational goal of 200 per officer. To qualify for loans, farmers must:

- Have access to land that they own or rent;
- Not have defaulted in a previous season with One Acre Fund;
- Join as a group of 4 to 16. In Rwanda, FOs aim for 15+ per group in order to work effectively.

Photo: Hailey Tucker | One Acre Fund

At the start of a season, farmer groups sign a contract with OAF indicating which package they choose. For each group, OAF provides a draft constitution they have to fill in with a set of rules to encourage e.g. the creation of a group savings plan. Groups then have two months to pay an advance amount to prove their commitment (known as a starter payment). Then, they pay a fixed portion of their loan, known as the pre-payment to receive inputs. In Rwanda, there is no starter payment – farmers simply have to meet the pre-payment requirement in order to take their inputs on distribution day.

The inputs are insured so that farmers only repay a portion of the inputs to OAF if rains fail. This is administered by a third-party insurance company to remove any risk on the part of OAF. When purchasing this package, farmers also get in-person weekly trainings on farming techniques and use of inputs, as well as on post-harvest handling and storage in order to sell their surplus crops several months after harvest when prices are higher.

HOW IT OPERATES FINANCIALLY

OAF finances these service offerings with a blend of farmer contributions and global investment. Farmers get the products on credit in time for planting and repay over the full growing season. They also pay a service fee to offset the costs of trainings, local delivery, and other services. Fees aim at covering all the regular in-country activities, while costs related to new country scouting and government partnerships, innovations, M&E, and global support programmes are paid for by donors. **The rationale here is that if OAF had to stop all corporate functions, its core model delivery would not be affected.**

RISKS/CHALLENGES

One obvious risk to the model is loan default given the flexible nature of repayment. OAF has attempted to overcome this operational challenge via adequate targets for its field staff. When faced with slow repayments, OAF used to strongly incentivise its field officers to recoup the money quickly. However, this had two adverse effects:

- The additional money (in terms of labour time) spent on tracking down repayments sometimes exceeded the repaid amounts;
- Some field officers pressured their clients to repay, leading to clients complaining of harassment.

One Acre Fund solved these challenges with a rationalisation of field officers' work with daily objectives for gathering a minimum amount from clients to avoid a rush and pressuring the farmers at the end of the lending period. Mobile-based records have also proven helpful in identifying potential defaulters early.

As with other models the major challenge is, of course, sustainability. As with FIPS, innovation and upgrading has been reliant on donor funding. This may always be the case for OAF. However, they have also developed a partnerships team to seek expansion strategies that embed their direct service model into existing market functions. One such example has been to partner with MFIs to make the case for their model in order to de-risk investments in smallholders. The team has evidently had success working with cocoa buyers in West Africa, who have a strong financial incentive to invest in their outgrowers.

Rwanda – Rural Retail Innovations

In Rwanda, OAF is seeking to develop cost effective ways to expand on its core model. This is due to the fact that Rwandan farmers tend to be poorer than Kenyan smallholders, so what OAF calls its 'deficit per farmer' is too high to be sustainable.

As a result, OAF is piloting a partnership model they call PShop (short for Partner Shop) with one agro-dealer (expecting expansion to five shortly). For context, the Rwandan agro-dealer market is heavily regulated and coordinated. Each agro-dealer is allocated a portion of a sector (administrative area in Rwanda) and is given a subsidised supply of inputs from the government. Usually there are 3,000 – 6,000 or so households within a sector. Thus, working with agro-dealers allows OAF to utilise 1 – 2 officers to reach 3,000 households as opposed to their core model, where an officer will generally reach around 200 and may reach up to 1,000 in a densely populated area.

For the agro-dealer, responsibilities include the management of the inputs subsidy administration via the Rwandan government as well as their usual retail sale of inputs. OAF, in turn, layers on:

- Solar products (both small handheld units and a 3-light home system);
- Access to credit for farmers, for both inputs and solar products;
- 'Smart' ordering, i.e. assisting farmers to work out what quantities and types of products they should be buying, according to self-reported land size and crop plans;
- Planting training services, offered free outside the shop. These are sub-contracted to local extension agents;
- Marketing, both in-field and in-store.

Currently, this partnership is experiencing several challenges, particularly with regard to stock management and credit repayment. OAF had initially offered credit for solar products as well as Purdue Improved Crop Storage (PICS) bags. This involved a contract and 30% pre-payment, after which both were delivered with lorry and inputs. Credit could not be offered for inputs as OAF is currently forbidden from playing a wholesale role in the Rwandan context. All credit offering has been discontinued with PShop, however, as it had a poor record of paying back loans.

Instead, they have moved to a *'shop-in-shop'* model, where PShop is responsible for the safety of the product and expected to pay the retail price if it is damaged or goes missing. OAF then arranges delivery and keeps products stocked with the agro-dealer.

PShop never makes a payment on those products, and simply receives a commission for every product sold out of their shop. This model is interesting as it utilises the retail space of the agro-dealer with OAF maintaining ownership over its stock. As OAF is not legally allowed to wholesale inputs in Rwanda or franchise, this model only applies to solar products and PICS bags in the first instance.

Regarding stock management, there are a few issues. Inputs are managed at the wholesale level in Rwanda by a government parastatal that delivers at prices far above the market price for transport. This means that selling inputs is not a particularly profitable business. The benefits of a *shop-in-shop* model are that they allow OAF to maintain quality control and reduce the occurrence of stock-outs as the agro-dealer is not expected to pay for products at any point other than to receive a commission on sale. Related, the model reduces OAF's administrative costs as the agro-dealer will already have their own shopkeeper and retail space and is responsible for managing the risk of keeping cash in store. *Shop-in-shop* also resolves transportation issues as OAF can deliver products when it has full lorries rather than when agro-dealers have accrued enough cash on hand for pre-payment.

OAF hopes to be able to wholesale inputs again soon, but this depends on a Government of Rwanda decision regarding the removal of its inputs distribution parastatal and digitising its subsidy programme. This would allow the team to bundle solar/PICS bag deliveries with that of inputs when possible.

Photo: Hailey Tucker | One Acre Fund

A SHOP-IN-SHOP MODEL ALLOWS ONE ACRE TO MAINTAIN QUALITY CONTROL AND REDUCE THE OCCURRENCE OF STOCK-OUTS

Photo: Hailey Tucker | One Acre Fund

4.4 iPROCURE

iProcure is a virtual platform that connects farmers with inputs suppliers via a mobile purchasing software and *'just-in-time'* delivery system.

Within this system, farmers place orders with village agents whom they pay directly. Agents then bulk orders and pay inputs suppliers/manufacturers via their mobile phones using iProcure's software. Suppliers/manufacturers then deliver to an iProcure depot, from where the agent picks up the stock to be delivered to farmers or, depending on circumstances, stock is delivered close to the agent.

> "IPROCURE SEES ITSELF AS A 'SMART LOGISTICS' COMPANY

THE MODEL IN DETAIL

Unlike other businesses described above, iProcure sees itself less as a direct social enterprise serving smallholders and more as a *'smart logistics'* company. Having a virtual platform linked to physical depots allows them to know who is buying what, how much they need, and how long it will take to get to them. They provide this information to inputs suppliers and manufacturers, which gives them assurances on, e.g., how much fertiliser to produce. They now have three distribution channels:

1. Distribution to distribution (i.e. other wholesalers);
2. Distribution to stockists;
3. Direct supply to farmers (either retail at its depots or via an agent network).

iProcure has increased its reach through expansion of its depot network into increasingly rural areas as well as the use of an agent network that aggregates orders on behalf of farmers. They see this as a low-cost 'virtual presence' as the agents are only paid a commission on sales. The agents have a great model in their view as they purchase at wholesale, sell at retail and have no inventory or fixed costs as orders are taken on a mobile platform and then delivered to an agreed point by iProcure transporters.

More recently, the company has begun using its logistical capacity and access to data to partner with breweries and feed mills as an off-taker for these farm groups. This is still a nascent component of its business model, however.

HOW IT WORKS FINANCIALLY

iProcure's value proposition to inputs suppliers is as a high-volume, low-risk buyer. To farmers/stockists, their proposition is wholesale pricing, closer to the farm-gate. They now purchase the majority of their stock on consignment, although the timing for repayment varies based on products.

RISKS/CHALLENGES

iProcure's biggest risks are related to capital investment in infrastructure as well as default risks on consignment stock. Their model, on the whole, is predicated on limiting risk by not offering credit, by limiting purchases from suppliers to pre-ordered stock, and by minimising its staff.

4.5 MYAGRO

myAgro's model is predicated on the need to ease cash flow issues for smallholders to access inputs. 'Chunky' cash flow on the part of farmers means that they do not have the funds available to purchase inputs during planting season.

To solve this problem, myAgro allows farmers to make small instalments throughout the year towards the purchase of relevant inputs (seed and fertiliser). At planting time, myAgro delivers these close to the community. The pitch to farmers is therefore: high quality inputs delivered on-time and near to them, followed by free advice.

THE MODEL IN DETAIL

The main entry points for myAgro are community-based savings groups. In Tanzania, these were formed with support from development actors such as Aga Khan. Savings groups aggregate input orders through a commission-based sales person (CSP) that then brings orders to myAgro. CSPs are not considered myAgro employees, but operate as the first point of contact between savings groups and the company.

Unlike other models, where agents also provide information to farmers, myAgro employees handle advice through scheduled demonstrations with savings groups organised by the CSPs. myAgro also handles delivery as well as interfacing with inputs suppliers.

In terms of how payment works, in West Africa farmers would purchase scratch cards from local retail shops in a system that worked a bit like airtime top ups. Once they purchased the card, they could top up an account. This has proved costly and time consuming, however, so moving forward the company will utilise mobile money through savings groups. Each farmer in the group has a savings goal associated with their land size and the savings group collects their payments. These are then processed through the CSP via mobile money to myAgro.

This system has two benefits. The first is that myAgro takes no credit risk as the farmer only receives as much as they put in. Secondly, the savings group is able to bulk purchase inputs, so if one farmer misses their target, the shortfall is covered through the group.

HOW IT OPERATES FINANCIALLY

As with most other models discussed, the main driver of revenue is through a retail margin on inputs stock. Currently myAgro are not covering costs but, like BG, FIPS and OAF, they hope to find efficiencies through economies of scale and increased density. Currently, they are covering 30% of overheads, with 70% of costs subsidised by donor funding.

RISKS/CHALLENGES

One big risk with this model is a heavy reliance on voluntary savings groups that have been set up by NGOs. This means that the scale and sustainability of the model are partly determined by external actors that have no commercial 'skin in the game'. Related, savings groups are not compensated in any way for their participation in the scheme. It is also not clear as of yet if myAgro's approach is profitable in the long term.

4.6 SUMMARY

- Specialised service companies tend to utilise a pre-determined package model, where they offer farmers seeds, fertiliser etc that pertain to a certain crop. This is beneficial in ensuring quality control, relevance to farmers' needs, as well as in contributing to economies of scale, i.e. by purchasing high quantities of maize seed as opposed to a suite of seed packages.
- These packages tend to be catered to different farmers based on systems of trust-building and loyalty over time.
- There is a common argument that each field officer should be reaching out to 200 farmers. Whether this is an arbitrary target or genuinely reflects the point at which each model breaks even is difficult to say. However, this is the field officer to farmer ratio that myAgro, Babban Gona, OAF as well as Meridian (detailed in a subsequent section) all target.
- The bulk of income for these models tends to derive from wholesale purchasing and resale of inputs. However, profitability tends to be achieved through engagement in output markets or through diversified revenue streams. The exception here is iProcure, but even they are looking at involvement in output markets.
- Most of the companies mentioned work to some degree through farmer groups as a means of increasing efficiency and introducing an element of group accountability in their models.
- These models tend to utilise agents to the extent possible and minimise full-time salaried staff to managerial roles. This reduces risk and limits administrative overhead in the off-season.
- OAF and Babban Gona, in particular, highlight that farmers are not price-sensitive if they are receiving a high-value product. Instead, as the 2015 Hystra report also noted, farmers were more interested in *"risk-free investments than cheap products"*. Likewise, farmers were more interested in programmes in which they could easily opt in and out.
- Risks surrounding these models include the significant capital expenditure to get them up and running, and the need for highly capable and motivated staff to implement them. In the case of OAF, this has involved an arguably high reliance on expatriate staff with higher rates of turnover. External funding is therefore often key to developing, replicating and scaling these models.
- iProcure has largely avoided these risks, albeit doing so has involved sacrificing some support to smallholders in favour of enhancing supply chain efficiencies through better data and increased warehousing capacity.

> THERE IS A COMMON ARGUMENT THAT EACH FIELD OFFICER SHOULD BE REACHING OUT TO **200 FARMERS**

5 INPUT SUPPLY-DRIVEN MODELS

As the Ben Fowler/Dan White report highlighted, the majority of market systems development programmes that have sought to improve last mile distribution of inputs and services to smallholders have attempted to do so by embedding innovations within input supply markets (as opposed to working through output markets). These interventions have focused at different levels of the industry and attempted to work to differing degrees of scale depending on local context and market conditions.

Photo: Hailey Tucker | One Acre Fund

5.1 RETAIL-BASED STRATEGIES

This refers to programmes that have attempted to improve commercial access to inputs services by focusing on improving relationships at point of sale.

VILLAGE AGENTS

One common starting point in relatively thin or nascent market contexts has been to focus energy on expanding retail to hard-to-reach farmers via the creation of village agent networks. This involves the development of a network of commission-based village agents that are selected as local representatives for either retailers, wholesalers, or directly for input supply companies. Well-known examples include:

- The village agent retail model promoted by the USAID Uganda Livelihoods and Enterprises for Agricultural Development (LEAD) Project[6];
- Kenya Markets Trust Market Assistance Programme's agent network[7], focusing on wholesalers;
- The USAID-funded Production, Finance and Improved Technology (PROFIT) project[8] in Zambia, focusing on input supply companies.

The model tends to work by local villages selecting a village agent, not unlike in a lead farmer model, who aggregates stock for the village. This individual is then trained either directly by an employee of an inputs supply company, a programme or, more often, a local retailer/agro-dealer. As with FIPS, they are then tasked with aggregating orders and take a commission on sales.

The benefits of the model are that it requires limited upfront investment on the part of the agro-dealer/input supplier/wholesaler and involves limited risk as agents are generally not extended credit until they are deemed to be trustworthy. They also have an incentive to provide good information to farmers as they live in the community and want a positive reputation. Likewise, they have an incentive for repeat sales.

Village agent models tend to suffer from high agent attrition, limited innovation, and lack of structured investment by input suppliers (who sometimes see the network as a subsidised extension of their sales staff). *Without being embedded within the rest of the input supply market, their potential to scale without continued donor subsidy tends to be limited.*

FROM AGENTS TO AGRO-DEALERS

As with the others mentioned above, CARE Zambia, with funding from AGRA, sought to partner with existing agro-dealers to develop a network of rural sales agents. With support from iDE, the project was known as the Agro-Dealer Project[9] (ADAPT). After a year of operation it became clear that a major challenge to the model was that agro-dealers lacked the capacity to manage a network of agents, so the project opted to support rural entrepreneurs to become agro-dealers themselves, opening or expanding their shops in rural villages. Under this new model, ADAPT staff would spend more time building the capacity of new rural agro-dealers – as opposed to supporting existing businesses and trying to link them with agents. ADAPT subsequently sought to expand their model in three ways:

1. Establishing links with suppliers

Beyond organising demonstration and branding events – which were partly meant to promote these relationships – ADAPT's senior staff spent significant time discussing the project with seed company representatives to address concerns they had about engaging directly with rural agro-dealers.

2. Promoting agro-dealer associations

These were intended to ensure that practices introduced by ADAPT, such as seed fairs and demonstration plots, would continue after project support. They were also meant to build institutions through which agro-dealers could address other persistent challenges (e.g. lack of access to formal credit).

3. Developing an innovation fund

ADAPT set up a $160,000 USD fund with which any agro-dealer could submit a proposal requesting a matching grant. Submissions were judged on the needs of the agro-dealer, the potential for the investment to catalyse their expansion, and the degree to which the idea would test an innovation that could be replicated by other agro-dealers.

1. and 2. were early ideas to address the sustainability challenge, but neither went far enough to ensure the network was linked into the formal input supply market.

Related, the village agent model promoted by the Livelihoods and Enterprises for Agricultural Development (LEAD) project in Uganda suffered from high agent attrition, a lack of follow-on investment from agro-dealers, as well as limited engagement with a fragmented input supply market. To address some of these issues, the Uganda Feed the Future Agricultural Inputs Activity[10] sought to move agro-dealers from transactional business models to what they called *'customer service business strategies'*. This involved offering a suite of support to agro-dealers such as links with ICT firms, SMS aggregators and radio stations for better marketing.

To deal with the lack of sector coordination, poor quality seed, and counterfeits, the Agricultural Inputs Activity also focused on certification, anti-counterfeit measures such as e-verification and increased professionalism in the industry. For example, they worked with the Ministry of Agriculture to revise and adapt business licensing for agro-dealers to increase barriers to entry for firms that did not have an active interest in running their shops as viable businesses. They also supported the emergence of a private sector-led seed certification service, which would delegate authority to a third-party entity to oversee the local seed market.

As with ADAPT, these were useful starting points, but did not go far enough into attempting to change behaviours and incentives high enough in the supply chain to have a prolonged or sustainable impact on how the industry as a whole functions.

MICROENTREPRENEURS

There are three prominent cases where these types of models were rolled out: the USAID funded NAFAKA project[11] in Tanzania; Syngenta Foundation India's Agri-Entrepreneur model[12]; and Helvetas' Samriddhi programme[13].

In NAFAKA, the model was based around Village-Based Agricultural Advisors (VBAAs) – smallholders that had demonstrated entrepreneurial potential, who were subsequently trained and linked to the input supply market.

For Syngenta Foundation India, Agri-Entrepreneurs (AEs) earn commission on the sale of agricultural inputs and produce. To link farmers to markets, they coordinate harvesting schedules to ensure availability of enough produce for either a trader to come or for transport to market.

Both VBAAs and AEs are meant to be a *"one-stop solution"* for smallholders, providing four services:

- crop advice;
- agricultural input sales;
- market linkages and, in the case of AEs;
- credit facilitation.

In Syngenta Foundation India's case, however, the model is underpinned by links to agri-credit from the Industrial Development Bank of India (IDBI). AEs act as the bank's business correspondents and receive a commission on the credits they facilitate. In turn, farmers are required to spend 60 – 80 per cent of the credit at an AE shop.

Samriddhi identified and trained lead farmers to access others in their village. As the capabilities of lead farmers increased, they progressively diversified their value proposition and charged higher prices for services. Unlike the previous models, Samriddhi sought to bring sustainability to the whole effort by structuring lead farmers in associations and facilitating links with suppliers. Subsequently, Samriddhi conducted research to develop relevant value propositions and models for twelve output sectors, including livestock (bull fattening, dairy, duck and chicken rearing), crops (fruits, vegetables, medicinal plants), and fisheries.

Despite these efforts, associations had mixed success, with 21 out of 58 considered sustainable by 2014. Associations that remained weak were typically informal, had an executive committee composed of volunteer lead farmers, did not employ any full-time staff, and had limited financial resources. The 21 successful associations generally benefited from skilled leadership and were able to sustain strong partnerships with larger companies, e.g. with medicinal plants companies with whom they could guarantee purchase via contract farming models.

As with FIPS, the major downside to these models is the need for an entity with stronger managerial capacity to support replication and continued innovation (i.e. linking individual microentrepreneurs to new relevant products on the market). However, as Fowler/White note (emphasis added):

"Where larger firms are unwilling to invest in new systems and business models to expand their outreach to smallholder farmers, microentrepreneurs can act as an initial driver. With time, they could potentially be linked to larger players as their capacity and sales volumes grow. Under the NAFAKA project, several VBAAs are now acting as marketing and informal sales agents for large-scale seed companies. These companies found that VBAA marketing and extension activities led to significant increases in demand for their seeds in rural areas previously beyond their market interest, leading them to increase investment in linkages with the VBAAs to continue building market share."

The following sections address more structured and intentional approaches to sustainability.

5.2 WHOLESALE MODELS

In contexts where retailers exist in hard to reach communities (either via agents or as more rurally-based agro-dealers), a few programmes have sought to improve on the deficiencies of the agro-dealer/ agent networks by linking them to input suppliers via an improved wholesale function. These can be summarised as *'hub'* models and *'franchise'* models.

HUB MODELS

This refers to situations in which an external facilitator has addressed a market gap between input suppliers and agro-retailers either by establishing an entity that provides a wholesale function or one that provides principally a retail function, with the view to expanding reach to more remote areas over time. The following highlights two examples of this approach.

Musika – The Hub

Over the past few years, Musika has built on its initial innovations in agricultural input supply via the village agent model. Referred to as 'hubs', this model works on the assumption that an input supplier already has roots in the smallholder market. In which case, the supplier employs an agronomist to set up a regional hub to serve rural demand with a range of products at wholesale prices. The expectation is that the hub would also take a small marketing margin. This made sense for expansion into hard to reach customer segments, such as in Zambia's Northern region.

In this model the supplier manages the hub directly or outsources its management to a third party. Inputs stock held at the hub is distributed to farmers primarily through franchised or accredited agro-dealers located in district locations deemed to be strategic (e.g. because of road access). In some cases, the supplier places a container directly in the community, managed by selected community-based agents/entrepreneurs.

The purpose behind the model is to achieve:

- Improved efficiency in terms of product information and general agriculture production;
- Improved information tied to customised trainings, demonstrations, advisory services, individual farmer visits, field promotions, and on-farm research;
- Opportunities for early pre-paid purchase of inputs to ensure that farmers have inputs in place for immediate planting the following season.

In this set up, there are very limited direct sales to farmers by the hub. Thus, the major role of the supplier is to create demand for products and to direct farmers to franchised and/or accredited agro-dealers and community agents in their areas. In addition, the supplier works with agro-dealers and community agents to build their capacity to service local smallholders by providing financial, management support and technical information. This allows input suppliers to develop an improved distribution network for their products as well as outsource extension and marketing promotions.

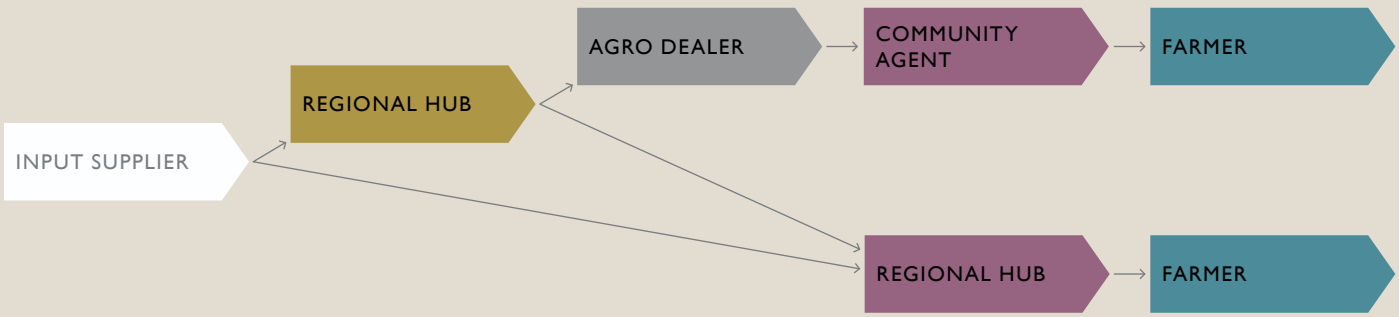

Diagram adapted from *Feed the Future Uganda Agriculture Inputs Activity – Strategic Assessment Report* (June – July 2015)

Creating New Frontiers in Agriculture – Farm Service Centre Model

Farm Service Centres[14] (FSCs) are an idea that was promoted by Creating New Frontiers in Agriculture (CNFA) in Moldova and Afghanistan, evidently quite successfully. Across Africa, CNFA initially promoted agro-dealer network models based on the view that an FSC would not be viable for rurally dispersed, low-income smallholders across sub-Saharan Africa. As they expanded and began to see the limitations of agro-dealer networks, CNFA decided to pilot the FSC model in Ethiopia with plans to expand elsewhere if successful.

FSCs act as a one-stop shop for farmers operating principally as a retailer but also provides a sales point to agro-dealers based out of district centres. Thus, unlike in the hub model, their primary business is acting as the point of sale for quality-assured inputs closer to farmers. FSCs have nearby demonstration plots as well as on-site extension officers and veterinarians.

FSCs earn an income principally through the retail sale of seeds/fertilisers/crop protection products but have also offered the following services where demanded for by their customers:

- Crop price information;
- Credit and financing;
- Equipment leasing.

FSCs do not charge for training, but rather employ salaried agronomists and veterinarians to conduct field days, demonstrations, seminars and in-store consultations. FSCs' goals are to have satisfied long-term customers who will select the right products, use them properly, achieve good results and return year after year.

CNFA has linked individual FSCs into an apex organisation, registered as an LLC in Ethiopia known as EGAA (the individual letters are the first letters of the original 4 FSCs to register). The goal here has been to establish a network of stores that is united through shared interests, common branding, and a commitment to serving smallholders. Through informal and formal cooperation (i.e. through EGAA), the FSC network engages collectively with input suppliers to negotiate competitive prices. EGAA pools resources, buying power and inventory needs, allowing FSCs to:

- Access national and international distributors;
- Obtain volume discounts and trade credit;
- Gain greater flexibility and negotiating power for inventory selection and delivery terms.

Individual FSCs were established via a USAID-funded grant-matching scheme (50% of start-up costs tied to business training) and EGAA was supported in its initial legal set-up and convening. However, both FSCs and the network writ large are required to operate without external funding.

Franchise models

This refers to models that seek to address trust and access issues within the inputs market through the development of branded, franchised retail locations. Prominent examples include CARE's Kirshi Utso micro-franchise network[15] in Bangladesh as well as Kenya Markets Trust's (KMT) ongoing work in the inputs sector.

For KMT, the franchise model was a way to work higher up the inputs chain while recognising the limitations of disjointed relationships with inputs suppliers and manufacturers. Franchises offer:

- Quality assured services and products (locking out counterfeits);
- A scalable model (i.e. a business in a box);
- Economies of scale – franchises drive down costs of improving access and open up marketing opportunities.

The role of the franchisor is to provide branding and store set-up; source and purchase inputs; ensure product delivery, technical and business training; support with marketing and national promotions; and provide access to finance. The franchisee, in turn, is expected to provide technical advice to farmers, lead on local promotions, and to sell inputs. This also works with the aforementioned agent model, where agents are expected to aggregate orders, provide advice to farmers, and to organise demonstrations.

Revenue streams include margins on bulk purchases, a monthly sales premium, a small margin from product credit, soil testing fees, as well as fees for agronomists or vets to join network. These models have been running well but suffer from some ongoing credit issues due to short turnarounds from suppliers to franchisors, which often require 1 – 2 weeks for franchisees to pay back credit.

Other challenges include price undercutting, high transport costs, a high cost of entry for agro-dealers, as well as drop-outs. These could potentially benefit from OAF's 'shop in shop' idea, which would simplify credit issues and reduce the occurrence of stock-outs.

5.3 INPUT SUPPLIER-LED STRATEGIES

This refers to situations where a programme has the benefit of working directly with input suppliers to extend services to smallholders.

Photo: Neil Thomas

PRIVATE EXTENSION UNITS

A fairly unique example of this model comes from Malawi's largest agri-retailer Meridian and its Farm Services Unit, which is tied to the company's commercial activities rather than as a CSR initiative. Its goal is to expand the retail function of the company to hard to reach smallholders utilising an agent-based network and some innovative use of ICT.

Meridian – Farm Services Unit

Meridian is Malawi's largest agri-retailer and a major producer of fertiliser. Its Farm Services Unit (FSU) offers farmers technical and practical advice, with the goal of bringing services nominally reserved for larger commercial farmers to the smallholder market. Their soil-testing work has led to the launch of a series of specialised blends, which are the first crop-specific blends to be offered on the Malawian market.

The FSU is comprised of 60 extension officers operating from Farmers World and Agora (Meridian-owned retail chains) outlets in the Central and Southern Regions. These officers are referred to internally as 'agronauts' and are full-time staff as opposed to agents. The core functions of an agronaut include:

1. Soil testing

Tied to its work with commercial farmers, Meridian offers localised soil testing and the development of specialised fertiliser blends that are crop-specific and account for nutrient requirements in the local soil. From 2015 – 2017, FSU conducted over 3,000 samples, leading to the creation of comprehensive soil fertility maps of the Central & Southern Regions. The FSU has invested recently in a local infrared lab, which will aim to drive down the time and costs per sample.

2. Advice and information on application and GAPs

These are provided via in-shop advice, demonstrations plots, farm clinic sessions and organised farmer group trainings. The difference between the FSU model and others is that information provision is used here as a sales tactic rather than an add-on to a pre-defined sales package. On the back of its soil-testing work, FSU has established fertiliser trial sites – there are 120 such sites being established between 2017 – 2018. These are used to showcase the performance and impact of customised blends, which in turn is expected to drive sales. Preliminary results have highlighted, for example, a 19% yield increase compared to government standard blends.

3. Data collection

In July 2017, the FSU contracted Smallholdr, an ICT platform (detailed in Annex II), to help manage its workflow. A key feature of this platform is the use of QR codes to identify and track individual farmers. By scanning a QR code into the system, an agronaut can quickly bring up past information on an individual farmer and identify when and where they have attended trainings or what products they have purchased. The QR cards also capture purchases, which adds to a large dataset of individual customer preferences that can be utilised by Meridian's operations and marketing teams. This can then be used for promotional purposes, e.g. operating like a loyalty card that could be built on with credit provision for reliable clients. Lastly, the platform allows managers to monitor the work of remote staff.

The expectation is that each agronaut will interface directly with 200 farmers over the course of a season.

Agronauts are paid a basic salary as well as a housing allowance. However, they can earn an extra month's salary over the course of a quarter if they meet their targets. Currently their targets are tied to field days and number of soil tests collected, as well as a management assessment. In the future, however, Meridian hopes that agronaut performance can be tied to farmer sales via QR codes.

The main risk with this model is profitability. Originally, the unit was set up with the Meridian Group company Farmers World contributing about 20% for the annual cost of the FSU, with the rest coming from an EU grant mechanism. Now that cost share has gone up to 50% – split between four Meridian Group companies – and is increasing steadily. The FSU has also been able to earn income through trials for other companies as well as soil sampling for commercial entities. It has also recently won a contract to provide extension on behalf of another private company, and expects strong returns (~20%). It still remains to be seen, however, if the financial investment in the FSU will be offset by increased sales.

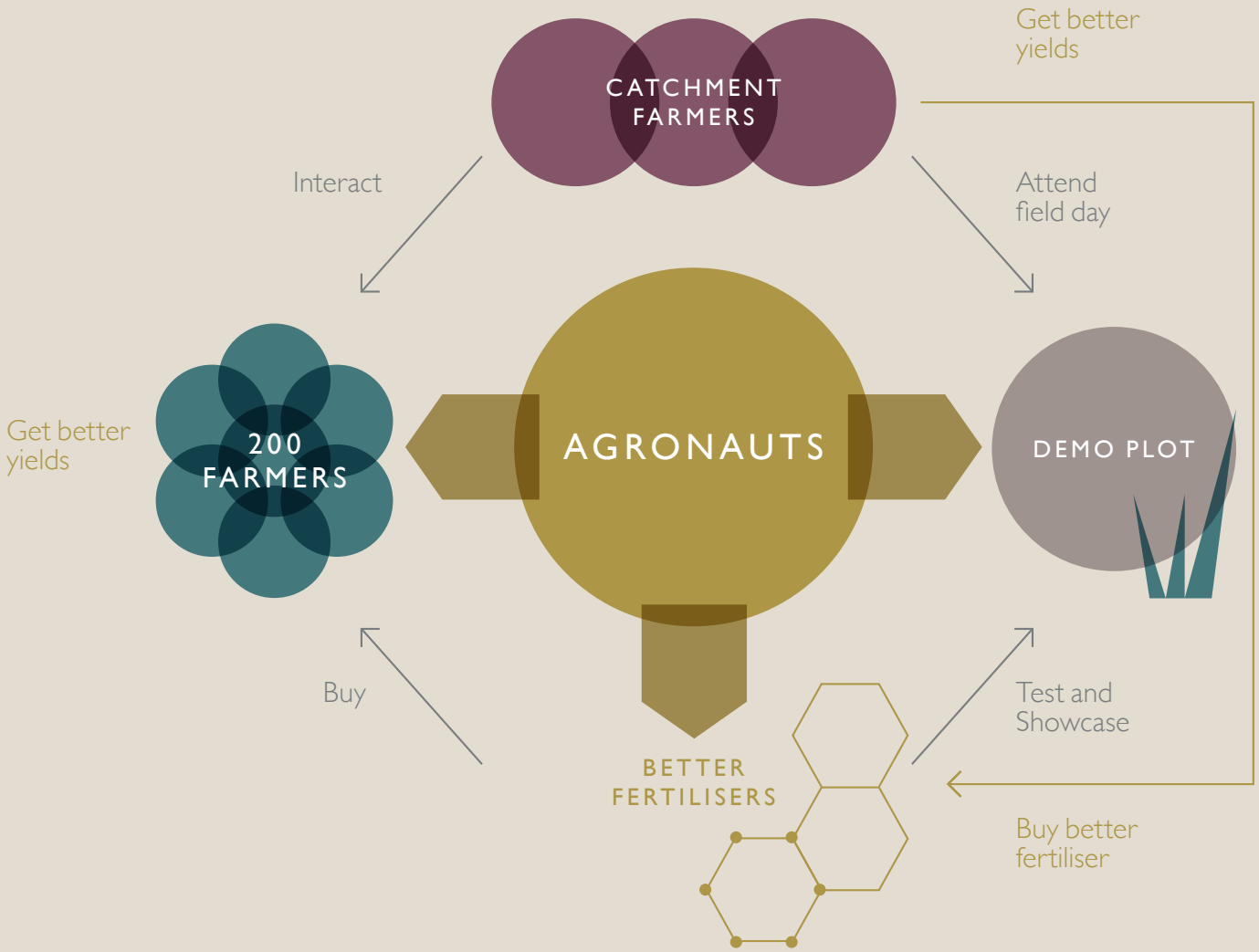

Diagram adapted from www.meridian.africa

5.4 SUMMARY

> SUCCESS HAS IN SOME WAYS DERIVED FROM INNOVATIONS IN FINANCING AND INFORMATION AND COMMUNICATION TECHNOLOGY

- Where input suppliers are not interested in hard-to-reach customer segments but a functional retail network exists, Musika's hub, KMT's franchise network and CNFA's FSC model all offer strong examples of bridging networks.
- Stock management appears to be a challenge across the board. This makes OAF's move towards its 'shop in shop' idea appealing for a company that wants to limit its financial exposure in the short-term.
- As with specialised companies, success has in some ways derived from innovations in financing and Information and Communication Technology (ICT). Improved distribution, communications, farmer outreach and reductions in stock out have often come from emerging mobile-based platforms.

6 CONCLUSION

There have been several recent efforts – both from the private and development sectors – that have proven successful in expanding smallholders' access to relevant inputs and services. This paper has grouped them into the categories of specialised service companies and facilitating improved inputs supply chains. Key findings in these categories include:

SPECIALISED SERVICE COMPANIES

- Most specialised service companies operating at scale utilise a *'package'* model where they offer farmers seeds, fertiliser etc that pertain to a certain crop – rather than offer a menu for farmers to choose from.
- Likewise, most have sought to be profitable by selling other retail goods or purchasing produce from farmers.
- There are a couple of examples, such as One Acre Fund's Rural Inputs Innovations team, where a company has attempted to link their work more directly into the formal inputs supply chain (as opposed to dealing directly with farmers themselves), but this has proven challenging to date.

FACILITATING IMPROVEMENTS IN INPUTS SUPPLY

- There have been a number of projects that have been effective in expanding a retail function (i.e. building out agro-dealer and agent networks) in contexts where smallholders have had limited access to inputs.
- A few of these projects have moved to the next stage, usually by looking to strengthen wholesale functions within existing inputs supply chains.
- There are also a few examples of inputs suppliers – such as Meridian in Malawi – that have attempted to pursue their own extension model. In most other cases of success in reaching smallholders at scale, an external facilitator has built capacity at the retail or wholesale level before making the case to suppliers to invest downstream.
- The projects that have been most successful have been able to work throughout the supply chain, rather than focusing on one level exclusively.

ANNEX I: KEY INFORMANTS

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Photo: Neil Thomas

ANNEX II: INNOVATIVE USE OF TECHNOLOGY

There are a number of recent innovations in ICT that have been able to improve coordination and reduce the transaction costs involved in reaching smallholder customers.

The following chart, from a recent landscape scan funded by MasterCard and AGRA, provides a good summary of relevant firms and products on offer:

ICT

There are a few ICT firms – such as Smallholdr and iProcure – that offer useful services in staff/ inventory and client management that are relevant across a range of distribution models.

A few of the more relevant models – as well as those that have been mentioned by key informants and/or through secondary research – are detailed below:

Tulaa

Tulaa is a mobile platform, based on the Esoko platform in Ghana, meant to connect input suppliers, financial service providers and commodity buyers to smallholder farmers. Generally, Tulaa's clients are input suppliers themselves that want to better manage supply chains. Its value proposition to them is that the platform can lower the cost and risk associated with working with smallholders. They do this through:

ICT4Ag Solution	Model	Information solutions	Expert advice and extension solutions	Supply chain management solutions	Trading platform	Financial products
GHANA						
Ignitia	Hybrid	X				
mFarms	B2B	X	X	X		
VOTO	B2B	X			X	
Prep – eez	B2C	X		X	X	X
aWhere	B2B	X				
TANZANIA						
Agrlinsight	B2B	X				
mFarming	Hybrid	X		X		
Agrinfo	Hybrid	X	X	X		
Bei Sokoni	Hybrid	X		X		
Ratin	B2B	X				
KENYA						
iShamba	Hybrid	X	X			
Sokopepe	B2C	X	X		X	
M – Shamba	Hybrid	X	X	X	X	
WeFarm	B2B	X				
NAFIS	B2C	X				

Table adapted from *ICT4Ag business models: How to Sustain and Grow the Digital Harvest*, a report by Alliance for a Green Revolution in Africa (AGRA)

– **Offering tailored extension to farmers via mobile apps** – Tulaa offers a digital channel for the existing proper use of extension information of companies, and sends relevant updates to farmers that register on its system. Finding these farmers and getting them on the system is up to the companies themselves – or to their retailers. This requires a certain level of industry coordination to be in place.

– **Allowing agro-dealers to manage stock and aggregate orders** – This involves agro-dealers keeping digital records of sales, which would allow suppliers having up-to-date data on sales and stock.

– **Offering mobile-based credit** – This system is backed by a local MFI that makes the initial loan to farmers, who then purchase inputs from an agro-dealer. They then use the platform for repayments.

Smallholdr

Smallholdr is a mobile app and web-based platform meant to collect and manage information on smallholder farmers. The platform involves three components: a database, a data collection tool, and field staff management.

It works on the basis of using QR codes to track individual farmers. Each farmer gets a card that registers them on the system. This, in turn, allows a company to collect and utilise data on these clients. For example, for Meridian's FSU, this data was used by their agronauts to plan activities as well as record which farmers had attended trainings and when. They could also keep records of what problems individual farmers were having in order to deliver tailored advice.

Supervisors could then assess the progress of individual agronauts against stated workplans using the Smallholdr dashboard. It also allowed Meridian to capture purchasing data from these farmers when they bought inputs in order to understand purchasing habits and to roll out loyalty programmes.

Sibesonke – mFarming platform

Sibesonke was established in 2009 in Finland as a spin-off from Nokia. In 2013, the company launched the mFarming platform in Tanzania through its subsidiary Sibesonke East Africa Ltd. Its focus is on ensuring that farmers receive relevant and timely information on GAPs and inputs use. The service offers weather forecasts, agronomic information, information on farm inputs, market linkages as well as market prices. Its key features include:

– **A dashboard** – This allows clients to review real-time information of mFarming customers in a usable format, for example through ad views of their products & services, number of customer sign-ups, relevant market research, and geo-analysis.

– **Customer communication** – The platform offers new sales leads from mFarming sign-ups in a timely fashion.

– **Links to agro-dealers & sales agent** – The platform allows companies to advertise with distributors and sales agents to smallholders on mFarming.

– **Demonstration plots** – The platform allows clients to advertise field events and demonstration plots to nearby smallholder farmers as well as effectively plan new field locations based on where customers request most.

Digital Green

Digital Green (DG) is a not-for-profit founded in 2008 that aims to increase the productivity of smallholders by making agricultural extension services more effective. To do this, DG partners with clients (public, private and civil society) to produce, disseminate and monitor the impact of short, *'locally-relevant'* videos that share knowledge and increase the uptake of GAPs. They had experimented with other approaches but found video had the best results in terms of recollection of content, improved yields etc.

After assessing farming needs, *'frontline'* workers (existing extension officers of government, NGO, or private agencies) and content producers create content meant to address identified needs through the sharing of best practices. Videos can be accessed online but are also disseminated to communities using mobile projectors. Workers are equipped with the necessary training equipment (DVDs, TVs, projectors) and facilitate the training sessions themselves.

This could be highly useful in reducing costs and ensuring quality control, e.g. for a wide network of village agro-dealers.

Agrinfo

Agrinfo is an online database that documents farmland ownership in Tanzania using GIS mapping. The database records the location of an agricultural investment and its related information (e.g. ownership, area size, type of investment and expected outputs). This is then used to track farmer data on behalf of MFIs as well as output buyers and input suppliers. Agrinfo works on a subscription basis, with the charge added to farmer organisation membership fees for farmers who decide to sign up. It also collects commissions from input and output suppliers.

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