Making tractor markets work for the poor in Nigeria

A PrOpCom case study

PrOpCom

Making Nigerian Agricultural Markets Work for the Poor

In early 2009, PrOpCom field assessments revealed rural labour shortages at critical times in the agricultural calendar to be a pressing concern for smallholder farmers nationwide. The low, inconsistent availability of hired labour and the associated increase in the daily rates of casual labour had serious consequences for the poor smallholder, impacting both annual output and farm profitability. Aware of the unmet, increasing demand for farm mechanisation, PrOpCom sought to redress the scarcity of tractors available for land preparation, and in so doing engage with the highly dysfunctional set of processes that characterised tractor procurement, distribution and service provision systems nationwide. Wishing to steer clear of a short-lived aid-funded solution, and also to avoid gifting tractors to exclusive groups and thereby limiting benefit to small and isolated pockets of smallholders, PrOpCom set about piloting a new model for the commercial distribution of tractors and the commercial provision of tractor services. Representing a completely new way of doing business in a sector dominated by unfulfilled government promises and dissatisfied stakeholders, this case study documents not only what PrOpCom did, but why, and, importantly, how they did it.

About PrOpCom

PrOpCom (Promoting Pro-Poor Opportunities in Commodity and Service Markets) is an innovative programme funded by the UK's Department for International Development (DFID) to facilitate functionality and efficiency of Nigerian commodity and service markets in such a way as to assure these markets benefit the poor. The programme is mandated by DFID to employ the market development (M4P) approach. This approach has allowed programme staff the conceptual and operational space to design and implement pro-poor interventions that embed change in local systems, and are crucially owned and led by the market players themselves. Using a facilitation model that adheres to the principles of sustainability, M4P programmes are oriented toward more than simply delivering impact for the lifetime of the programme. They instead aim to ensure that programme outcomes result in the ability for outreach to expand, and impact to deepen, even when programme activities have ended.

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1. Relevance of mechanisation to the poor

Like many developing nations in Africa and worldwide, Nigeria's agricultural sector is dominated by smallholder farmers. Nearly 16 million smallholder families work an average of 1–2 hectares (ha) each, with rain-fed conditions characterising more than 99% of such holdings. Nationwide there are over 30 million ha of land under cultivation season-to-season, falling substantially short of the estimated 78.5 million ha of land that is adjudged suitable for farming. Rapid population growth, set against a backdrop of chronic hunger and undernourishment in the wider region, serves as a constant reminder of how vital smallholder farms are to the attainment of better food security. Achieving this need not require wholesale commercialisation, nor blanket expansion of land put to seed, but it clearly necessitates a change in farm practices and management.

PrOpCom identified increased mechanisation of smallholder farms as a way to boost production and profit, and offer solutions to some problems commonly encountered by the poor smallholder, as highlighted below.

Declining supply of rural labour increases farm costs

As labourers migrate away from rural areas, the number of workers available for seasonal on-farm employment declines year-on-year. Whilst beneficial for the few workers that remain, this is problematic for the typical smallholder who faces both high costs in recruiting labour at crucial times, and significantly higher costs of production. Migrant labourers from neighbouring countries have filled the gap somewhat, however, their availability throughout the seasons is often inconsistent and unpredictable.

Double season cropping opportunities are being missed

When farmers are forced by labour shortages (and/or unfavourable weather patterns) to plant their first crop late, the window within which land-holdings can be cleared and prepared ahead of the second planting season (or low-season) narrows. Labour shortages in this changeover period can delay planting, resulting in smaller yields, ruined crops, or even farmers abandoning the second season altogether. All these eventualities reduce annual output and overall farm income, and are most common in the south of the country where rural labour shortages are even more pronounced than in the north.

Returns to digging are diminishing

On relatively level, unobstructed land, manual labour is generally less thorough than mechanised equipment. Given the physical nature of the work, a hoe labourer will tire as the day progresses—with diminishing returns to time spent on the farm. The soil is turned to reduced depths, broken down less, and in the case of ridging, the spacing between rows increases in order to complete the plot quickly. All these elements reduce the quality of the seedbed and the potential size of the standing crop, substantively reducing yields.

Views from the field

Farmers in the southwest region of Nigeria are all too aware of the consequences of late planting. Farmers in Ogun state wishing to practice off-season farming will often choose to intercrop melon with a second maize crop. The chances of getting a good return on melon are, however, greatly reduced if the seeds are not in the ground by mid-September. Timely land preparation has been a challenge in these areas and has routinely impacted upon the investment decisions made by farmers, resulting in opportunities foregone.

Box 1: But doesn't mechanisation reduce rural job opportunities?

Widely considered and researched, evidence is mixed as to whether increasing mechanisation displaces farm labour. In some instances, particularly in the case of partial mechanisation and/or expansion of plots cultivated, it is not so much labour displacement, but labour re-assignment and re-allocation—from land preparation activities to other on-farm activities, albeit later in the season, when there can be a greater demand for labour for sowing, weeding and harvesting activities. There is also some evidence of a further shift toward field management activities as hired labour adapts to the smallholders' graduation from subsistence to commercial production under a more complete mechanisation scenario. From a quality-of-life perspective, land preparation is also one of the more physical on-farm activities. Hand sores, muscular aches and back pains go hand-in-hand with this type of work—which become increasingly challenging as farmers age. With the rising scarcity of rural youth due to urban migration, there are also physical barriers to timely and thorough land clearing and preparation. The availability of tractor services to replace such toil affords even poorer farmers the ability for increased choice over their livelihoods.

Benefits derived from mechanisation

1. **Cost savings**: Recent years have witnessed a surge in the daily rates of casual labour, from ₦200/day (£0.75) to approximately ₦500/day (£2) in the most severely affected states. The average costs associated with manually prepared land can range from ₦8,200/ha (£32), or ₦9,600/ha (£39) with an ox-plough, to ₦11,400/ha (£44) in the north and southwest respectively. Relative to this, the cost of hiring a private tractor for land preparation is

less expensive, estimated at ₦6,000/ha (£23) in the states of the north, and ₦7,500/ha (£29) in the south-western states.[1]

2. **Expansion**: Tractors also allow farmers to open up their entire land-holding and cultivate previously unfarmed government, private or community-held land under leasing arrangements. Many smallholders own land that they are unable to cultivate—land that has been left fallow over the decades of rural labour shortages and out-migration. Where land is abundant, easy to lease and uncontested, and where some level of labour is locally available to support harvest and post-harvest activities, tractor availability can aid smallholder expansion, enabling them to cultivate a higher proportion of their own land-holdings or those of others within the year. The ability to access mechanised services can also allay farmer fears of missing crucial planting windows in the wait for labour. Hence, the availability of a tractor also lends farmers a degree of assuredness that investing in second season farming—i.e. buying inputs—is worth the risk.

3. **Productivity**: Productivity enhancement requires the combined use of a broader range of tractor implements (attachments) that, together, can perform primary and secondary tillage operations better for optimal seedbed preparation and long-term conditioning of the soil. Whilst the effect of different tillage practices on crop yield are not uniform for all crop and soil types, evidence from elsewhere in the West African semi-arid tropics suggests that productivity can increase by between 20% to 100% depending on the crop, with effects on rice and maize crops being the most significant. However, productivity-enhancing combinations of implements are rarely utilised and the low levels of knowledge—among existing tractor operators—of such improved measures and implements (sub-soilers, chisel ploughs, rotavators, tilth producing harrows, among others) means that many farmers access only simple ploughing services, which in themselves will have little productivity benefit over manual labour. Tractor operators are not, in the average case, taking the opportunity to use such implements to improve the organic material content or the water absorption capacities of the soil as part of their work. Even for basic ploughing, tractor implements are often more thorough than manual labour, particularly in row and ridge spacing, conferring an additional, though marginal, productivity benefit.

2. Nature of the problem

The essence of the mechanisation problem in Nigeria is straightforward: there are not enough functional tractors in the country to meet the high demand among smallholders. Access to the few tractors that are available is often determined by political patronage and social networks, further disadvantaging smallholders.

Understanding supply-side weaknesses

In general this is not a demand-side problem. Farmers understand the costs and benefits of mechanised land preparation over manual labour. They also tend to understand the need to budget for such a lump-sum expenditure, routinely setting aside cash for hiring labour ahead of each planting season. However, smallholders do not own tractors, nor do they have the resources to purchase one. For the vast majority, the only means of access is through a tractor service provider who will service their land for a fee—charged per ha or per hour. The problem is that there are too few of these service providers—public and private—to meet the sheer weight of demand, especially at peak season.

Box 2: How many are we short by?

According to World Bank data, the average number of tractors per 100 km^2 of arable land in Nigeria is 6.8, compared to 26.9 in Kenya and a world average of 195.3. With just over 30 million ha of land under cultivation, Nigeria is home to somewhere in the region of 20,000 public and private tractors, though not all of these tractors are in constant working order, nor are they available throughout the season. This falls significantly short of the numbers required, even under conservative estimates. Given that one tractor can service an average of 137 smallholders in the course of a typical year (some of these may be the same smallholder twice if they double-season crop) and that approximately 60% (9.6 million) of the nation's 16 million smallholders could be legitimate potential customers for a tractor service provider, there would need to be over 70,000 tractors distributed relatively evenly across the country, and readily available for hire, before the market begins to meet potential demand. Tellingly, 100% of respondents in PrOpCom's survey of private tractor service providers believed that the supply of services did not meet the demand.

PrOpCom's point of departure was to question why more tractors were not 'out there' at present and in so doing understand why commercial tractor distributors in Nigeria were not responding to the manifest demand. Even assuming the regular functionality of the nation's estimated 20,000 tractors, and taking into account realistic yearly service provision figures and cautious levels of demand for such services, Nigeria would still have less than one-third the number of tractors it requires. Indeed tractor distributors themselves have estimated Nigeria's potential market size to be between 250–500 new tractors each month. The management of one distributor believes that his company should be targeting 1,000 tractors a year, more than three times its current sales. So, what is limiting the supply-side

response, and why was it the case that all tractor distributors were tied up in just one activity: courting government contracts?

Box 3: The state of 'publicly-run' services.

The number of tractors available for hire from Ogun state's agricultural centres epitomises the dearth of publicly-run tractor service providers across the country. In March 2009, only 36 functioning tractors were available for hire from public providers in Ogun. The far larger and more agricultural neighbouring state of Oyo is similar, with an estimated availability of 77 functional tractors. In the north, Kano state had less than 70 tractors available for public hire. Publicly-provided tractor services are generally assumed to serve less than 10% of the farmers that demand their services. Whether or not the ones that do manage to access services are the poorer smallholders is an additional concern. Whilst private hire services do exist, and out-number public hire services across the states, service shortfall remains huge.

How a farmer might access tractor services

Government buyers dominate the market for tractors in Nigeria. There are few private buyers in direct contact with commercial tractor distributors other than those representing large commercial farming operations or construction companies wishing to purchase tractors for non-agricultural purposes. Consequently, tractor distributors pay little attention to private parties demanding a tractor, real or latent. Three public schemes, all of which are comparable in their ineffectiveness, now exist whereby an interested party can own outright or hire a tractor procured and distributed through government channels:

1. **Subsidised direct sale**: Tractors are purchased from distributors by the federal government and passed through to state governments with subsidies added by both: 25% and 15% respectively. Tractors are then available to buyers for 60% of their market price, to be paid in instalments, and are targeted toward farmer cooperatives, associations and smallholder groups. However, in reality, many of these tractors remain on government premises or are sold to well-connected businessmen either for resale to 'legitimate' owner-operators (at a margin) or because they own large tracts of land themselves. Many tractors may indeed sell, second- or third-hand, for near-market rates with little benefit of the subsidy accruing to the end-user. This scheme is the most common channel for getting tractors 'out there' though in many cases, tractors do not immediately fall into the right hands. The likelihood of a smallholder getting access to one of these new tractors is thought to be minimal.
2. **Subsidised public-private partnership with bank loan**: As above, tractors are subsidised by federal and state governments to the total value of 40%. Individual or group buyers then put down a further 10% equity stake before taking out a 3-year loan to the value of the remaining 50% from the bank. The scheme has been troubled by the high risk-aversion of the bank selected by the state, the institutional shortcomings of public offices, and their deficient capacity to manage and oversee this 'semi-commercial' process. Once more, the extent to which subsidies benefit the end-buyer in this nascent scheme is marginal when the potential for over-invoicing and kickbacks have been accounted for.
3. **Publicly-owned tractors for hire**: Under this scheme, state-run agricultural centres purchase new tractors for the specific purpose of hiring them out to farmers for a fee. Again, few subsidised tractors make it to these centres and the number of tractors available for service provision is grossly inadequate. The fleet of tractors are often grounded through mechanical failure or hired on a weekly basis by well-connected individuals to be used on their large, private land-holdings. On occasion, operators take the tractors on weekly hires and provide tractor services to poor smallholders above market rates, in which case the benefit of any small subsidy is swallowed up by the operator. Further, when taking into account fuel expenses, the total cost of hiring the tractor for hourly/daily use (fee + fuel) is comparable with prices offered by private service providers, hence there is little means by which a subsidy reaches the smallholder in any and all services rendered.

Views from the field

It is not difficult to find examples of tractor owner-operators dissatisfied with existing tractor procurement channels. The Kaduna state Tractor Hiring Cooperative Society waited over two years to receive the 55 tractors for which they laid down deposits (10% of asset cost). Such deposits totalled ₦180 million (£726,000). The Ogun state chapter of the Tractor Owners and Operators Association of Nigeria (TOOAN) decided not to participate in the new federal government's tractor PPP initiative upon learning that the price, tractor model, and level of after-sales services were not to its liking.

Many owner-operators are highly frustrated by these schemes, their inefficiency and their politicisation. Examples abound of owner-operators who have had difficulties in sourcing equipment, paid full- or near-market rates, bought a damaged or soon-to-be defective tractor, or faced a wait in excess of two years after laying money down for purchase in advance.

Understanding the state of private tractor service provision

The majority of today's private tractor service providers (owner-operators) came into possession of their tractor through the subsidised direct sale scheme either directly or, less directly, as a result of one of the original recipients selling a tractor. Many tractors now in operation are in fact second- or third-hand and their condition, reliability and ability to provide quality services were found to be questionable.

In 2010, existing owner-operators (n=53) belonging to the Tractor Owners and Operators Association of Nigeria (TOOAN) in Kaduna, Ogun and Oyo states participated in PrOpCom's baseline survey. Findings were as follows:

- **Age**: Two-thirds of tractors in service during the time of the survey had been purchased before 2000. Nineteen percent of the tractors had been purchased two decades previously. Tractors were, on average, eight years old at the date when owner-operators first came into their possession. Only 13% of tractors were brand new and deemed unlikely to have had a previous owner.
- **Reliability**: A proxy for understanding the durability and staying-power of the machinery being utilised determined that 40% of owners required at least four services a month. If implements are defective or flawed in their design, then service quality also suffers.
- **Quality**: Of the sample, 34% tended to only perform basic ploughing services (i.e. no secondary tillage), which in itself would be unlikely to bring about any productivity increase; 45% performed both ploughing and ridging, which may confer some marginal benefit to yield enhancement through improved (possibly optimal) spacing between standing crops. Of those surveyed, 21% offered harrowing services alongside ploughing, but only one of the 53 operators would routinely perform ploughing, harrowing and ridging services—a combination that would benefit yield, all else being equal. In spite of these findings, however, later field visits confirmed that some TOOAN-associated operators (in Zaria) had very low comprehension of the most fundamental cultivation tasks—including the basics of setting up a plough or 'opening' a field—and, with only few exceptions, had little knowledge of the process of quality tillage and seedbed preparation.

Getting to the root of the problem

The pervasiveness of the government, the principal buyer, in the Nigerian tractor market has created a damaging split between tractor distributors and tractor owner-operators, disrupting what, in other less dysfunctional environments, would be a conventional transactional relationship. Where the government has placed itself as an artificial 'middleman,' tractor distributors have oriented themselves solely toward capturing the orders of large government buyers. They neither invest in diversifying their customer base by developing more tailored, private sector-oriented marketing and sales functions, nor do they have appropriate product and service offers responsive to end-user demands and capabilities. Tractor distributors have become distant from the end-users of their products, accustomed as they are to the convenience and comfort of the aforementioned public procurement schemes.

This detachment, and the erosion of entrepreneurial instincts, is understandable in certain respects. Government buyers have offered them something that the individual tractor service provider could not: bulk purchase and upfront payment. Given that the government is often not the end-owner, nor end-user, of the tractor purchased, they have also been far less demanding than a private commercial customer would be in terms of the product and service offered by the distributors.

Tractors are expensive and the ability of potential service providers to afford one outright is rare. From the distributors' perspective, does it make sense to court one large centralised order, or chase more demanding, disparate customers with less capital? Against this background, a series of interconnected issues unfold:

1. **Financial sector risk aversion**: Commercial banks have not developed appropriate financing products to cater to individual private buyers of heavy machinery in the agricultural sector. Indeed, banks deem such investments highly precarious and risk-laden. Such risk aversion to commercial agriculture has not been assisted by the recent shake-up of the banking sector, where CEOs of several banks were removed from their positions. Compounding this, there has been very little demand for products to serve a tractor sector set in its ways, and hence innovations, particularly around loan- or lease-financing of such equipment, are scarce. The Central Bank's Agricultural Credit Guarantee Scheme (ACGS) and other risk-sharing systems for agricultural lending were rarely used.
2. **Infancy of private buyer coordination and representation**: Tractor owner-operators do have representative associations at state-level—i.e. chapters of

PrOpCom tip

Intervention manager at PrOpCom, Tunde Oderinde, reflects on the need for facilitators to immerse themselves in their sector: "The state of chaos within the market required me to understand all of the unknowns and begin to view the market through the eyes of an investor. I received technical support from an external consultant, which was helpful in equipping me with useful knowledge of tractors (products, implements, usage) and the wider tractor market (marketing, business incentives and so on)."

the Tractors Owners and Operators Association of Nigeria (TOOAN)—and at sub-state level—i.e. tractor hiring cooperatives and associations—however they don't consider it their role to approach commercial tractor distributors as a united front and advocate for direct sales. They are small organisations with little managerial capacity, acting as a shop-window for smallholders to approach and hire services from, or a closed cooperative that shares machinery between members only. The absence of buyer coordination among private service providers has resulted in large tractor distributors ignoring such groups, considering them an insignificant market.

3. **Underdeveloped product and service response aimed at tractor operators**: A well-functioning commercial relationship between tractor buyer and seller would normally encompass operator training on maintenance and use, after-sales service, and information on the terms and conditions of sale. The distributor-government-user disconnect has demonstrably contorted this norm. The following 'gaps' in the distributor-government transaction feature heavily:

   - Maintenance, usage, and implement-training does not occur because most service providers receive their tractor some years after the distributor originally sold it to state government, and often, via previous owners. Whilst some distributors claim that such services are part of their offer, the nature of the disconnect means that most end-owners would not have received any such training.
   - Distributors do not regard the downstream sales of spare parts and services as a priority. The two tractor distributors assessed had no substantive operational network outside of their home state, and where service centres (in-house trained mechanics) and front-line franchised mechanics existed, they were too small in number, too narrowly distributed, and in cases, not mobile enough to provide a high quality support service to owner-operators spread across the country. The centralised storage of spare parts at distributor premises also causes owner-operators delays in the sourcing of appropriate replacements and, in the long-run, will reduce the operational lifetime of the machine as untrained mechanics improvise parts in the meanwhile and underlying weaknesses go unresolved.
   - Distributors do not invest in promoting tractor implements beyond the standard 'package' that comprises most government sales—a disc plough, disc harrow, disc ridger and a trailer. Government channels do not offer any choice, hence the notion of promoting the sale of a greater variety of implements is unfamiliar, despite the standard package being less adequate for the agronomic task at hand.
   - Though available and part of the agreement between distributor and state government within existing state-run procurement schemes, knowledge of the warranty that covers tractor purchase (against transmission, hydraulics and gear malfunction) for the first three services seldom reaches the end-owner or service provider. Most remain unaware that their tractors may be covered by a warranty, what the procedure is to redeem the warranty, and what it covers in the event of a problem with the machinery and/or implements owned.

Box 4: It never used to be this way.

In the 1970s, when Nigeria had a vibrant agro-industrial complex, sales by various companies totalled in excess of 3,000 tractor units per annum. The companies all had extensive networks of sales and service outlets throughout the country, and the focus of operations in these regional dealerships was to provide maintenance services and spare parts for the full range of equipment sold. The range of equipment offered for sale was wide, covering tillage and processing equipment. Companies also provided extensive training in all aspects of agricultural equipment maintenance, operation and care. The focus of the business model in those days was to sell equipment at a small margin but make profits through the sale of spares and services—a model completely contrary to what distributors employ today. [PrOpCom Report, by consultant Trevor Bullen]

3. Planning for change

It was clear that PrOpCom's interventions in the tractor market needed to focus on stimulating a new sales channel, better able to directly equip private tractor service providers with new, functional tractors on demand. The channel would allow private tractor owner-operators greater choice, more ownership over the transaction and, importantly, an alternative to the dysfunctional state-run schemes upon which they had become dependent. It was important that PrOpCom's strategy moved towards the greater commercialisation of the sector, not necessarily replacing government-led modalities, but providing current and potential owner-operators with plurality of procurement and distribution options. Significantly, the new channel would not merely entail the transfer of tractor ownership from distributor 'X' to service provider 'Y', but include the necessary product and service offers that would ultimately support tractor owner-operators to continue to deliver quality services to smallholders. In essence, this would entail a new business model for the distributor, premised on a re-orientation of how distributors view their customers.

For PrOpCom, developing an approach to the principal players in the tractor market meant not just identifying the aspects of the tractor sales system that needed to work differently, but also what market players needed to do differently; what

existing incentives—commercial or otherwise—could be built upon, and how investments made by both buyer and seller could be mutually profitable, and as a consequence, beneficial for the smallholder.

Developing the new offer

A private sector sales model was proposed that offered quality after-sales services—both built into the purchase, and available as ancillary fee-based services. Such services would comprise training on tractor maintenance and use, in order to increase the longevity of the tractor and equipment purchased, and would form a necessary pre-condition on the transfer of ownership to the operator. Further, all equipment would be insured and covered by an after-sales warranty to re-assure service providers. Service providers would be made fully aware of the terms and conditions of the warranty, and the process to follow in the event of equipment failure.

The existing service centre/agent model would have to be decentralised in order to localise the distributor's response to demand—for spare parts, repair services and new implements—from tractor owner-operators. This would have two prime benefits. First, it would complement the insurance and warranty agreement, giving surety to service providers that in the event of a breakdown or failure, not only would costs be covered, but the response time to repair the problem—a function of qualified mechanic and spare part availability—will be improved, allowing tractors to be operational for as much of the season as possible. Second, the greater availability of implements allow tractor service providers to offer complementary services to farmers, to evolve their business model and, possibly, in the medium- to long-term develop 'total mechanised solution' packages for smallholders. Crucially, the offer of new implements would have to be accompanied by training in their usage and application in different soil and cropping scenarios.

Taking a strategic approach: focal areas in developing a private sales channel

Given the nature of the systemic constraints, tractor distributors would need convincing that focusing on smaller customers, and the investments in organisational restructuring that this implied, were worthy of attention. For this, two keystone market functions required redress before distributors would take interest, and indeed, before a private sales model along the aforementioned lines could be viable. This involved bringing three parties to the table, capable of providing solutions to the issues of buyer coordination and financing individual purchases.

1. **Buyer coordination**: PrOpCom required a means of demonstrating to distributors that selling directly to individual tractor service providers was a market that had some semblance of organisation, and a degree of capacity to orchestrate and enable buying in bulk. The presence of TOOAN in important agricultural states would give tractor distributor Springfield Agro a conduit through which they could reach out to individual buyers en masse, and a means of targeting promotions and the accompanying after-sales support services in a manner that made commercial sense to them. PrOpCom needed to facilitate a commercial relationship between Springfield Agro and state-level TOOAN bodies in order to expedite Springfield's courting

Box 5: Forming partnerships with key players.

PrOpCom's initial engagement with the tractor market required partnering with three market players: a tractor distributor, Springfield Agro Ltd; a private sector tractor owner-operators association, TOOAN; and a commercial bank, First Bank of Nigeria. Choosing partners was a careful process for both PrOpCom and the tractor owner-operators themselves, necessitating a nuanced understanding of each commercial player's interests, capacities, incentives and relations in the sector.

Springfield Agro Ltd is a private company involved in the marketing of Mahindra & Mahindra branded tractors and implements. The government has historically been its main customer, but sales were in decline and often highly unpredictable. Springfield Agro at the time sold less than 300 tractors each year despite having targets ten times greater than that amount. The stock level of tractors was high in the assembly plants and management was often frustrated with deals that fell through due to changes in state administration and/or protracted negotiations. Springfield Agro was willing to experiment with developing a private channel and indeed had made some attempts to cultivate more direct, private sales in the past.

First Bank of Nigeria PLC is a large commercial bank with a commitment to agricultural financing. Its large network of branches was appropriately positioned for easy access by agricultural enterprises in both peri-urban and rural, as well as urban settings—a primary concern of tractor owner-operators. First Bank hoped to develop a viable financial product through its involvement in the proposed pilot tractor scheme, which it could eventually roll out to many other states nationwide.

Tractor Owners and Operators Association of Nigeria (TOOAN) is a membership organisation with state chapter representation in Ogun, Oyo and Kaduna states (founded ahead of the pilot). Tractor owner-operators belonging to TOOAN sought access to finance that would enable them to acquire new tractors and implements in order to build their businesses. Owner-operators were largely dissatisfied with the current procurement options available.

of potential buyers, and to offer TOOAN senior executives (committees) the opportunity to develop a new offer for their members.

2. **Financing**: The other binding constraint would be the finance necessary for owner-operators to make the purchase. Under public schemes, distributors like Springfield Agro would receive payment in full for multiple machines at a time, however, individual TOOAN members would not have the capital to buy a tractor outright and hence the issue of financing proposed a significant barrier to getting distributors interested in selling directly to private owner-operators. With an established relationship between Springfield Agro and TOOAN, and the potential for a high number of orders, it was anticipated that a commercial bank would be interested in developing a suitable lease-finance product, extended through state-level branches, with the representative TOOAN body ensuring payback from buyer members. Given the risk-aversion among commercial banks to providing agricultural loans it was expected that the three parties could secure the involvement of the Central Bank of Nigeria's Agricultural Credit Guarantee Scheme (ACGS).

A results chain illustrating PrOpCom's work in the sector is contained within Annex 1, schematically outlining the sequential cause-and-effect steps that characterised PrOpCom's strategy and vision.

Intervention targets

In early 2010, PrOpCom, together with its private sector partners, had developed a vision for Springfield Agro to sell 500 tractors to TOOAN members nationwide, beginning with a 50-tractor pilot across three states to determine the viability of the new model proposed.

- **Farm-level outcomes**: The pilot directly targeted 3,150 smallholder beneficiaries (8.5% female), predicting that each tractor service provider would service an average of 63 smallholders ahead of planting each season. All beneficiaries would benefit from the relatively lower costs of mechanised land preparation as opposed to manual labour, though cost savings were expected to be higher in the southwest (₦3,900/ha/season) (£16) than in the north (₦2,900/ha/season) (£12). For farmers in the north, who often cultivate crops on half of their land in the off-season too, cost savings could amount to ₦8,700/year (£34).

  The improved availability of tractors was also predicted to encourage 20% (n=630) of farmer beneficiaries to cultivate crops in the off-season where this would otherwise not have taken place. The gains would vary from farmer to farmer depending on the crop cultivated, however, taking the average of two commonly grown crops in the off-season (melon and rice), PrOpCom calculated that the additional off-season farming activity each year, attributable to the improved presence of tractors, could increase profits by up to ₦54,000 (£215) for these farmers. Further, the additional land under cultivation would create employment for labourers involved in off-season weeding and harvesting activities; a number estimated at 245 full-time equivalent jobs.

- **System-level outcomes**: The pilot intervention would also result in 100 tractor service providers being trained in tractor maintenance and use, and six mechanics trained (two in each pilot state) by the tractor distributor to service any newly-purchased tractors that may incur damage and require spare parts.

  Crucially, if the business model for the 50 tractor service providers were profitable, impact at the farm-level—in the form of cost savings and revenue increases through additional second-season farming—would endure. Hence, the benefit would accrue not just once, but year-on-year.

4. How PrOpCom facilitated change

Pivotal to PrOpCom's approach in the tractor sector was a commitment to ensuring that any support given was discrete and strategic: discrete in the sense of being one-off, and strategic in the sense of being both catalytic and bound to a definitive exit plan. PrOpCom wanted to guard against market players growing comfortable with an aid-funded presence in the sector, i.e. avoid using programme resources in a manner that would distort the commercial incentives of private players to internalise the procurement, distribution and service functions of the new model. In essence, the idea was for PrOpCom to work itself out of a job.

In keeping with the discrete and strategic nature of support given, PrOpCom's approach has continuously kept pace with the developments in the market. The "pathway to systemic change" schematic (Figure 1) attempts to capture the 'ever-changing' approach of the facilitator throughout the programme cycle, illustrating the diversity of intervention actions required to elaborate, trial, re-design, roll-out, ingrain and augment a new way of doing business. The structure of this section will follow that which is depicted: (i) entry, (ii) pilot and adaptation, (iii) widening outreach and (iv) deepening impact. In doing so, the notion is to acknowledge the 'art' of facilitation, rather than provide a chronological and linear account of implementation milestones.

Entry

Lasting sector-wide change is dependent upon important market functions being adopted by those public and private players with the keenest interest in their upkeep and improvement, and the capacity to continue performing them. These functions often materialise as a new set of roles and responsibilities for such players—for example, banks now bundling insurance in with their lease-finance products; or tractor distributors decentralising the stocking of spare parts by franchising a network of regional service centres. Knowing

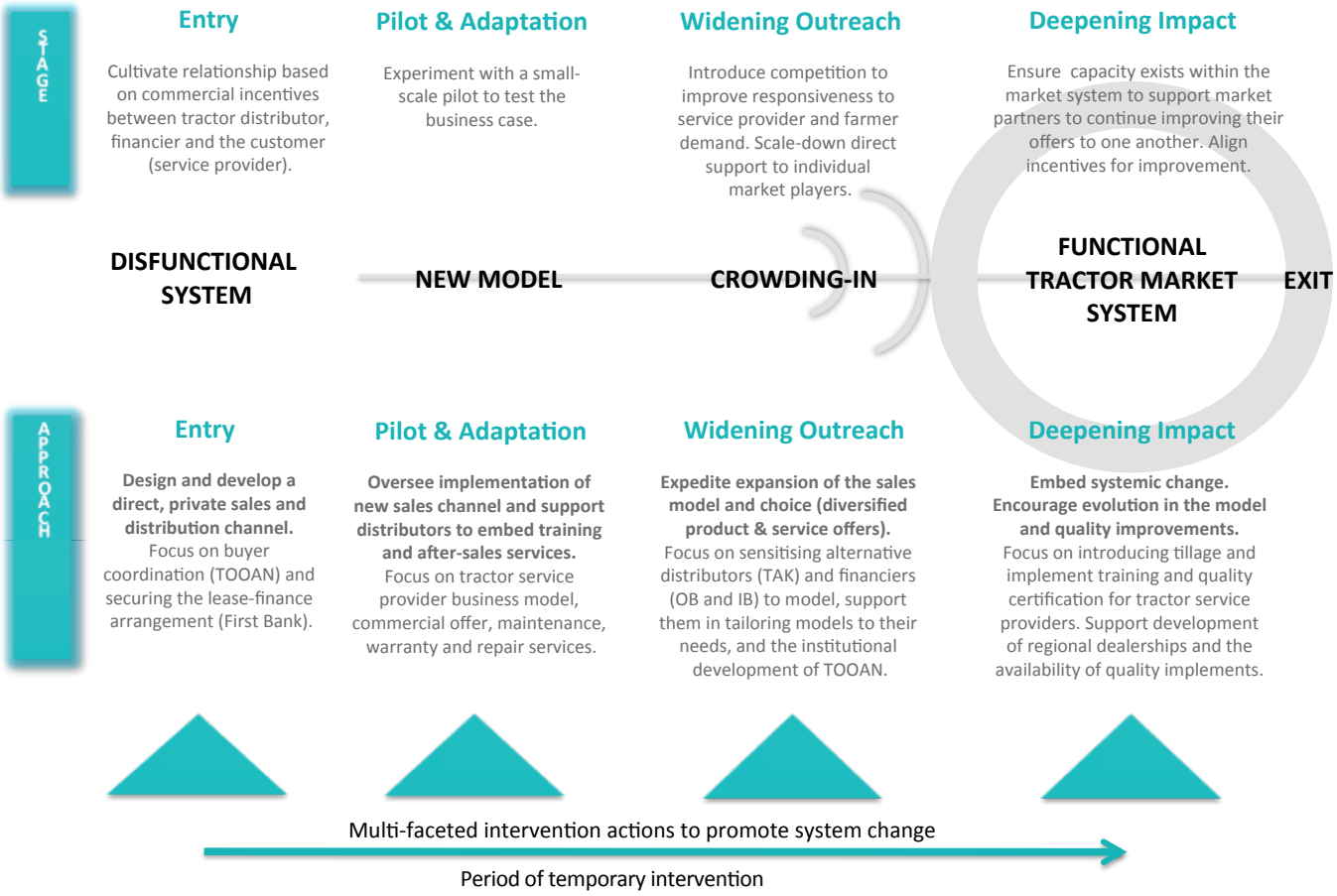

Fig. 1. Annotated "Pathway to Systemic Change". Source: The Springfield Centre for Business in Development Ltd (2011).

and establishing relations with partners who are, first, willing to change or experiment with a new way of doing business, and second, capable of changing, will therefore determine the success of the facilitator's engagement with the market.

Effective relations: selecting partners

At the outset of the intervention, PrOpCom needed to quickly identify the players in the market with whom a fruitful relationship could be fostered. If expanding private provision of tractor services was the vision, then identifying existing private players dissatisfied with government-run schemes was a sensible starting point. These players would have the most to gain from the development of such a system and the commercial motivation to participate in piloting a new model. In conversation with state agricultural ministry staff, PrOpCom was pointed toward a collection of private service providers in Igbogila (Ogun state) who were, in fact, members of a self-organised group, professionally registered as the Tractor Owners and Operators Association of Nigeria (TOOAN).

The discovery of TOOAN not only provided PrOpCom with a semi-organised market partner, representative of the players that would ultimately deliver services to the poor, but it also opened the door for PrOpCom to better understand the existing state of private service provision across the country on an aggregate level. The next step involved the PrOpCom team spending time nurturing relations with TOOAN representatives in Ogun and Oyo states; sketching out provisional plans for how distributors and banks could be engaged. Importantly, it was TOOAN that then took the lead in selecting and approaching these stakeholders, with counsel from PrOpCom. This early configuration of roles between TOOAN and PrOpCom served as an indication to later partners that TOOAN was leading this process and making decisions grounded in the commercial interests of its members; demand was selecting supply.

The shortlist of preferred distributors was developed by TOOAN members themselves after state chapters for Oyo and Ogun polled service providers to determine their tractor model preferences based on affordability, quality and reliability. The Mahindra 60HP 4-cylinder model was agreed upon; the sole distributor of which was Ibadan-based, Springfield Agro Ltd. The preferred financier—First Bank Nigeria—was a commercial bank to whom most, if not all, service providers had easy access through local branches.

Getting the pilot off the ground: the art of securing credit in Nigeria

Within the month, TOOAN, Springfield and PrOpCom had developed an outline for structuring the proposed private lease-financed scheme with the bank. It was TOOAN, under PrOpCom's counsel, that then opened discussion with

PrOpCom tip

"It is important to choose a partner whose interests fall in line with the programme's own interests, however, how do you deal with a partner who has the same interests but different expectations from the relationship? Their willingness to invest and share the cost brings with it the comfort—for the programme—that partners will continue to invest in such a model after the relationship with the programme ends. To get this to happen, programmes must demonstrate the business opportunities and profitability locked up in the constraints within the market and offer appropriate business consulting support and technical assistance to help partners take advantage of these. These are the signals and incentives that risk-averse private players actually respond to." Tunde Oderinde (Intervention Manager, PrOpCom)

First Bank, communicating the bare bones of the business idea in a formal proposal, highlighting the profitability of land preparation service provision, the viability of such an enterprise, and the ability for funders to recoup investments swiftly, especially during peak season. With the intention of both formalising relations between the parties concerned, and tempering the risks associated with an untested venture, PrOpCom chaired the drafting of a Memorandum of Understanding (MoU) between TOOAN, Springfield, First Bank and the programme itself. The MoU required players to, among other supporting obligations, commit to a small-scale pilot involving the financing of 50 tractors, whereby if successful, the MoU would expand to cover the delivery of up to 500 tractors to interested TOOAN members under similar conditions. In preparation for the 50-strong pilot, TOOAN took the lead in mobilising 50 service providers in Ogun and Kano states (some existing, some new), informing them of the expected terms of the lease, and determining their ability to put down the required equity contribution.

With legal terms agreed, the MoU began to encounter resistance from the bank's commercial department, prompting TOOAN, Springfield and PrOpCom to 'shop around' for more willing financiers. Discussions were held with several potential alternative funders, however, it was soon evident that the concerns held by First Bank were mirrored by financial institutions across the country. Banks were operating in a comfort zone unable to accommodate or respond to the commercial endeavour proposed. Neither First Bank nor its competitors were willing to commit funds without empirical evidence of the model's previous success and/or the guarantee of having 100% of any losses incurred, reimbursed under the exceptional approval of the Central Bank (CBN).

The depth of risk-aversion among banks was alarming, presenting a potential deal-breaker. PrOpCom responded

Box 6: Lease-financing model for the Pilot-50.

After much negotiation and 'goalpost moving', the final risk-sharing agreement came into being in June 2010. The intricacies of the agreement were necessary to overcome the risk-aversion of banks to 'pioneer financing' in the agricultural sector. Risk-sharing has circumvented concerns over legal enforcement and the ability to resolve contractual disputes, and has been a keystone achievement in PrOpCom's facilitated development of a new, better functioning system for commercial tractor sales. The terms and conditions of the risk-sharing agreement were as follows:

- **First Bank Nigeria**: Provides a loan of ₦2.98 million (£12,000) (80% of the agreed ₦3,725,000 (£15,000) selling price between Springfield Agro and TOOAN). This loan has a repayment period of 24 months and an interest levied of 16.5% (NB. inflation is approx. 10%).
- **Tractor service provider**: Deposits an upfront equity contribution of 20% of the asset's selling price into an individual account in order to begin the lease-financing arrangement and secure the ₦2.98 million from the bank. In the pilot, the value of this contribution came to ₦745,000 (£3,000). The repayment rate was agreed at a flat-rate of ₦146,000 (£589) per month. Springfield Agro is then paid ₦3.725 million, up front by First Bank.
- **Tractor Owner and Operators Association of Nigeria (TOOAN)**: Serves as the registered institutional body coordinating the transactions among tractor lessors, First Bank and Springfield Agro. Its role includes the coordination of the tractor owners' equity contributions and loan applications, maintaining a central record of repayments, and liaising with lessors over repayment schedules and any difficulties that may arise. Whilst the bank would have legal ownership of the asset in the case of default, TOOAN would support First Bank by assisting in the repossession and reallocation of the asset to another association member. Such a member would buy out the equity contribution of the defaulter and resume on the existing repayment schedule. In the event of reallocation not being possible (total default), TOOAN would commit to expediting the sale of the tractor on behalf of the bank.
- **Springfield Agro**: Provides a 5% recoverable equity to the bank at the time of purchase.
- **Central Bank of Nigeria**: Under the Agricultural Credit Guarantee Scheme, the CBN would provide a guarantee to First Bank for 75% of the outstanding balance of the securitised asset, up to a maximum of ₦1 million (£4,020)—in case a member defaulted and TOOAN was unable to reallocate the asset to another member.

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• **PrOpCom**: Provides a cash-backed guarantee to First Bank to the value of 20% of the tractor's selling price. This is claimed by First Bank in the event of continued failure to repay the loan (default).

The risk analysis demonstrated to First Bank that they would avoid any and all losses if service provider repayments remained on track for the first three months of the 24-month payback period. Under the above agreement, the exposure for these three months would, in fact, be a mere 2.2%, 1.3% and 0.4% of the overall loan amount, respectively. In the absolute worst case scenario—i.e. all 50 pilot lessors defaulting in the first month—the bank would stand to lose just ₦3,335,650 (£13,350) (see Table 1).

by supporting partners with an expanded, more detailed set of financial analyses to augment the original business case. In-depth projections of cash-flow (based on realistic interpretations of profitability, by crop and by season), profit and loss, and a month-by-month risk analysis were provided to highlight the level of bank exposure under different repayment scenarios should funding go ahead. The proposed risk-sharing agreement was shored-up yet further with the securing of a partial CBN guarantee for up to a maximum of ₦1 million (£4,020) under the Agricultural Credit Guarantee Scheme. With the new body of evidence put forward, the involvement of CBN, and a firmer line of negotiation, the MoU for the pilot-50 was signed with First Bank in June 2010, some 4-5 months after talks began.

Given that the financial modelling was predicated on the tractor's ability to remain operational throughout the term of the loan period, there was a renewed commitment among market partners of the need to foreground other functions that support the new model to work effectively—insurance and warranties, owner-operator training, and the training of mechanics to offer quality, tailored repair services and order appropriate spare parts.

Agreeing on partner roles and contributions

As it was with the lease-finance arrangement, it was also necessary to establish an agreement with partners that tied down the roles and responsibilities incumbent upon each for the commercial and developmental activities of the pilot, and who would bear the associated costs. Activities fell under three core groups:

1. **Enabling service providers to buy tractors and sell tractor services to farmers**: TOOAN, as the representative body for service providers would be responsible for selecting a preferred tractor distributor and financier with whom to partner for the pilot. Once terms were penned with both, TOOAN would lead on identifying qualified and creditworthy service providers among its members eligible to participate in the pilot and support service providers in their applications. Prior to disbursement of the loan, TOOAN state chapter committees would elect a 'loan taskforce' assigned with the responsibility of monitoring and documenting member repayments, following-up late payments, and mediating the relationship between service providers and the participating local branch of First Bank. Springfield, as distributor, would supply the tractor and equipment to the service provider upon receipt of full payment, provide training to member service providers (owners and operators) on basic use, maintenance and viable business plans for commercial service provision, and communicate the terms of the warranty. Springfield would also be responsible for the creation of brand visibility, basic promotional efforts, and the tractor service programme launch. First Bank Nigeria would set up and administer the bank accounts of participating service providers within which they deposit their 20% equity contribution and their monthly instalments. First Bank would also be responsible for insuring the assets against theft and damage for the duration of the lease.
2. **Establishing (and strengthening the capacities of existing) tractor service centres**: Once existing service centres and potential sites for new ones had been scoped and catalogued by Springfield and TOOAN, Springfield chief mechanics would identify service centre capacity gaps, their needs, support the reconditioning of service centre equipment and machinery as appropriate, and monitor the availability of essential parts and supplies. Springfield would then be responsible for training service centre technicians (mechanics) on the maintenance and repair of their Mahindra-brand tractors and distributed implements. It was also to provide one mobile service van to be located in one of the participating states to facilitate call-out repairs.
3. **Sensitising farmers on the benefits of mechanised services and the need to organise**: Though demand for mechanised services was high, a degree of awareness-raising was required to draw attention to the newly-available services, underline the benefits of utilising mechanised services, and inform smallholders of how and where they could access such services. Springfield employees and contracted agronomic experts would develop and deliver sensitisation materials and a training course for smallholders, advising on the benefits of using tractor implements for land preparation and the importance of coordinating 'bulk' tractor hire within the community to attract the limited number of service providers.

In addition to PrOpCom's basic offer—technical assistance, sectoral analysis, business model development, and consensus building among stakeholders—market partners could also avail financial assistance via a small challenge fund that sought to provide strategic and flexible grant support to make possible

Month	Risk on the loan (remaining loan balance uncovered as % of loan approved) at . . .				
	. . . 20% EC + 20% CB	. . . 30% EC + 10% CB	. . . 30% EC only (no CB)	. . . 35% EC only (no CB)	. . . 40% EC only (no CB)
1	2.2% (₦66,713)	2.7% (₦70,014)	6.3% (₦163,139)	4.9% (₦118,228)	3.3% (₦73,316)
2	1.3% (₦39,938)	1.8% (₦46,586)	5.4% (₦139,711)	4.0% (₦96,473)	2.4% (₦53,235)
3	0.4% (₦12,795)	0.9% (₦22,836)	4.4% (₦115,961)	3.1% (₦74,419)	1.5% (₦32,877)
4	-0.5%	0.0%	3.5% (₦91,884)	2.2% (₦52,062)	0.5% (₦12,240)
5	-1.4%	-1.0%	2.6% (₦67,476)	1.2% (₦29,397)	-0.4%
6	-2.4%	-1.9%	1.6% (₦42,732)	0.3% (₦6,421)	-1.3%
7	-3.3%	-2.9%	0.7% (₦17,648)	-0.7%	-2.3%
8	-4.3%	-3.9%	-0.3%	-1.7%	-3.3%
9	-5.3%	-4.9%	-1.3%	-2.7%	-4.3%
10	-6.3%	-5.9%	-2.3%	-3.7%	-5.3%

Table 1: Bank exposure analysis presented to potential financiers[2]

the successful implementation of new ideas and buy-down risk. PrOpCom set ₦16 million (£64,000) aside for the pilot-50—considered to be 50% of the total approximated cost. Payments were to be staggered, paid in instalments ahead of Springfield expenditure (60%) and upon achievement of pre-agreed milestones (40%). These programme funds were to be called upon to prove the worth of developmental activities and commercial activities new to Springfield, as well as to absorb some of the overall burden of risk associated with new ventures.

Pilot and adaptation

Prior to commencing the pilot, PrOpCom and partners were dealt a blow that posed a significant challenge to meeting the terms and conditions of the MoU agreed. Service providers from Kano state pulled out of the pilot, opting to invest in an alternative state-run tractor delivery scheme. This prompted all parties to reconvene and plan a response. The decision was made to move the pilot to nearby Kaduna state; a decision that necessitated arranging for the transfer of responsibilities (loan processing and ACGS coverage) from state-level branches of First Bank and CBN in Kano to Zaria, Kaduna. The MoU was also modified, as were the terms of the grant agreement between PrOpCom and Springfield.

Thirty-nine new tractors available

The delays caused by the last-minute alteration to pilot state location pushed back the processing of loan applications. Consequently, the decision was made to accept all applications submitted to the bank by end-August 2010; only applications received before this date would qualify for PrOpCom's cash backing. The delays associated with both securing the risk-sharing agreement and the withdrawal of Kano-based service providers had crucially resulted in tractors only becoming available for lease-purchase after the main agricultural season.

By the end of September 2010, 39 Mahindra tractors (and ploughs) had exchanged hands; fourteen in the southwestern states of Ogun and Oyo, and twenty-five in the northern state of Kaduna. Each of these tractors was covered by a 24-month (or 1,500-hr) warranty by Springfield and was also insured

Box 7: Responding to an unexpected change of plan.

In 2008, pre-dating PrOpCom's activities in the tractor sector, the state of Kano had declared an interest in establishing a public-private partnership arrangement for the disbursement of tractors across the state. The next year, PrOpCom scoped Kano state with its proposed initiative for the development of a private sales channel involving private tractor distributors and private tractor service providers belonging to state TOOAN chapters. After entertaining discussions for the first half of 2010, the state suddenly withdrew its support for the initiative in July 2010, deciding instead to pursue its own subsidised lease arrangement involving a 40% joint federal and state government subsidy, a 10% equity contribution from the beneficiary, and a lease contract with Unity Bank to cover the remaining 50% of the tractor cost. Eighty tractors (SCOA, John Deere and FOTON) were to be purchased imminently. Without state support for, and endorsement of, the PrOpCom initiative, the decision was made to pull out of Kano state when the seven intended service providers withdrew from the scheme. Running parallel programmes would be unfeasible and would distort TOOAN member incentives to participate in an unsubsidised private scheme where they would eventually pay for 100% of the cost of each tractor, rather than 60%. **Section 5 of the case study revisits the Kano PPP scheme, comparing results with the PrOpCom pilot.**

with NAIC through First Bank. One hundred and twenty-five owner-operators—including the 39 new tractor owners—were trained by Springfield on the business model underpinning commercial service provision, basic operating techniques and maintenance requirements. Twenty mechanics attended a 3-day residential training workshop run by Springfield's Mahindra-trained, in-house mechanics, three of whom sponsored their own attendance, and one of whom was sponsored by TOOAN itself.

Sensitisation workshops were also held, with 566 farmers (527 male, 39 female) participating across the four different local government areas of Kaduna state. In Ogun and Oyo a further 484 farmers (472 male, 12 female) were educated on the benefits of using mechanised services and the importance of coordinating hire for those within the same locale (or using agents to do so). To do this, Springfield contracted experts from the International Institute of Tropical Agriculture (IITA) in the southwest and from the University of Zaria in the north, with the support of PrOpCom.

Analysing the pilot: application of learning

Pilots are experiments designed to provide a basis by which programmes can redress design weaknesses and refine implementation approach. The 50-tractor pilot advanced PrOpCom's understanding of both how the new model could be improved to deliver better results at farm-level; and how arrangements between PrOpCom and market partners could be reconfigured, or subtly adapted, to ensure that dependency habits would not develop.

- **Revision required for basic owner-operator training**: Post-training field assessments observed that in some instances, the way in which service providers were operating their equipment was sub-optimal and would hence confer little benefit to the farmer hiring mechanised land preparation services. Teaching materials were revised to focus more prominently on correct tractor and implement usage, ensuring that more than just the commercial business case and simple maintenance advice is communicated and taken on-board. PrOpCom engaged a consultant, through Springfield, to upgrade the training curriculum to encompass further modules on what service providers could expect to see as a result of their operations, and a briefing on the different implements available, their purpose and proper usage. The training curriculum was an open resource, and would be shared with other tractor distributors as their interest in the new model grows.
- **Improving the implement options available within the existing package**: Service providers have need of a wider range of implements in order to offer new, differentiated services to farmers. A simple ploughing operation, particularly if badly performed, will not deliver any productivity benefit to the farmer. To achieve increased land productivity, a range of tractor implements are necessary for deployment, and requirements for these will differ depending on soil type, health and cropping patterns. The new private sales channel package offered a tractor with a plough and was, indeed, less diversified in its product offer than the government package—a decision made largely to keep the value of the loan required in check, and encourage uptake. However, choice was not yet a feature of the current package, nor were alternative implements readily available across the different states—excepting the sporadic availability of second-hand salvage-repair products—that would allow tractor service providers to take the initiative and invest in new implements as they saw fit. Sourcing high quality, new implements would likely require importation, and the nurturing of new relationships between Nigerian-based tractor distributors and implement manufacturer-suppliers overseas.
- **Adjustments required to the structuring of loan repayments**: Some service providers experienced difficulties in meeting the flat-rate monthly repayment schedule. Given the seasonality of work and the late distribution of tractors—which resulted in the peak season being missed—many tractors were far less operational from October/November onwards, particularly in the southwest. The combined effects of this late disbursement and the seasonality of work (compounded by a one-dimensional, ploughing-only business model) were reportedly problematic for some service providers. PrOpCom decided to support banks to institute stratified repayment rates to better accommodate the differences in service utilisation throughout the agricultural calendar (seasonality effects).
- **Moving towards more appropriate cost-sharing**: Owner-operator training, the training of mechanics, and farmer sensitisation were essential functions required for sustaining supply-side services and augmenting demand. Moreover, tractor owners required business management training in the areas of accounting, managing loan repayments, and searching for business opportunities throughout the agricultural calendar. All these capacity-building and awareness-raising efforts were necessary to give tractor service providers the best chance of succeeding in their new business endeavour, which should be in the interest of both the banks and the distributors. On reflection, PrOpCom contributed too heavily toward funding these embedded services that must, in the future, either encompass part of the distributor's commercial deal or be redefined as a shared responsibility between a set of market partners with vested interests. There was a risk that distributors would fail to see the need for such capacity-building endeavours, unless programme support diminished in these areas. In building upon the pilot, PrOpCom would ensure that stakeholders have bought into the commercial argument for providing such embedded services and, would, as competition is introduced, negotiate firmer terms and majority cost contributions in this regard.
- **Providing the right incentives through appropriate payment mechanisms**: In the next stage, PrOpCom

would rein in its advance payments system used in the pilot. There was a concern that the private sector was growing accustomed to receiving and spending aid money. Distributors would be called upon to invest their own money into further developing the model, and claim reimbursement from PrOpCom around pre-agreed items of expenditure up to a commonly understood ceiling. This would allow distributors to get used to the commercial reality of developing private sales channels and budget accordingly.

Widening outreach

The process of scaling-down support offered to initial partners and re-configuring support towards other interested stakeholders (service providers and otherwise) is often a tricky issue for a market development programme. Programmes can easily form 'unhealthy attachments' to the partners who took the early risk to make things happen when no-one else would. It would be an error, however, to leave tractor service providers tied into relationships with just one distributor and just one bank, as over the course of time, such relations can turn sour and, in the worst case, cause the model to grind to a halt. A healthy market characterised by competition between both distributors and financiers will help to embed the new tractor-procuring model within the system. The model is likely to take on a life of its own, as both tractor vendors and finance offers evolve to attract buyers and become more responsive to consumer demand.

Crowding-in 'alternatives'

PrOpCom support shifted focus over the latter stages of intervention. With the model proven, PrOpCom investments were redirected toward new activities that accelerate expansion, and away from undertaking and/or funding activities that merely replicated the work involved in getting the first fifty tractors signed-off. With evidence of a functional private finance and distribution model with high repayment rates, PrOpCom set about re-connecting with market players who were previously unwilling to get involved, to explore how the model could be taken to the next level. In responding to the lessons of the pilot, PrOpCom aimed to develop a second-generation model, with a new configuration of financial service providers and tractor distributors interested in competing with First Bank and Springfield Agro respectively. Activities with individual market players at this stage of implementation would necessarily be lighter-touch and directed solely at encouraging the copying and uptake of the model.

- **Re-engaging with competing market players**: Slow to roll out its "*FirstTrac*" product to branches nationwide, Springfield was eager to avoid over-reliance on First Bank as the only financial service provider. The priority for scaling-up was to get new commercial financiers on board, and whilst PrOpCom had been developing a working dialogue with Oceanic Bank over the course of the preceding months, verbal interest and buy-in were not transitioning to written commitments. It was evident that a change in PrOpCom's awareness-raising tactics was required. In March 2011, PrOpCom publicly aired a short documentary film showcasing the pilot phase approach and achievements, inviting select stakeholders from different banks, tractor distributors and farmers' associations.

  In May 2011, PrOpCom, together with Springfield, arranged a study tour to India for bank officials representing five banks that demonstrated the keenest interest following the screening of the documentary. Three state chairmen of TOOAN also participated in the programme. The study tour aimed to build participants' understanding of how Mahindra's model works in India, how the factory interacts with dealership networks, the service profitability of the dealership model, and how Mahindra Finance (a subsidiary of Mahindra & Mahindra) has set itself up to finance individual customers to purchase its tractors. Nigerian bank officials spent time enquiring about customer assessment and eligibility procedures, guarantee mechanisms, and the calculation of tailored amortization schedules in particular. The tour was also an opportunity for Springfield Agro to further demonstrate to future partners their commitment and capacity to supply quality products, spares and efficient, value-adding after-sales services. The costs of the visit, estimated to be near ₦6 million (£23,300) were completely borne by Springfield Agro and accounted for as a business development expenditure. Importantly, this signified a wholesale leap in the commercial mind-set of a Nigerian tractor distributor who, until recently, had solely courted unreliable government contracts.

  Following the Mahindra & Mahindra study tour, both Oceanic Bank and Intercontinental Bank developed financial products that built upon First Bank's *FirstTrac* product, affording tractor service providers a choice with variation in not only endowments and repayment rates, but also in the model of tractor.

- **Supporting TOOAN to keep pace**: How TOOAN would handle expansion was critical to the model's success. Each of the three banks relied on TOOAN chapters to play a pivotal role in the general coordination of interested service providers and in tracking loan repayments. As banks and distributors continued to collaborate and explore new markets, TOOAN, with little to no presence in many areas, would require assistance in managing its own expansion; notably, in adopting a more national character and in gaining traction in states where no chapter existed. To support the strategy to scale-up the model, PrOpCom engaged a management consultant to assist TOOAN in developing a business plan for expansion and organisational change.

  The business plan endeavoured to support TOOAN committees to elaborate a plan for managing decentralisation; forwarding a set of standard operating procedures

covering the induction of new chapters; the re-constituting of existing state-level tractor associations and cooperatives; the basis upon which to charge fees and how; and the range of membership services to be offered. It also entailed how TOOAN could strengthen its capacity to meet the challenges of more localised decision-making, particularly surrounding application processes and payment oversight. To aid this process, PrOpCom linked TOOAN with another DFID-funded programme in Nigeria (ENABLE), within whose remit it fell to support the development of business membership organisations. This would help TOOAN to grow into a nationwide organisation, better able to manage the relationships with state and federal governments and better able to engage more effectively with banks and other tractor distributors.

- **Maintaining momentum and tracking progress**: The eleven remaining tractor sales, agreed in mid-2010 but delayed in the original pilot, were also closely monitored to ensure that sales went through as planned. In March 2011, tractor service providers received their new units, thus completing the pilot.

  PrOpCom was also pleased to witness individual actors within cautious institutions taking the initiative to push the model in new areas. First Bank's business development manager for the states of Bauchi and Gombe, the former programme counterpart from First Bank Zaria became active in encouraging the same configuration of market players to assist him in bringing the pilot to the two new states under his jurisdiction. For PrOpCom, this represented a positive step and a degree of sub-national level buy-in. From the demand side, the existing tractor cooperative in Gombe state also pushed to participate in the new private sales scheme since hearing about the events unfolding in Kaduna as part of the pilot. As part of this proposed expansion into new states, PrOpCom contemplated modifying its existing equity contribution to cash-backed guarantee ratio with First Bank (from 20:20 to 30:10)—so as to more accurately approximate a commercial lease-financing scenario—however, the decision was made to halt further underwriting First Bank's commercial risk and encourage them to go ahead without any donor involvement.

Deepening impact

Whilst promoting the expansion and wider uptake of the model, PrOpCom simultaneously committed itself to activities that strengthen the quality and improve the effectiveness of the systemic changes achieved in the pilot. These activities ensure that the model, encompassing both tractor purchase and tractor service provision, is embedded within a market environment where its continued growth and evolution can be supported. Indeed, the ability of the model to continue to prosper, find its own feet, or develop into a new service offer altogether increases the likelihood that the farm-level benefits that it presently confers will continue in one form or another.

- **Tractor implement training for service providers**: With the exception of the disc plough and harrow—the most common implements—over 90% of TOOAN tractor operators had little experience in the utilisation of other tillage implements; many of which were better suited to the type of soil, terrain and crops grown by their farmer customers. In expanding service offers to include new land preparation services that confer productivity-enhancing improvements to seed beds, tractor operators would be able to go beyond selling their services on the basis of cost savings alone. For this, tractor operators required an improved level of agronomic knowledge and the ability to judge which combination of implements would yield the greatest benefit to their customers' land. PrOpCom sought to address this gap in best tillage practices with a training programme designed to improve service providers' understanding of the effect that their practices have on crop production and soil nutrient balance in both the short- and long-term. Run in collaboration with the Institute of Agricultural Training & Research (IAR&T), 18 lead tractor operators from three states were trained appropriately and introduced to the type of implements that would allow them to perform new, productivity-enhancing services. These lead operators were then tasked with training their peers within their respective TOOAN chapters. TOOAN opened a dialogue with IAR&T asking them to cost and commercially deliver a similar training programme that all TOOAN members would be encouraged to attend.

  PrOpCom also facilitated discussions between TOOAN, AMMOTRAC (the Agricultural Machinery and Machine Operators Training Centre), IAR&T and tractor distributors to decide whether all TOOAN-member tractor service providers that purchased a new tractor through private channels should be quality controlled and hold a certified "license to till." AMMOTRAC, as a government body with a national presence and jurisdiction, would be able to incorporate the required agronomic and tillage implement training into their mandate, however, the final modalities between TOOAN and the aforementioned market players were not finalised. Importantly, service provider certification would be a signal to farmers that tillage services offered are likely to result in both cost savings and productivity gains.

- **Improving the availability of quality tractor implements**: Despite distributors like Springfield Agro stocking a comprehensive range of quality tractors, there was a lesser range of implements available and those stocked tended to be of poorer quality. With many tractor operators showing interest in alternative implements, the implement range that distributors offered must be more diverse and appropriately costed, else service providers would be unable to provide a service that fulfilled the complete agronomic needs of the farmer. Springfield at the time did not stock many of these implements, which included, among others, chisel ploughs, spring tine cultivators, inter-row cultivators, zigzag and chain harrows, basic planters, tractor mounted

fertiliser spreaders, sprayers and water pumps. Were the demand for such implements to grow as a result of the IAR&T training programme on best tillage practices, then distributors like Springfield would need to adjust their owner-operator training to assist service providers in differentiating the costs of new business models based on different tiers of service provision.

- **Promoting the regional dealership network model**: PrOpCom evaluated the case for upgrading a quarter of the 'franchised' mechanics trained in the pilot (six of 20 have been trained so far) to be regional stockists of tractor implements, spare parts and even the tractors themselves. Salvage-repair traders, who procure and refurbish second-hand tractors and implements, would also be suitable for becoming franchised members of distributor dealership networks, should workshops be cost-effective to recondition to a competitive standard. Springfield moved to decentralise some of its sales and marketing operations, which until recently, had been heavily centralised at assembly plant headquarters.

The incorporation of improved tillage practices into services depends on the availability, quality and cost of tractor implements. However, service advancement has been constrained by the generally under-developed state of implement supply chains. Despite distributors like Springfield Agro stocking a comprehensive range of quality tractors, the range of implements in stock were limited and of mixed quality. Implements able to contribute towards improving productivity—chisel ploughs, spring tine cultivators, inter-row cultivators, zigzag and chain harrows, tractor mounted fertiliser spreaders, sprayers, water pumps and so on—were not readily available. With many tractor operators showing interest in alternative implements—and demand increasing yet further following the IAR&T training—the implement range that distributors offered must be more diverse and appropriately costed.

Whilst PrOpCom had no active intervention activities in this area, a certain degree of awareness-raising among distributors was undertaken in order to get this problem on the radar. Distributors like Springfield Agro would not only need to reorient their product offers, but also reinvest back into owner-operator training so that service providers are instructed on how new services can be incorporated into their existing business offer to farmers, and how costs might be differentiated between services that utilise different implements.

5. Early results

In July 2011, PrOpCom undertook an impact assessment of its work in the Nigerian tractor market, with a special focus on understanding the commercial viability and profitability of the 50 tractor service providers that purchased their tractors from Springfield as part of the original pilot scheme. Forty-nine tractor service providers were surveyed; 19 of these represented the 50 tractor service providers benefiting from PrOpCom's intervention, and 30 of these represented the existing stock of tractor service providers that pre-dated PrOpCom's intervention, forming a control group for comparison.

Over one-hundred (n=102) farmers were also surveyed in order for PrOpCom to understand the way in which tractor services were being procured and the degree of impact such services were having at the farm level. Programme personnel interviewed 42 farmers from the northern state of Kaduna and 60 farmers from the states of Ogun and Oyo. Importantly, control groups comprising farmers who continued to prepare their land manually through employing hired labour were also used; as such, 33 of the 102 farmers would form the basis for comparison.

Of equal importance to survey findings is an assessment of how the new model is functioning within the wider tractor market in Nigeria. The impact section will therefore begin with highlights of the new private procurement and distribution system that underline the model's capacity to sustain beyond the lifetime of the programme. It will also explore how the sector has been impacted by the introduction of the private sales model, drawing particular attention to the responses of programme partners and other market players since the pilot activities ended.

Signs of system change

The **loan repayment** data is one of the most significant and substantial signs that the model is working, providing empirical evidence for other potential financiers and interested tractor/implement distributors that a private sales channel through TOOAN is not only an improvement on the existing state-run delivery schemes, but is fully commercial and profitable for all parties. Given that all tractor service providers received their new units late in the season—thus missing the peak season—repayment rates have been extraordinarily high. The implication of this is exciting, suggesting not only that service provision has been taking place in the off-season, but that it has been profitable also.

Taking early repayments into account, the average repayment rate stands at 152%, or 136% (discounting the one significant outlier who was more than seven times ahead of the repayment plan). Taking an average that discounts all those that have paid more than 100%, the rate is still a respectable 72% average. Five of the 39 (13%) are behind in their payments, three significantly so; they all operate out of Ogun state. However, payments outstanding on individual portfolios are expected in the southwest, where less off-season opportunities are available.[3] Notably, there has been no incidence of 'total default' and, as such, no need for TOOAN to intervene to repossess, reallocate and resell assets. Indeed, a significant number of tractor service providers were reportedly eager to repay their loan within 12–18 months so as to either reduce

the interest due or to clear debts in order to quickly proceed with the purchase of a second tractor. The early repayment behaviour witnessed certainly serves as evidence to support such anecdotes.

The **warranty** 'repair and replacement' system has also been tested and deemed better functioning than its predecessor. Previous warranties were not comprehensive in their coverage of tractor parts and were only valid if claimed by the first owner within a specified hour of use. Given that the government was always the first owner and that all privately owned and operated tractors could be classified as at least second-hand, there was an inherent conflict in redeeming warranty claims. However, in many cases the problems with the terms of the warranty itself were redundant as policies were rarely communicated to private buyers/users in the first place. Owner-operators were unaware that their unit was covered by a warranty at all and had no contact with distributors or certified engineer services. To all intents and purposes, the previous system was largely non-operational.

The new warranty system has seen Springfield Agro commit to a new legal agreement (all parts; elapsing after 1,500 hours of use or two years after purchase), a staffed service hotline, and the cluster training of local mechanics to improve response times. Policies and claims procedures are well communicated and now widely understood among service providers. Claims against the warranty are assessed and repairs made within a 72-hour period by Springfield-trained mechanics. Indeed, during the pilot, one of the 39 tractor service providers belonging to the Ogun chapter experienced a unit malfunction two weeks after purchase; the result of a defective piston. Springfield Agro dispatched a service engineer to replace the piston and check other tractor units bought by TOOAN chapter members free of charge.

Evidence of **copying and crowding-in** has also occurred, suggesting a wider buy-in to the new model beyond what the market partners that participated in the original pilot. Two new banks, Oceanic and Intercontinental, have entered the marketplace to compete with First Bank's *FirstTrac* product, and another distributor, TAK Tractors, is taking action to improve its share in this expanding market. TOOAN has also expanded, inducting new chapters in Bauchi, Gombe, Adamawa, Taraba and Kwara states. Such expansion prepares the ground for the model to be rolled out to new areas where latent demand is high and the density of tractor service providers is low.

On 19th May 2011, PrOpCom signed an MoU with Oceanic Bank commencing the piloting of a new product to finance the purchase of 150 tractors. The tractor acquisition scheme will focus its pilot in northern Nigeria before extending to other parts of the country. The terms of the product are somewhat different from those agreed under the *FirstTrac* scheme. Oceanic's product constitutes a 21% rate of interest over a 31-month payback period upon receipt of an upfront equity contribution of 20% from the service provider—all of which is unsupported by the cash-backed guarantee that PrOpCom provided to First Bank in the pilot. The lease finance agreement proposed by Oceanic Bank will also leave the vendor open for the customer to decide between Springfield Agro and competing distributor TAK Tractors who offer a 75-HP tractor for ₦3.85 million. Moreover, Oceanic Bank has made a highly flexible product. Service provider repayments have been structured in such a way as to allow the representative TOOAN chapters in the north to allot a fair repayment amount each month based on the season and expected service provider performance.

Intercontinental Bank also undertook a small trial, committing to finance 30 new tractors in the southwest, where demand for new tractors has increased dramatically among service providers since the original pilot. Similar to Oceanic's product, Intercontinental has engaged TOOAN to decide the six most viable months for repayment (March-May, and August-October). For the remaining six off-peak months, service providers will only be required to service the interest on their loans, thus ameliorating the burden associated with making heavy payments 'out of sync' with the agricultural calendar. Intercontinental Bank has also introduced a further innovation to guard against repayment difficulties. Customer endowments and repayments will be paid into an interest-bearing savings account; in case of failure to repay in any one particular month, the month's repayment would be deducted from the saved funds. Making customer equity a partial guarantee against default allows customers to miss one off-peak season repayment before the bank commences the process of tractor repossession and reallocation.

By August 2011, 27 loan applications had been approved by Oceanic Bank, and 15 applications by Intercontinental Bank. Disbursement will occur once necessary conditions have been met. With these deals going through, PrOpCom would anticipate a greater response from First Bank beyond its simple geographic expansion into Bauchi and Gombe states. Improvements to the original *FirstTrac* product will be necessary to maintain a competitive edge over the newcomers.

Springfield has also been surprised by the extent to which TAK tractors has managed to manoeuvre itself to quickly compete with its Mahindra product. Of the 27 loans approved by Oceanic Bank to date, 25 of the tractors purchased have been TAK tractors, with customers likely influenced by the presence of TAK's assembly plant close to Zaria. Springfield has responded to TAK's presence by opening a service centre in Zaria and committing to decentralise a proportion of its stock and spare parts to this new northern base. Further, Springfield has invested in three new employees to be based in Kaduna and Taraba states, one focusing on technical issues and the sales of services and parts, the other two will have more of a marketing function. TAK has focused on gaining greater media exposure and holding demonstration days to showcase its

Box 8: A tale of two cities.

Kano state's withdrawal from the First Bank-Springfield Agro lease-financing scheme in favour of its own subsidised PPP scheme through Unity Bank provides a useful control test by which we can compare and contrast the fortunes of the two procurement and distribution modalities.

The PPP scheme has experienced lengthy delays, and despite state approval for the scheme and the budget significantly exceeding the previous years', none of the 80 tractors have yet been received. The would-be tractor owner-operators that had registered an interest in the PPP scheme had done so two years prior—forming 44 groups of 25, under the umbrella group 'Kano Tractor Hiring Services' (KTHS), at the government's request. Targeting unemployed youth and retirees, the scheme required group members to provide a 10% equity contribution (₦528,000, or £2,182) toward the purchase of the tractors. KTHS opened an account with Unity Bank and many members deposited their money into this account, expecting to receive their tractor shortly after. Many months on, group members continue to wait; their funds still tied-up in this account. KTHS are concerned, but remain hopeful that the newly-appointed Commissioner of Agriculture can push this item forward on the agenda. The ongoing dysfunction that characterises the state-managed Kano PPP scheme has provided the opportunity for PrOpCom to 'test the counterfactual' and to better capture the difference between the two systems, old and new.

products and the results. Indeed, both distributors have shown signs of becoming far more strategic in their marketing and business development endeavours.

The presence of a second tractor distributor and a further two financiers are an ample catalyst for the accelerated expansion of new private sales channels, and should result in original and improved offers—to the ultimate benefit of the poor smallholder. As a consequence of increased competition between service providers, smallholders will benefit, first, from increased access to mechanised land preparation services and, second, from a better quality of land productivity-enhancing service delivery.

How are the new tractor service providers performing?

On interpretation of the survey of tractor service providers, PrOpCom has found that the new tractors are performing well and that service providers are satisfied with the product purchased and the after-sales support they have received. The new tractor owner-operators have been in high demand across all states where a new, larger presence of tractor service providers now exists, as Table 2 below indicates.

Service provider profitability

Averaging results from the service providers surveyed, the tractor service providers that participated in the Springfield-First Bank-TOOAN pilot (n=19) are more profitable in both the peak and the low seasons than the tractor service providers that did not participate (n=30), once the servicing of loan repayments are stripped out. In the north, gross profits for participating service providers are a substantial ₦814,000 (£3,170) higher in peak season and ₦218,600 (£850) higher in the low season. In the southwest, the difference is narrower, but still significant, at ₦426,900 (£1,725) and ₦66,650 (£270) respectively.

PrOpCom is encouraged by the high level of profitability that new service providers have been able to attain in such a short period of time. Indeed, the high level of demand with which the new service providers are being met indicates a strong likelihood that the model will be sustained. Further, overall operational costs were lower for the experimental group than for the control group, reporting a difference of ₦91,000 (£368) and ₦526,000 (£2,130) between participating and non-participating service providers in the north and southwest respectively. This was largely due to the new tractors incurring far less costs in replacing damaged parts and other associated incidental expenditure; a substantial difference of ₦15,000 (£58) against ₦223,000 (£868) for tractor service providers operating in the north. In the southwest, the difference was comparable; amounting to ₦38,000 (£154) as opposed to ₦133,000 (£539) across both seasons. The new tractor service providers generally have higher running costs (fuel,

	New service providers (SW); n=8	New service providers (N); n=11
Average days worked (peak)	67.68 days	96 days
Average hectarage/day (peak)	2.7ha/day	5.167ha/day
Average days worked (low)	29.28 days	24 days
Average hectarage/day (low)	0.7ha/day	2.2ha/day
Total hectarage (both seasons)	203.2 ha	548.8 ha
Estimated outreach/tractor (total)[5]	118 farmers/tractor	246 farmers/tractor

Table 2: Performance of new owner-operators across three states[6]

oil, servicing and operator salaries) as compared with the old, though this is expected given that they have serviced more hectares.

Pilot outreach

PrOpCom estimates the 50 pilot tractors have reached 9,476 farmers between them throughout the course of the 2011 peak season.[4] Whilst the case study can make no definitive statement as to whether these farmers can all be strictly classified as poor smallholders, there is more certainty that the average farmer that purchases tractor services would typically be cultivating a land-holding between 1.5 ha to 2.5 ha in size. Service providers themselves also report that many of their customers are poorer farmers. It should be noted, however, that land-holding size is not directly correlated with a household's poverty status. Farmers may have access to more land than they currently use. It is also true that land use from season-to-season is bound by the farmers' ability to invest in the costs of cultivation prior to the season beginning. The average size of land-holdings being cultivated were, however, lower for the farmer control group where farms hiring manual labour in the north were typically 1.1 ha, whilst those in the southwest were 1.7 ha. Given that the most instantaneous benefit of procuring tractor services for the purposes of land preparation is the saving made on such costs of cultivation, the programme anticipates that poor farmers will be equally likely to demand the tractor services as non-poor farmers—as and when the tractor service provider market thickens and the number of tractors increases at the local-level. As is often the case with the introduction of a new, non-discriminatory service, it is unlikely to be the poorest farmers that invest first. There is no evidence to suggest that services are being monopolised or overwhelmingly procured by mid- to large-sized farms.

Pilot impact at farm-level

Beneficiary farmers have profited in two principal ways. As expected, all farmers reached have reduced their production costs by replacing manual labour for land clearance and seedbed preparation with mechanised tractor services. These cost savings are augmented further when tractors are used for haulage operations post-harvest, a service that many (if not all) farmers in the southwest purchase in addition to mechanised land preparation services. The second benefit has accrued in terms of the increased propensity among smallholders to open up and prepare additional land for cultivation, largely in the low season. The presence of tractor services has encouraged smallholders to make the investment into second-season farming where this would otherwise have not occurred.

An estimated 1,484 cassava and maize farmers in the southwest and 7,992 sorghum, rice and maize farmers in the north will share ₦60,454,380 (£234,110) worth of cost savings between them each peak season. These savings will accrue so long as the service itself sustains. As more tractor service providers enter the sector in each location, competitive dynamics are likely to reduce the costs of purchasing such services even further. There will also be an additional effect in the relative increased availability of rural labour for farmers still unwilling or unable to purchase tractor services, hence, reducing the costs for non-service user farmers too. This will especially be the case in areas where there is a high density of tractors accessible to hire.

There has also been a significant impact in the number of farms in the northern state of Kaduna that are putting more land to seed than would otherwise have been the case. The increased presence of tractor services throughout the year has resulted in an additional 14,640 ha of crop cultivation, largely in the north, and largely in the low season. The exact additional profit this grants individual farmers is difficult to calculate as crop type, inputs used for cultivation, practices and overall productivity will vary from farmer to farmer. Notwithstanding contributions to farming household incomes, mechanised services are also clearly making important improvements in the state of local and regional food security.

It is worth noting that whilst the figures presented in Table 2 may suggest that little additional land was cultivated in the southwest, this is because the control group (farmers using manual labour) also significantly increased the amount of land they cultivated in the peak season over and above that which was put to seed in recent years.

Realistic predictions of medium-term impact

The results above provide continued grounds for optimism. The pilot, together with subsequent crowding-in activities, has triggered an increase in the number of individual tractor sales and an evolution in how commercial players think about and target their market. Tractor distributors and financiers

	Southwest (est. 1,484 farmers)	North (est. 7,992 farmers)
Cost saving/farmer/season/ha	₦5,712 (£23.05)	₦2,574 (£10.40)
Peak season cost saving per farm	₦9,825 (£39.60)	₦5,740 (£23.15)
Value of peak season cost savings (total)	₦14,580,300 (£58,815)	₦45,874,080 (£185,050)
Additional land cultivated/farmer (peak)	0.037 ha	0.145 ha
Additional land cultivated/farmer (low)	---	1.68 ha
Additional land cultivated (total)	55 ha	14,585 ha

Table 3: Summary of impact[7]

are increasingly investing into their own versions of the business model piloted, dedicating time and resources to the development of specific products and services that cater to the interests of private, individual tractor buyers rather than solely courting large government orders.

The original MoU with First Bank has paved the way for the sale of 500 tractors, 50 of which have been completed to date.[8] Pencilling-in the obligations under Oceanic and Intercontinental Bank pilots—coming to an additional 180 tractors (42 of which have already been processed)—just shy of 700 new tractors could become available to perform fee-based land preparation and haulage services in the coming years, conferring an estimated 10-fold increase in the outreach and impact figures given above. By the end of 2011, at least 92 new tractors will have been sold as a result of PrOpCom's intervention, nearly doubling the rates of access and farm-level impacts witnessed thus far. Further, as productivity-enhancing implements become more widely available through distributors, and as service providers take the decision to invest in developing new mechanised service offers to farmers, land productivity as a result of improved seedbed preparation is predicted to generate additional benefits to farmers opting to invest in tractor services.

Notes

1 Many farms in the southwest will require a double-ploughing operation to thoroughly prepare the seedbed ahead of planting. In the majority of cases, the cost of using a tractor to prepare the land-holding will therefore be twice that of a single ploughing operation, totaling ₦15,000/ha. In such instances, the costs of using manual labour and ox-ploughs to prepare the land would also double.

2 The Springfield Centre for Business in Development Ltd (2011).

3 All repayment data correct as of February 2011. Data refers to the 39 tractor operators that received their tractors in the first wave of the pilot in September 2010.

4 If low season outreach estimates are also included, then the figure would rise to 10,508 farmers. However, it is likely that farmers who availed tractor services in the low season would also have availed services in the peak season (i.e. repeat customers) and hence there is a risk of double-counting outreach. The programme is unable to state whether or not any of the 9,476 farmers reached had previously accessed and used tractor services from non-participating tractor service providers. If this were the case, then the figure would require some level of downward adjustment to take into account the level of displacement that has occurred. It should be assumed that not all of the 9,476 constitute *additional* outreach.

5 Outreach has been estimated using the average land-holding size of the 102 farmers interviewed. For the southwest, average land-holdings among respondents were 1.72 ha/farmer; in the north, they were 2.23 ha/farmer. The total hectarage per tractor was divided by these figures to estimate how many farmers each tractor was likely to have serviced. It is important to note that these outreach figures are best estimates only.

6 The Springfield Centre for Business in Development Ltd (2011).

7 The Springfield Centre for Business in Development Ltd (2011).

8 At the time of writing, First Bank's *FirstTrac* scheme was incurring delays in being rolled-out nationwide, as bank officials consider how the product will need to be revised in light of the PrOpCom-funded 20% guarantee being withdrawn. First Bank has approached the Central Bank of Nigeria, requesting that it can up its own guarantee over-and-above the current level it is set at (₦750,000).

Annex 1

Note: The original impact logic (for the pilot-50) did not include land productivity objectives, as the simple ploughing operations performed were deemed too modest to confer any significant and noticeable changes in productivity. However, for scale-up, productivity changes will be monitored as tractor service providers (TSPs) gradually begin to offer a broader suite of land preparation services beyond ploughing. These are indicated by the red boxes above. Any changes in productivity witnessed in the field will be monitored and recorded. However, productivity improvements themselves are not a measurable indicator for the programme.

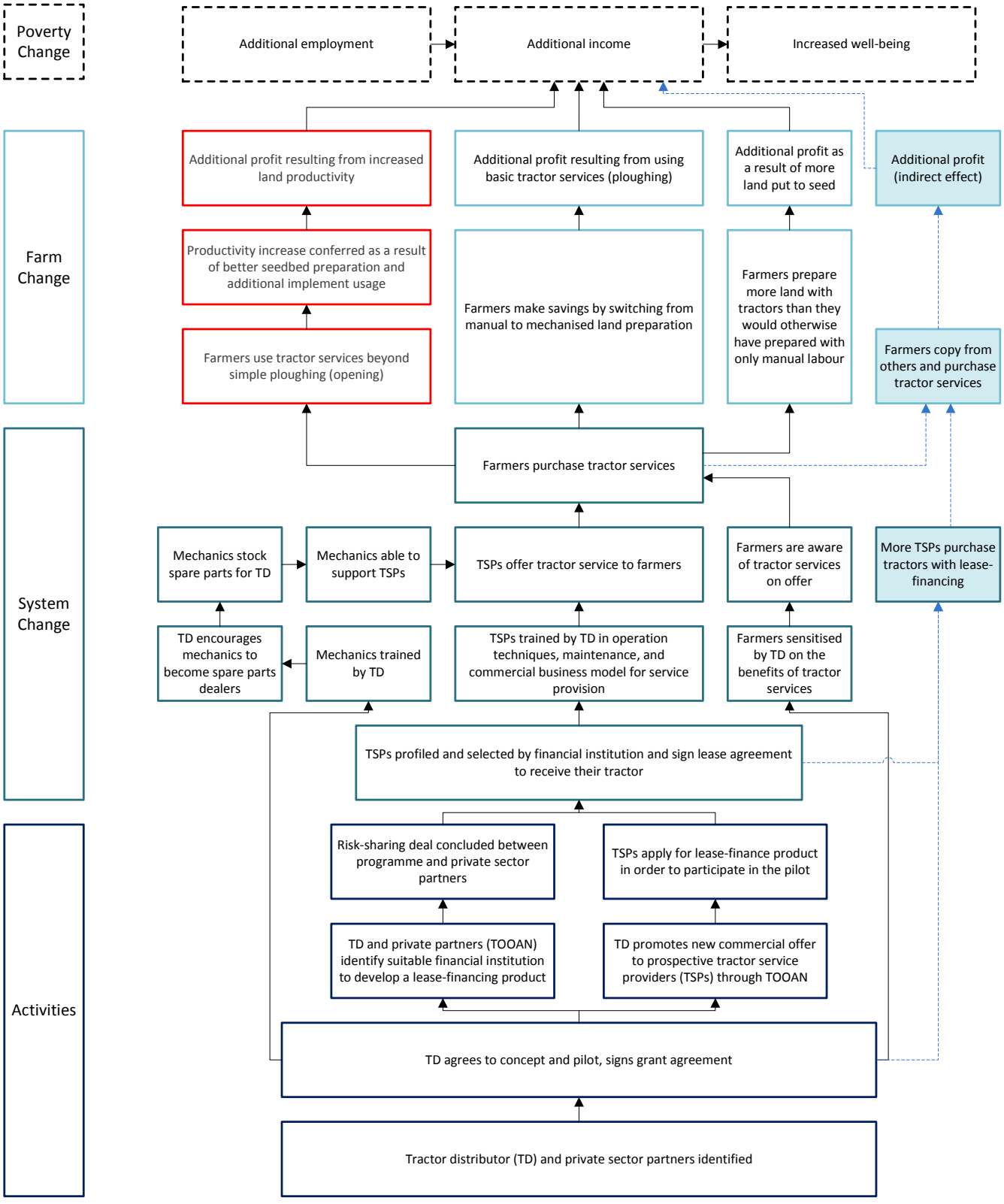

Fig.1. Impact logic [see Section 3]. Source: The Springfield Centre for Business in Development Ltd (2011)

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