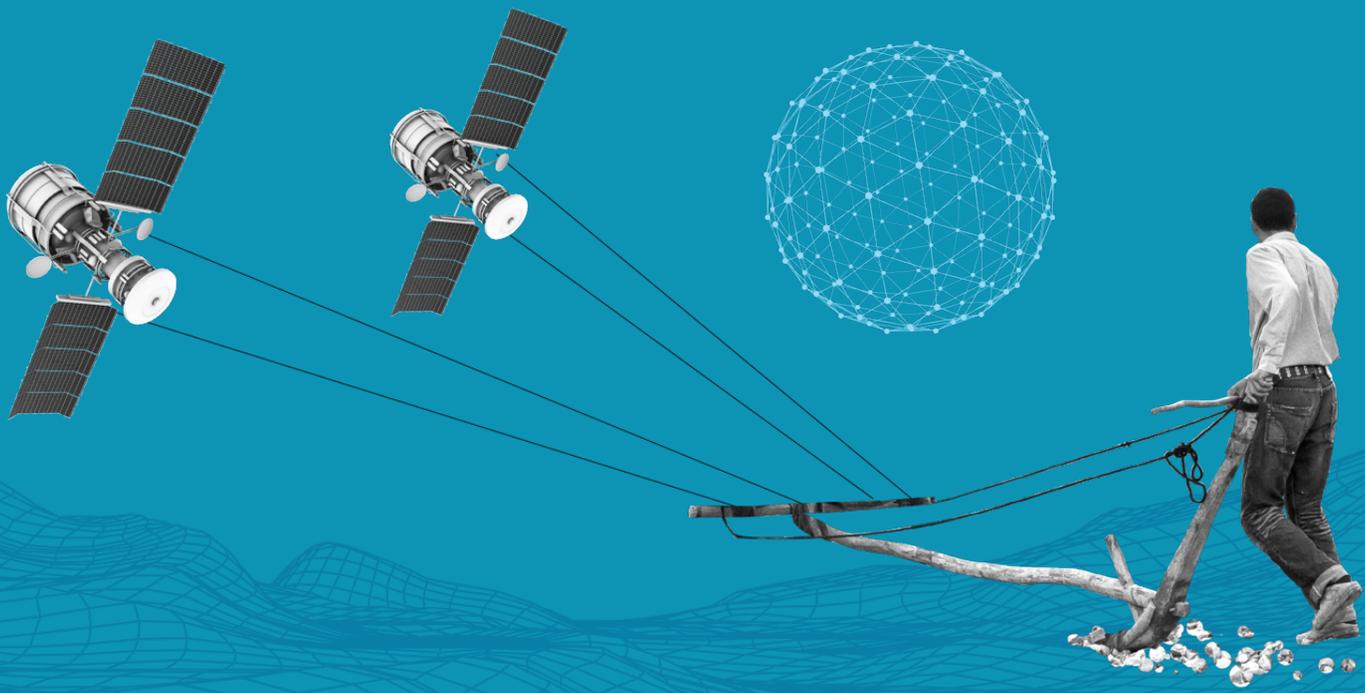


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CONCEPT NOTE SCALING SATELLITE- ENABLED AGTECH SERVICES



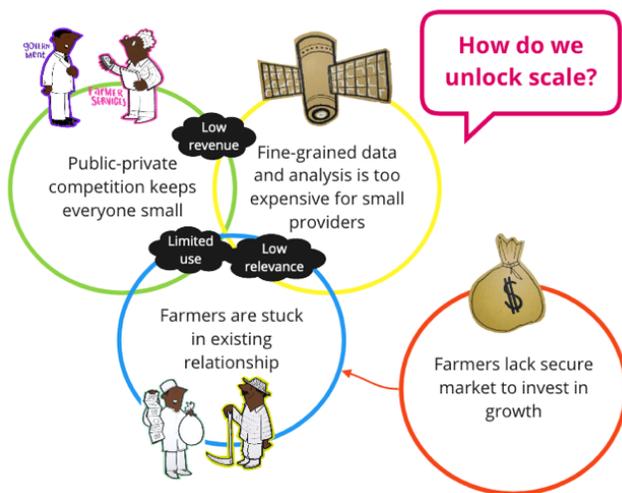
This concept was co-created by the following partners at ii2030



The challenge

Satellite-based agtech services for smallholder farmers exist. In order for them to deliver tangible value and impact, they have to scale up.

Satellite data enables a range of services for smallholder farmers. Data on soil, moisture and vegetation is used to provide advice to farmers on what to plant, when to plant and to predict risks such as droughts or diseases. Data on field sizes and past yields informs credit profiles and thus enables access to credit. Data on weather or soil moisture can be used to trigger agricultural insurance. Some of these services are already available to smallholders via their phones. In Nigeria, for example, AgriTask is supporting Royal Exchange to provide insurance against drought and excessive rainfall to small farmers, aiming to reach one million farmers by 2025. However, the available service range and depth, as well as the reach to farmers, are still very small.



In order to be able to provide meaningful services, agtechs have to scale up. Today, agtechs are caught in a Catch-22: because they are small, they cannot afford to provide good services. Because they cannot provide relevant services, they stay small. This is due to four interlinked challenges, as illustrated in the system diagram to the left:

1. **Fine-grained data and accurate algorithms are too expensive for agtech startups.**

While some satellite data is freely available, higher resolution data is expensive. Furthermore, ground

truth data (such as farm measurements, soil tests or crop cuttings) is needed to calibrate satellite-based models and triangulate data. However, these assessments are costly. Finally, building algorithms from scratch, as most agtechs do, requires a substantive amount of expert time. The cost of data and algorithms is thus a significant barrier to develop better services. But without reliable analysis, the relevance of services is low.

2. **Public-private competition keeps everyone small.** In Nigeria, public and private service providers are offering similar services. The Nigerian Agricultural Insurance Scheme (NAIC) is providing insurance at subsidized rates. The Nigeria Incentive-Based Risk Sharing System for Agricultural Lending (NIRSAL) provides credit guarantees. While these public services are subsidized, they do not reach many users. Private providers compete with these services as well as with each other. As no one is providing a comprehensive solution, farmers do not know what to choose, how to use and, who to trust in this fragmented market. As a result, everyone stays small.

3. **Farmers are stuck in existing relationships.** Farmers usually rely on one or few existing agents for advice, finance, inputs and offtake. This can be a middleman, cooperative or outgrower scheme. These

agents provide their own services, and do not have an incentive to promote agtech services or build farmers' digital literacy. Without a human interface, farmers will not give up this existing relationship in favor of a digital service.

4. **Farmers lack a secure market to invest in growth.** Farmers can only invest in new services or take the risk of a loan or pay for insurance if they know that they can realize the return of their investment by selling their crop at a cost-covering price. However, most farmers lack this security. Farmers will thus stick to their usual way of doing business and/or hedge their risk by engaging in other activities besides farming, rather than invest in their farm as a business.

The solution

Extension services are an important link to smallholder farmers, providing advisory, but sometimes also market linkages for inputs and sales. Building a strong two-way interface between agtechs and extension services can unblock barriers and enable scale. This includes two separate but connected solutions: a data commercialization platform and a service marketing cooperation.

In Nigeria, several organizations provide extension services. The public extension agents are today few in number, with only 14,000 agents for the whole country, each catering on average to 10,000 farms. In addition, there are about 8,000 private extension workers. The National Agricultural Extension and Research Liaison Services (NAERLS) builds knowledge and supports the regional programs via trainings as well as via a farmer helpline. Sasakawa Africa Association as a private foundation is supporting the education of extension workers in several states. Traders with outgrower schemes such as Olam or ECOM are providing their own support to farmers. Lastly, new actors are joining the field with the model of agripreneurs, providing farmer services as a business. For example, Syngenta Foundation is about to launch an agripreneurship program, including a digital interface.

Why Nigeria?

Nigeria was selected as a focus country due to several conducive factors:

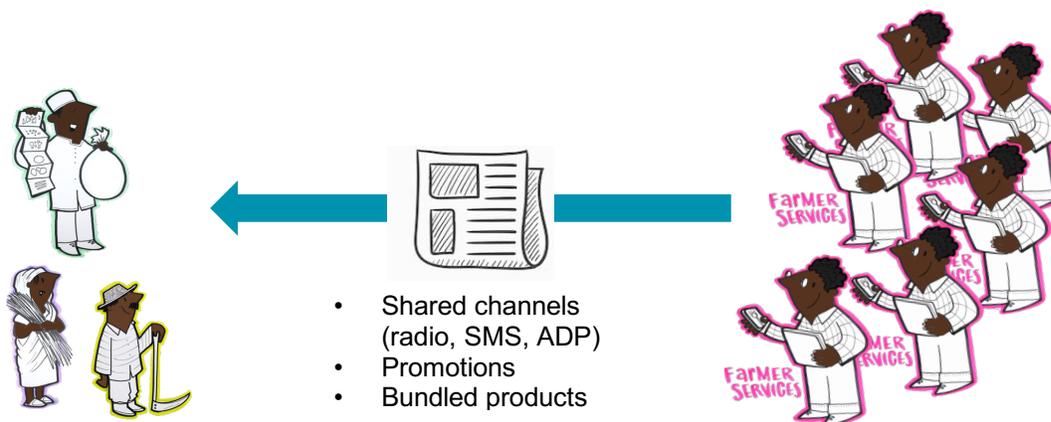
- A large farming population, with about 14 million farmers, mainly of very small scale (> 1 ha on average)
- A significant and growing number of agtech startups, several with rudimentary satellite-based services, including participants of the Africa4Future accelerator
- Public policy recognizing the relevance of risk in farming and supporting comprehensive risk management services
- Presence of large banks and insurance companies and traders as potential partners

Since farmers need human support in order to learn about and use agtech services, extension workers are an important “route to market” for agtechs. At the same time, extension workers are collecting critical data from farmers, including farm sizes, crops grown, inputs used, yields and prices achieved. Building an interface to reach out to extension workers and to collect data from them could thus be the critical infrastructure to enable scale-up. Extension workers can benefit from engagement with agtechs by being able to offer more services and charge fees (depending on their status and contract). Low pay and revenues or, from an organizational perspective, high cost of extension is the main reason why few extension workers are available today. Additional revenues could thus also scale up the presence of these critical service providers. How to build this interface? Two independent but interlinked solutions were identified.

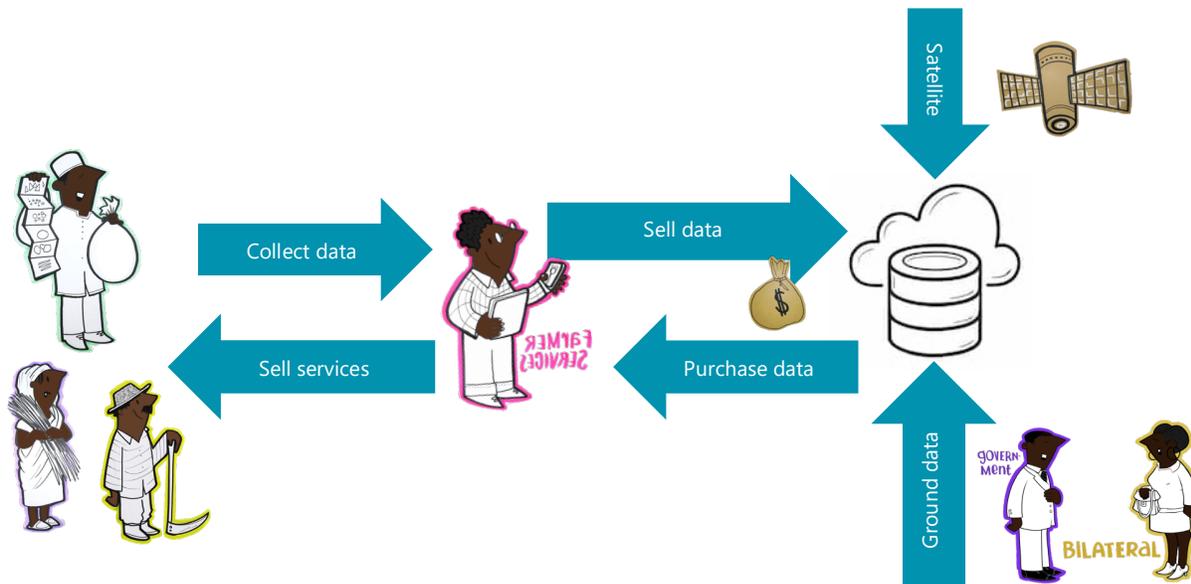


Data commercialization platform

1. **Service marketing cooperation** will enable agtechs to reach extension workers in a coordinated way. This will make it easier for extension workers as well as farmers to select among the existing services. NAERLS as the public agency supporting extension could help to ensure that only services that have tangible benefits for small farmers get promoted. For example, this quality assurance could be achieved via an advisory board. Agtech services could then promote their offering to extension agents and farmers via existing communication channels, including trainings, SMS and the farmer helpline. In addition, NAERLS or Sasakawa Africa Association could convene the qualified agtech services in order to enable them to bundle their services, develop joint promotions and improve interoperability. The cooperation can also include research to understand the actual benefits for extension workers and farmers, thus providing evidence to inform continuous improvement.



2. A **data commercialization platform** will make data available to all agtechs, thus sharing and reducing the costs of data. The platform can integrate different sources of data, including satellite data and ground data that is collected by extension agents, other ground data available from public sources or non-governmental organizations. Agtechs can also feed in the data they generate. Agtechs would thus both be suppliers and customers of the platform and would gain a new revenue stream from the data they supply. In addition to a pure data warehouse, such a platform could also include the provision of generic algorithms to process the data. For example, most agtech services require algorithms to identify the field size or vegetation.



EXPECTED IMPACT

This initiative will contribute to making satellite-enabled agtech services available to smallholder farmers in Nigeria on a broad scale.

1. Farmers have easier access to validated agtech services via extension workers.
2. Agtech services can bundle products, thus achieving synergies and higher value for farmers.
3. Data is available and affordable for agtechs.

How will it work

The two solutions can be implemented independently from one another.

Service marketing cooperation should be implemented by local actors in Nigeria. The first step would be to convene relevant players to map out the capabilities, needs and constraints. From there, roles and activities can be further defined. The table below presents a first suggestion on potential roles and responsibilities.

Potential partner	Potential role	Responsibilities
	Quality assurance and channels SMS)	<ul style="list-style-type: none"> • Set up and run a validation mechanism for agtech services, e.g. via an advisory board • Provide channels to inform extension workers and farmers about agtech services (e.g. SMS, trainings) • Enable own extension workers to support farmers using agtech services • Evaluate the impact of the initiative, eg via Randomized Controlled Trials
	Convene agtechs	<ul style="list-style-type: none"> • Convene validated agtechs and facilitate dialogue to bundle services, provide joint promotions and improve interoperability • Support own extension workers to provide agtech information and support to farmers
AgTechs companies	Provide services	<ul style="list-style-type: none"> • Provide data on the effectiveness and good governance of their solution for validation • Participate in meetings with peers and collaborate to bundle services

The **data commercialization platform** should be implemented on a regional level in Africa. Good governance mechanisms are important to ensure data is used appropriately. The platform can be operated by a private player on commercial terms. However, care must be taken that data ownership remains with farmers or providers and users have the option to withdraw their own data at any time without a cost.

Potential partner	Potential role	Responsibility
	Platform host Implementation partner	<ul style="list-style-type: none"> • Set up a data platform that can integrate different sources of data • Engage partners to share data on the platform • Set up a governance mechanism that ensures data ownership is handled appropriately • Promote data services to users
 	Data and algorithm provider	<ul style="list-style-type: none"> • Provide satellite data and algorithms
	Endorsement, Governance support	<ul style="list-style-type: none"> • Support platform governance and link with public actors / expectations
	Alignment	<ul style="list-style-type: none"> • Align with other initiatives to build data infrastructure for agtech services
Agtech services	Data providers and users	<ul style="list-style-type: none"> • Sell existing data on farmers • Buy relevant data