

Mobile Technologies for the SDGs

How start-ups in emerging markets are using mobile technology to offer life-changing solutions in the agriculture sector

Agriculture plays a central role in the development of emerging economies, generating nearly half of rural income in South Asia and more than two third in Africa.¹¹ African farmers and agribusinesses have the potential to create a trillion dollar market by 2030 provided there is greater access to capital, technology, electricity, irrigated land to grow crops, and support from African governments.

However, glaring inefficiencies in the agricultural value chain are still holding the sector back. Stakeholders tend to work in silos and are connected by weak infrastructure.¹² An efficient agricultural sector would generate social, economic and environmental benefits, such as boosting income,

cutting transaction costs, reducing CO2 emissions, and saving energy and water. The potential of mobile technology to overcome these inefficiencies and connect stakeholders along the agricultural value chain cannot be overstated.

Increasingly, start-ups are using mobile technology to help farmers and agribusinesses become more efficient. Based on data gathered from more than 550 start-ups that applied to the second round of the [GSMA Ecosystem Accelerator Innovation Fund in July 2017](#), **around one in five start-ups across Africa and Asia Pacific are currently operating in the agriculture vertical.**

Mobile: A range of digital tools for agriculture

Mobile technology can help address many pain points and provide solutions to the business challenges faced by farmers and agribusinesses alike.¹³ Mobile **information services** delivered via SMS or voice channels such as IVR and increasingly via apps can improve farmers' agricultural practices and skills. Furthermore, as illustrated in the case study on Twiga Foods (first section of this report), mobile can allow start-ups to solve supply chain and logistics pain points for farmers but also vendors (**supply chain services**).

Transitioning from cash to **mobile financial services** allows for more secure, timely and potentially less costly payments for farmers. Digital payments can also support the creation of an economic identity in turn opening up to full financial inclusion (access to credit, savings and insurance products). Mobile also plays a role in remotely observing and monitoring crops, livestock, and input usage, among other applications (**monitoring services**).

¹¹ The World Bank, 2017, "Future of food: shaping the food system to deliver jobs".





<http://documents.worldbank.org/curated/en/406511492528621198/Future-of-food-shaping-the-food-system-to-deliver-jobs>

¹² YourStory, 20 February 2012, "Fixing the Agricultural Supply Chain from the Top and Bottom", <https://yourstory.com/2012/02/fixing-the-agricultural-supply-chain-from-the-top-and-bottom/>

¹³ More information on the spectrum of digital tools aimed at agribusinesses in developing countries: GSMA mAgri, 2017 "in Opportunities in agricultural value chain digitisation: Learnings from Uganda", <https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2018/01/Opportunities-in-agricultural-value-chain-digitisation-Learnings-from-Uganda.pdf>

FIGURE 8

Examples of agritech start-ups using mobile applications and services in Africa and Asia Pacific

MOBILE AGRICULTURE APPLICATIONS AND SERVICES ¹⁴	Information services: Weather, market, information, agriculture best practices	Supply chain services: Matching platforms, traceability and tracking systems, management of supplier/distribution network	Mobile financial services: Payments via mobile money, savings and credit products, micro insurance (for inputs, crops or livestock)	Monitoring services (incl. IoT): Equipment monitoring, precision agriculture, environment monitoring, livestock management, farm management
				
Impact Terra (Myanmar)	✓			
MLouma (Senegal)	✓	✓		
Farmerline (Ghana)	✓		✓	
Agribuddy (Cambodia)	✓		✓	
Twiga Foods (Kenya)		✓	✓	
Farmcrowdy (Nigeria)			✓	
Trotro Tractor (Ghana)				✓
MimosaTek (Vietnam)				✓
Illuminum Greenhouses (Kenya)				✓
CI-Agriculture (Indonesia)				✓

Cambodia-based [Agribuddy](#) runs a 'buddy' (rural entrepreneur) network that brings smallholder farmers together. Buddies gather local farmers who provide information on themselves and their farms (**information services**) to Agribuddy to build a credit scoring profile (**mobile financial services**), enabling them to access loans and credit. [Trotro Tractor](#), an agritech startup incubated by [MEST](#) in Ghana, is a GPS-enabled mobile platform (**monitoring services**) that connects farmers to tractors in their vicinity. Farmers pay to use the tractors with **mobile money (mobile financial services)**. [CI-Agriculture](#) uses

sensors, unmanned aerial vehicles, satellite imagery and data analytics (**monitoring services**) to improve smallholder farmer maize production in Indonesia.

Most agritech start-ups we researched are using information services and mobile money. However, increasingly, start-ups operating in the agricultural space are looking at leveraging more advanced tools like digital profiles, IoT applications for agriculture and agribusiness analytics.



¹⁴ GSMA mAgri, July 2017, Creating scalable, engaging mobile solutions for agriculture
 <https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2017/07/create-scalable-engaging-mobile-solutions-agriculture.pdf>

Start-ups, agriculture and the Sustainable Development Goals (SDGs)

Start-ups are leveraging mobile technology for agriculture not only improve efficiency across the value chain, but also contribute to social, economic and environmental change. We have observed that while most agritech start-ups typically address SDG 1 (No Poverty), 2 (Zero Hunger) and 8 (Decent Work And Economic Growth), agritech start-ups using

mobile technology are much more versatile and can tackle a number of other SDGs either directly or indirectly.



START-UPS	SUMMARY	SDGs
Impact Terra (Myanmar)	A mobile platform that provides smallholder farmers with farming information and best practices. As of January 2018, Impact Terra's product, Golden Paddy (launched in December 2016), had over two million users who provided knowledge and skills training to help farmers improve their productivity. ¹⁵	1 NO POVERTY
FarmDrive (Kenya)	A mobile platform that connects unbanked smallholder farmers to financial solutions. FarmDrive uses mobile technology and analytics to assess farmers' risk profiles. It has registered over 3,500 farmers and disbursed over 1,000 loans (a total of USD 150,000). The proportion of female farmers is very high and they tend to have less access to financial services than their male counterparts. FarmDrive's technology can help to narrow this gap.	5 GENDER EQUALITY
MimosaTek (Vietnam)	An IoT platform that integrates sensors on agricultural equipment to increase crop yields, reduce risks and expenses, and save water and energy. MimosaTEK claims its solutions have helped save as much as 50 per cent on water and electricity and increase yields by up to 25 per cent.	6 CLEAN WATER AND SANITATION 7 AFFORDABLE AND CLEAN ENERGY

Twiga Foods (Kenya)	A mobile- and web-based B2B supply chain platform that connects smallholder farmers to small- and medium-sized fruit and vegetable vendors. As of January 2018, Twiga Foods made around 7,000 weekly deliveries to 3,500 registered vendors. In Kenya, 30 per cent of food produced never reaches the table due to losses or waste along the supply chain. ¹⁶ Twiga Foods' technology consolidates the fragmented purchasing power of urban vendors, allowing them to access stable markets at better prices, while minimising post-harvest losses through efficient logistics. Twiga Foods is one of the start-ups funded by the GSMA Ecosystem Accelerator programme .	12 RESPONSIBLE CONSUMPTION AND PRODUCTION
Illuminum Greenhouses (Kenya)	Greenhouses and drip irrigation kits equipped with SMS-controlled solar-powered sensors. The system allows smallholder farmers and farm owners to monitor and regulate conditions remotely via SMS. By controlling water via irrigation schedules, the startup claims farmers using their greenhouses can reduce water usage by up to 60 per cent. ¹⁷	13 CLIMATE ACTION
eFishery (Indonesia)	An integrated feeding technology for fish and shrimp farms. eFishery's internetconnected automated aquaculture feeding device can sense the fish's food intake, adjust it according to appetite and avoid overfeeding. Fish feed is one of the biggest water pollutants as excess fish feed introduces extra nitrogen and phosphorous directly into the water. eFishery claims its service can reduce up to 93 per cent of overfeeding practices. eFishery is one of the start-ups funded by the GSMA Ecosystem Accelerator programme .	14 LIFE BELOW WATER
Farmcrowdy (Nigeria)	A digital platform that connects investors to farmers through sponsorship packages that fund higher yields for a share of the returns. Smallholder farmers produce 90 per cent of Nigeria's agricultural output, but have little access to credit to sustain and grow their businesses. Farmcrowdy provides a solution to finance sustainable agriculture. Farmcrowdy is one of the start-ups funded by the GSMA Ecosystem Accelerator programme .	15 LIFE ON LAND
Meridia (Ghana)	A mobile platform that provides smallholder farmers with land documentation by collecting field data on each farm to create digital profiles. Smallholder farmers in Ghana, as in most emerging markets, have very little control over their land and are therefore subject to land disputes or evictions. Since launching in Ghana in 2016, Meridia has sold over 4,000 documents and mapped over 40,000 acres of land. ¹⁸	16 PEACE, JUSTICE AND STRONG INSTITUTIONS

¹⁵ Impact Terra, "Farmer Financing Enabled Through Mobile Technology", <https://www.impactterra.com/press-release-loweringbarriers-to-finance-and-insure-farmers/>

¹⁶ AgriProFocus, 24 November 2017, "Enhancing food security and business opportunities through food waste and loss reduction in a changing climate: Reflections from the Network Day 2017", <https://agriprofocus.com/post/5a17e58b26b72a09161f197a>

¹⁷ Changemakers, "Illuminum Greenhouses Kenya: Smart Mobile Farming", <https://www.changemakers.com/globalgoals2015/entries/illuminum-greenhouses-kenya>

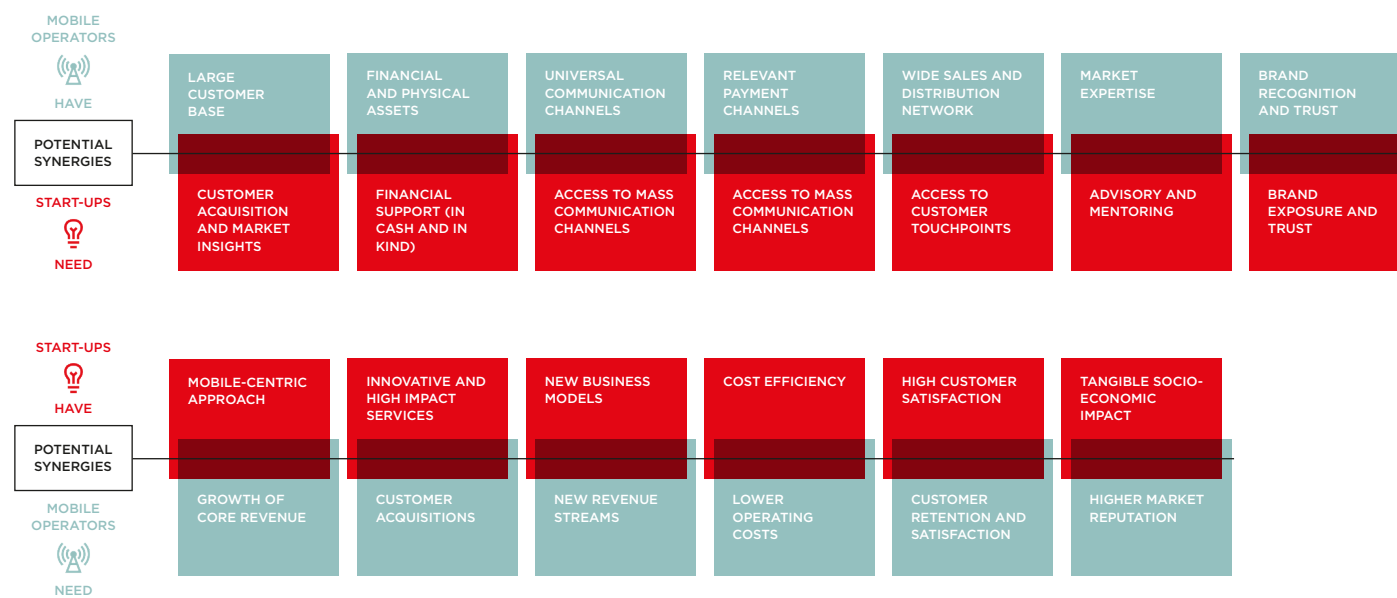
¹⁸ Meridia: <http://www.meridia.land/>

Unpacking the collaboration opportunity for mobile operators and agritech start-ups

As we highlighted in *Building Synergies: How Mobile Operators and Start-ups Can Partner for Impact in Emerging Markets*, mobile operators have reached the scale that start-ups lack, while start-ups have the local innovation mobile operators need.

FIGURE 9

A synergies framework for mobile operators and start-ups in emerging markets



From our discussions with start-ups and the applications we have received through our Innovation Fund, it has become clear that agritech start-ups seek specific “needs” from mobile operators. At the top of the list is API access and integration, the most popular being SMS, USSD, mobile money and location APIs. Discounted or subsidised SMS, USSD, mobile money or IVR prices are also a strong need for start-ups. Many also want to gain access to mobile operators’ customer base in rural areas, while others are seeking insights into operators’ customers through anonymised data and farmer profiles. Others are seeking co-branding and co-marketing opportunities.

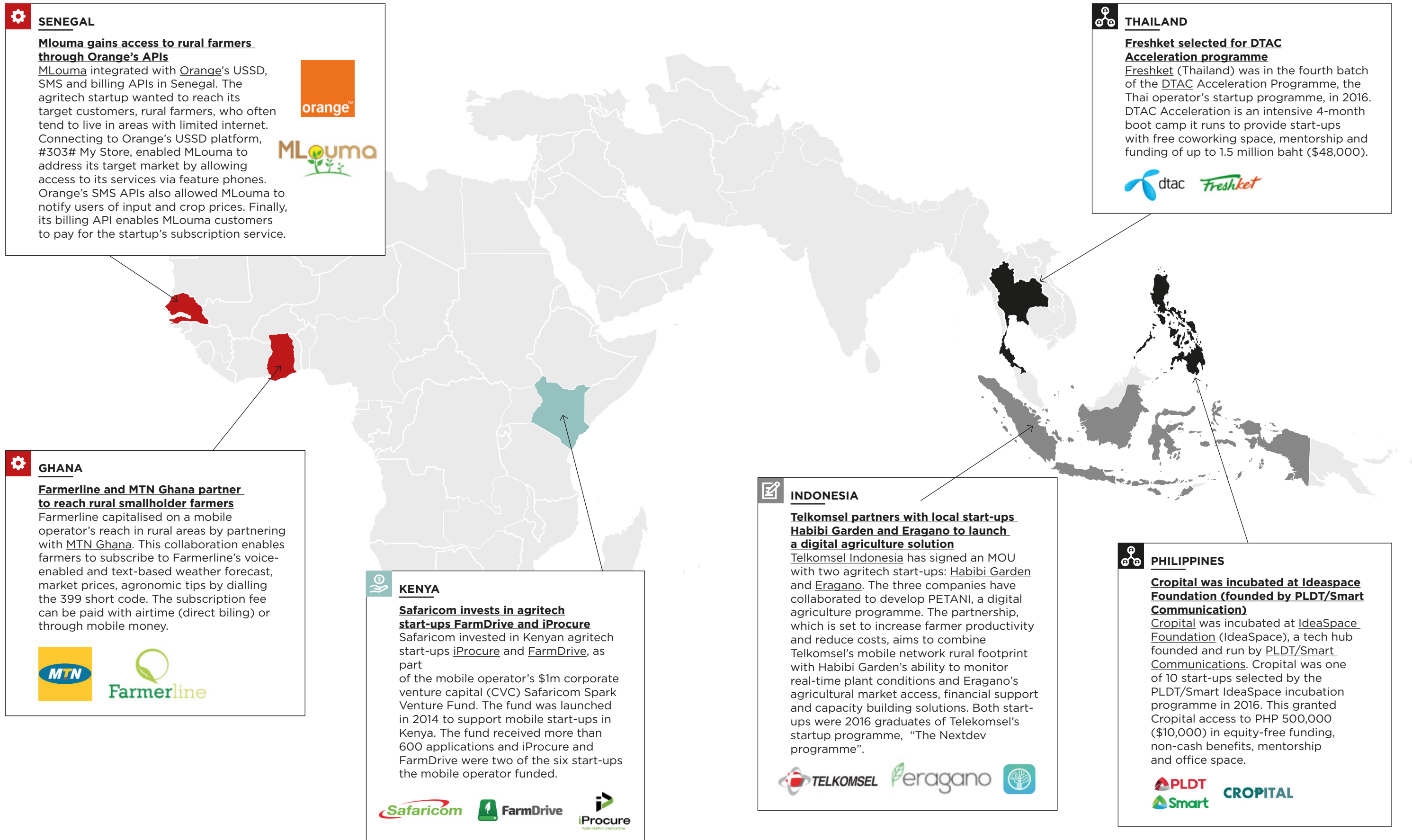
Since the lion’s share of agritech startup end users (mainly farmers) are rural—an increasingly important segment for most mobile operators—we believe there are significant opportunities for mobile operators to work with agritech start-ups to create win-win partnerships while also having a social, economic and environmental impact. While enabling start-ups to scale up, these partnerships could not only drive new customer acquisitions in rural areas, but also reduce churn and increase usage of core mobile operator services.



FIGURE 10

Examples of collaborations between mobile operators and agritech start-ups in Asia Pacific and Africa

- INVESTMENTS
- COMMERCIAL AGREEMENTS
- TECH HUBS
- APIS





Looking ahead: Calling on mobile operators to strengthen their role in agritech

Mobile technology offers a wide range of relevant digital tools for agriculture (information services, mobile financial services, monitoring services) and agritech start-ups are increasingly leveraging these to overcome market inefficiencies and generate

positive socio-economic impacts. Since farmers in rural areas are less likely to be well covered by mobile broadband and are often lower-tech users, access to mobile operator APIs (primarily SMS, USSD and mobile money) to reach them goes a long way.

We believe that mobile operators have a bigger role to play in working with agritech innovators. Through deeper and meaningful partnerships, mobile operators and agritech start-ups can significantly transform a sector that remains the largest employer in most emerging economies.

