



# Start-ups and Mobile in Emerging Markets:

Insights from the GSMA Ecosystem Accelerator

Issue 2, Spring 2018



## Ecosystem Accelerator

The GSMA represents the interests of mobile operators worldwide, uniting nearly 800 operators with almost 300 companies in the broader mobile ecosystem, including handset and device makers, software companies, equipment providers and internet companies, as well as organisations in adjacent industry sectors. The GSMA also produces industry-leading events such as Mobile World Congress, Mobile World Congress Shanghai, Mobile World Congress Americas and the Mobile 360 Series of conferences.

For more information, please visit the GSMA corporate website at [www.gsma.com](http://www.gsma.com)

Follow the GSMA on Twitter: [@GSMA](https://twitter.com/GSMA)



This document is an output of a project funded by UK aid from the Department for International Development (DFID) and Australia's Department of Foreign Affairs and Trade (DFAT), for the benefit of developing countries. The views expressed are not necessarily those of DFID and DFAT.

### Authors:

Sam Ajadi – Insights Manager  
Ecosystem Accelerator, GSMA

Maxime Bayen – Senior Insights Manager  
Ecosystem Accelerator, GSMA

### Contributors:

Peter Ndichu – Market Engagement Manager  
Ecosystem Accelerator, GSMA

Nicole Darabian – Knowledge Manager  
mAgri, GSMA

Daniele Tricarico – Senior Insights Manager  
mAgri, GSMA

The GSMA Ecosystem Accelerator programme focuses on bridging the gap between mobile operators and start-ups, enabling strong partnerships that foster the growth of innovative mobile products and services. These partnerships bring impactful mobile solutions to the people and places that need them most, generating the greatest socio-economic impact. In particular, the programme operates an Innovation Fund which supports African and Asian start-ups with direct grant funding, technical assistance, and connections with mobile operators.

Learn more at [www.gsma.com/ecosystemaccelerator](http://www.gsma.com/ecosystemaccelerator) or contact us at [accelerator@gsmamobile.org](mailto:accelerator@gsmamobile.org)

Follow GSMA Mobile for Development on Twitter:  
[@GSMAm4d](https://twitter.com/GSMAm4d)

## Foreword

The beginning of the year is always an exciting time for the mobile industry, when most stakeholders join the crowds at Mobile World Congress in late February. This year was no exception for our programme, as we were joined by our partners from the UK Department for International Development (DFID) and the Australian Government, mobile operators and 13 of our current portfolio start-ups to announce our second cohort of Innovation Fund start-ups.

With 15 new additions, **our portfolio now comprises 24 start-ups from 15 countries across Asia Pacific and Africa**. They cover more sectors and business models ('agritech' in particular—see the section on 'Mobile technology for the SDGs') and a wider range of innovative uses of mobile technology as SMEs look to solve local problems. We hope this will in turn help us to identify and highlight more ways these start-ups can collaborate with mobile operators to boost their reach and impact.

Some of the start-ups featured in this report have already reached significant scale. Agritech start-up Twiga Foods in Kenya now delivers 350,000 bananas daily to food stalls in Nairobi, with most of the payments across the value

chain processed through M-Pesa. Ruangguru in Indonesia has just passed the 7 million registered users mark and launched a joint data plan with local mobile operator Telkomsel. Such stories confirm the value of integrating mobile technology and working with mobile operators, which is becoming more and more relevant to start-ups. Meanwhile, mobile operators are gearing up to be better partners, for instance, by launching new funds or collaborating across regions.

Building on this momentum, we have launched our third call for applications to the Innovation Fund. The core eligibility criteria remain unchanged (post-revenue, socio-economic impact, willingness to engage with operators, matching funding), and we are more open than ever to new and innovative uses of mobile technology (e.g. big data, IoT) and models. **Applications are open until 15 April**, and we count on your support to refer promising start-ups in your markets to the Fund.

As always, we welcome your feedback on this publication and appreciate you sharing these stories with your network.



**Max Cuvellier**

Head of the Ecosystem Accelerator programme, GSMA

# Contents

---

## Start-ups and Mobile innovation 5

How our Innovation Fund start-ups are using mobile technology to offer services with impact



---

## Mobile Operators in the News 18

How mobile operators are collaborating with local start-ups



---

## Mobile Technologies for the SDGs 24

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



# Start-ups and Mobile Innovation

**How our Innovation Fund start-ups are using mobile technology to offer services with impact**



## Case Study 1

## Raye7: Carpooling as a solution to Cairo's traffic challenges



|   |   |
|---|---|
|   | <b>Founding year</b><br>2015  |
| <b>Geography</b>                            | Egypt   |
| <b>Founding team and GSMA grant manager</b> | Samira Negm - Co-founder and CEO<br>Ahmed Negm - Co-founder and Public Relations Officer  |
| <b>Tweet pitch</b>                          | Raye7 is a culturally sensitive carpooling platform that helps people find convenient and affordable rides while reducing the number of cars on the road.<br><a href="http://www.raye7.com">www.raye7.com</a> |

Cairo is one of the most congested cities in the world. According to a 2014 World Bank report, the yearly direct cost of traffic congestion in Cairo is estimated at USD 2.5 billion, or 1.4 per cent of GDP.<sup>1</sup> While promoting public transportation—and fewer private vehicles—seems like a worthy effort, public transportation is not always a safe alternative, particularly for women and girls. According to a UN survey, 83 per cent of women in Egypt feel insecure in the street because of high levels of harassment.<sup>2</sup>

In response to this situation, Raye7 was commercially launched in December 2015 as a culturally sensitive ridesharing solution that matches people ('riders' and 'drivers') in the same social communities, such as work colleagues or friends, for their daily

commute. The start-up recognised that security and safety should be at the forefront of ridesharing in Egypt, hence its community-focused approach (as opposed to the typical ridesharing model).

Raye7's solution also takes social norms into account when it comes to payments. For instance, the fact that people are generally uncomfortable accepting money from friends or colleagues. Raye7 runs a cashless, point-based payment model that allows riders to purchase points using credit cards or mobile money to pay for their rides. Drivers earn these points for every ride they share and can convert these points into cash once they reach the minimum payout limit of EGP 500 (USD 28).

- ~ \$130,000 saved per year on fuel costs
- ~72,000 hours saved per year for riders
- ~262 tonnes of CO2 emissions saved per year

### ESTIMATED SAVINGS FOR EVERY 100 PEOPLE USING RAYE7 ON A WEEKLY BASIS FOR ONE YEAR

As of February 2018, Raye7 had reached 15,857 registered 'ride sharers' (both drivers and riders), 5,440 of whom are active and had completed more than 116,000 trips since the service launched in late 2015. More than 20% of the ride sharers are women.

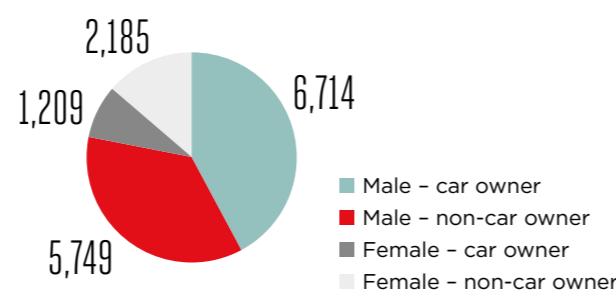
FIGURE 1

### Raye7: Registered users



FIGURE 2

### Raye7: Ride sharers (Feb 2018)



## How the service works

When a new user signs up to its platform, Raye7 begins the verification process by automatically asking for information on where the new user works and lives. It then verifies their identity, phone number, work email and LinkedIn and/or Facebook profile. Riders and drivers are only matched when they are in the same networks and communities (e.g. companies, universities or social circles).

### VERIFIED CLOSED COMMUNITIES



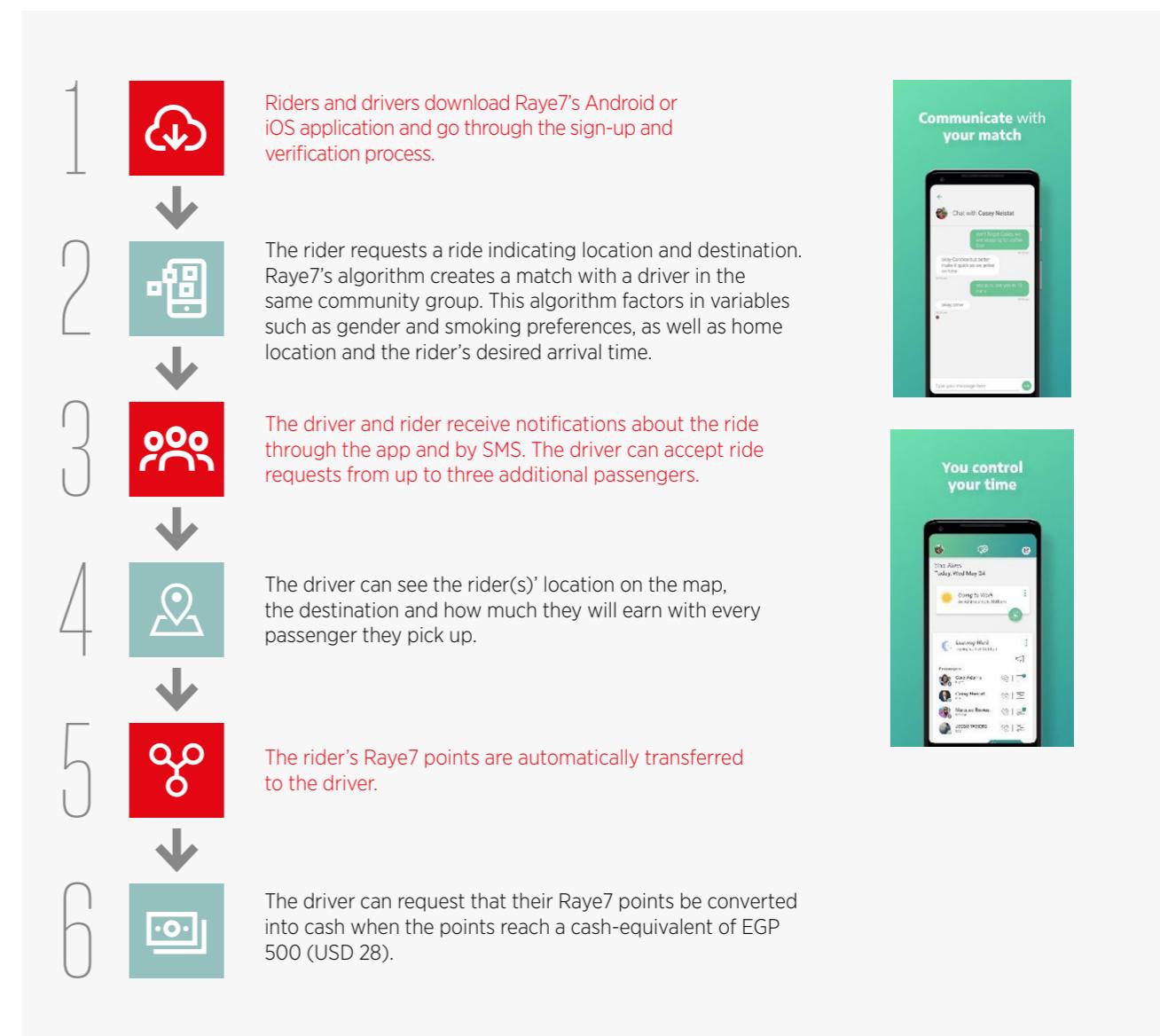
People working in companies



Students going to Universities



People doing Activities



## Working with mobile operators

At the end of 2017, Raye7 entered a partnership with Dsquares, which runs Vodafone's local loyalty programme. The [Vodafone Sherkety platform](#) is a marketplace that provides discounts and offers to Vodafone Business customers. Raye7's partnership with Dsquares and Vodafone allows companies that are Vodafone clients to give their employees access to Raye7 services. In exchange, Raye7 is paid with Vodafone Red Points through the Sherkety platform.

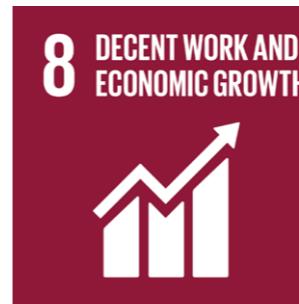


"SMS API enables start-ups to purchase the required number of SMSs simply through their Orange lines in a pay-as-you-go model. Raye7's use of Orange SMS API will surely enable them to communicate easily with their customers and ease their business operations. We believe that the integration of SMS API is just a start of many initiatives between Orange Egypt and Raye7 to deliver a very unique service to both Orange Egypt's and Raye7's customers and to work coherently to solve, at least part of, Egypt's traffic problems."

— **Peter Kaldas**  
**Marketing Sr. Supervisor, Core VAS, Orange Egypt**

In addition, Raye7 has been integrating with [Orange Egypt's SMS API](#) to send customised messages and notifications to ride sharers when a match is found, such as estimated arrival time, pickup details and changes to their trip. Thanks to the API, Raye7 sends out up to 6,000 SMS to its users every month.

## Changing lives



Raye7's solution allows car owners to generate extra income from their daily commute while providing a high-quality, cost-effective and safe transportation solution to riders. In January 2018, the average monthly earning for active drivers on Raye7's platform was EGP 1,634 (USD 92).<sup>3</sup>

Private cars are not being fully optimised. It is estimated that over 70 per cent of cars in Cairo are privately owned with less than 1.6 people per car, on average.<sup>4</sup> By creating an incentive for people to carpool, Raye7 is helping to increase this ratio while also lowering CO2 emissions and contributing to a more sustainable, eco-friendly Cairo where residents can commute effortlessly, safely and securely.

"I have been using Raye7 for two months now as a driver. I am using Raye7 every day to organise carpooling trips with colleagues from the same community. This service is helping me financially with the cost of consumed car fuel."

**Omar, Cairo, Engineer**

"I have used Raye7 for carpooling since June 2017. I use it mainly because it is the most convenient to me in comparison to other means of transportation where I have to compensate my time, effort, or money. With Raye7, I don't have to do so actually. It helps me now to keep a planned daily commute, less costly, and in a comfortable car."

**Diaa, Cairo, Student at Arab Academy for Science and Technology**



## Working with the GSMA Ecosystem Accelerator

Raye7 received a grant from the [GSMA Ecosystem Accelerator Innovation Fund](#) in April 2017 to increase its user base by offering the service to those in large homogeneous communities (e.g. universities, business parks) who work far from residential areas.

With this project, Raye7 is planning to unlock USD 96,000 in additional income (or savings) for users—both drivers and riders—and reach about 178,000 total beneficiaries by the end of the grant in October 2018. Beyond the funding, GSMA also supports Raye7 by helping it strengthen its relationship with Egyptian mobile operators.

<sup>3</sup> This is comparable to Egypt's current minimum monthly wage of EGP 1,200 (USD 68) <http://www.cairoscene.com/Buzz/Egypt-Plans-to-Raise-the-Minimum-Wage-From-EGP-1-200-to-2-000-in-The-Private-Sector>

<sup>4</sup> Glen Dalakian II, 14 September 2012, "Egypt's Tech Community to Conquer Cairo's Traffic", Wamda, <https://www.wamda.com/2012/09/egypt-s-tech-community-to-conquer-cairo-s-traffic>

## Case Study 2

## Ruangguru: Accelerating Indonesia's educational outcomes



|   |  |
|---|--|
| <b>Founding year</b>                        | 2014   |
| <b>Geography</b>                            | Indonesia  |
| <b>Founding team and GSMA grant manager</b> | Adamas Devara - Co-founder and CEO<br>Muhamad Iman Usman - Co-founder, Head of Product and Partnerships  |
| <b>Tweet pitch</b>                          | Ruangguru is a freemium learning management system that helps students prepare for exams using content tailored to the national curriculum, and helps teachers to crowdsource educational content and distribute it to students.<br><a href="http://www.ruangguru.com">www.ruangguru.com</a> |

While Indonesia has the fourth largest education system in the world, with over 50 million students and four million teachers, it is one of the lowest performing.<sup>5</sup> The country ranked 62nd out of 72 countries in the 2015 Program for International Student Assessment (PISA), a benchmarking study by the OECD that assesses the achievement and application of key knowledge and skills of 15 year olds.

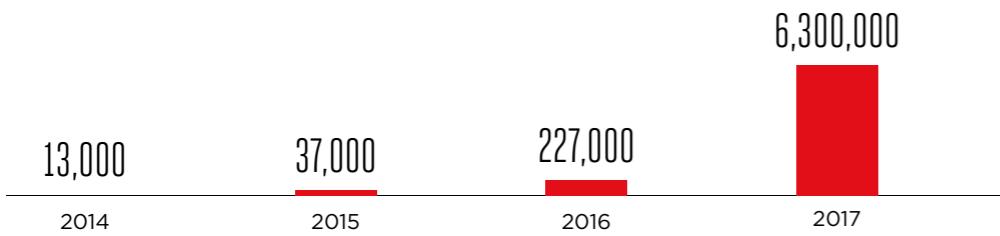
Ruangguru was launched in 2014 to tackle these challenges. Ruangguru is a tech-enabled education provider whose first product was a tutoring marketplace. Since then, the startup has launched a range of products aimed at accelerating educational outcomes. Its flagship product, RuangKelas, is a freemium Learning Management System (LMS) that helps students prepare for exams using content tailored to the national curriculum, and helps teachers to crowdsource and distribute educational content to students.

With this service, Ruangguru is supporting the Indonesian government in its efforts to advance the national education system. The startup has forged partnerships with 32 of Indonesia's 34 provincial governments and more than 325 city and regency governments, many of which are using RuangKelas to help students prepare for high school entrance exams. As of the end of January 2018, Ruangguru, now an established business with 254 staff, had attracted over seven million registered students and reached 900,000 monthly active users.<sup>6</sup>

Complementing RuangKelas is a range of paid supplemental education services offered outside of school, including RuangBelajar, an integrated learning video subscription service; Ruangguru Digital Bootcamp, a social learning education solution for group-based distance learning; RuangLes, a private tutoring marketplace; RuangUji, an online exam simulation product; and RuangLesOnline, an on-demand tutoring service.

FIGURE 3

### Ruangguru: registered students



<sup>5</sup> The World Bank, 1 September 2014, "World Bank and Education in Indonesia", <http://www.worldbank.org/en/country/indonesia/brief/world-bank-and-education-in-indonesia>

<sup>6</sup> Students are not only registered on the LMS, but are also accessing other Ruangguru services.

## How the service works

By working with the GSMA Ecosystem Accelerator programme, Ruangguru has been able to add an ondemand tutoring service, RuangLesOnline, to Ruangguru's mobile solution. With this platform, students are now able to get one-on-one consultations with tutors. Here is how the service works:



## Working with mobile operators

In August 2017, Ruangguru entered a collaboration with Telkom Indonesia, which operates Telkomsel, Indonesia's leading mobile operator with close to 186 million connections.<sup>7</sup> With this partnership, Telkom agents can promote Ruangguru's products through the operator's marketing channels (i.e. call centres and door-to-door sales).

In January 2018, Ruangguru deepened its partnership with the mobile operator, collaborating with the team from Telkomsel's prepaid youth brand, *Loop*. Through the partnership, Ruangguru and Telkomsel Loop launched a campaign in February 2018—the Ruangguru Data Package—that gives users 1GB of

data, and 2GB of free data exclusively to access Ruangguru's educational content on the web and on mobile. Ruangguru has also begun feeding its content into Telkomsel Loop's educational portal, Ensiklopedia.



“Ruangguru has over 6 million registered users and Loop – Telkomsel’s youth brand – sees this as an opportunity to bundle Ruangguru’s product on our platform. Users gain access to 2GB of free data when surfing Ruangguru’s bundled content. Ruangguru has a similar target market to ours (junior high and senior high students) thus we can leverage the startup’s brand awareness and customer reach.”

**— Nastiti Yuniansari, Segmented Community Product Marketing, Loop, Telkomsel**

## Changing lives



According to the OECD Skills Matter Study,<sup>8</sup> almost 70 per cent of adults in Jakarta have level 1 literacy or below and this figure is expected to be even lower in rural and remote areas. In contrast, only 4.5 per cent of the OECD population is below level 1 literacy. Ruangguru is working to address this issue by facilitating access to relevant and customised educational content for millions of students.

“The era of rapid technology encourages us as teachers to keep innovating and seeking new learning strategies to engage our students. I am glad I found Ruangguru.com. It equips us with the right tools to quiz and test our students. It is also a way for us to improve our teaching quality. I thank Ruangguru for providing this virtual class to help us in educating the future generation of our country.”

**Sri Rochani, Magelang, High School Mathematics Teacher**



“RuangLesOnline is very interesting and helpful for me. My grades have improved since I started using RuangLesOnline. The teachers are very friendly and their teachings are easy to understand. This way of learning is very effective for me, as it is difficult for me to find a private home tutor. From where I live, the tutors live very far away from my house.”

**Ayu, Ciamis, West Java, Senior High School Student**

## Working with the GSMA Ecosystem Accelerator

Ruangguru received a grant from the GSMA Ecosystem Accelerator Innovation Fund in April 2017 to:

- Develop user-generated content;
- Launch its classroom platform, Ruangguru Digital Bootcamp, in 10 cities across the country; and
- Launch online tutoring features, RuangLesOnline, on its mobile apps.

With this project, Ruangguru is planning to unlock additional income for about 9,000 teachers by the end of the grant in April 2018. Beyond funding, the GSMA Ecosystem Accelerator also supports Ruangguru by facilitating partnerships with mobile operators.

Find out more about Ruangguru, its collaboration with Telkomsel and our work with them in our video case study: [Meet our portfolio start-ups: Ruangguru, Indonesia](#).

## Case Study 3

## Twiga Foods: Improved market access for farmers and a reliable supply for vendors



|  |   |  |
|--|---|--|
|  | <b>Founding year</b>                        | 2014   |
|  | <b>Geography</b>                            | Kenya  |
|  | <b>Founding team and GSMA grant manager</b> | Peter Njonjo - Co-founder<br>Grant Brooke - Co-founder and CEO<br>Kikonde Mwatela - Co-founder and COO<br>Caine Wanjau - CTO (GSMA grant manager)                    |
|  | <b>Tweet pitch</b>                          | Twiga Foods is a mobile-based supply platform for small- and medium-sized fruit and vegetable vendors.<br><a href="http://www.twigafoods.com">www.twigafoods.com</a> |

Agriculture accounts for over a quarter of Kenya's GDP (or around half if other related sectors are included).<sup>9</sup> Over 75 per cent of the country's population makes some part of their living from agriculture.<sup>10</sup> However, the Kenyan agricultural sector can be inefficient and complex, and food waste is high due to inefficient handling practices. At the same time, small- and medium-sized fruit and vegetable vendors often lack access to a reliable supply of affordable and quality products.

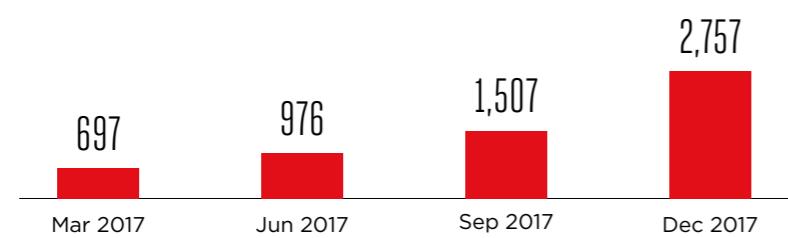
Twiga Foods was created in 2014 to reduce fragmentation in the produce market. The agritech startup runs a mobile-based B2B food supply platform that supplies fresh fruits and vegetables sourced from farmers in rural Kenya to small- and medium-sized vendors, outlets and kiosks in the country's capital, Nairobi. The mobile-based cashless

platform allows Twiga Foods to offer higher prices and a guaranteed market to farmers, and lower prices and a reliable supply to vendors. It also helps to reduce post-harvest losses and waste as it matches demand with supply. Consumers also benefit as they are able to buy fresher products at lower prices thanks to a more efficient supply chain.

Twiga Foods deals directly with farmers and operates 25 collection centres and a fleet of 50 delivery vehicles. Twiga Foods employs 240 staff and has become the largest seller of bananas in Kenya. As of January 2018, the startup had sourced more than 245 tonnes of bananas each week from over 3,000 farmers. These bananas are distributed through 7,000 weekly deliveries to more than 3,500 registered vendors who re-order every two days, on average.

FIGURE 4

### Twiga Foods: Number of farmers enrolled

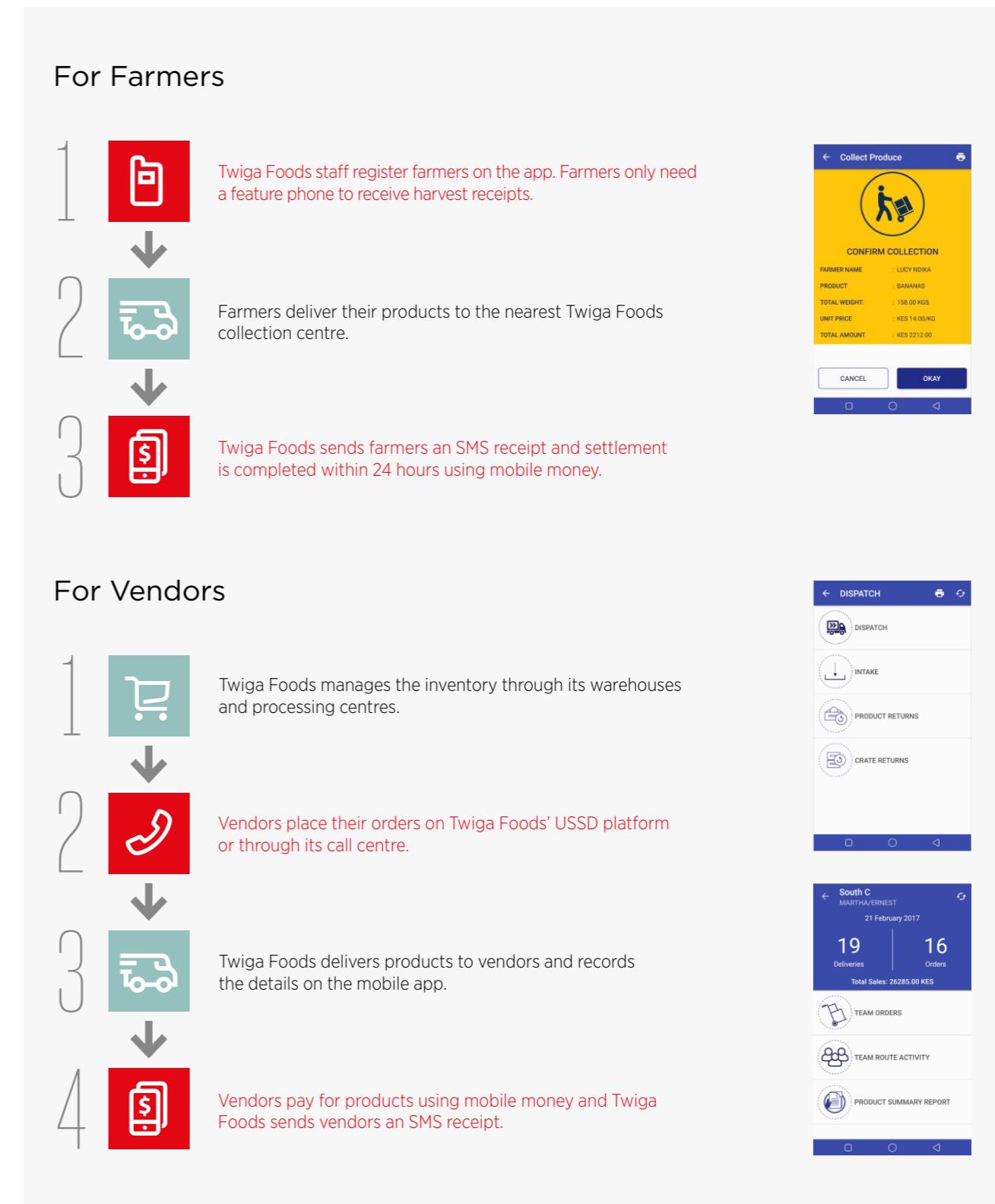


9 FAO, "Kenya at a glance: The agricultural sector in Kenya", <http://www.fao.org/kenya/fao-in-kenya/kenya-at-a-glance/en/>.

10 Feed the Future, "Country Profile: Kenya", <https://feedthefuture.gov/country/kenya>.

## How the service works

Twiga Foods' distribution infrastructure is managed through a digital platform that enables real-time, end-to-end data collection. The platform is also integrated with mobile money (M-Pesa) to provide cashless payments throughout the value chain. Here is how the service works:



## Working with mobile operators

Twiga Foods uses M-Pesa, Safaricom's mobile money service, to manage and streamline their payment processes for vendors and farmers. Through M-Pesa, Twiga Foods makes about 1,000 payments to farmers a week. Given these volumes, M-Pesa reduces the risk and transaction costs of handling cash. Previously, vendors would pay with cash and the Twiga Foods sales team would then deposit the money at a mobile money agent at the end of the day. Twiga Foods has now provided each delivery route with a till number to enable vendors to pay directly through M-Pesa.

Furthermore, the company has integrated mobile payments in its supply chain platform whereby the majority of farmers receive their payments through mobile money and information is recorded in real time in the field to enable timely settlement of payments.



## Changing lives



Twiga Foods improves the livelihoods of farmers and vendors at both ends of the value chain and contributes to waste reduction and lower food prices in urban centres. It offers higher quality products at lower prices (up to 10 to 15 per cent cheaper than the traditional wholesale market). Furthermore, Twiga Foods-managed direct deliveries save vendors time and money as they do not have to pick up the products themselves twice a week.



"Before, I had to get up early and go to the market to get vegetables. Now, with Twiga Foods, I can place my orders through my phone and get it delivered to my shop."

**Dominic, Nairobi, Fruit and Vegetable Vendor**



"Before, I was selling my products to those who take bananas to Gikomba (a wholesale market in Nairobi) or to Mombasa. Since working with Twiga Foods, my finances have improved"

**Sarah, Meru (three hours from Nairobi), Farmer**

## Working with the GSMA Ecosystem Accelerator

Twiga Foods received a grant from the [GSMA Ecosystem Accelerator Innovation Fund](#) in April 2017 to:

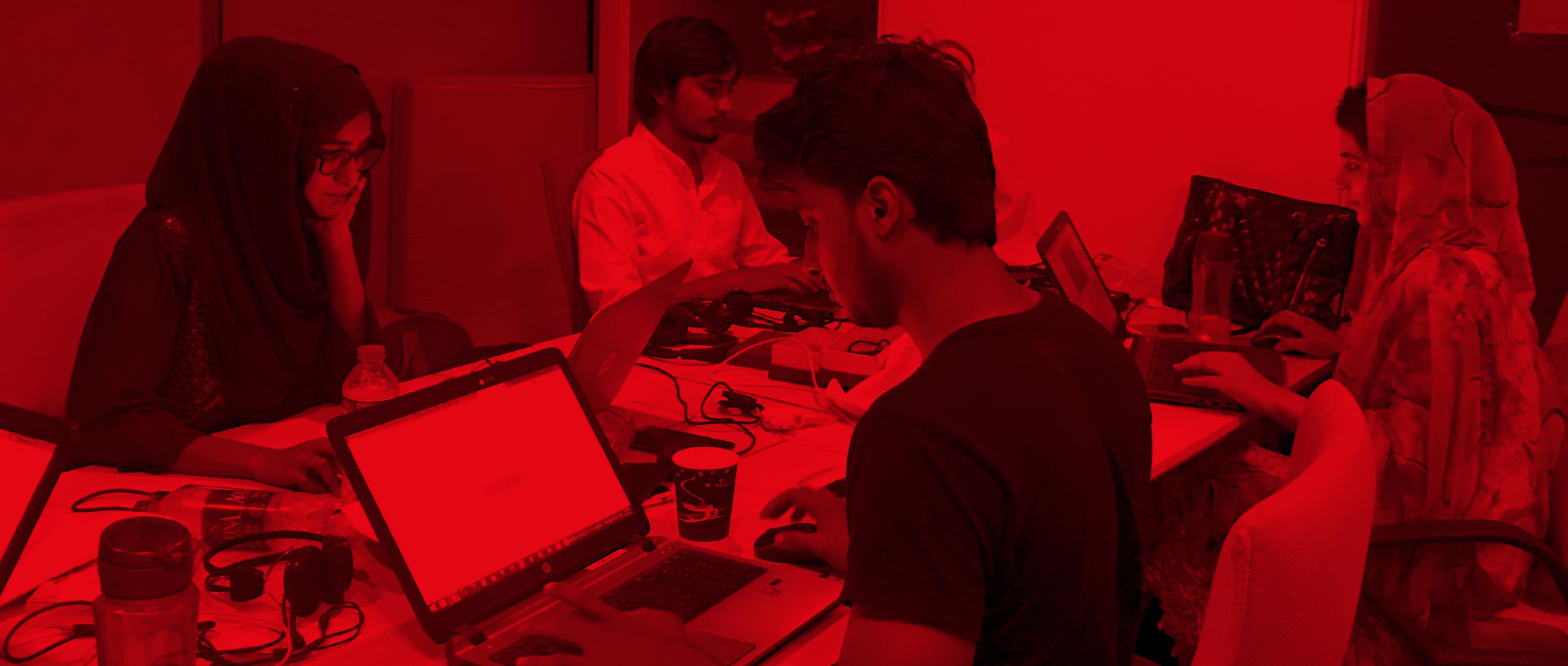
- Enhance the use of mobile technology to collect data across the value chain; and
- Build a platform to enable vendors to place orders via feature phones and smartphones rather than through a sales representative.

With this project, Twiga Foods is planning to unlock USD 225,000 in additional income and reach more than 289,000 beneficiaries in the agricultural value chain.

In addition to funding, GSMA has been supporting Twiga Foods in strengthening integration with mobile operators.

# Mobile operators in the News

**How mobile operators are collaborating with local start-ups**



The map below is a snapshot of mobile operator and startup initiatives launched between September 2017 and January 2018. Each initiative has been mapped against a framework we developed in our 2017 report,

*Building Synergies: How Mobile Operators and Start-ups Can Partner for Impact in Emerging Markets*, including investments, competitions, APIs, commercial agreements and tech hub initiatives. In the report, we dive deeper into six of the initiatives.

FIGURE 5

## Mobile operator-startup collaborations in emerging markets (September 2017–January 2018)

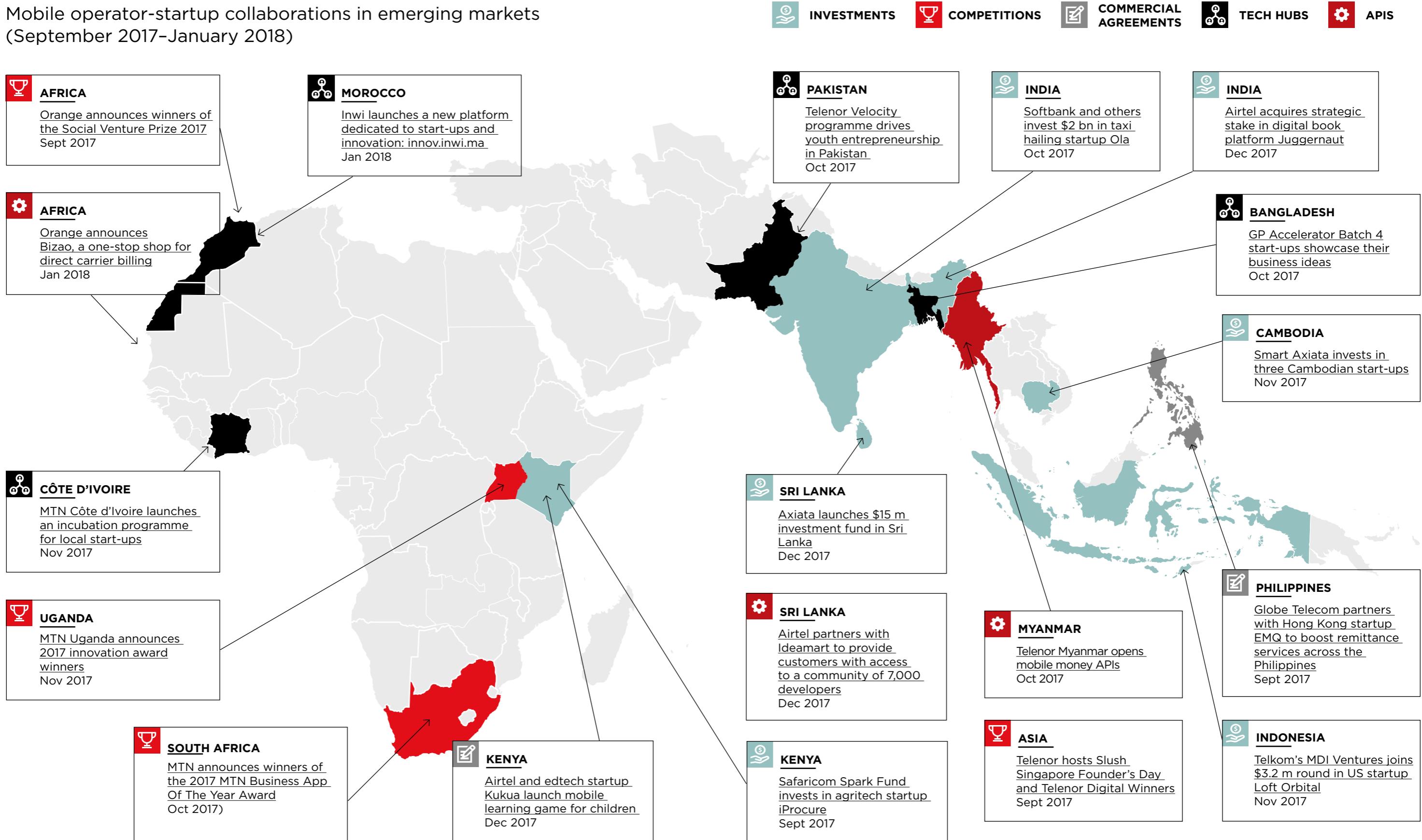


FIGURE 6

## Airtel acquires strategic stake in digital book platform Juggernaut



INVESTMENT

Bharti Airtel (India) acquired a stake in publishing platform [Juggernaut Books](#) in November 2017. Juggernaut runs a mobile app that hosts books across a variety of categories, including fiction, non-fiction, crime and business. The startup provides authors with a digital and physical platform for their books. Launched in 2016, the platform had over 5,000 books with about one million downloads across Android and iOS by December 2017. In May 2017, the startup launched a writers' platform that allows amateur writers the opportunity to publish digital content and have a chance at winning publishing contracts.

The investment is in line with Airtel's goal to build an open content ecosystem and bring digital content to its customers. The funding from the mobile operator will help Juggernaut expand its distribution network, ramp up content acquisition and digital marketing, and help it prepare for the launch of its subscription offering.

## Dialog Axiata launches Sri Lanka's first digital venture capital fund



INVESTMENT

In December 2017, Dialog Axiata (Sri Lanka) launched a USD 15 million investment fund dedicated to Sri Lankan start-ups. The investment vehicle will be managed by Sri Lanka and Singapore-based fund management firm [BOV Capital](#). The new fund aims to invest in start-ups with a strong business model, product market fit and demonstrable ability to scale or replicate in multiple markets.

The fund is looking to invest between USD 50,000 and USD 500,000 in 10 to 20 start-ups in the following sectors: financial services, digital commerce, entertainment, social media, advertising, education and healthcare.

The corporate venture capital (CVC) fund was launched following the launches of similar CVC funds by Axiata in Malaysia and Cambodia. The Sri Lankan operator plans to leverage its infrastructure, brand and reach to nurture and support its portfolio start-ups. As of February 2018, the firm had already made two investments: [Roar Media](#), a digital-first content company, and [Insureme](#), an online insurance comparison platform. Beyond funding, the portfolio companies will also benefit from mentoring, knowledge sharing and business development support.

## MTN Côte d'Ivoire launches startup incubator



TECH HUB

MTN Côte d'Ivoire launched its startup incubator programme, Yello Startup, in October 2017. The mobile operator sought start-ups with innovative, commercially sustainable business models that would have a social impact. The programme aims to help young entrepreneurs design and scale innovative digital solutions. MTN Côte d'Ivoire selected 10 start-ups for the first phase of the incubator, which lasted one month, then narrowed them down to four, which will be incubated by MTN until August 2018.

The four start-ups selected were: [Mon Artisan](#), a mobile and web platform that connects individuals to craftsmen; [Coliba](#), a web and mobile-supported waste management platform; Rec-Cv, a digital resumé creation assistant platform; and [C\\_Propre](#), a network-based waste collection solution.

The four start-ups received FCFA five million (USD 9,450) from MTN, office space, as well as access to financial and technical support from selected mentors and coaches, including MTN staff. In addition, the four start-ups will gain access to MTN Ivory Coast's USSD, SMS and mobile money APIs.

FIGURE 7

## Airtel, Kukua launch fun learning through mobile gaming



COMMERCIAL AGREEMENT

Airtel Kenya and edtech startup, [Kukua](#), have teamed up to promote Kukua's Sema Run, a learning app that helps children improve their literacy skills through interactive mobile gaming. Kukua partnered with the mobile operator to distribute instructions on how to download its app to over two million Airtel users via SMS.

Sema Run is a gamified learning app that teaches children aged five to 10 years how to read, write and perform basic arithmetic using characters, music, animations, games and stories related to African culture. The literacy aspect of the game is designed by world experts in literacy, cognitive psychologists and education specialists. Sema Run works offline to ensure users can use the app without requiring internet connectivity.

## Telenor opens mobile money APIs for third-party developers in Myanmar



APIS

In Myanmar, Wave Money, a mobile money operator formed as a joint venture between Telenor Myanmar, Yoma Bank and [First Myanmar Investment](#), opened its API access to third-party developers in October 2017. The API it released was Pay by Wave Money, a solution that allows eCommerce companies to integrate Wave Money into their websites and apps. When a customer wants to perform a transaction, they enter their mobile number into the website or app and a USSD push message to their phone prompts them to enter their PIN. The transaction is authenticated and completed once the PIN is entered.

Wave Money plans to release more APIs, making it easier for partners to integrate with its platform. Because Myanmar has low debit and credit card penetration, Pay with Wave Money increases the number of customers merchants can reach and reduces the risk and cost of handling cash.

## Orange announces Bizao, a one-stop shop for API integration in Africa and the Middle East



APIS

Bizao by Orange is a one-stop shop that enables third-party businesses and start-ups to monetise and distribute digital services in Africa and the Middle East.

Bizao's platform provides payment, communication and distribution for digital services across Orange Africa and Middle East's footprint. Through the platform, start-ups and other businesses can gain access to Orange's billing, USSD and SMS APIs. The direct carrier billing API provides start-ups and other businesses with an efficient way to commercialise and incorporate billing into their digital services. The USSD API, #303# My Store, is Orange Africa and Middle East's USSD shop. The SMS API allows digital services from third parties like start-ups to automatically send an SMS to their mobile users.

Beyond technical integration, Bizao aims to centralise commercial and financial relationships between third parties and Orange across its footprint in Africa and the Middle East.

# 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 thirds in Africa.<sup>11</sup> 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.<sup>12</sup> An efficient agricultural sector would generate social, economic and environmental benefits, such as boosting income,

cutting transaction costs, reducing CO<sub>2</sub> emissions, and saving energy and water. The potential of mobile technology to overcome these efficiencies 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.<sup>13</sup> 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**).

<sup>11</sup> The World Bank, 2017, "Future of food: shaping the food system to deliver jobs", <http://documents.worldbank.org/curated/en/40651149252862198/Future-of-food-shaping-the-food-system-to-deliver-jobs>

<sup>12</sup> 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/>

<sup>13</sup> More information on the spectrum of digital tools aimed at agribusinesses in developing countries: GSMA mAgri, 2017, "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 <sup>14</sup> | Information services:                                    | Supply chain services:   | Mobile financial services:   | Monitoring services (incl. IoT):   |
|--|--|--|--|--|
|  | Weather, market, information, agriculture best practices | Matching platforms, traceability and tracking systems, management of supplier/distribution network | Payments via mobile money, savings and credit products, micro insurance (for inputs, crops or livestock) | Equipment monitoring, precision agriculture, environment monitoring, livestock management, farm management |
| <u>Impact Terra</u> (Myanmar)                              | ✓  |  |  |  |
| <u>MLouma</u> (Senegal)                                    | ✓  | ✓  |  |  |
| <u>Farmerline</u> (Ghana)                                  | ✓  |  | ✓  |  |
| <u>Agribuddy</u> (Cambodia)                                | ✓  |  | ✓  |  |
| <u>Twiga Foods</u> (Kenya)                                 |  | ✓  | ✓  |  |
| <u>Farmcrowdy</u> (Nigeria)                                |  |  | ✓  |  |
| <u>Trotro Tractor</u> (Ghana)                              |  |  |  | ✓  |
| <u>MimosaTek</u> (Vietnam)                                 |  |  |  | ✓  |
| <u>Illuminum Greenhouses</u> (Kenya)                       |  |  |  | ✓  |
| <u>CI-Agriculture</u> (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.



# 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  |
|----------------------------------|---|---|
| <u>Impact Terra</u><br>(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. <sup>15</sup>  | 1 NO POVERTY  |
| <u>FarmDrive</u><br>(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   |
| <u>MimosaTek</u><br>(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<br>7 AFFORDABLE AND CLEAN ENERGY |

|  |   |  |
|--|---|--|
| <u>Twiga Foods</u><br>(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. <sup>16</sup> 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 <a href="#">GSMA Ecosystem Accelerator programme</a> . |  |
| <u>Illuminum</u><br>Greenhouses<br>(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. <sup>17</sup>  |  |
| <u>eFishery</u><br>(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 <a href="#">GSMA Ecosystem Accelerator programme</a> .   |  |
| <u>Farmcrowdy</u><br>(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 <a href="#">GSMA Ecosystem Accelerator programme</a> .  |  |
| <u>Meridia</u> (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. <sup>18</sup>  |  |

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

<sup>16</sup> 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/5a17e58b26b72a0916f97a>

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

<sup>18</sup> 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.

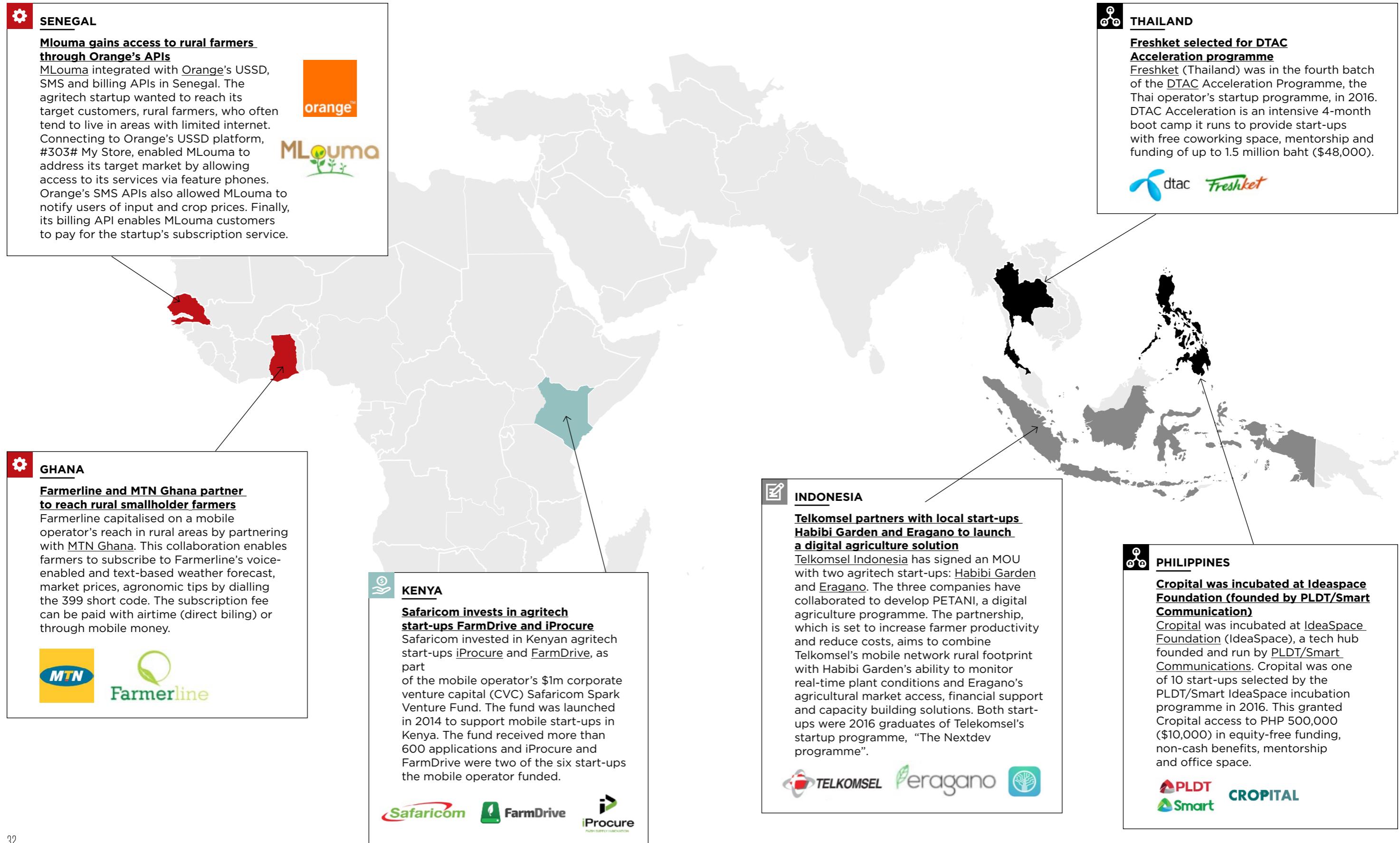
Since the lion’s share of agritech startup end users (mainly farmers) are rural—an increasingly important segment for most mobile operators—we believe there are significant opportunities for mobile operators to work with agritech start-ups to create win-win partnerships while also having a social, economic 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.



## Acknowledgements

We would like to thank the mobile operators, external consultants, start-ups and experts who were interviewed and consulted for this report, and specifically:

- Samira Negm, CEO and Co-founder, Raye7 (Egypt)
- Ahmed Negm, Public Relations Officer and Co-founder, Raye7 (Egypt)
- Adamas Devara, Co-founder and CEO, Ruangguru (Indonesia)
- Rachel Arinii Judhistari, Project Director, Ruangguru (Indonesia)
- Iman Usman, Co-founder, Head of Product and Partnership, Ruangguru (Indonesia)
- Caine Wanjau, CTO, Twiga Foods (Kenya)
- Ahmad Saiful Huda, General Manager Youth & Community Product Marketing, Telkomsel (Indonesia)
- Nastiti Yuniansari, Segmented Community Product Marketing, Telkomsel (Indonesia)
- Mohamed Idriss N'DAHO, Marketing Manager, MTN (Côte d'Ivoire)
- Aurélien Duval-Delort, Managing Director, Bizao by Orange Middle East and Africa (France)
- Abdul Ashraff, Specialist – Finance and Strategy, Dialog Axiata (Sri Lanka)
- Fariq Cader, Vice President – Digital Services, Dialog Axiata (Sri Lanka)



For further information please visit  
the GSMA website at [www.gsma.com](http://www.gsma.com)

**GSMA HEAD OFFICE**

Floor 2  
The Walbrook Building  
25 Walbrook  
London EC4N 8AF  
United Kingdom  
Tel: +44 (0)20 7356 0600  
Fax: +44 (0)20 7356 0601