Desert Locust Citizen Reporting

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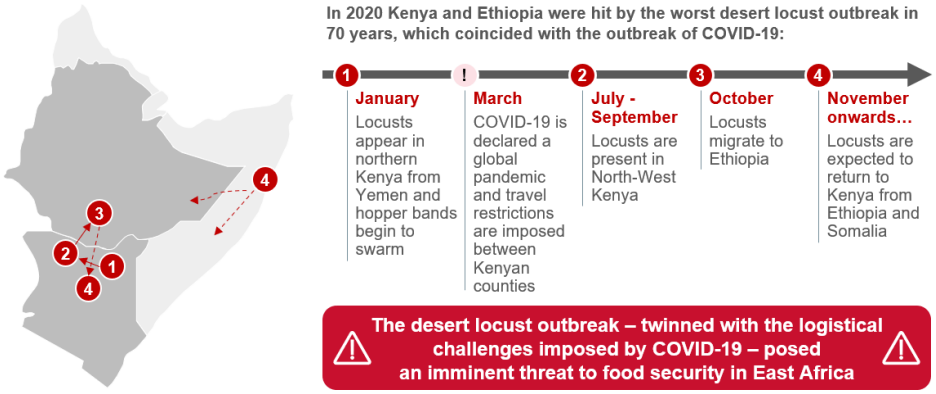
Introduction

This year East Africa has experienced a dual crises of the largest desert locust invasion in decades and the global COVID-19 pandemic, both threatening farmers' livelihoods. In response, Mercy Corps AgriFin deployed public health and desert locust messaging via multiple digital channels to over 16 million smallholder farmers. To support the mapping and control effort, many of these channels were designed to enable farming communities to report sightings

of desert locusts, turning rural communities into a large reporting force to assist FAO and the Kenyan/Ethiopian governments map the locations of and direct the control efforts to these voracious migratory pests. Access the **full length case study**.

What was the threat posed by desert locusts?



Over 20 million locusts can be in one swarm and move upwards of 90 KMs per day – a plague can consume multiple farms' crops within hours. When desert locusts first arrived, there was a deep concern that they could migrate to the most fertile and productive farming communities of East Africa, potentially causing a catastrophic food security crisis. Due to favourable climatic conditions and successful control efforts, they remained in arid/semi-arid regions. Still, they caused significant vegetative damage, especially within pastoralist communities. **Preliminary estimates early last**

month indicated that the swarms had flattened about 175,000 hectares of crop and pastureland upsetting the livelihoods of nearly 164,000 households. Desert locust swarms continue to plague the region ongoing surveillance efforts are critical to ensure they remain contained.

Why was citizen reporting used?

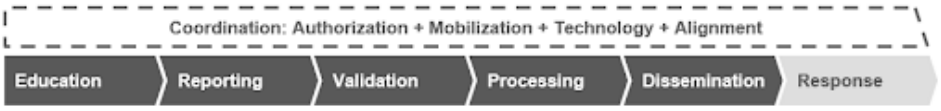
When the desert locusts arrived in northern Kenya for the first time in 70 years COVID-19 concerns were limiting field deployments, the Kenyan government explored ways to enable remote rural communities to be part of the reporting and monitoring solution. Having never seen desert locusts' swarms before, especially of this magnitude, it was also important to inform rural people about the desert locusts, the tools availed to them and their weekly movements via FAO mapping. Citizen reporting via digital means provides the perfect two-way communications systems to allow both reporting of locust sightings and to inform via real time updates on maps, videos and content.

The potential to quickly deploy citizen reporting tools was also important. AgriFin had been working with a network of partners in Kenya on a "WhatsApp for Business" sandbox with Turn.IO, to enable partners such as iShamba and ATA to complement their SMS and call center-based communications systems with interactive WhatsApp platforms. With partners and technologies in place, AgriFin was able to design and deploy citizen reporting channels within 2 weeks to support the FAO's response effort and during these early uncertain months, to provide critical additional data to the ongoing elocust3m field surveying tools trained extension workers had been deployed with.

Citizen reporting has therefore been critical to 1) complement extension services at a national and regional scale, 2) inform rural communities about the desert locust threat quickly, 3) provide an important feedback loop between farmers and the mapping and control effort.

How was citizen reporting used for desert locusts?

The desert locust citizen reporting ecosystem was structured across several stages of data collection and communication: public information campaigns were broadcast to educate potential citizen reporters, in order to prompt the reporting of locust sightings, which were then validated and processed to predict future locust activity and, in turn, disseminated to inform both the public information campaigns (creating a farmer feedback loop) and response efforts, such as the targeted spraying of pesticides.

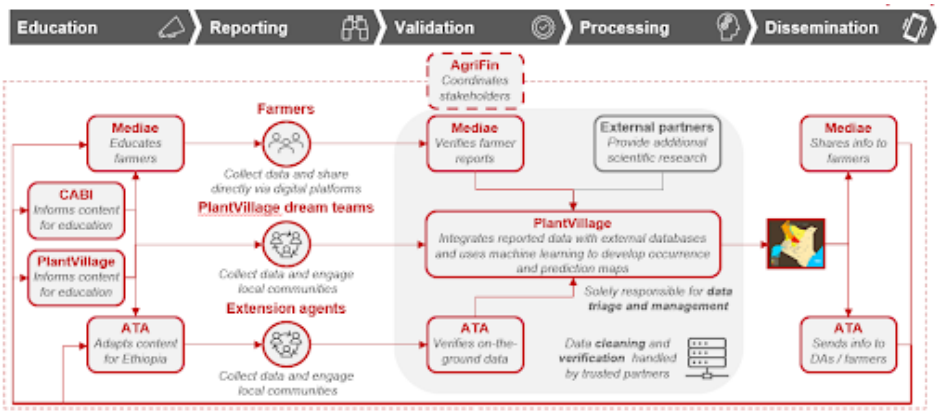


At the outset, once the need for citizen reporting was recognized, authorization was secured from enabling bodies to enable the rapid formation of the citizen reporting model. AgriFin and Ethiopia's Agricultural Transformation Agency (ATA) secured government buy-in from FAO and the Governments of Kenya and Ethiopia respectively to approve

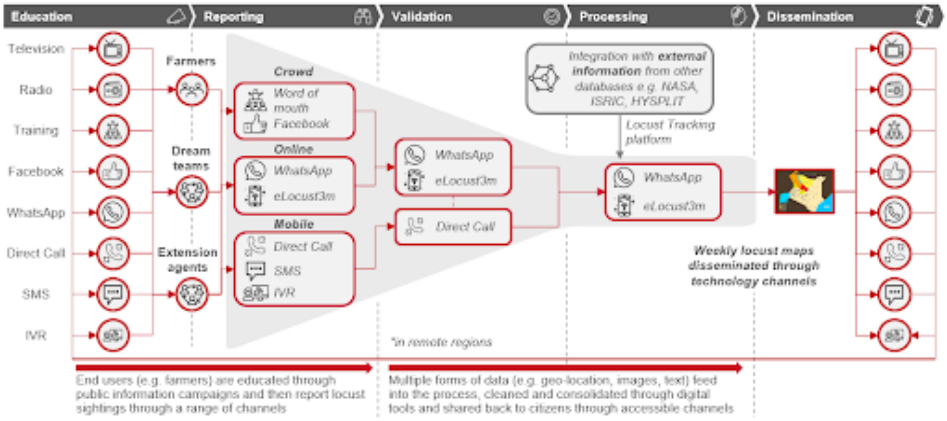
the citizen reporting concept and communication of data through new technology channels that complemented pre-existing systems, such as FAO's global monitoring and early warning system.

A consortium of partners – with the technical capabilities and domain expertise required to meet the context of desert locusts in Kenya and Ethiopia – was mobilized at each stage of the ecosystem and coordinated by AgriFin. At the education stage, CABI, PlantVillage and FAO developed scientifically accurate content to inform potential citizen reporters of the locust threat and how they could reporting sightings across different channels. This content was then adapted and communicated through public information campaigns led by Mediae and ATA to reach end users across different regions and languages in Kenya and Ethiopia respectively. In response to such campaigns, citizen reporters – comprising farmers, PlantVillage scouts and ATA extension agents – were able to report desert locust sightings as and when they occurred.

Reported locust sightings were aggregated, validated and processed by PlantVillage to ensure accuracy and scientific robustness. Locust sightings were verified through a series of steps, including on-the-ground verification by PlantVillage field scouts, follow-up calls from Mediae call centres and ATA extension agents and PlantVillage data scientists' use of artificial intelligence. Validated locust sighting data was then integrated with external databases, such as ISRIC soil types and NASA satellite soil moisture imagery, to build locust activity prediction maps, which were disseminated across a range of technology channels to inform public information campaigns and response efforts.

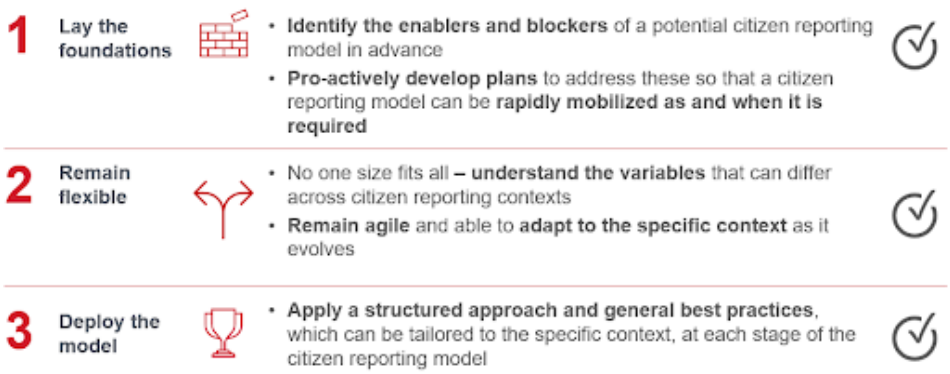


The deployment of a range of complementary technology channels was fundamental in supporting each stage of data communication and maximizing the outreach of the citizen reporting model. Pre-existing, trusted media channels, such as Mediae's Shamba Shape Up TV show and several radio channels, were used to broadcast educational content, whilst reporting channels, including WhatsApp for Business, SMS, IVR and eLocust3m (a locust reporting app developed by PlantVillage), were deployed to accommodate a broad spectrum of digital literacy and maximize uptake. In turn, end users could be contacted across these channels by ecosystem partners – for both educational and validation purposes – to provide up-to-date information and sustain the citizen reporting model.



How can citizen reporting be deployed in the future?

The response to desert locusts proved that citizen reporting can be used to support the rapid, scalable, and cost-effective collection of data during agriculture and climate-related disasters. Drawing on experience from the desert locust response and other citizen reporting models, we have developed a three-step approach for development actors to follow when deploying citizen reporting in the future:

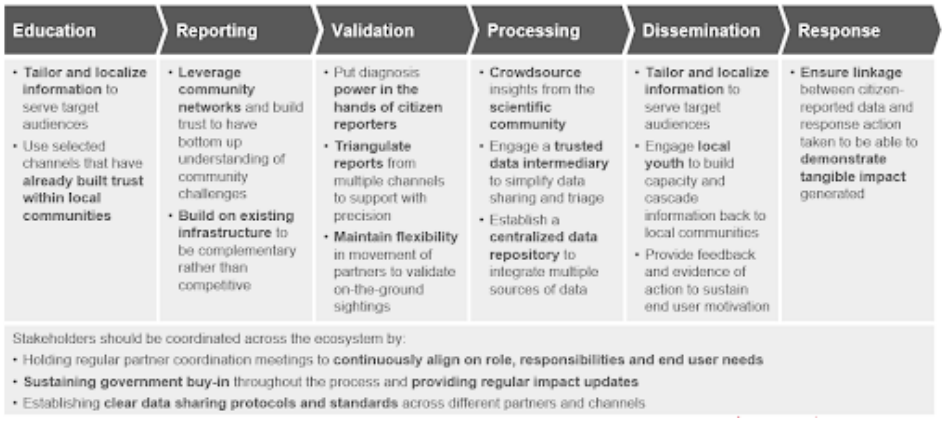


Firstly, potential conveners of citizen reporting models should try to lay the foundations of any response by identifying potential enablers and blockers and pro-actively addressing these in advance. For example, the rapid deployment of a citizen reporting model could be contingent on deploying flexible funding, receiving authorization from governments, mobilizing a network of relevant partners and leveraging the local digital infrastructure. In each instance, planning efforts, such as networking with potential donors, government bodies and technology partners, could remove potentially costly obstacles to a future response effort.

Secondly, the design of potential citizen reporting models must remain flexible to variables that can differ across contexts and as crises evolve. No one size of citizen

reporting model suits all scenarios, but instead it can vary according to the development sector at hand, geographical coverage, predictability of an event, technology environment and types of end user data required. As such, potential conveners of citizen reporting models must remain agile and adapt to each specific context as it evolves.

Finally, stakeholders should apply a structured approach and general best practices if or when the need for citizen reporting arises. We have derived a series of general best practices from the experience of the desert locust and other citizen reporting models that can be applied and tailored to the specific context across each stage of data communication and for the coordination of stakeholders:



Together, these steps could be taken to respond to and reduce the impact of a range of agriculture and climate-related events. Within the context of climate change and digitization, farming communities have become the frontline of disaster response efforts – through their ability to rapidly crowdsource data – and will continue to do so in the face of other emergencies, including transboundary pest outbreaks (e.g. fall army worm), drought, floods and soil damage. The future deployment of citizen reporting can reinforce and

augment the lessons learned from desert locusts as the model becomes established and applied across broader emergency response efforts.

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