

Covid-19 briefing:

The potential for productive use solar technologies to address food security in East Africa

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An emerging consensus has formed among donors, humanitarian agencies, and NGOs that the effects of the COVID-19 outbreak, locusts swarms, and flooding in parts of Kenya, Ethiopia and Rwanda could double the number of food insecure people in East Africa in 2020.¹ While providing emergency support will be critical in the short term, development organizations must also focus on supporting longer term solutions which strengthen local and regional

food systems. Productive use solar technologies have the potential to contribute by increasing access to energy for agricultural production and storage in areas without reliable grid access – this brief highlights some of the potential use cases in East Africa and provides recommendations for donors on how to help scale these technologies and integrate them into food security programming.

The Context

There are early indications that the direct and indirect effects of COVID-19 have already affected production and distribution in some key staple and cash crop value chains across the region. Limitations on supplies of imported inputs (e.g. seed, fertilizer and pesticides), extension services and farm labour due to movement restrictions is expected to affect farm productivity, while farmers producing cash crops for urban consumption could switch to producing food for their families amidst concerns about food security.² Disruptions to distribution due to movement restrictions (e.g., border testing and the requirements for “essential services” licensing), compounded by a lack of proper cold

storage for perishable produce in farms, collection centers and informal sale points, could lead to food losses which may worsen food shortages in some value chains (e.g., fruits, vegetables, meat and dairy). Finally, volatile consumer demand, closure of many “mama mbogas” (e.g. small informal retailers) in urban areas, and the effects of social distancing measures on large wholesale markets is expected to interfere with distribution of food. This has led to the World Food Program estimating that the number of people who are food insecure in East Africa could rise from 20 million to between 34 to 43 million in 2020, driven by an increase of food insecurity in urban areas.³

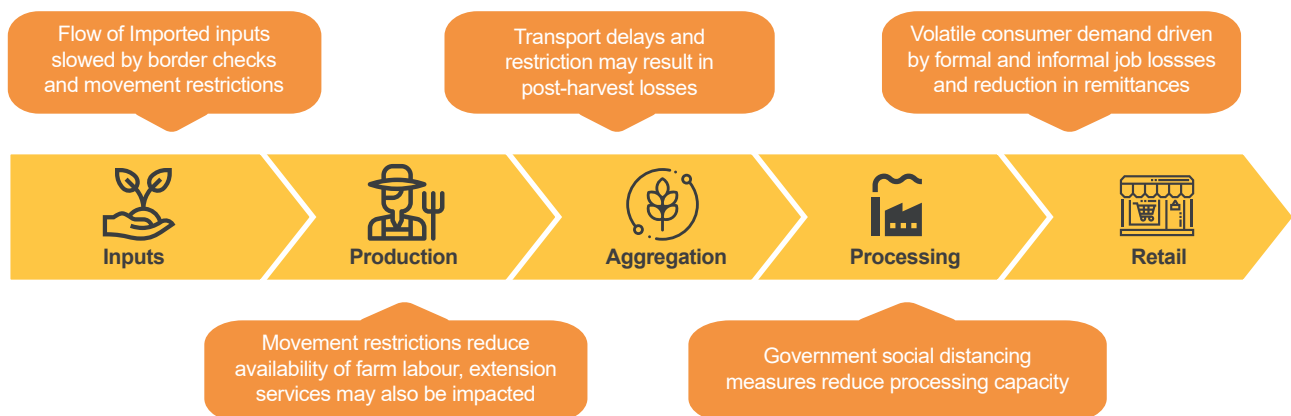


Figure 1: The potential effects of Covid-19 restrictions on agricultural value chains in East Africa

This is compounded by the fact that unusually wet conditions have produced a favourable environment for desert locust breeding. Although the combined efforts by aid agencies and governments to contain them have limited their impact to date, a second wave of locusts is expected in June and July 2020 during key harvesting periods for many farmers in East Africa. Furthermore, flooding in Kenya,




Rwanda and Somalia in May 2020 has washed away thousands of acres of crops.⁴ While short-term humanitarian responses to these crises will be critical in the worst-hit areas, funding longer-term solutions are equally important to build resilience in food systems against increasingly unpredictable climatic conditions and the potential for recurring government lockdowns.

The Potential For Productive Use Solar Technologies To Address Food Security

Off-grid renewable energy solutions have the potential to strengthen local and regional food systems during and after the pandemic by increasing access to energy for production and storage, while also providing economic benefits such as job creation (e.g. directly through sales agent networks and indirectly through increased agricultural productivity).⁵ Productive Use Leveraging Solar Energy (PULSE) technologies such as solar water pumping and refrigeration are currently the most viable off-grid renewable energy solutions to address food insecurity

in East Africa. There are a number of private sector players already distributing PULSE technologies in the region, a number of use cases with the potential for significant impact on food security, and high mobile phone and mobile money penetration rates which can be leveraged to enable end users (e.g., farmers, aggregators and retailers) with the capacity to contribute financially to easily make daily or monthly payments. Some of the most high potential use cases are shown below.

Figure 2: Use cases for PULSE technologies to strengthen food security in East Africa

		USE CASES
Production	 <p>Solar Water</p>	The use of solar irrigation powered irrigation pumps could boost productivity by reducing over-reliance on rain-fed agriculture in areas with unpredictable rainfall and scarcity of surface water. ⁶
		For pastoralist communities, whose main economic activity is livestock herding for milk and meat, solar water pumps have been used to provide drinking water for their families and herds at 31% of the cost of diesel equivalents. ⁷
Processing	 <p>Solar Milling</p>	Millions of households across East Africa rely on grains and cassava as staples, with milling a key processing activity. Solar mills offer the potential to build localized processing capacity, which reduce the need for aggregation and transportation. However, the technology requires a high up-front investment, thus requiring support from donors for prototyping to drive efficiency gains. ¹²
Distribution and Retail	 <p>Solar Cooling and Fridges</p>	Small scale (e.g. 40 liter) cooling systems have been designed specifically for value chains such as dairy and horticulture and would enable smallholder farmers to reduce spoilage due to delays in transportation to aggregators or unreliable demand patterns. ⁸ Larger scale cold storage rooms can also stem losses at the aggregation stage in areas with unreliable grid access. ⁹
		There are already several companies selling commercial PayGo solar refrigeration products in East Africa. These could reduce losses by enabling retailers with no or unreliable power to store fresh fruits, vegetables and dairy products during periods of unpredictable supply and demand. ¹⁰
		Solar milk ATMs and cold chain vans have been piloted for pastoralist communities, enabling storage of milk products for longer periods and facilitating transportation to larger local markets. ¹¹

There is an opportunity for donors, development agencies and international NGOs to support the innovation and scaling of these technologies and mainstream their use across food security programmes.

Recommendations

Donors, development agencies and international NGOs should integrate PULSE technologies into their medium and long-term strategies to combat food insecurity in East Africa, particularly in light of potential recurring lockdowns and supply chain disruptions over the coming years. While some of these technologies (e.g. solar refrigeration) are currently being sold commercially, others have only been piloted in limited contexts. Throughout, donors should be careful to ensuring that private sector businesses developing PULSE technologies are incentivized to become commercially sustainable where possible. Some potential interventions include:

1

Pilots:

Donors could directly collaborate with private firms on pilots through technical assistance in contexts where they have a deep understanding of local food security challenges and the behaviours of farmers, cooperatives and pastoralists communities. This, in addition to catalytic grants provided, will help businesses tailor their products to specific cases and test demand and effectiveness.

2

Results based financing schemes:

Donors and development organizations could also employ Results Based Financing schemes to subsidize roll out of technologies in hard to reach, “last-mile” areas, where some of the most vulnerable communities are located. Incentive payments would be offered to private actors against pre-specified results achieved in delivery and sustainable operation of modern energy technologies, and have been effectively used across sub-Saharan Africa to scale up other off-grid solar technologies.¹³

3

Demand-side subsidies:

Development organizations could promote uptake of proven technologies through demand side subsidies such as facilitating longer payment terms for equipment and discounted pricing based on data reported on the usage and performance of equipment by customers.

4

Challenge funds:

To enable private sector led innovation while ensuring that technology solutions create real impact, a productive use renewable energy challenge fund that frames geographic and value chain specific problems and encourages partnerships between organizations already in the agricultural areas (government, coops, NGOs) and the technology companies could be developed.

5

Public-private consultative groups:

Bringing together a national consultation of key parties (e.g. agricultural coops, NGOs and community organizations, private companies and government) to clearly identify value chains and use cases with the highest potential, as well as actors best placed to implement. Coordinated planning will reduce the risk of duplicated effort and wasted funds.

References

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