USAID
FROM THE AMERICAN PEOPLE

DIGITAL TECHNOLOGY AND RESILIENCE

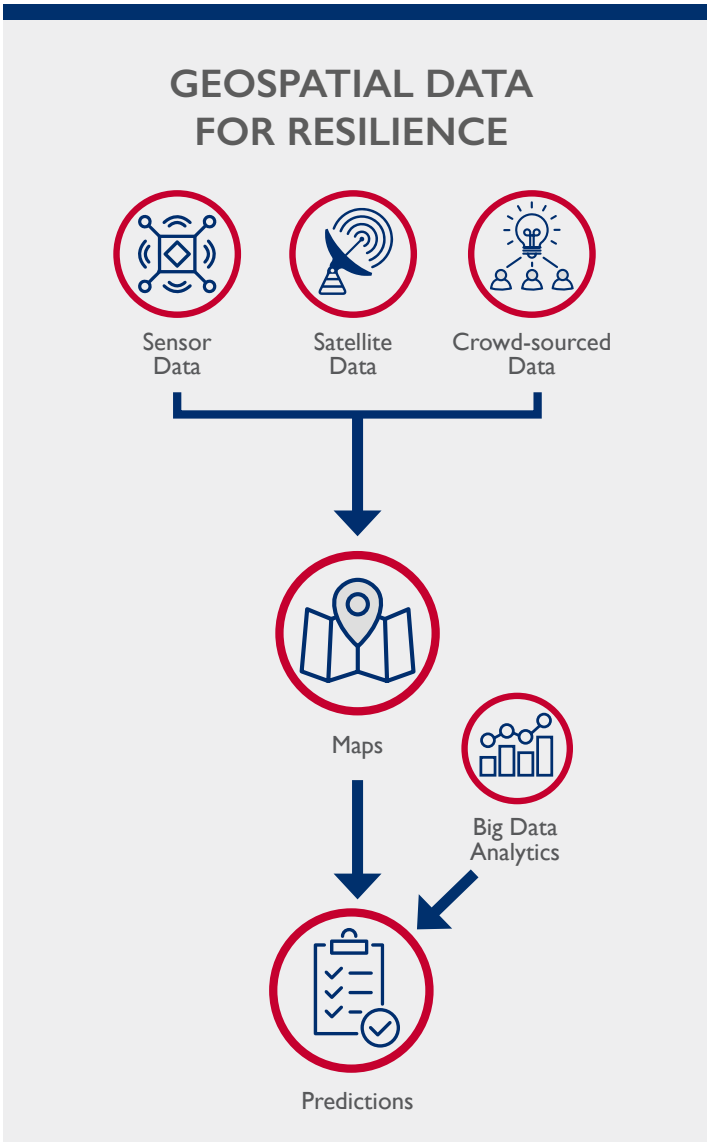
USAID seeks to use digital technology to help people around the world lead more prosperous and resilient lives. Digital technology offers the potential to predict shocks (e.g., droughts, floods, and disease outbreaks) and mitigate their impacts, support people to recover, and equip them to better withstand future shocks. Users may be international or local organizations, national and local governments, communities, and individuals. While digital technology offers exciting potential, gaps in the access to, use of, or benefit from technologies among vulnerable populations should be carefully considered, given the potential for exclusion and exacerbation of inequalities.

COMMON PURPOSES OF DIGITAL TECHNOLOGY FOR RESILIENCE

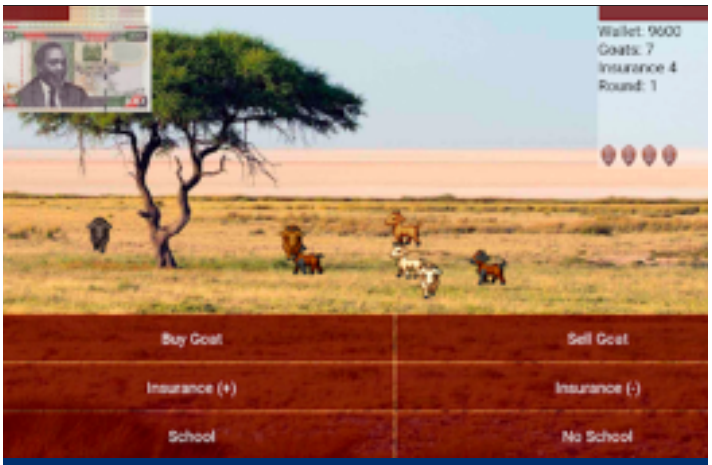
Digital technology has multiple applications within resilience; it can strengthen shock preparation, crisis response, and change measurement, while offering new tools for weathering difficult times.

HAZARD PREDICTION AND PREPARATION

Mapping is key to **forecasting natural disasters.** Map-based solutions often pull geo-tagged data from sensors for measures like precipitation and surface water levels (to predict floods or droughts), water pressure at the ocean floor (to predict tsunamis), or slope movements (to predict landslides). Satellite imagery can supplement sensors around measures like surface water and provide measures of additional factors, such as crop absorption of sunlight (to predict food shortages). SERVIR, a joint initiative of USAID and NASA, helps developing countries use information provided by satellites and geospatial technologies for managing climate risks.[1] Crowdsourced observations can offer an additional data source; they supplement satellite imagery to inform predictive modeling of East Africa's locust infestation. Some systems integrate big data analytics to bolster their predictive power and precision. **Early warning systems** alert government users to forecasted hazards or integrate mass communication strategies, such as SMS alerts, themselves. Some initiatives facilitate community participatory mapping on GIS platforms – helping people to understand local risks and leverage geospatial tools to bolster their **emergency and adaptive planning.** The Open Data for Resilience Initiative compiles risk data for open use and engages communities and governments in further data collection while working with them to integrate mapping in planning and preparedness activities. Map-based solutions are also used to **measure change** – whether to understand the impacts of changing climate conditions or how interventions are lowering hazard exposure.



[1] https://servirglobal.net/



A digital game builds pastoralists' understanding of index insurance
Source: Feed the Future MRR Innovation Lab

RESPONDING TO CRISES

Geospatial solutions also support effective responses to crises. Crowdsourced data sent by mobile phone plays an important role on platforms that allow governments and NGOs to see where disaster impacts are being experienced. Digital beneficiary registration and shared maps can help organizations coordinate their responses. Social media platforms, like AtmaGo, enable on-the-ground communication among affected communities before, during, and after crises. In the rapidly evolving conditions of an emergency response situation, citizen reporting can help others learn where to access essential supplies and services.

EXPANDING FINANCIAL SERVICES AND CAPACITIES

Digital financial services improve the reach and efficiency of financial products that can strengthen resilience. When accompanied by learning initiatives, people's capacity to understand and effectively use financial services can also be improved. Digital savings accounts reduce household risk from storing wealth in physical cash, and ensure households have financial resources to draw upon in difficult times. Digital cash transfers can get funds into the hands of vulnerable or crisis-affected households more efficiently and safely than in-person distribution. Digital technology enables insurance products that can reach large numbers of users at low cost; data from weather stations, soil sensors and/or satellites can determine eligibility for parametric (index) insurance payouts, which themselves can be automated.

LIVELIHOOD SUPPORT

Productive livelihoods enable households to build assets and wealth between shocks. Emerging digital solutions offer training, market and peer connections, access to finance, tools to manage operations, and platforms to recruit employees or find a job. Through the AfriScout app, pastoralists access maps showing grazing conditions and crowdsourced alerts, helping them make more strategic decisions about where to take their herds to graze, reducing livestock loss, overgrazing, and conflict. Digital tools not only strengthen income generation but may make it easier for households to venture into additional livelihood activities and thereby diversify their livelihood risks. Digital e-commerce marketplaces better organize trading and help sellers reach customers at better prices; they have realized an additional benefit during the COVID-19 pandemic as digital marketing reduces physical contact and allows trade to continue. Digital technology can also strengthen income generation and resilience by broadcasting information on changing conditions, such as market prices or weather forecasts (e.g., by SMS, outbound dialing, radio), enabling actors like farmers to make adaptive decisions. Digital technologies can reduce barriers to information and market participation among groups often excluded due to geography, such as pastoralists, migrants, and displaced people.

CHALLENGES IN USING DIGITAL TECHNOLOGY FOR RESILIENCE

Barriers can limit the success of digital technology toward resilience outcomes. For example:

- A number of obstacles limit digital adoption, including affordability of mobile handset or data, lack of network access, and limited digital literacy. Perceived relevance and usefulness drive uptake, while concerns around security and scams detract from it.
- Amid natural disasters, cellular towers can go out of service or networks can be over-congested. Mobile phone-based solutions may have limited use if satellite capacities for switching, functions to handle congestion, and redundancies have not been built into the cellular system.

DIGITAL DIVIDE CONSIDERATIONS

While digital technology offers exciting opportunities to improve resilience, the digital divide risks the potential exclusion of vulnerable populations from the benefits and their underrepresentation in crowdsourced data used to guide decision making. The unconnected may not receive early warning notices or digital cash transfers, while gaps may grow in their access to markets and information. As a result of the digital gender divide, women are at greater risk of exclusion, and gender inequalities may be further exacerbated.

[2] https://opendri.org/
[3] https://atmaconnect.org/
[4] USAID was an early supporter of AfriScout. https://www.pciglobal.org/afriscout/