



The impact of new LEO systems on humanitarian relief operations in Africa



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The global digital transformation market size has been estimated to value at \$590 million in 2021 and is projected to grow at a compound annual growth rate (CAGR) of 15.6% from 2021 to 2030. With 45% of Africa's population living more than 10km away from any fibre-optic network infrastructure, satellite communications offer reliable and secure coverage to take advantage of opportunities for digitalisation. In fact, according to the African Space Industry Annual Report 2019, satellite communications generate approximately \$6.5 billion in Africa annually.

In the humanitarian sector, satellite communications contribute considerably to relief efforts in areas without reliable cellular service – from portable connectivity kits for first responders and drone surveillance to coordination of food distribution and e-learning programmes. Digital technologies are facilitating aid operations like never before.

The advent of LEO connectivity solutions enables improved access to aid services even in the most remote parts of Africa, offering the potential to revolutionise humanitarian relief efforts by providing advanced connectivity for real-time data collection, remote sensing capabilities, digital healthcare support, enhanced coordination, and improved logistics. Such advancements can help address the challenges faced during relief operations and ultimately save more lives in times of crisis.

Modern digital applications are being constantly developed to serve humanitarian operations

and require low latency – greatly enhanced by LEO connectivity. On average, LEO networks exhibit a 40ms delay as opposed to 180ms on MEO and 600ms on GEO networks. This technology is fast evolving – the new generation of LEO constellations, will be independent of terrestrial infrastructure. Not only will this further increase the quality of service, but also allow ultra-secure connectivity for critical missions. By routing traffic over inter-satellite laser links, new LEO technology will provide an extra layer of defence for sensitive data.

Cyber security is one of the key requirements for humanitarian communications. The architecture of future LEO constellations eliminates high-level interference risks, yet certain threats must be treated on the ground. Humanitarian organisations need to stay in control of traffic consumption; the majority of cyber risks originate from the unintended misuse of infected devices. Considering the complexity of humanitarian operations, the role of network management increases exponentially.

Today, LEO technologies enable

humanitarian staff members to browse a satcom network akin to GSM. This is, of course, a major development. Internet access is an important factor in securing healthy working conditions for humanitarian staff engaged in long-term projects. Connectivity in the field is the gateway to socialisation, enabling humanitarian operatives to stay in touch with loved ones, keep abreast of international news, access e-learning programs, and more.

However, for operational centres, the growing number of personal connections means increased vulnerability to cyber threats. Modern network management systems offer a dependable solution. The corporate environment, used for mission-critical operations, can now be isolated from staff and third-party browsing, eliminating the risks of cross-contamination. ICT terminals get more compact year upon year. In the past, network segregation was only possible as an element of long-term camp infrastructure. Today, the exact same functionality is offered via portable devices, which can be used for first-response operations and

vehicular missions.

Moreover, today LEO connectivity enables field missions in Africa to operate like remote offices. And the impact goes far beyond increased operational efficiency. Humanitarian stations can become 'connectivity hubs' that extend the benefits of digitalisation to remote areas. From mobile clinics to e-school services and legal consultation centres to remote expert guidance opportunities, enabled by connectivity, the spectrum of accessible aid operations can increase exponentially.

By enabling new social services for underserved communities in Africa, NGOs and IGOs help remote communities to access resources previously reserved for urban citizens, spreading equality, and boosting economic development. According to the African Development Bank, every 10% increase in broadband penetration is expected to increase the GDP by 2–3%. LEO-based solutions are well-positioned to bridge this digital divide and unlock the growth and development opportunities in African communities. ■

