Connecting Sarawak, one signal at a time

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Ganendra believes satellite connectivity can help reach those areas while carrying information collected on the ground to the people who need it.

IMAGINE a river beginning to rise in the interior of Sarawak after heavy rain upstream.

A sensor along the river could alert the relevant authorities, potentially giving nearby communities more time to prepare.

For MEASAT chief commercial officer Ganendra Selvaraj, this is one example of how satellite technology could make a difference in a state where distance and terrain continue to shape access to services and information.

Sarawak's rivers, forests and highlands make it difficult and expensive to extend conventional telecommunications infrastructure to every community.

Ganendra believes satellite connectivity can help reach those areas while carrying information collected on the ground to the people who need it.

"Reliable connectivity is essential because information has a shelf life. A flood warning received several hours late may no longer be useful.

"The network should therefore be designed around the decision that needs to be made," he told Sarawak Tribune.

Bringing information together

Ganendra said the value of technology lay not simply in collecting data, but in ensuring that information could be transmitted and used in time to support decisions.

He pointed to Premier Datuk Patinggi Tan Sri Abang Johari Tun Openg's vision of strengthening Sarawak's geospatial data ecosystem, where information could be brought together rather than kept separately by different agencies.

"The Premier's ambition to create one trusted geospatial ecosystem, rather than keeping information in separate agency silos, is exactly the right direction.

"Data only creates value when it can move securely and reliably from where it is collected to where decisions are made," he said.

Geospatial technology can provide information about what is happening across an area, from changes in land use and forest cover to rainfall and river conditions.

Ganendra explained that satellite connectivity could help carry data from river gauges, drones, survey teams and remote communities into Sarawak's own platforms for analysis.

"Critical alerts, such as rapidly rising river levels or a fire hotspot, must reach the relevant authority quickly and reliably.

"Routine readings, such as soil moisture, rainfall or temperature, may only need to be transmitted at scheduled intervals," he said.

For a state as vast as Sarawak, Ganendra said having a clearer picture of conditions on the ground could help authorities respond earlier and make better use of resources.

He added that reliable data was also important to Sarawak's artificial intelligence ambitions, as information from the interior needed to reach the relevant platforms before it could be analysed or acted upon.

"AI is only as useful as the data it receives. If information from the interior cannot reach the relevant platforms, it cannot be analysed or acted upon.

"Satellite connectivity closes that gap by extending the flow of field data beyond terrestrial coverage and into the systems that decision-makers rely on," he said.

From farms to forests

Ganendra said the benefits of connected data could be felt across several sectors, including agriculture, forestry and environmental management.

In agriculture, soil and moisture sensors could help farmers decide when to irrigate or fertilise their crops, while image analysis could help identify signs of crop stress or pest risks.

"In forestry, Earth observation combined with ground sensors can monitor changes in forest cover and identify fire or haze hotspots.

"For environmental management, connected sensors can report river levels, rainfall and coastal conditions continuously, rather than only when a team visits the site," he said.

Ganendra said Earth observation, geographical information systems, terrain data and field sensors could also be combined to support disaster management.

For infrastructure planning, survey and drone teams could use satellite connectivity to send field data back on the same day, even from remote locations.

"The common benefit is better visibility: knowing what is happening across Sarawak earlier, more consistently and across a much wider area," he said.

Ganendra said these applications could help authorities make decisions more quickly and plan their responses more effectively.

"The technology is important, but the real outcome is straightforward: earlier warning, faster response and better use of public resources," he said.

Reaching communities beyond coverage

For communities in the interior, connectivity is about more than sending data to a central platform. It can also open the door to services that may otherwise require long journeys.

Ganendra said satellite technology had advanced, with smaller terminals that required relatively little power and were becoming more cost-effective.

"Many rural and interior communities can only be reached through dense forest, rivers or highlands, where paved roads, electricity and other utilities are often scarce.

"At the same time, satellite connectivity has advanced significantly. Today, solutions are increasingly cost-effective, use much smaller form-factor terminals and require relatively little power," he said.

Ganendra said these features were important when connectivity needed to be deployed and maintained in remote areas.

He pointed out that MEASAT's CONNECTme broadband service was intended to provide ongoing internet access in communities where conventional terrestrial infrastructure might not be viable.

"Rather than connectivity being a one-off infrastructure deployment, CONNECTme provides communities with an affordable and practical way to access the internet on an ongoing basis, where conventional terrestrial infrastructure may not be viable.

"Importantly, a CONNECTme site can also become a gateway to other digital services," he said.

Ganendra said MEASAT was preparing to introduce telehealth services in Sarawak, drawing on its experience in Sabah.

The company also saw potential to explore how satellite connectivity could support existing rural healthcare services and, where suitable, drone delivery of medicines.

"One example is telehealth, which MEASAT is preparing to roll out in Sarawak, allowing the same connectivity infrastructure to support access to healthcare services in remote communities," he said.

Working alongside existing networks

Ganendra stressed that satellite technology should complement fibre and mobile networks as Sarawak continues to expand its telecommunications infrastructure.

He identified three areas where satellites could help: extending coverage, connecting remote mobile towers to the core network and providing an independent communications path when terrestrial infrastructure was disrupted.

"Satellite is not a replacement for fibre or mobile. It complements them.

"There are really three areas where satellite can play a role. First is reach, extending connectivity to areas where fibre is difficult or uneconomical to deploy," he said.

Ganendra said the second role was backhaul, which allows remote mobile towers to be connected to the core network.

Satellite connectivity could also provide an alternative link if a fibre connection was cut or mobile tower infrastructure was disrupted.

"So to me, it is not about choosing between fibre, mobile or satellite. Each has its strengths.

"The right approach for Sarawak is to use the right technology in the right place, and increasingly, to use them together," he said.

Staying connected during emergencies

That combination could become particularly important during floods, landslides or fires, when communications infrastructure on the ground may be damaged or lose power. Ganendra said satellite-connected river and rainfall sensors could support earlier warnings, while portable terminals could help responders and evacuation centres communicate during a disaster.

"Before an emergency, connected river and rainfall sensors can provide earlier warning. During an emergency, portable satellite terminals can restore communications for responders and evacuation centres.

"After the event, Earth observation can support damage assessment and recovery planning," he said.

Ganendra also drew attention to the safety of those sent into remote areas to help others.

MEASAT's space-based CONNECTme IOT personal tracking terminals, he said, could provide location tracking, SOS alerts and two-way short messaging in areas beyond terrestrial coverage.

"The terminals are rugged, compact and low-power, with GNSS positioning and a physical SOS button.

"I think there is a strong case for making this type of low-cost but robust tracking terminal mandatory for first responders operating in remote or disaster areas," he said.

Ganendra said such equipment should be considered before an emergency occurred and incorporated into response plans.

He said this would help ensure responders could communicate when terrestrial networks are unavailable.

"If every responder can be located and can send an SOS when terrestrial communications are unavailable, we can manage the safety of the people carrying out the rescue much better.

"The key is to prepare before the emergency," he said.

Connecting sensors across Sarawak

Ganendra said satellite-enabled Internet of Things (IoT) technology was commercially available and suited to small, regular readings such as water levels, rainfall, temperature, soil moisture and equipment status. Compact terminals can be powered by solar energy or batteries, making them suitable for locations without electricity or mobile coverage.

"Satellite IoT is well suited to small and regular readings such as water level, rainfall, temperature, soil moisture or equipment status.

"The terminals can be compact and low-power, and they can operate with solar or battery power in locations without electricity or mobile coverage," he said.

At the same time, Ganendra cautioned that satellite IoT was designed for small packets of operational data, rather than continuous video.

He said the opportunity was to move beyond isolated pilot projects and develop an integrated sensor network that could serve different agencies and needs across Sarawak.

"Used for the right applications, it can be reliable, practical and increasingly affordable.

"The opportunity now is to move beyond isolated pilots and develop an integrated sensor network that supports multiple agencies and use cases across the state," he said.

A place for Sarawak's talent

While much of the discussion around space technology centres on satellites and rockets, Ganendra believes Sarawak's opportunity extends far beyond them.

Local companies, he said, could participate by developing sensors, communications terminals, electronic components, data analytics platforms and geospatial applications.

"Local companies do not necessarily need to build a rocket or satellite to be part of the space economy.

"A Sarawak company that develops a better sensor, communications terminal, electronic component, data analytics platform or geospatial application can be part of this ecosystem," he said.

Universities could support research and nurture talent, while young Sarawakians could pursue careers in fields including engineering, software, data analytics and satellite operations.

Ganendra said skills and technologies developed for space applications could also create opportunities in agriculture, manufacturing, healthcare and environmental management.

"Technologies developed for the space industry do not have to remain within the space industry.

"The engineering, electronics, communications, data analytics, materials and other capabilities developed for demanding space applications can potentially create value in other sectors as well," he said.

Ganendra said MEASAT saw Sarawak as a long-term strategic partner in digital inclusion, resilience and innovation.

He said a foundation had already been established through the company's 2024 memorandum of understanding with the Sarawak Multimedia Authority on space-industry and talent development.

"Our approach is to support what Sarawak is building, not to compete with it," he said.

Ganendra said MEASAT was ready to share its experience operating satellites from Malaysia and explore collaborations with local institutions on research, skills development and industry exposure.

"As Sarawak develops its own capabilities, we are ready to share that experience while helping local talent and companies take a larger role in the value chain," he said.

Looking towards 2030

Ganendra believes Sarawak could become a regional example of how a geographically vast state uses space technology to improve everyday life. He said that future could include earlier flood warnings, rural families accessing basic health services without a full day of travel, farmers using sensor data and planners working from a trusted statewide information base.

"Just as importantly, these solutions could be developed by Sarawakians: local companies, researchers and young engineers building applications in Sarawak and taking them into the wider ASEAN market.

"The technology required already exists. The challenge is not invention. It is joining the pieces together, establishing clear governance and committing to implementation at scale," he added.



GANENDRA at the International Digital Economy Conference Sarawak 2026 at the Borneo Convention Centre Kuching.



GANENDRA at MEASAT's booth showcasing satellite connectivity and digital solutions during the International Digital Economy Conference Sarawak 2026 (IDECS2026), held recently at the Borneo Convention Centre Kuching (BCCK).