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How IoT connectivity paves the way for smart farming

Across some of the most rural terrain, highly advanced eSIM technology and IoT connectivity are at work, improving efficiency and quality while also boosting production.

 # CONNECTIVITY

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While the mix of high-tech IoT connectivity and sprawling fields may have been difficult to imagine just a generation ago, experts predict that smart farming will reach a global market value of 22.5 billion by 2026 (up from 15.3 Billion in 2020)[1].

Smart farming with connected sensors, and so much more

What makes smart farming "smart?" On a smart farm, a cow might wear a tiny connected sensor embedded in its collar that **monitors and sends data** on its behavior, sleep, movement and diet. With this data, farmers can efficiently single out a sick cow within the herd and quickly treat or isolate the animal. The same connected sensor can **identify a cow** when it is weighed and milked and alert farmers if it is under or overweight or if its milk may be tainted. That cow can be treated by a vet and their milk can be closely screened in the future.

And that's not all. Smart farming extends far beyond livestock monitoring—connected devices **power driverless tractors** and **control irrigation systems** while robots plant, harvest and sort produce. The possibilities continue to grow with each passing day.

How to ensure that reliable IoT connectivity powers smart farming

If smart farming is going to modernize farms, its success depends entirely on reliable IoT connectivity via a secure network. The connectivity necessary to power smart farming is similar to that of asset tracking in that it requires sending small amounts of intermittent data. In this case, **low power, wide area networks** such as Narrowband and LTE-M are ideal even with spotty or unstable network connection or infrequent access to a power source, as is generally the case in the fields. Most recently, **5G specifications** have also been introduced to address low power use cases such as smart farming. Regardless of the network type, whether on a local cellular network or a private network set up by the farm, each device must be equipped with an IoT SIM or with eSIM technology in order to connect.

That being said, it is important to keep in mind that smart farming connected sensors and other types of technology integrated into farming equipment spend a substantial amount of time outdoors. All the device components, including the IoT SIM or eSIM technology, therefore, must be robust enough to **resist harsh weather conditions and humid or wet environments**.

Once connectivity is established with a dependable IoT SIM or eSIM technology, end-to-end security solutions can be put into place to ensure that credentials are sent to the device and all data is exchanged in a secure manner over the air. To that end, it is recommended in GSMA specifications that the IoT SIM or eSIM **integrates an IoT SAFE applet** to

establish a secure communication channel with each device.

The impact (and aspirations) of smart farming

By 2050, there will be roughly 10 billion mouths to feed on the planet and the agriculture and farming industries are tasked with the looming need to produce enough food to properly nourish our growing population. Perhaps farming smarter is part of the answer—and smart farms will only deliver on this promise with the most reliable and secure IoT connectivity.

1 https://www.globenewswire.com/news-release/2021/10/18/2315821/0/en/Smart-Agriculture-Market-Size-Globally-Estimated-to-Reach-USD-22-5-Bn-with-8-9-CAGR-by-2026-Facts-Factors.html