

What is "Agriculture 4.0"?



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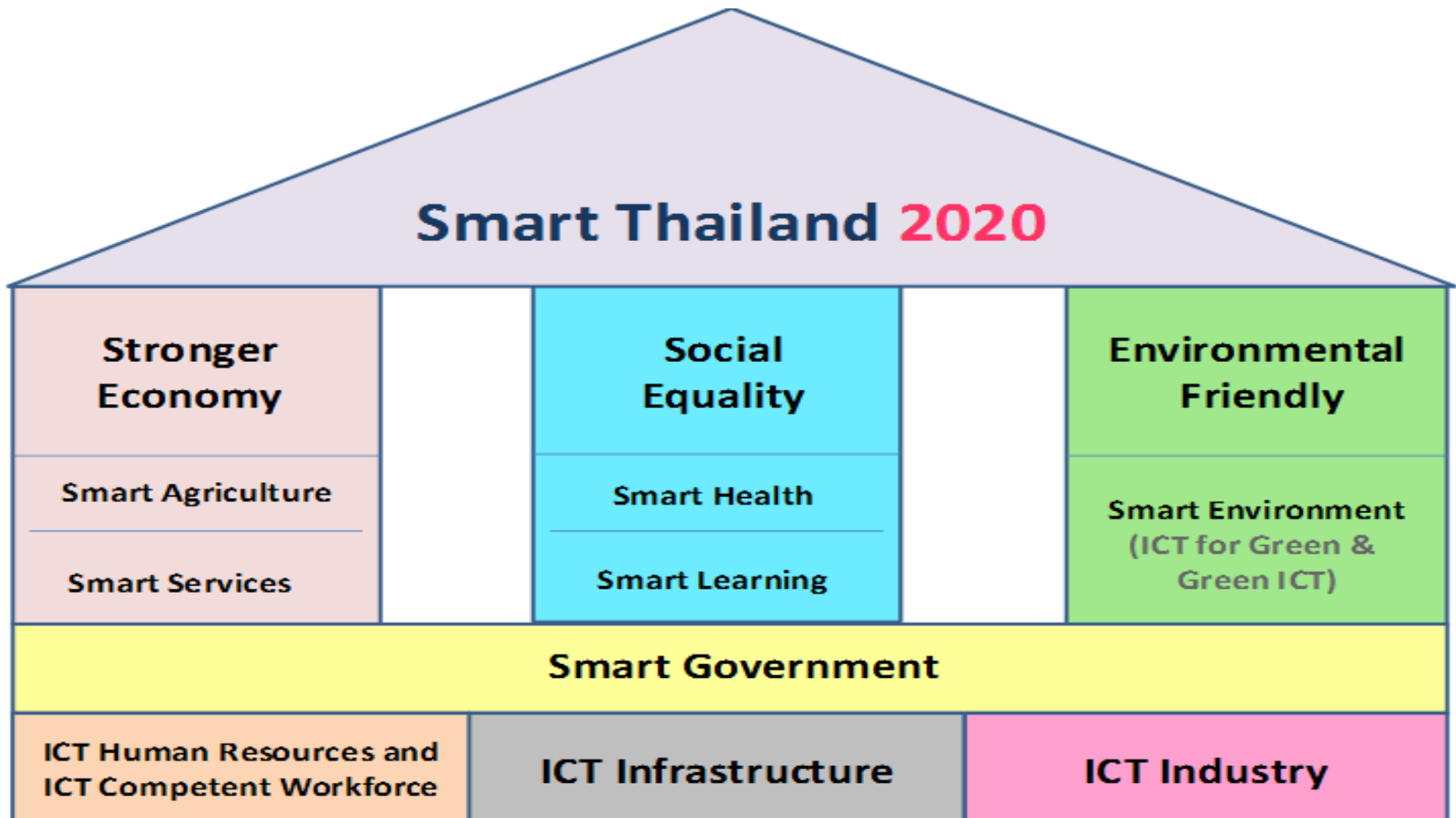
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Thailand 4.0



Thailand 4.0



ICT 2020 Framework

Farming History



Cyber farming

Source: Bangkok Post

Thanks to FieldServers farmers will be able to find out exactly what crop they should sow for the best results at the click of a mouse.

■ Suchalee Pongprasert
THE NATION

It's a hot day. The sun is shining brightly in a cloudless sky. To find out if there will be a drought, a farmer logs on to the Internet to check out the latest weather reports.

With the advancing technology and the near-to-completion development of an agricultural data warehouse, which covers such issues as the amount of rainfall by area, humidity, wind, fertility of soil in given locations and so on, farmers and agriculturists nationwide will soon be able check if their land is likely to experience flooding, as well as which plants are most likely to flourish.

To access the data, all the farmers will have to do is go to the nearest Internet cafe or access point, select the data relevant to their area and wait for the information requested to pop up on the screen.

For example, instead of growing corn, agriculturists may learn that their land is actually more suited to crops like sugar cane, tapioca, pineapple or other fruit and vegetables. Since the quality of soil as well as the weather in each area is different, the correct information will protect them against planting inappropriate crops.

Thanks to the National Electronics and Computer Technology Centre (Nectec), this vision will soon become

Under the tele-metering plan, a number of wireless Internet-based devices known as FieldServers will be installed to collect agriculture-related data. This will then be processed at the centre. The final information will not only be used by government agencies to formulate planning and policies that effectively support planting in each zone, but will also be simplified to make it understandable to farmers.

Designed as an automatic monitoring system, the FieldServer, which is a lamp-like device, made of a CPU with a Web browser, and sensors that

megabits per second and transfers information through the network to the server at the centre.

Digital and web cameras can be attached and remotely controlled via the web browser.

By installing the FieldServers in fields, yards or even streets, real-time data such as weather conditions and images at any given place can be automatically monitored.

"This will help us get an enormous amount of data from all areas nationwide without the need to send people out to the field. More importantly, it allows us to call up data from a certain date and time and process it along with other information," Nectec's

rainfall will affect their community or province as a whole.

At the same time, the move will also allow the government agencies to more effectively manage the development of agricultural, forestry, environmental and ecological projects.

Tele-metering is part of Nectec's Agricultural Information Network (AIN) joint project with the Agriculture and Agricultural Cooperatives Ministry and the Bank of Agriculture. The aim is to integrate agricultural information from a variety of sources into a single database thus enabling farmers to check weather reports, crop prices and other vital

available in all rural areas. The plans to develop a device locally rather than import.

The centre will, with the National Research Organisation of Science and Technology, Japan, which has expertise in producing and transferring technology and researchers and development country.

As a first step, Nectec will develop the FieldServer and distribute the related information to potential local users. In turn will produce and sell them to users who



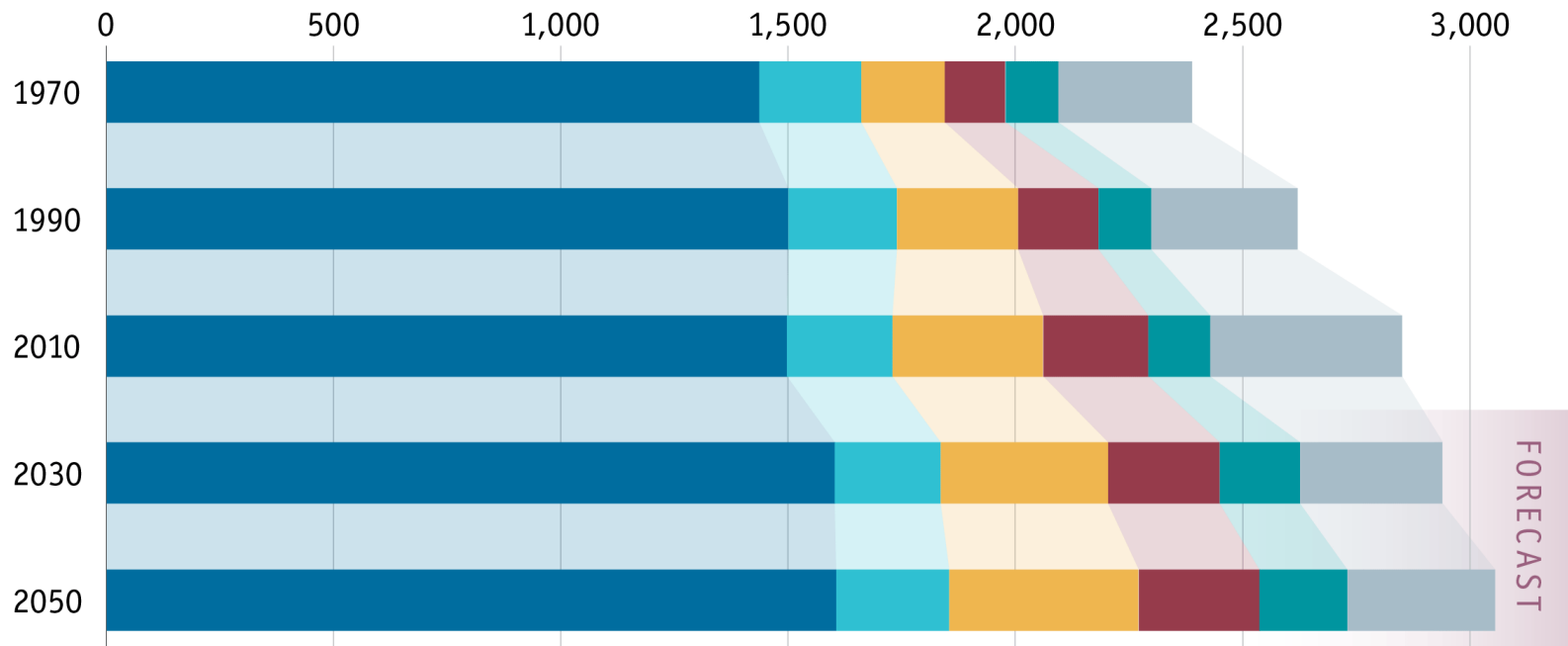
ILLUSTRATION BY TITIKANDORN

World's Menu

What's on the world's menu

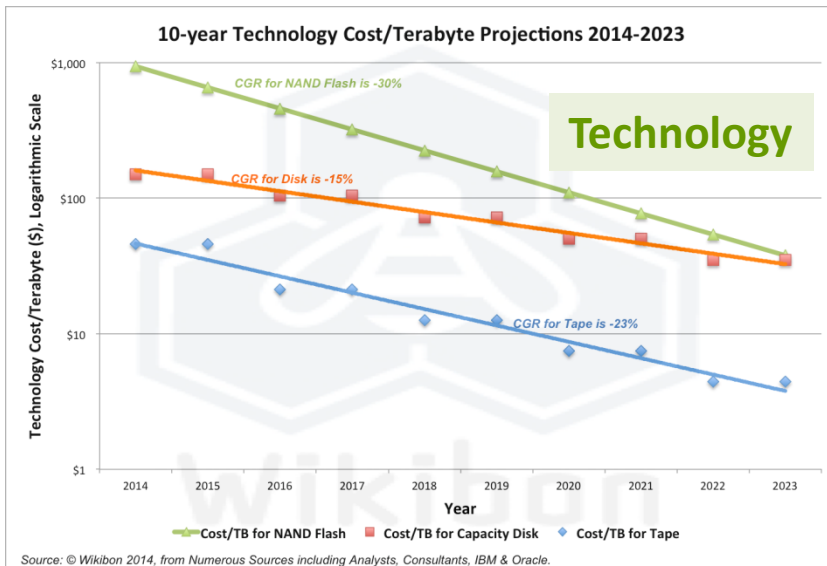
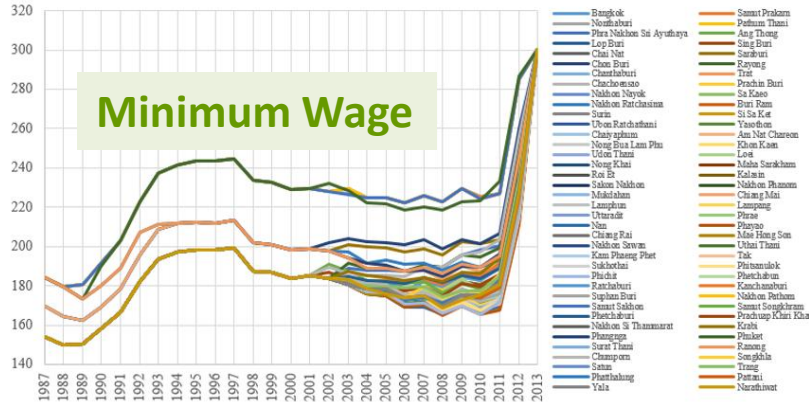
Daily calories per person by type of food

■ Cereals, roots and pulses ■ Sugar ■ Vegetable oils ■ Meat ■ Dairy ■ Other



Source: FAO

Costs & Consumer Behaviors



Paradigm Shift in Agriculture

Future of Farming

Indoor Farming		Outdoor Farming	
Vertical Farming	Urban Agriculture	Smart Agriculture	Geo-engineering
Plant Factory	Home Farm	Precision Farming	
In vitro meat	Rooftop Farm	Sharing Agriculture	
Synthetic foods			
Hydroponics / Aquaponics / Aeroponics			

IoT, Sensor, Big Data, Prediction Model, Robot, ...

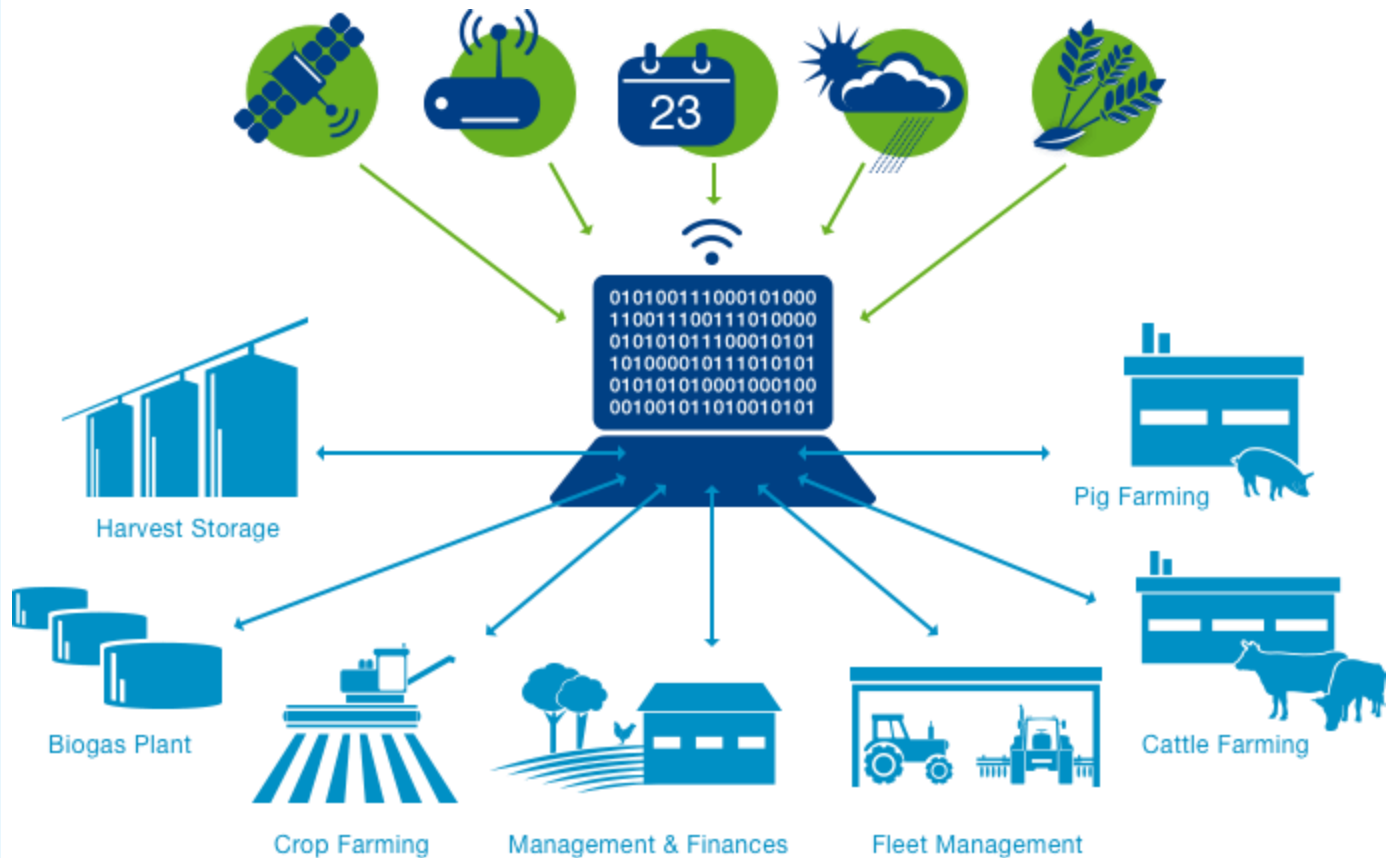
=> **Smart Agriculture**



The Networked Farm

More Data for Efficient Processes

The farm of the future is completely connected: satellites and ground-based sensors deliver detailed information on crop conditions. Combined with weather forecasts and histories, crop variety and crop cultivation databases and even work schedules, the farmer obtains a solid foundation on which to make his important everyday agronomic decisions. He also receives live alerts from every corner of his business, be it the cowshed, the combine harvester, the silo or his finance institute.

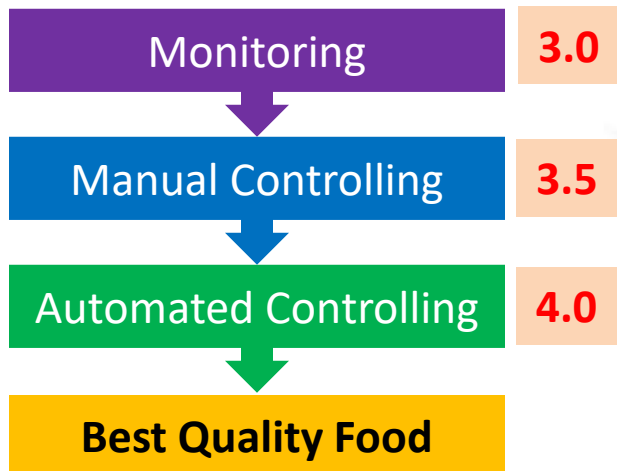


Precision Agriculture



Weather

Rain, Light, Temperature, Humidity ...



Soil

Fertilizer, Temperature, ...



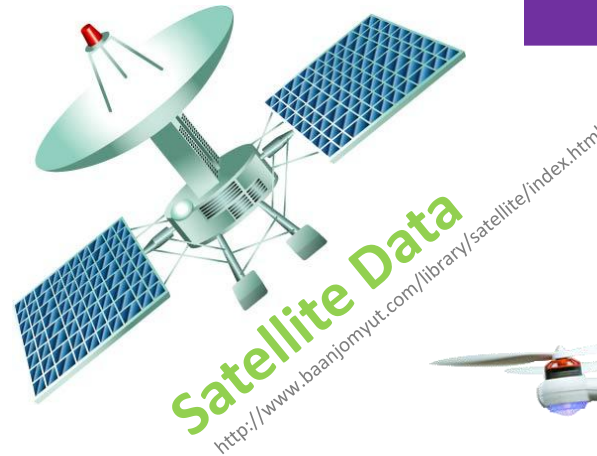
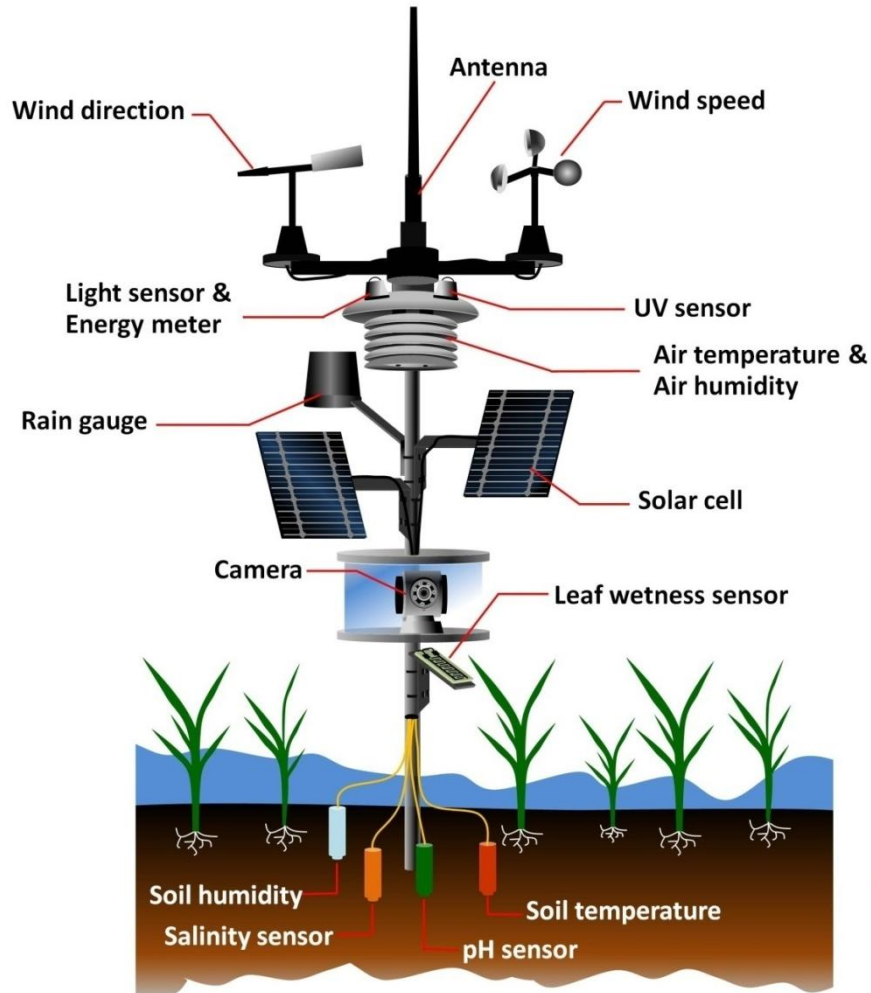
**Plant Disease &
Agricultural pests**



Water

Precision Agriculture (2)

Weather station



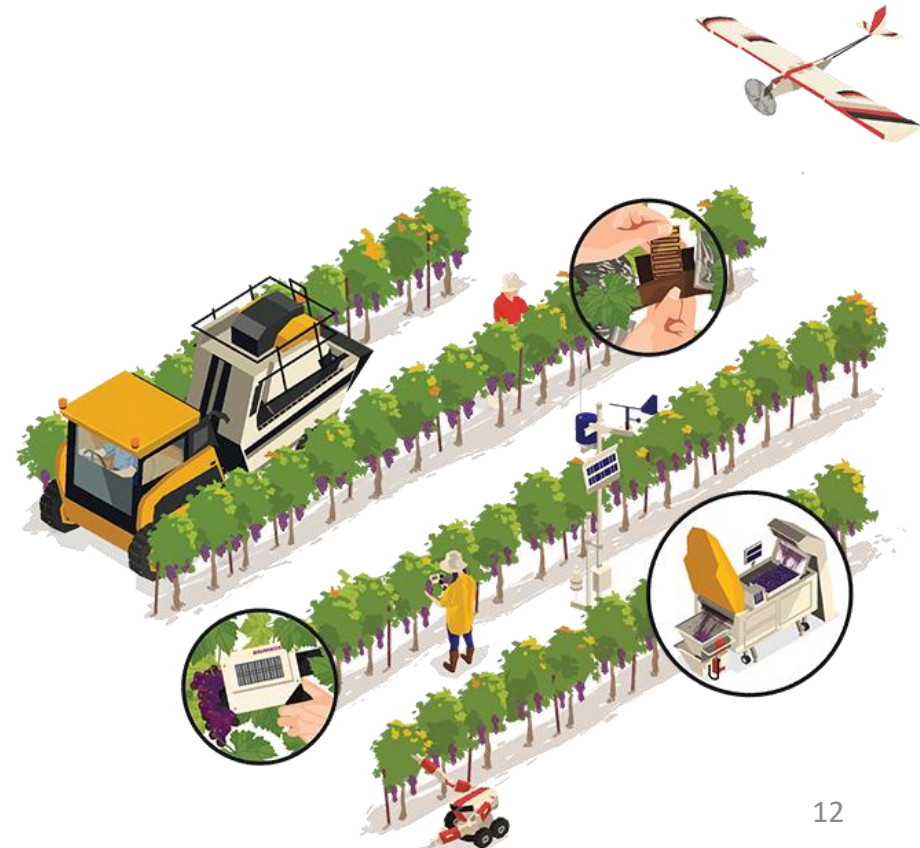
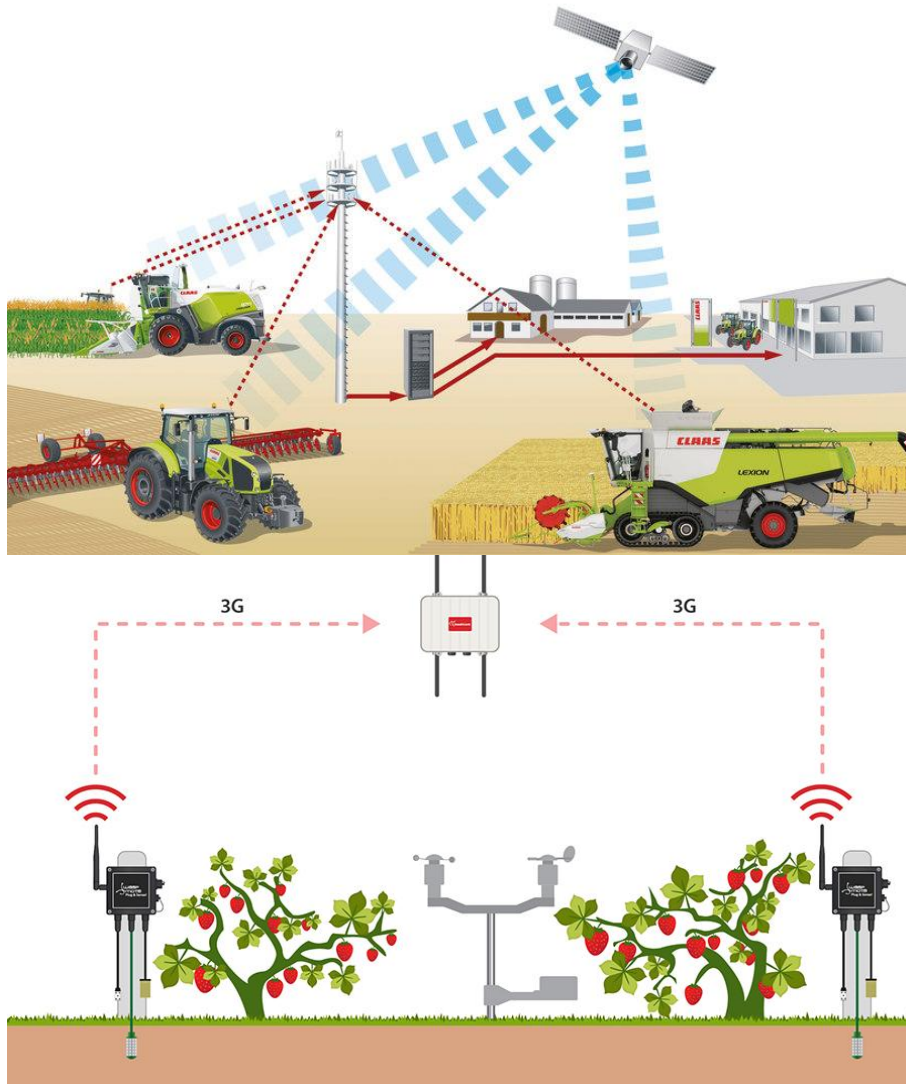
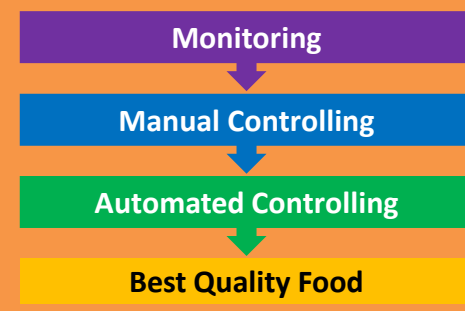
Monitoring



Image (Drone)
<https://www.maplin.co.uk/drones>



Future Farm



Future Farm (2)

Monitoring

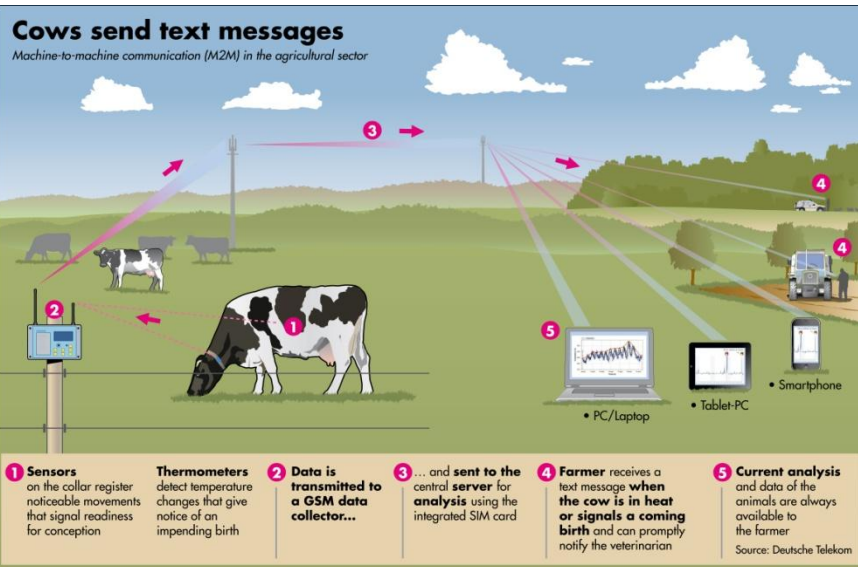
Manual Controlling

Automated Controlling

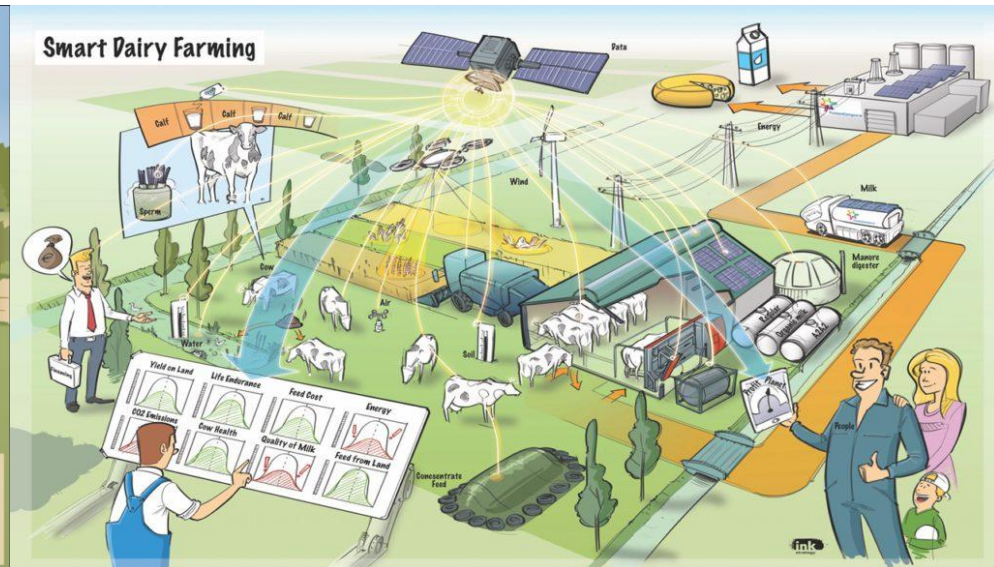
Best Quality Food

Cows send text messages

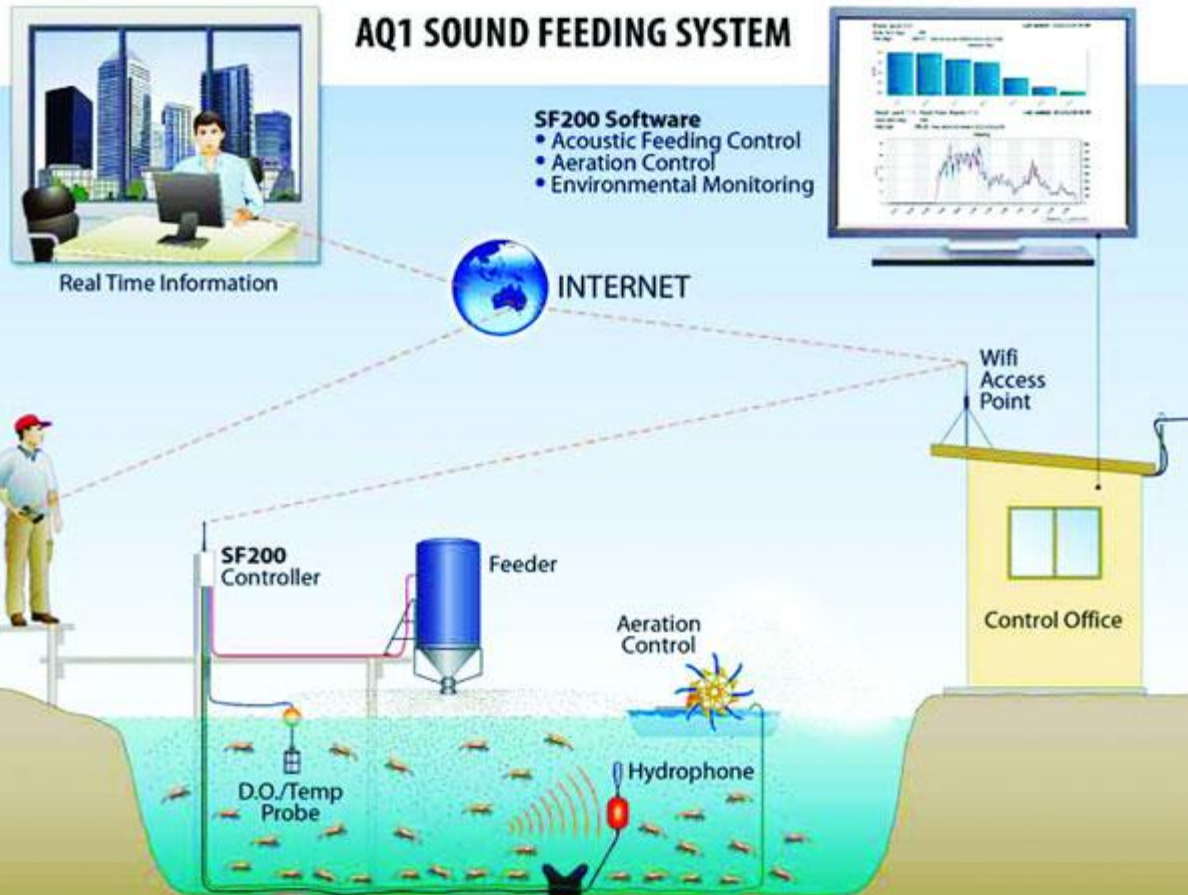
Machine-to-machine communication (M2M) in the agricultural sector



Smart Dairy Farming



Future Farm (3)



Plant Factory



Indoor farming allows farmers to grow year-round. In Japan, agrotechnician Shigeharu Shimamura turned a former semiconductor factory into the world's largest indoor farm illuminated by LEDs. At 25,000 sq ft, the farm uses 17,500 LEDs and produces 10,000 heads of lettuce per day.



Credit: GE Reports

<http://gelookahead.economist.com/slideshow/plant-factory-2/>

In vitro meat, Plant-based meat



<https://www.singularityweblog.com/is-in-vitro-the-future-of-meat/>



<https://www.nextnature.net/projects/meat-the-future/>

