

# NW TECS Smart Precision Agriculture Solutions





**Asset location and activity tracking**



**Remote equipment monitoring**



**Soil and plants condition monitoring**



**Livestock health and location tracking**



**Smart irrigation**



**Full-scale smart greenhouse**



**Inventory tracking and analytics**



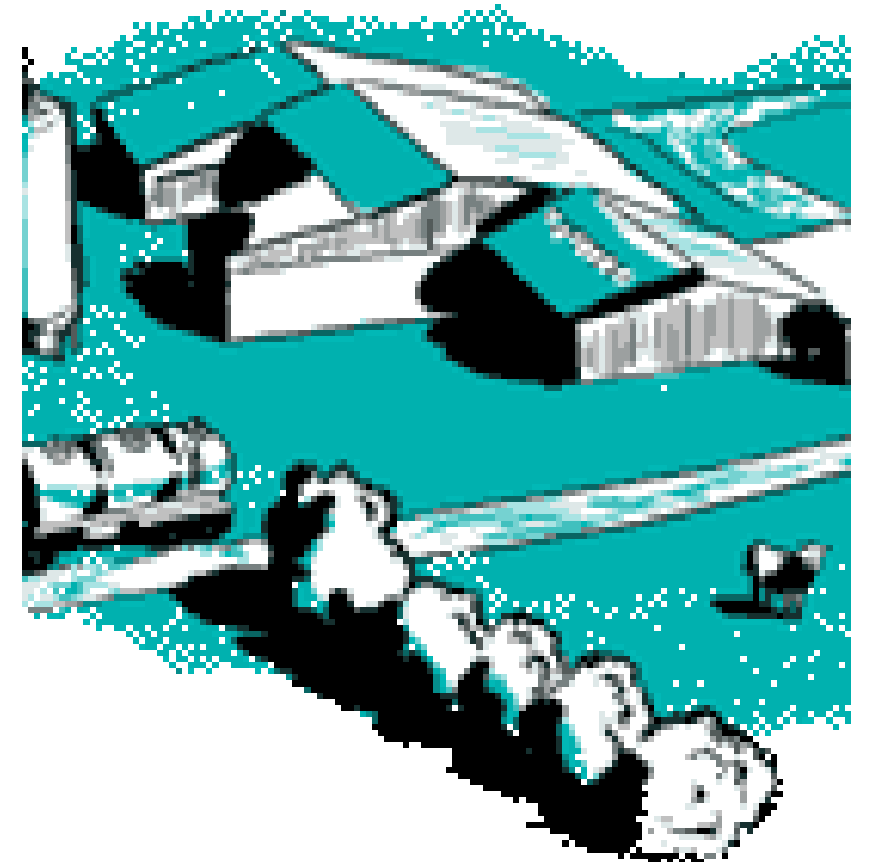
**Smart farming data analytics and alerts**



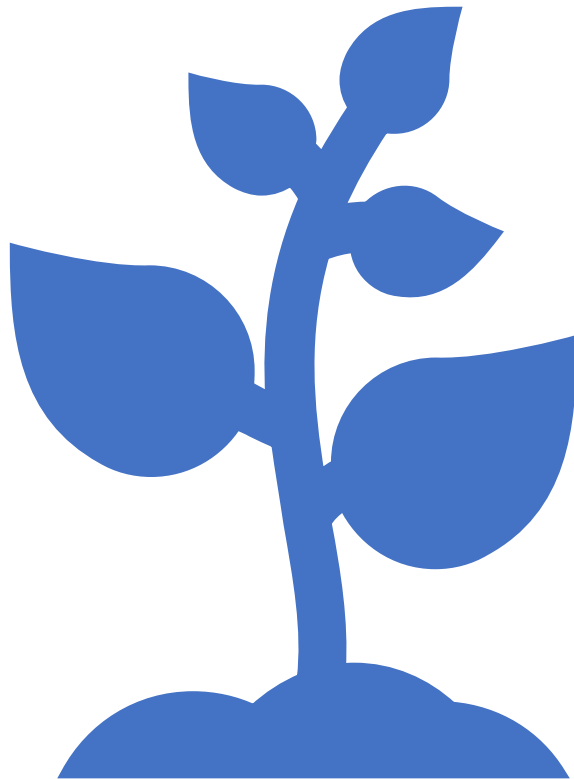
# Introduction

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- **Farming the future today**
- Global population is expected to grow by 70% by 2050, putting ever-increasing pressure on agriculture to feed the world. At the same time land and water shortages, changing consumer patterns and a global trend toward preserving natural environmental resources such as soil quality add to the burden on farmers to balance the various demands. So far, farmers have had to monitor manually the condition of their livestock, environment or agricultural produce, even on large farms. Their property also requires safety controls and security protection against natural disasters, theft, and accidents.
- Until now, the implementation of automated monitoring and control systems has been limited by the poor coverage of cellular networks in many highly productive but sparsely populated rural areas. Thanks to LPWA technologies like LoRaWAN™, **IIoT now enables detection, monitoring and control over very long distance** (over 15 km) of a wide variety of key agricultural data: **soil temperature and moisture; weather, rainfall and water quality; airborne pollution; crop growth; livestock position, condition and feed levels; smart connected harvesters and irrigation equipment; fire, theft and flood detection...** LoRaWAN™ technology's long-range, low-power wireless qualities enable the **use of low-cost sensors to send data from the farm to the Cloud** where it can be analyzed to improve operations. **NW** enables agricultural companies to deliver various services using a **common IoT enabler platform, providing LoRaWAN™ network server and software to manage public or private networks, under a unified, scalable, multipurpose IoT network infrastructure.**



# IoT in Agriculture



- **Use IoT to know how much and how often to irrigate**
- The advent of affordable IoT can alter the irreversible consequences of poor irrigation management by providing farmers with **real-time soil moisture monitoring and tools for remote irrigation management**. The sensors-based system provides the ability to **detect water levels at various depths** and **automate irrigation valve controls**. **LoRaWAN™** -based solutions provides producers with actionable data, therefore enabling more **efficient water management, optimized plant growth, increased crop yields, and up to a 50% savings in irrigation water usage**.

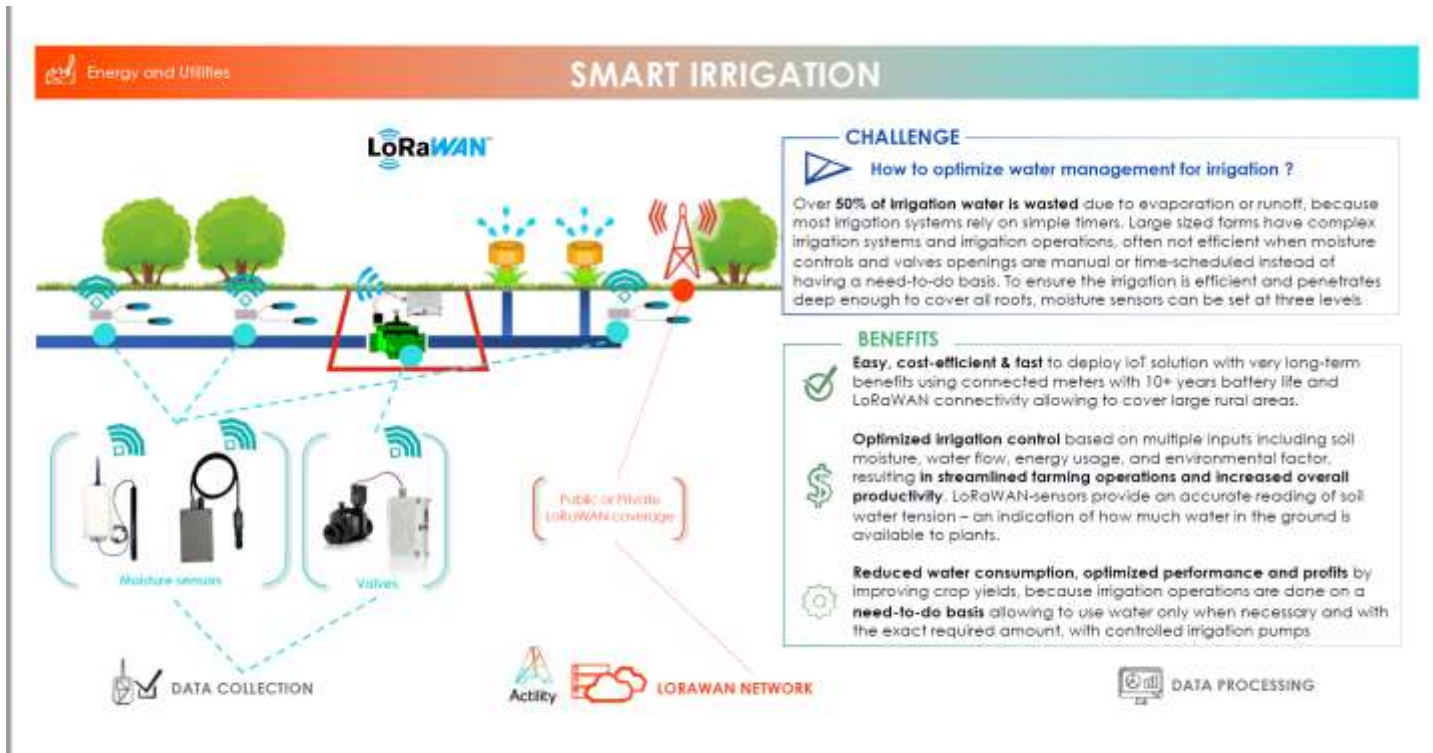
# Irrigation Control

Farmers need to enhance the efficiency of irrigation processes and minimize water losses. Large sized farms have complex irrigation systems and irrigation operations, often **not efficient when moisture controls and valves openings are manual or time-scheduled instead of having a need-to-do basis. The soil is not homogenous** and it holds moisture differently in various areas so it needs to be monitored efficiently. Also, **connectivity has always been an issue** for regional and rural areas due to lack of coverage and the relatively high cost of cellular connection.

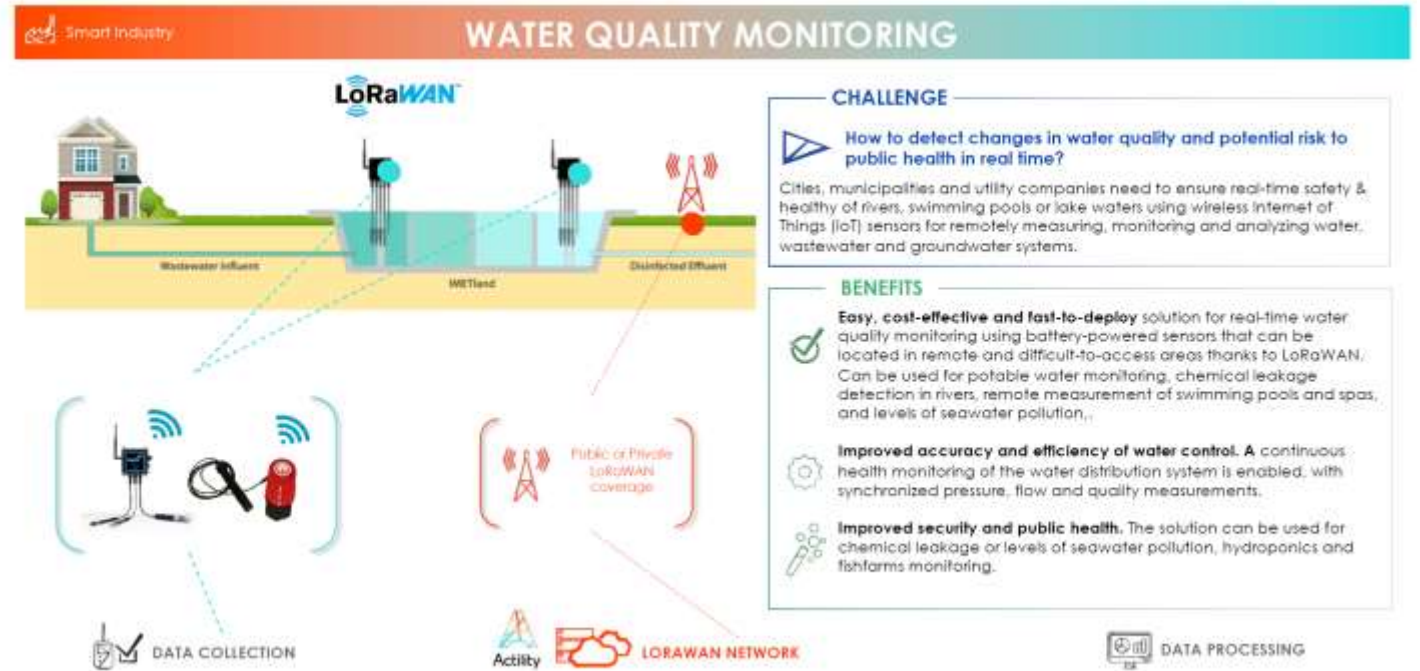
**Optimized irrigation control** based on multiple inputs including **soil moisture, water flow, energy usage, and environmental factors. LoRaWAN-sensors** provide an accurate reading of **soil water tension** – an indication of how much water in the ground is available to plants. **Irrigation pumps are activated and turned off remotely** using LoRaWAN. A connected device can be added to any existing pumps to override manual switches. **Actility** provides the **ideal IoT connectivity platform** to manage the network and the sensors, working with partners' dedicated applications.

With **Smart Irrigation IoT solutions**, growers schedule and apply just the right amount of water on crops when needed only, so they can significantly **reduce water consumption, optimize performance and profit by improving crop yields.** LoRaWAN-based networks are ideal for agriculture due to the low cost of data sending on very low power, with up to 15 years of sensors battery life, allowing growers to scale their deployments and benefit from **true operational visibility.** Operator intervention is limited and therefore lower maintenance and operating costs for the farmer.

# Smart Irrigation



# Water Quality Monitoring



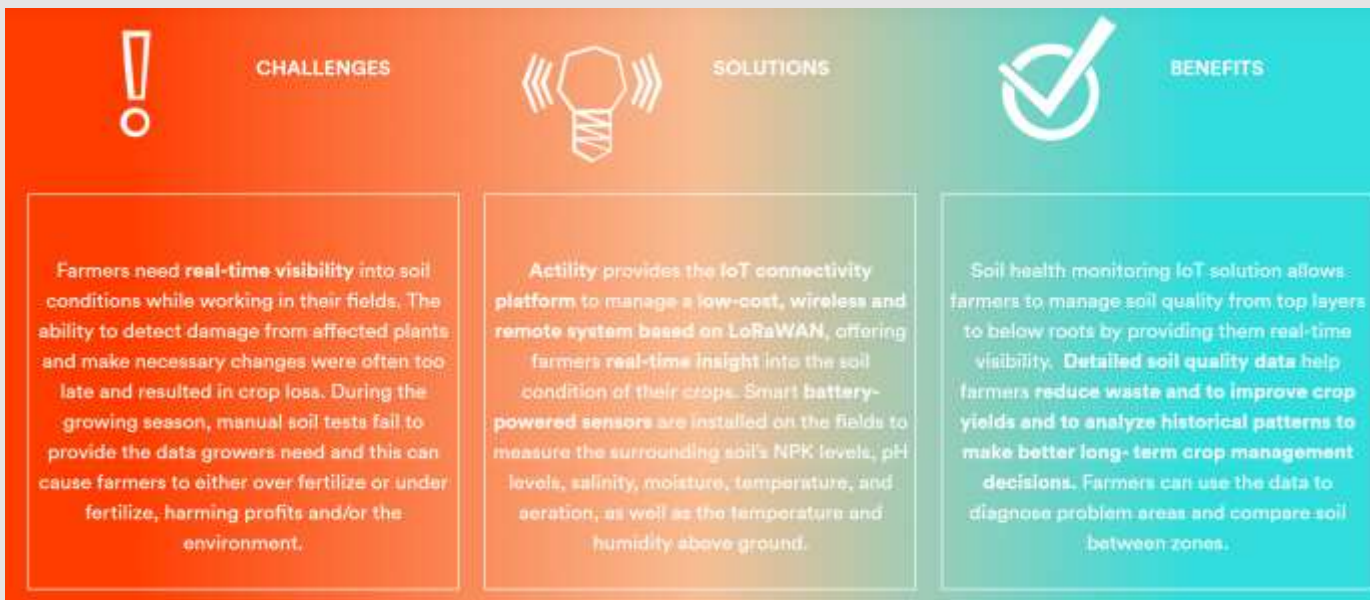
# Environment Monitoring



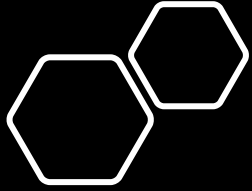
- **Keep an eye on your farms environment**
- IoT enables easy and cost-effective solutions for **weather conditions monitoring, flood detection, and water quality control**, providing you the data to make accurate decisions about your fields and crops. Remotely access real-time information about the water level in rivers and canals, the rainfall, temperature changes, wind conditions, air pressure, and humidity for your precise location. Optimize labor, water usage and crop health with the smart solution to precision agriculture. By implementing a **network of LoRaWAN™ sensors and gateways across your fields**, environmental indicators can be measured in real-time, detecting issues before they become crises.



# Soil Health Monitoring



- **Collect soil condition data with IoT**
- Until now, growers did not have an effective way to measure soil conditions other than to visually inspect the crops. Today, IoT connects your fields and gives them the voice to tell you everything they need to thrive. **Soil monitoring sensors deliver real-time readings of soil temperature, volumetric water content, air temperature, but also nitrogen, phosphate, and potassium (NPK) levels** – directly from the field to the Internet. Smart sensors deliver data at customizable intervals, **eliminating the need for manual readings**. You can accurately **predict optimal planting and fertilization times, reduce water usage**, and minimize the plant stress that comes from over or under-watering.



# Asset, energy, and inventory management

- Some essential constituents of smart farming include promoting efficient use of energy, tracking vehicles in the field, optimizing storage conditions for crops, and managing inventory. This is where smart farming overlaps with other popular IoT use cases, such as fleet management or smart metering. By addressing these tasks in a holistic manner, farmers will be able to overcome many pitfalls and inefficiencies associated with siloed IoT applications.
- As an end-to-end IoT platform targeting all popular IoT use cases, NW provides necessary features, graphical widgets, and analytics for an integrated asset management and efficiency tracking IoT solution. For a quick start, it also includes ready-to-go dashboards for use cases such as smart metering, fleet management, and building automation - which are very common for mid sized and large farming businesses. More dashboards are coming out soon. All of these solutions are conveniently organized within the Kaa user interface so that you could access every part of your business automation in seconds.
- The following applications are some of the most essential ones that you can set up with Kaa to optimize your asset performance and efficiency:
  - Smart metering and smart lighting
  - Fleet management
  - Building automation, storage climate control
  - Asset tracking, inventory management
  - Waste management

# Contact Us

[www.nwtecs.com](http://www.nwtecs.com)

info@nwtecs.com