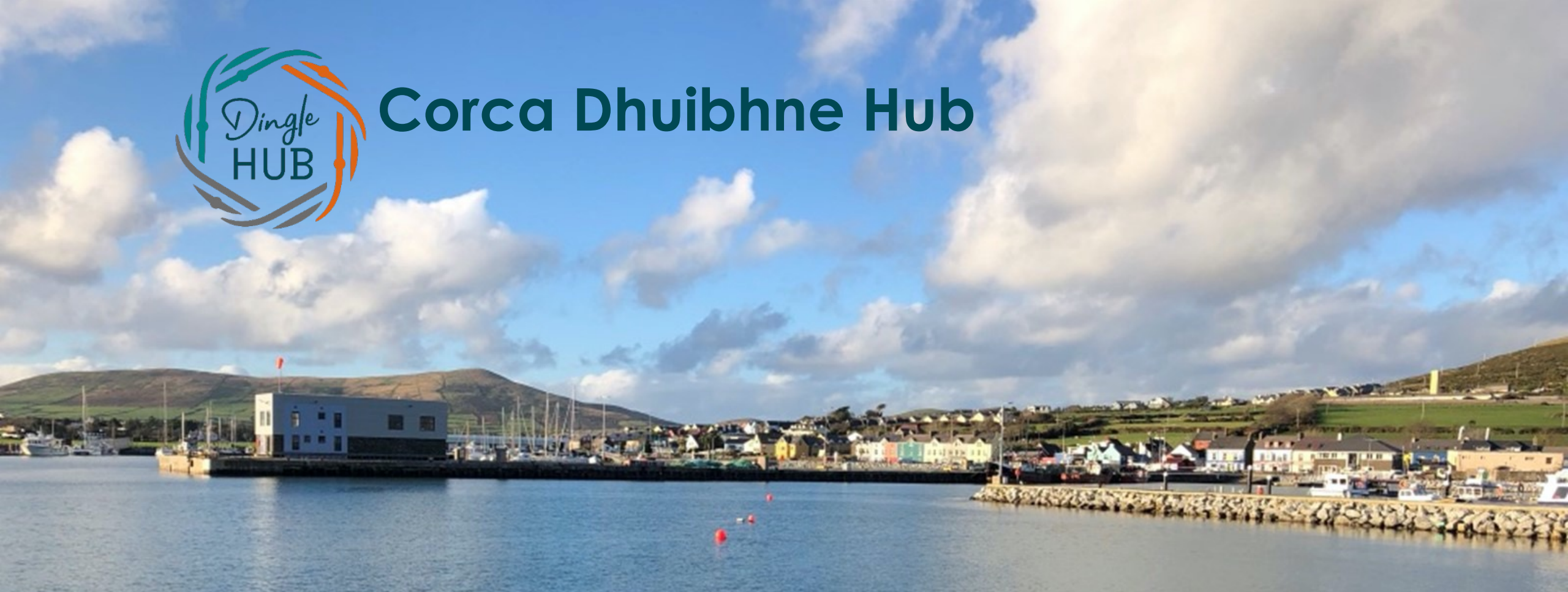


Corca Dhuibhne Hub

EU Ploutos: A sustainable innovation pilot

www.dinglehub.com

To build a creative, liveable, sustainable and inclusive community, fostering a vibrant and diverse ecosystem of stakeholders to facilitate the creation and maintenance of well-paid, year-round incomes on the Dingle Peninsula

EU Ploutos Project

Ploutos aims to create opportunities for changes that can rebalance the value chain in the agri-food system towards a more environmentally, socially and economically sustainable system.

The project will support and enable co-created, innovative solutions to address climate change and support the financial viability of farms.

Some of the aims of the project are **to market products using data from the sensor technologies**, specifically, for farms initiating new agri-food / agri-tourism industries.

PLOUTOS has received funding from EU's programme H2020 under GA 101000594

There are 11 Participating Sustainable innovation Pilots

- SIP 1: The Support of a Frozen Fruit Value Chain Consisting of Small Farmers – **Greece**
- SIP 2: Better food-chain contracts for improved durum wheat production – **Italy**
- SIP 3: Empowering consumers through crowdsourcing to regain control over their food and create healthy, sustainable, fair-trade product – **France**
- SIP 4: Traceability solutions covering the Horticulture Greenhouse Value Chain to improve overall efficiency, sustainability performance and brand recognition – **Spain**
- SIP 5: ***Smart Farming on rural farms demonstrating its benefit in the wider agri-food community and co-creating new food products and services – Ireland***
- SIP 6: *Applying soil-passport approach and precision farming technologies in Slovenia to increase soil health and sustainability as a whole* – ***Slovenia***
- SIP 7: Supporting wine producers in taking advantage of the changes in labelling regulations – **Cyprus**
- SIP 8: Carbon Farming: compensating farmers for climate friendly management – **Netherlands**
- SIP 9: Facilitating the transfer of surplus food from farms to socially disadvantaged group by aligning logistics and processes – **N. Macedonia**
- SIP 10: Increase sustainability in the grapevine sector by introducing payments for ecosystem services – **Italy**
- SIP 11: *Introduction of IoT solutions through NADIA platform to the agri-food sector and generate synergies between tourism and agriculture – Balearic Islands,* ***Spain***

Who are the project partners?

PLOUTOS

PLOUTOS has received funding from EU's programme H2020 under GA 101000594

Dingle HUB

KERRY AGRIBUSINESS

teagasc
Agriculture and Food Development Authority

National Farming Research body
Scientific input on Smart Farming and Farm Advisory services

VistaMilk

DCU
Ollscoil Chathair Bhaile Átha Cliath
Dublin City University

IFA

National Farmer's Association

netfeasa

Technology provider
Smart Farming Service Provider

Phase 1: Farm Ambassador Pilot Project

IoT Farm Ambassador Project

- **Digital Technologies introduced** to 6 local farms
- **Relationships established** between farming community, technology providers and data analysts
- **Toolkit of validated sensors identified** to support decision making criteria to reduce GHG emissions and improve cost / labour efficiency on farms.

Project deliverables

- Calibration protocols developed and validated
- Robust, uniform installation methods developed for all sensors
  - Weather stations at same height
  - Mounting pole design for Libellium unit
  - Soil moisture and temperature probes at same depth
  - Protective coverings on nodes
  - Watermark placement procedure to ensure good contact with soil
  - Milk and slurry tank attachment procedures developed

Recommendations

- Maintain float stock to ensure continuation of data in the event of failures
- Real-time access to the data essential

Phase 2: EU Ploutos Sustainable Innovation Pilot

EU Ploutos Project Objectives

PLOUTOS has received funding from EU's programme H2020 under GA 101000594

- **Roll-out sensor technologies** to an additional 30 farms on the Peninsula to support grassland management to extend the grazing season
- **Encourage new collaborations and enterprises** across the value chain between farmers, technology designers, data analysts, food/service entrepreneurs and consumers
- **Greater carbon efficiencies** on farms. For every 10-day extension in grazing season there is a 1.7% decrease in greenhouse gas (GHG) emissions
- **Increased profitability on farms** as well as new income streams from higher value products. for every 10-day extension in grazing season, profit is increased by 27 Euro per dairy cow
- **Work with 33 consortium partners** through the Ploutos Innovation Academy

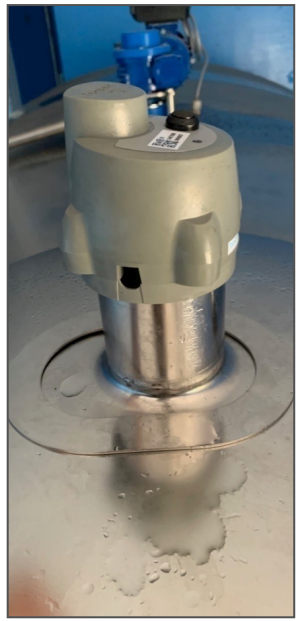
Farm Sensor Technology

Multitech LoRaWAN Gateways

- MultiTechConduit®IP67 Base Station
- Gateway relays messages between sensors deployed on the farm and NetFeasa's central network server and data platform, EvenKeel

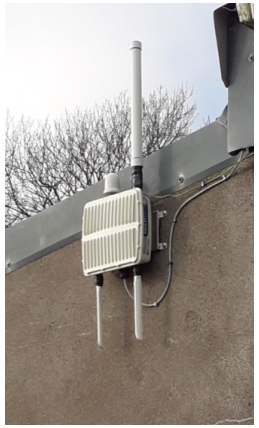
Tekelek Ultrasonic LoRaWAN Tank Sensor

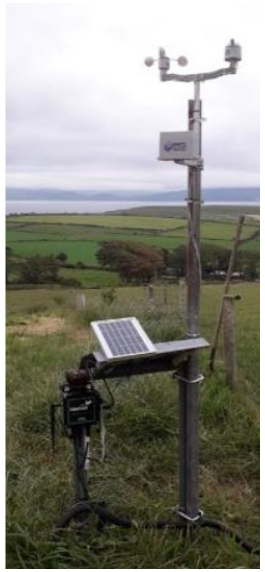
- Sensor measuring distance from sensor to liquid in cm
- Two installed per farm:
  - Milk Tank reporting hourly
  - Slurry Tank reporting every 6 hours



Sensoterra Soil Moisture

- Plug and Play device, inserted into the soil and give soil reading in %
- Transmitting hourly, depth of 15cm

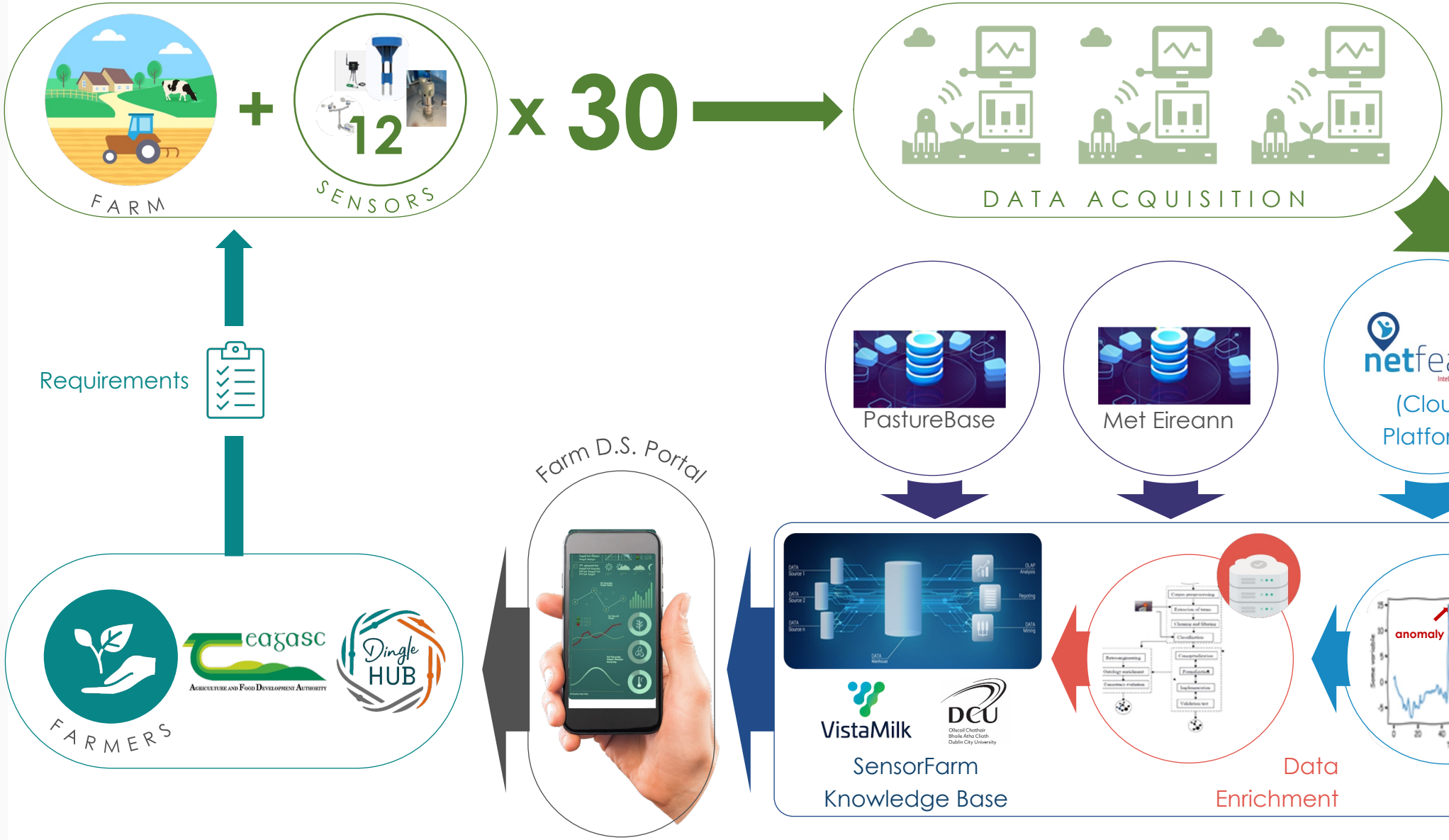




Libelium Smart Agri sensor array allowing implementation of up to six sensors, with one rechargeable central control unit. Following probes attached:

- **WS-3000 Weather Station**
  - Wind Speed m/s
  - Wind Direction
  - Rainfall mm
- **BME280 node**
  - Air Temperature (°C)
  - Relative Humidity
  - Atmospheric Pressure (Pascal, kPa)
- **Soil Moisture, Watermark (2 depths 10cm & 20cm)**
- **PT-1000 Soil Temperature (°C) (Depth of 10cm)**
- **Solar Panel to recharge battery**
  - Data validation carried out by Teagasc
  - Data from this sensor can be used to produce a soil moisture deficit model and correlated to grass growth rates and milk production rates allowing a localised model for the farm to give predictive decision making matrix for the farmer.

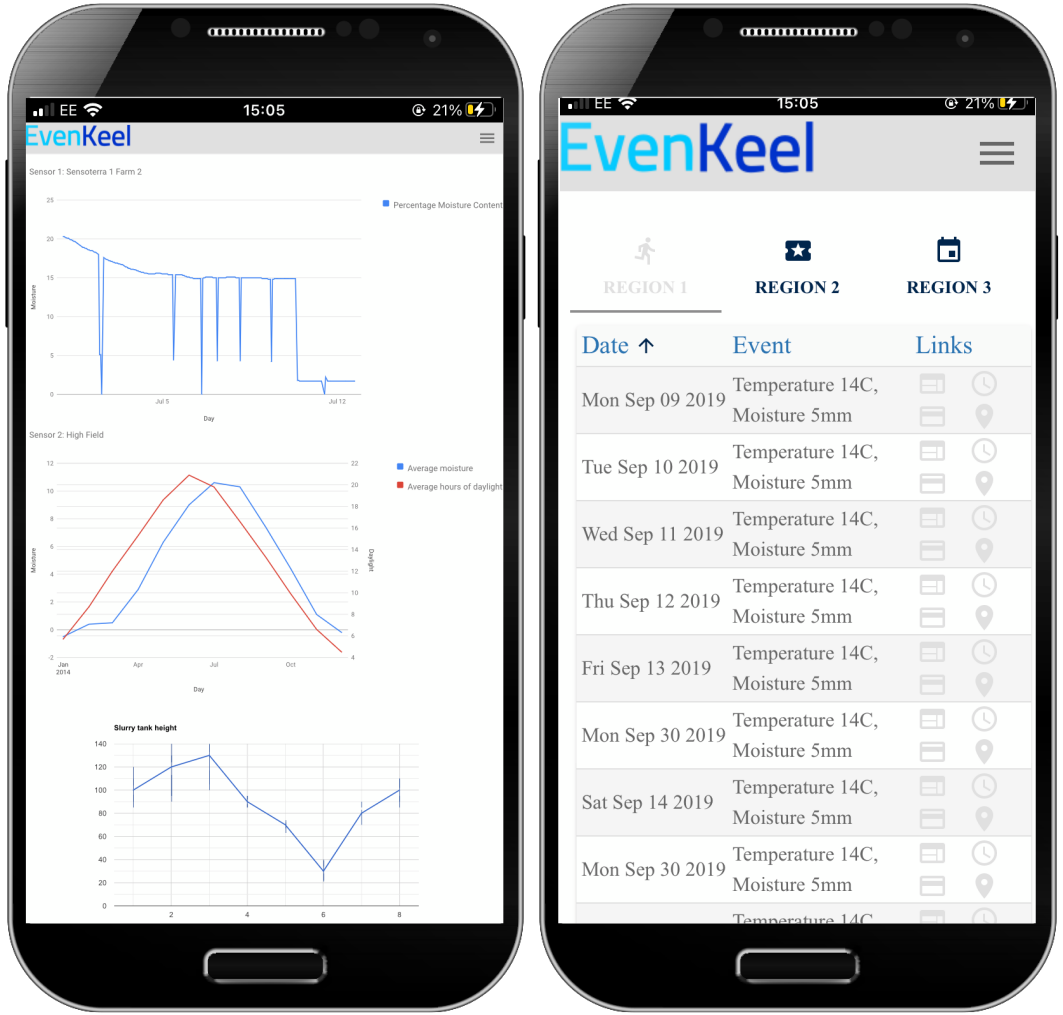
Data Management & Mobile Decision Support



Online data access platform

A co-created online decision-making platform will be available to all the farmers.

- This will allow the farmers to analyse the flow of information and use real time data for decision support.
- Your data will be available via an app on your smart phones.
- The development of this tool has been sponsored by Kerry Agribusiness



Real Time Data measurements and benefits

1 Weather station data

What is being measured?

Rainfall Air temp Soil temp

What can it be used for?

Recommend time for fertilizer/ slurry application, match grass growth rates to weather, calculate soil moisture deficit.

Can do:

(a) soil moisture deficit; and

(b) grass growth prediction model at individual farm level.

FREQUENCY 60 mins

2 Soil moisture data

What is being measured?

Moisture content of soil

What can it be used for?

Can relate to weather data and support decision making for fertilizer / slurry application

FREQUENCY 60 mins

3 PastureBase data:

What is being measured?

Overall herbage mass (HM),kg DM/ha
HM in each paddock
Grass growth rate
Demand of the herd

What can it be used for?

- Quantity of grass being fed
- Control using the wedge; Allocations
- Planning close-out, etc

FREQUENCY  Weekly / fortnightly

Real Time Data measurements and benefits

4 Milk tank sensor data

What is being measured?

Height of milk in the bulk tank

What can it be used for?

- Show weekly and daily milk production for the farm and benchmark against others
- Look at weekly and daily milk production on each farm in conjunction with the values for the grass parameters (weekly) of herbage mass (HM) and grass growth rate
- Match milk production data with paddock data and with weather data – observe association between these parameters and use them to predict what options should be taken in terms of management, e.g. allocation of grass

FREQUENCY 60 mins

5 Slurry tank sensor data

What is being measured?

Height of slurry in the tank

What can it be used for?

Daily production rate;
can indicate days of storage remaining in tank and amount of slurry applied – relate to weather and soil moisture

FREQUENCY 6 hrs

6 Nutrient Management Plans

- Work with the farmers to create Nutrient Management Plans for all participating farms and provide inputs such as grass measurements, pasture utilisation and slurry spreading data
- Data Analysis will provide the most efficient strategy for using grass for grazing animals; the land areas most in need of fertilizer; management of slurry application based on soil and weather conditions.
- Grass availability and soil nutrient requirements of lime, N, P, K. inputs will be provided manually by farmers and farm advisors. Data will provide the most efficient strategy for using grass for grazing animals; the land areas most in need of fertilizer; management of slurry application based on soil and weather conditions.
- Labour, "profit monitor" and grazing season extension data will be recorded for all farms to quantify emissions and cost savings linked to optimized farm management. Baselines will be recorded in M12 measured again in M32 to quantify improvements.

FREQUENCY *Annually*

Data ownership

Each farmer will have an individual account for farm specific data to maintain confidentiality.

For the duration of this project data gathered will be shared with participating partners in order to develop the online platform, we will ensure that our processes clearly identify the requirements for safely managing your data and that they are up to date and compliant with our policies and all legal obligations.

We would appreciate if **each farmer grants permission to share the weather data** collected to other users who would benefit from this information including:

- **Fire Brigade**
- **Coast Guard**
- **Gardai**
- **Mountain Rescue**

- **Citizen / School Science Projects**

- **Academics / Research**

- **Hospitality Sector**

- **Marine** and **Agriculture** Sectors

EU Ploutos Project Schedule Overview