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DELIVERABLE

Report on the Deployed Networks of Telemetric Stations and Traps

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Executive Summary

The aim of this deliverable is to present all the information related to the deployment of the telemetric stations (gaiatrions) and traps. To start with, the general protocol followed in this task is presented. All steps from the planning of the trip at NP to the communication with the farmers and cooperatives on the installation day are explained. Following, detailed information for each Use case are presented and a many pictures are used to document the process and the final placement of the stations on the fields. Maps with the deployed traps are used to provide good overview of the traps placements result.

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Definitions, Acronyms and Abbreviations

Acronym	Title
AB	Advisory Board
ALs	Action Leaders
AUTH	ARISTOTELIO PANEPISTIMIO THESSALONIKIS (Aristotle University of Thessaloniki – Special Account of Research Funds)
CE	Circular Economy
EU	European Union
GAIA	GAIA EPICHEIREIN ANONYMI ETAIREIA PSIFIAKON YPIRESION
M2M	Machine2Machine
NP	NEUROPUBLIC AE PLIROFORIKIS & EPIKOINONION
SF	Smart Farming
COSTEIRA	VIÑA COSTEIRA SCG
MIRABELLO	Agricultural Cooperative Partnership Mirabello Union S.A.
VELVENTOS	Agrotikos Synetairismos Epexergasias kai Poliseos Oporokipeftikon Proionton (ASEPOP) Velventou SYN.P.E
CONFAGRI	Confederação Nacional das Cooperativas Agrícolas e do Crédito Agrícola de Portugal CCRL
ORESTIADA	Enosi Agrotikon Synetairismon Orestiadas
AIGINA	Omada Pagagogon Kelyfotou Fistikiou Aiginas
ELASSONA	Agrotikos Synetairismos Kelyfoton Elassonas
DRAMA	Enosi Agrotikon Synetairismon Dramas
SPEKO-PESKO	Koinopraksia Agrotikon Synetairismon SPEKO-PESKO
KIATO	Geoponiki Kiatou
STYLIDA	Stylis Olive Producers Cooperative
THESTO	Agricultural Cooperative of Thessalian Tomato Producers
THESGI	Farmers' Cooperative of Thessaly
LASITHI	Enosi Agrotikon Synetairismon Oropediou Lasithiou

1. Introduction

1.1. Project Summary

The main objective of the LIFE GAIA Sense project is to demonstrate Gaiasense, an innovative “Smart Farming” (SF) solution that aims at reducing the consumption of natural resources, as a way to protect the environment and support Circular Economy (CE) models.

More specifically, this project will launch 18 demonstrators across Greece, Spain and Portugal covering 9 crops (olives, peaches, cotton, pistachio, potatoes, table tomatoes, industrial tomatoes, grapes, kiwi) in various terrain and microclimatic conditions. They will demonstrate an innovative method, based on high-end technology, which is suitable for being replicated and will be accessible and affordable to Farmers either as individuals or collectively through Agricultural Cooperatives.

Moreover, LIFE GAIA Sense aims to promote resource efficiency practices in SMEs of the agricultural sector and eventually, contribute to the implementation of the Roadmap to a Resource Efficient Europe. This project will demonstrate a method on how the farmer will be able to decide either to use or avoid inputs (irrigation, fertilizers, pesticides etc.) in a most efficient way, without risking the annual production. The focus is on the resource consumption reduction side of CE, and the results will be both qualitatively and quantitatively, considering the resources’ efficiency in agricultural sector.

1.2. Document Scope

The aim of this deliverable is to provide all the information related to the deployment of the telemetric stations (gaiatrons) and traps for the 13 Use Cases of the first year of the project. Telemetric stations and traps form the substantial infrastructure for data collection and analysis are essential for the development and operation of the Smart Farming services.

2. Deployment of telemetric stations - Summary

Gaiatrons¹ can be regarded as the backbone of the smart farming services developed within the scope of the LIFE GAIA Sense project. The stations are “sensing” atmospheric and soil data such as rainfall, wind, temperature, soil moisture etc. The data is further transformed into information with the aid of computational processing and scientific modelling in order to provide advices and assist the agronomist and farmer in managing the fields in a more efficient and environmental friendly way.

The location for each telemetric station has already been defined as an output of the placement study based on certain soil/climate characteristics of the parcels. The deployment of the stations resulted in a fully operational network of stations interconnected with the cloud computing infrastructure of NP which was properly parameterized to meet the needs of each Use Case.



Figure 1: Location of each LIFE GAIA Sense Use Case

¹ The gaiatron station is an IoT “Deploy-and-Forget” platform incorporating a wide variety of sensors intended for the continuous surveillance of cultivation environment variables in selected agricultural areas. It is designed in-house, manufactured by qualified contractors and installed by specially trained company personnel. All discrete gaiatrons’ parts meet demanding requirements regarding resistance to the elements. The stations are designed to be installed next or inside cultivated fields and left there for years with minimal or, if possible, no maintenance. The system is designed in such a way that it combines durability, accuracy and a wide operational conditions span with a low-carbon footprint. To that end, environmentally friendly materials have been opted for during the design of the gaiatron stations. Last but not least, the gaiatron station is CE certified.

Based on the different location of the Use Cases (Fig 1) an initial plan for the deployment of the stations was set up. However due to the fact that the deployment of the stations has some pragmatic and physical limitations i.e. the soil has to be dry before the station is deployed (no rainfall for some days before the trip), the plan was adjusted and specified on a day level as the period for the deployment of the stations approached.

The team responsible for organizing the specific dates of the deployment trips, was in close contact with the meteorologist of NP. His contribution was very valuable in finding the best weather conditions for organizing the trips as well as proposing alternatives in cases of changes of the weather conditions.

Based on the meteorologist's suggestions the best possible days to visit each location were determined. This information was then combined with the relative distance between the different Use Cases, and an optimized plan for the deployment of the stations was set up respecting both the weather constraints and the aim to combine as many trips as possible in order to minimize the environmental footprint and the costs.

The installation is following a strict protocol both during the preparation at the premises of NP before the trip (certain checklist of equipment that has to be taken and used etc.) as well as upon arrival at the cooperatives, the communication with the cooperatives & producers and the installations itself.

The whole process for deploying the stations is depicted in Fig 2.

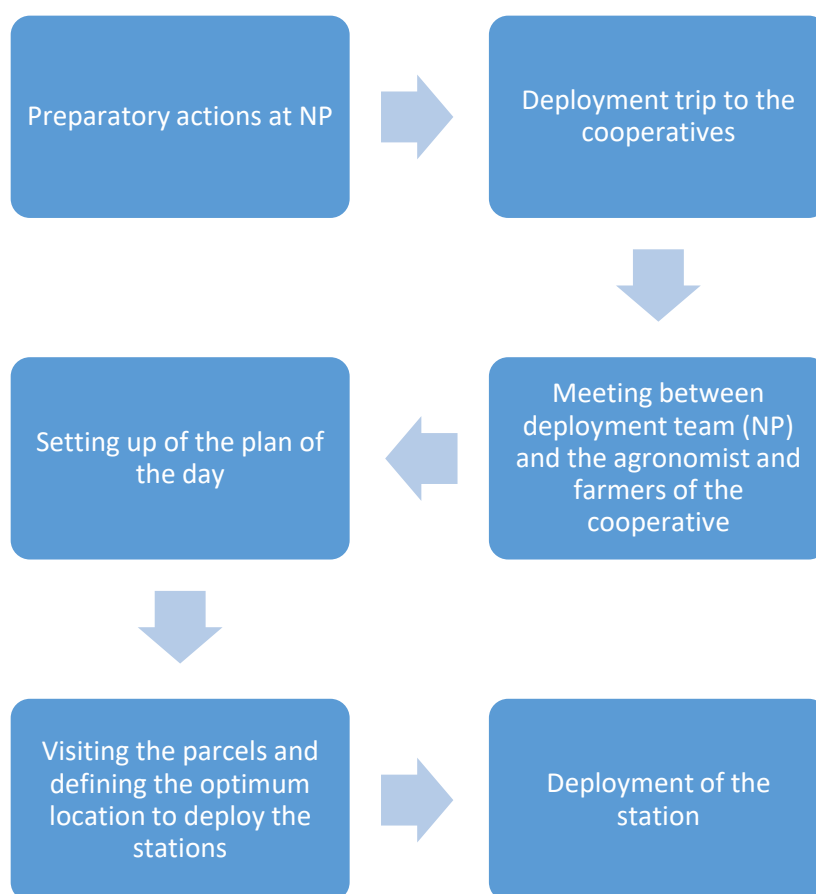


Figure 2: Telemetric stations' deployment workflow

The placement study for ORESTIADA resulted in 5 stations that had to be deployed in 5 different locations.

Table 1: ORESTIADA - locations of the gaiatrons

ORESTIADA	Toponym
	Kavyli
	Kastanies
	Rizia
	Valtos
	Kyprinos

The placement study for VELVENTOS resulted in 4 stations that had to be deployed in 4 different locations.

Table 2: VELVENTOS - locations of the gaiatrons

VELVENTOS	Toponym
	Ragazia
	Brava
	Ag. Christoforos
	Plakes

The placement study for AIGINA resulted in 2 stations that had to be deployed in 2 different locations.

Table 3: AIGINA - locations of the gaiatrons

AIGINA	Toponym
	Vigla
	Aggelakia

The placement study for ELASSONA resulted in 3 stations that had to be deployed in 3 different locations.

Table 4: ELASSONA - locations of the gaiatrons

ELASSONA	Toponym
	Amaxi
	Ampelia Kouri
	Sykies

The placement study for LASITHI resulted in 2 stations that had to be deployed in 2 different locations.

Table 5: LASITHI locations of the gaiatrons

LASITHI	Toponym
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	Perivoli
	Ag. Giannis

The placement study for SPEKO-PESKO resulted in 5 stations that had to be deployed in 5 different locations.

Table 6: SPEKO-PESKO locations of the gaiatrons

SPEKO-PESKO	Toponym
	Bournazi
	Xerokampi
	Toumpa
	Skandaliara
	A' Katigoria

The placement study for KIATO resulted in 3 stations that had to be deployed in 3 different locations.

Table 7: KIATO - locations of the gaiatrons

KIATO	Toponym
	Fieri
	Kliozi
	Panagia

The placement study for STYLIDA resulted in 3 stations that had to be deployed in 3 different locations.

Table 8: STYLIDA - locations of the gaiatrons

STYLIDA	Toponym
	Ag. Nikolaos
	Leyka
	Kouvela - Meg. Peyko

The placement study for THESTO resulted in 4 stations that had to be deployed in 4 different locations.

Table 9: THESTO - locations of the gaiatrons

THESTO	Toponym
	Geladina
	Karamouza
	Maxalas
	Genigeri

The placement study for THESGI resulted in 3 stations that had to be deployed in 3 different locations.

Table 10: THESGI - locations of the gaiatrons

THESGI	Toponym
	Kapatsair
	Karagkiozia
	Mayrochomata

The placement study for MIRABELLO resulted in 4 stations that had to be deployed in 4 different locations.

Table 11: MIRABELLO - locations of the gaiatrons

MIRABELLO	Toponym
	Ambella
	Petromenous
	Kampos
	Ag. Paraskeyi

The placement study for COSTEIRA resulted in 2 stations that had to be deployed in 2 different locations.

Table 12: COSTEIRA - locations of the gaiatrons










Vina Costeira	Toponym
	Coio Branco
	San Cibrao





The placement study for CONFAGRI resulted in 2 stations that had to be deployed in 2 different locations.

Table 13: CONFAGRI - locations of the gaiatrons

CONFAGRI	Toponym
	Beja
	Serpa

Some pictures from the installed stations can be seen below.

		
ORESTIADA	VELVENTOS	AIGINA
		
ELASSONA	LASITHI	SPEKO- PESKO
		
KIATO	STYLIDA	THESTO

		
THESGI	MIRABELLO	COSTEIRA
		
CONFAGRI		