Sustainable intensification of food production through resilient farming systems inWest & North Africa

Deliverable D4.2
First In-Person of Training

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DISSEMINATION LEVEL: Public

ABSTRACT

The first in-person training session within the scope of this project, as documented in Deliverable D4.2, focused on Smart Farming. This training was designed for professionals, service providers, and educators and was conducted at CIHEAM Bari, Italy. It encompassed content from Work Packages (WP) 2, 3, and 5 and spanned a full week. Participants from Ghana, Tunisia, and Egypt attended. The objective of this training was to educate stakeholders and end-users on the latest research findings, results, and technologies that promote sustainable intensification of agriculture—a central goal of WP4 in the SustInAfrica project. WP4 led the organization of this training which covered topics such as use of Bluleaf, InsectaMon, and Remote Sensing. This preparatory training aimed to equip participants for subsequent country-specific training sessions. The rationale behind this training was to emphasize the importance of smart, open, and cost-effective monitoring technologies within agroecological practices. These technologies aim to enhance plant production, plant health, water management, and the provision of ecosystem services. The training included hands-on experience with various monitoring tools and data testing methods including SMS crowd technologies provided by Farmerline, a partner of the SustInAfrica consortium. Additionally, participants explored smartphone apps such as Plantix, InsectaMon, Bluleaf app, and remote sensing platforms like UAV COPERNICUS satellite data. After customizing the training to address the specific needs and regulations of individual countries, WP3 will oversee the testing of these tools within the SustInAfrica study countries in North and West Africa.

TABLE OF CONTENTS

4

List of Abbreviations and Acronyms

AEZ	Agroecological Zone
ATB	Leibniz Institute for Agricultural Engineering & Bioeconomy, Germany
BOKU	University of Natural Resources & Life Sciences Vienna, Austria
CIHEAM	Mediterranean Agronomic Institute of Bari, Italy
FL	Farmerline Ltd., Ghana
FC.ID	Faculty of Sciences, Investigation and Development, Universidade de Lisboa, Portugal
HUSD	Heliopolis University for Sustainable Development, Egypt
ISEG	Lisbon School of Economics and Management, Universidade de Lisboa, Portugal
IO	Olive Tree Institute, Tunisia
Ltd	Limited
LUKE	Natural Resources Institute Finland [coordinator], Finland.
UAMN	Abdou Moumouni University, Niger
UAV	Unmanned Aerial Vehicle
UCC	University of Cape Coast, Ghana
UDDG	University of Dédougou, Burkina Faso
UDS	University of Development Studies, Ghana
SHA	Self Help Africa, NGO, Ireland

Introduction

Deliverable (D) 4.2 of the SustInAfrica project, titled 'First In-Person Training on Smart Farming' under WP4, serves a crucial objective within the broader scope of SustInAfrica. The primary aim is to educate stakeholders about cutting-edge technologies, tools, applications, and experimental results. This education empowers them to conduct field trials, contributing vigorously to the pursuit of sustainable agricultural intensification in Africa. This initial phase lays the groundwork for subsequent training sessions, tailored to individual countries, considering their specific contexts and the needs of their Agroecological Zones (AEZs).

The training equipped participants with knowledge that is vital for their communities or specific segments of their agricultural value chain. As ambassadors of this knowledge, they play a pivotal role in disseminating these insights to others in their communities or value chain segments. This, in turn, empowers smallholders, medium to large-scale farmers, and agribusiness value chains across the regions under study with the latest digital innovations that foster sustainable intensification in Africa. Throughout the training, participants learn about smart, open, and cost-effective monitoring technologies that enhance agroecological practices. These technologies are designed to improve various aspects, including plant production, plant health, water management, and the delivery of ecosystem services. Specific tools and monitoring data, tested before the training, include SMS crowd technologies, powered by Farmerline Ltd, a consortium member of SustInAfrica. Additionally, participants engage with smartphone apps like Plantix and InsectaMon, the Bluleaf tool by CIHEAM for fertilization and water management, as well as UAV and COPERNICUS for remote sensing and satellite data.

The ability to test these tools in Ghana, Burkina Faso, Niger, Egypt, and Tunisia will depend on evolving socio-political events and country-specific guidelines and requirements outlined in WP3-led experiments. WP4 will play a central role in coordinating various stakeholders training done by local partners to ensure the site-specific implementation of the introduced technologies, including Bluleaf, InsectaMon, and remote sensing.

To pave the way for this effort, a smart farming workshop was conducted in person at the Centre International de Hautes Etudes Agronomiques Méditerranéennes (CIHEAM), also known as the Mediterranean Agronomic Institute of Bari, from September 11th to 15th, 2023 that is hereby described.

Training Purpose and Objectives

The purpose of this training was to achieve the objective of educating key stakeholders about technologies that enhance sustainable agricultural intensification in Africa.

The training aimed to expose participants to SustInAfrica's cutting-edge technology-oriented innovations through practical, hands-on experience sessions on how to use them.

The training sessions were designed to introduce and implement the following topics:

- Bluleaf DSS: The training began with an introduction to Bluleaf DSS, a real-time irrigation management smartphone application. Participants engaged in practical exercises on laptops and smartphones, which included tasks such as logging in, app installation, creating working scenarios, simulations, and interpreting results.
- Farmerline Ltd: Participants were introduced to Farmerline Ltd and its services, with a particular focus on their 399 services, which offer mobile financial and content-related services. These services aim to help rural farmers access high-quality inputs, enhance their

financial literacy, and adopt best agricultural practices.

- UAV Use in Agriculture: The training introduced the use of Unmanned Aerial Vehicles (UAVs) in agriculture. This included an overview of regulations and legal requirements, drone fundamentals, safety procedures, and drone operation. As a practical exercise, participants conducted a data collection flight using UAVs at the experimental fields of CIHEAM Bari.
- UAV Photogrammetry: Participants received practical training in UAV photogrammetry using MetaShape, a software tool for processing aerial images.
- InsectaMon: The training also covered theoretical background and practical insights into InsectaMon, a tool designed for monitoring pest insects. InsectaMon is currently under development by ATB.

These training sessions aimed to equip participants with valuable knowledge and skills related to these technologies, enabling them to contribute to sustainable agricultural intensification efforts in Africa.

Justification

The training was conducted as part of the broader initiative to educate professionals, service providers, and teachers, as outlined in the SustInAfrica project proposal (sequel to D4.2 and T4.1.c), as amended in 2022. The primary objective of this training was to assess the practical application of various technologies, including Bluleaf technology, InsectaMon, SMS Crowd Technologies, Plantix, UAVs (Unmanned Aerial Vehicles), and COPERNICUS satellite data in the context of sustainable agricultural intensification.

In preparation for this training, key stakeholders who would later serve as pioneers for similar training sessions in their respective countries underwent their own training. This approach ensured that these key stakeholders were well-equipped to facilitate and disseminate knowledge about these technologies in their local contexts.

1. Training Plan:

The training was planned with a dedicated budget to cover the expenses associated with the training program. This included the cost of training itself, transportation, and accommodation for both facilitators and stakeholders, as well as other necessary budgetary allocations. The training was designed to span a week, comprising a combination of classroom sessions, practical fieldwork, and field trips for real-life, hands-on experiences.

Although the initial intention was to include all stakeholders from SustInAfrica's study countries, the training was regrettably affected by recent socio-political events in certain study countries, particularly Burkina Faso and Niger. Unfortunately, due to these events, the stakeholders and anticipated participants from these countries were unable to travel and attend the training. Consequently, the realization of the training for stakeholders in Burkina Faso and Niger had to be postponed.

The progression of the training will largely depend on the deployment of state-of-the-art weather stations in the study countries. Additionally, it will be contingent upon compliance with existing laws and regulations regarding the use of certain technologies, such as drones. The rescheduling of training for stakeholders in Burkina Faso and Niger will be contingent upon the availability of suitable circumstances and context.

2. Training strategy

The training program was carefully designed to encompass a multifaceted approach, seamlessly blending engaging field visits, hands-on practical sessions, and insightful theoretical components that offering participants a comprehensive and enriching learning experience.

3. Training courses & Topics

The primary focus of the training was on Smart Farming, encompassing essential aspects of modern-day smart farming practices. The training workshop included a comprehensive array of courses and topics, which are as follows:

- Opportunities and Barriers for Scaling Agro-ecological Practices in West and East Africa
  This course explored the opportunities and challenges associated with scaling agro-ecological practices in both West and East Africa.
- Overview of UAV Use in Agriculture
  Participants gained insights into the use of Unmanned Aerial Vehicles (UAVs) in agricultural applications, including an overview of their functionalities and benefits.
- Theoretical Background of UAV Photogrammetry and Remote Sensing
  This course delved into the theoretical foundations of UAV-based photogrammetry and remote sensing, offering participants a deeper understanding of these techniques.
- Low-cost Remote Sensing Monitoring Tool for Crops and Greening Infrastructure
  Participants explored cost-effective remote sensing tools for monitoring crops and greening infrastructure, emphasizing their practical application.
- Eco-efficient Agricultural Water Management: Concept and Application
  This course introduced the concept of eco-efficient agricultural water management and its practical applications in the field.
- Soil Water Balance Modeling for Irrigation Scheduling
  Participants learned about soil water balance modeling, a crucial component of effective irrigation scheduling in agriculture.
- Smart Technologies and Best Management Practices in Agricultural Water Management
  This course covered smart technologies and best practices for efficient agricultural water management.
- Bluleaf DSS: Software Architecture, Technologies, Main Functions, and Examples of Application
  Participants were introduced to Bluleaf Decision Support System (DSS), where they explored its software architecture, technologies, main functions, and real-world application examples."

The Details of the agenda is contained in the annex of this report.

8

The Training involved the following courses/modules and topics for each course as itemized below.

Module A - Transforming Agriculture: Cultivating a Thriving Farmer Ecosystem with Digitization & 399 Service

- Introduction
- Why 3-9-9?
- Operational & Targeted Countries
- 399 Ecosystem
- How the 399 Service Works
- 399 Delivery Channels
- Focus: Weather: The Weather Factor
- Focus: Weather
- Weather Forecast with Mergdata
- Types of Forecasts
- Accuracy
- Farmer Onboarding
- Dashboards & Reporting
- Focus: Market Access
- The Market Access Factor
- Market Access Requirement
- Market Access with Mergdata Sales: Resources & Opportunities
- Conclusion

Module B - BluLeaf Training Content

- Login
- Insert the data about your company.
- Insert crop data.
- Insert irrigation system data.
- Insert soil data.
- Insert data about the area of interest (farms)
- Inset data about the plots (fields)
- Create a plot/field scenario (weather, soil, crop, irrigation system, management)
- Display soil water balance components
- Manage irrigation (when and how much water to supply)
- Display/manage fertilization and disease control.
- Environmental assessment (water footprint, carbon footprint)
- Weather data display and forecasting

Module C - UAV Training Contents

- Definition of UAV (Unmanned Aerial Vehicles)
- Typical UAVs for crop monitoring
- Combined systems
- UAV for spraying application
- In research: UAV miniatures inspired by insects.
- Use and intended use of UAVs in German agriculture.
- Pro / Cons for UAV use in agriculture.

- Technology used for UAV navigation and flight.
- Consumer-grade RGB cameras
- UAV Multi-spectral camera
- UAV Hyperspectral camera system
- UAV Thermal camera
- UAV LiDAR
- Structure from motion photogrammetry
- Dense point cloud
- Orthophoto
- Monitoring from plant to field scale
- Getting 3D structural information by SFM
- Typical applications for UAVs for crop monitoring
- Relationship to agronomic parameters with RGB UAV
- Relationship with N content in rice crops
- Relationship of chlorophyll content and LAI tomultispectral VI (LCI)
- Corona Pro SfM generated tree heights for application maps.
- Corona Pro (SfM - 3D point clouds)
- Corona Pro (Results Fruit Wall Apple Orchard)
- FungiDetect: Yellow rust monitoring in winter wheat
- FungiDetect: Yellow rust monitoring in winter wheat
- FungiDetect: Yellow rust spreading (intra-plot)
- Weed-AI-Seek Mapping weed species distributions.
- Weed-AI-Seek Mapping weed species distributions.
- Weed-AI-Seek (UAV)
- Weed Detection: Yolo-based object detection.
- Summary

Module D - Scaling Agroecological Practices: Unveiling Evidence, Exploring Opportunities, and Prioritizing Practices and Barriers
- Introduction to the concept of Agroecology
- Agroecological practices
- Multi-criteria decision analysis
- Current Status of Planetary Boundaries
- Why should we care? Land degradation, Degradation Cost & Desertification
- Types of Degradation
- Maize Yield Gap
- Fertilizer Inflation
- Definition of 5 Levels of Food Systems.
- Five Levels of Transition and 13 Principles of Agroecology
- Technology Vs Agroecology
- Definition of Key Terms
- Sustainable Intensification & Agroecological Intensification
- Agroecological Practices & Nature: Recycling of Nutrients, Increase of efficiency & Internal inputs, External input reduction & Farming Systems Design.
- Agroecological Practices, Biodiversity & Healthy Food Production
- Agroecological Practices & Environmental Impact Reduction

- Agroecological Practices & Resilience against Climate change Impact
- Resilience through Farming Practices
- General Evidence: Agroforestry, Cover Crop Systems,
- Multi-criteria Decision Analysis.
- Crop & Livestock System.
- Crop & Livestock Integration
- Intercropping, Agroforestry,
- Cover cropping /Green Manure, Fallowing,
- Diversified Crop Rotation, Mulching/Direct Seeding,
- Tillage, Reduced Tillage, Zero Tillage,
- Fertilizer Management: Organic Fertilizer (On-farm & Off Farm),
- Soil Improver: Biochar
- Biofertilizer (Bio stimulants)
- Split Fertilization, Micro-dosing of Fertilizer.
- Pest & Disease: Cultivar Mixtures, Use of Resistant Cultivars, & Biological Pest Control
- Insectary Plantings, Companion & insectary plantings,
- Botanical pesticides / biopesticides,
- consists of smart, open and affordable monitoring technologies as agro-ecological practices
- Push-pull (repulsion-attraction)
- Semi-natural landscape elements/Habitat management
- Semi-natural landscape elements/Habitat management
- Semi-natural landscape elements / Wind breaks / shelter belts
- Trapping: (Mass) Trapping, Pruning & Integrated Pest Management
- Water management: Drip irrigation, Rainwater harvesting, Contour bunds (stone bunds, grass strips etc)
- Raised bed planting.
- Conclusion

Module E - Optimizing crop protection with a smart pest monitoring solution: The InsectaMon tool
- InsectaMon Approach Overview
- Image data and annotation
- Data collection
- Recorded images and annotations.
- Why monitoring pests to begin with?
- Pests of InsectaMon: Olive pests
- Olive fruit fly (Dacus oleae/Bactrocera oleae)
- Olive moth (Prays oleae)
- Mango pests
- Mango fruit flies complex (Ceratitis sp. and Bactrocera sp.)
- Maize and Millet pests: Fall armyworm (Spodoptera frugiperda)
- The model of InsectaMon
- What Is an Image?
- What is a convolution?
- Convolutions and RGB

- What Do We Learn
- How Do We Make a Network?
- Model Representations
- Model Approach
- Image Modifications
- Data
- InsectaMon Mobile App
- Conclusion

Module F - Low-cost Remote Sensing Monitoring Tool for Crops and Greening infrastructure

- General ideas / concept's
- Satellite (Excourse)
- Data acquisition
- Data analysis (exemplary)
- UAV
- Limits / Restrictions
- UAV specifications
- Flight planning
- Achieved data.
- Field trip: Flight mission (2x)

Module G - Structure from Motion - live Training

- What is photogrammetry?
- Photogrammetry – like our eyes
- Advice for image capturing.
- *Georeferenzieren - Kontrollpunkte*
- Photogrammetry software
- Additional useful software (exemplary)
- Metashape Professional (Agisoft) Workflow
- Import of aerial imagery
- Align cameras - Sparse point cloud.
- Align images - Sparse point cloud.
- Sparse cloud calculation
- *Georeferenced* - Ground control points (marker)
- 3D point cloud (dense point cloud)
- Dense point clouds
- Digital elevation model
- Plant height estimation based on digital elevation model (potatoes)
- Ortho image
- Agisoft Meta-shape Professional Parameter Setting

THE PRECISION CROP PROTECTION IN PRECISION AGRICULTURE: THE CIHEAM BARI EXPERIENCE

- CIHEAM Bari Crop Protection Precision (PCP) Unit
- Pest Surveillance Systems
- Some PCP Unit Activities: Use of Satellite Imagery to Detect Citrus Tristeza Virus (CTV)
- Some PCP Unit Activities: Precision Surveillance of Xylella Fastidiosa
- Some PCP Unit Activities: Sentinel-2 Satellite Data: Homogeneous Crop Areas Detection
- Some PCP Unit Activities: Development of Spatial Models for Automatic Extraction of ''Features'' in a GIS Environment
- Development of Applications for SMARTDEVICES: Apps for Phytosanitary Surveillance
- Development of Applications for SMARTDEVICES: Apps for Survey (Agronomic, Phytosanitary, Socio-economic Data, etc.)
- ApPhyto & PhytoDB: The Surveillance Framework
- Some PCP Unit Activities: Precision Approaches in Pest Surveillance: Spatial Decision Support System
- Training for Professionals and Researchers in Smart Farming

4. Audience

A total of 15 participants from Egypt, Tunisia, and Ghana attended the training program, representing a diverse group of individuals with varied backgrounds and expertise. The audience included members of extension services, researchers and professors, as well as essential service providers, creating a rich and collaborative learning environment.

5. Budget

The budget for this training is captured in the budget of WP3 and WP4. The details of the budget for this training are archived in the financial report of WPs and partners that shall be reported in the appropriate reporting period.

6. Training Aid

In facilitating this training, moveable and immoveable assets, some materials, stationery and equipment were deployed, and they include.
- One main meeting room with portable chairs and/or tables.
- Participants' Identification Cards.
- Access to Wi-Fi (passwords, etc.).
- Printers.
- Projector connected with computer and screen.

- Sound conditions (e.g., microphone).
- Flipchart + permanent markers in various colours.
- Board + markers + eraser or blackboard + chalk + eraser.
- Stationary: scissors, mask tape or *Bostik*, colour markers.
- Weather Stations
- UAV and its gadgets.
- BluLeaf Equipment
- Crowd SMS Platform

Coffee breaks were frequently held, providing participants with opportunities to refresh and recharge. In addition, lunch and dinner were thoughtfully provided to all participants, ensuringthat their nutritional needs were met, and fostering a sense of camaraderie and community throughout the training program.

7. Photos

Some photos from these training sessions are provided below while the remaining can be found in the annex.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 861924
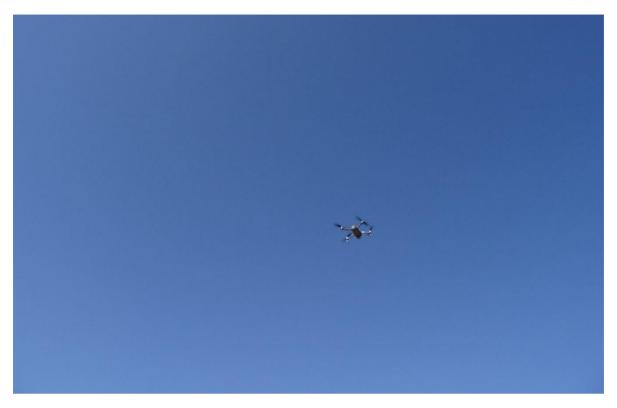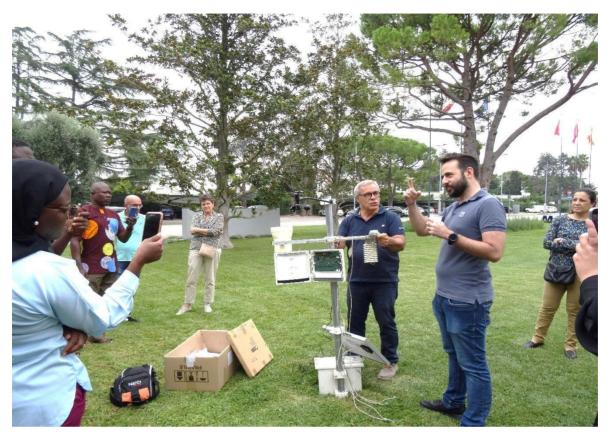
14

8. Exigencies

The preparation for this training was affected by a few factors like the airport workers strike at the Amsterdam airport which affected the arrival date of some of the participants from Ghana. The availability and deployment of state-of-the-art weather stations affected the training on the scheduled date.

9. Attendance/ Participants List

The attendance list as duly signed daily by the participants is contained in the annex of this report. However, below is a list of the participants with their countries and institutional affiliations. Certificates were presented to all attendees.

Name/Surname	Country	Organization
Sameh Shaddad	Egypt	Zagazig University
Hend Elsawey	Egypt	Heliopolis University (HU)
Fatimah Abubakari Von	Ghana	University of Cape Coast (UCC)
Kwame Agyei Frimpong	Ghana	University of Cape Coast (UCC)
Abdul Halim Abubakari	Ghana	University of Development studies (UDS)
Abdullah Karim	Ghana	University of Development studies (UDS)
Daniel Mac-Lomotey	Ghana	Ghanaian Ministry of Food & Agriculture (MoFa)
Theophilus Tettehfio Laryea	Ghana	Ghanaian Ministry of Food & Agriculture (MoFa)
Adrian Csordás	Portugal	Lisbon School of Economics and Management (ISEG)
Olfa Boussadia	Tunisia	Olive Institute
Nada Mzid	Tunisia	Tuscia University
Nasreddine Soomali	Tunisia	SESIT Tunisia
Eugene Anin-Adjei	Ghana	DexAfrica
Effah Foster	Ghana	DexAfrica
Marvin Nii Adom Armah	Ghana	Farmerline Ltd
Marius Hobart	Germany	ATB
Michael Schirmann	Germany	ATB
Pierre Ellssel	Austria	BOKU
Stephanie Saussure	Finland	LUKE
Mladen Todorovic	Italy	CIHEAM
Generosa Calabrese	Italy	CIHEAM
Andi Mehmeti	Italy	CIHEAM
Giles Young	Finland	LUKE

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Hobart, M. (2023) "Structure from Motion – live Training" *SustInAfrica* Smart Farming Training. Report in Tiimeri, Project Repository.

Saussure, S., Bdeir, A. & Schirrmann, M. (2023) "Optimizing Crop Protection with a Smart Pest Monitoring Solution: The InsectaMon Tool")" *SustInAfrica* Smart Farming Training. Report in Tiimeri, Project Repository.

Schirrmann, M. (2023) "Crop Monitoring with Unmanned Aerial Vehicles (UAV)" *SustInAfrica* Smart Farming Training. Report in Tiimeri, Project Repository.

Todorovic, M. (2023) "Bluleaf – A Smart DSS for Sustainable Irrigation Management" *SustInAfrica* Smart Farming Training. Report in Tiimeri, Project Repository.

Annexes

1. Training Agenda

Monday, 11th September 2023

Time	Programme/activity	Speaker/Moderator
08:30 – 09:00 Welcome coffee and registration		
09:00 – 09:30	Welcome addresses, presentation of the project, training, and participants • Maurizio Raeli, CIHEAM Bari Director – Welcome greetings. • Annamaria D'Onghia CIHEAM Bari, scientific coordinator - the Master of Science course on 'Precision Agriculture for the region Mediterranean'. • Franco Santoro CIHEAM Bari - Smart Farming in CIHEAM Bari • Giles Young, SustInAfrica project coordinator – the training in the frame of the SIA project	*Generosa Calabrese, CIHEAM Bari*
09:30 10:30	Transforming Agriculture: Cultivating a Thriving Farmer Ecosystem with Digitization & 399 Service	Marvin Nii Adom Armah, *Farmerline*
11:00 – 11.30 Coffee break		
11:30 – 13.00	Scaling Agro-ecological practices: Unveiling evidence, exploring opportunities, and prioritizing barriers (part I)	Pierre Elsell, *BOKU Vienna*
13:00 – 14.30 Lunch		
14:30 15.30	Intro to UAV use in Agriculture and flight plan preparation.	Michael Schirrmann, *ATB Potsdam*
15.30 17.30	Practical exercise: Conducting a UAV flight campaign at the premises of CIHEAM(outside)	Marius Hobart, ATB Potsdam Eugene Anin-Adjei, *DeX Africa*
19.00 20.00	Dinner	

Tuesday, 12th September 2023

Time	Programme	Speaker/Moderator
08:30 – 09:00 Welcome coffee and registration		
09:00 11:00	Smart pest monitoring solution: The InsectaMon tool Overview and theoretical background Hands-On: Practical use of the Smartphone APP	Michael Schirrmann, *ATB Potsdam;* Ahmad Bdeir, *University of Hildesheim;* Stephanie Saussure, *LUKE*
11:00 – 11.30 Coffee break		
11:00 13:00	The use of unmanned aerial vehicles in agriculture and field experiments "Theoretical background of UAV photogrammetry	Michael Schirrmann, Marius Hobart, *ATB Potsdam*
13:00 – 14.30 Lunch		
14:30 17:00	Practical training for UAV photogrammetry with MetaShape	Michael Schirrmann, Marius Hobart
19.00 20.00	Dinner	

Wednesday, 13th September 2023

Time	Programme	Speaker
08:30 – 09:00 Welcome coffee and registration		
09:00-10:00	Eco-efficient agricultural water management: Concept and application / Coupling smart technologies and best management practices in agricultural water management	Mladen Todorović, CIHEAM-BARI
10:00-11:30	Adoption of DSS for agricultural water management, Blueleaf DSS – technical overview – soil water balance modelling for irrigation scheduling	Mladen Todorović, CIHEAM-BARI
11:30-12:00	Coffee break	
12:00-13:00	Adoption of DSS for agricultural water management, Blueleaf DSS – technical overview – irrigation management terms and strategies	Mladen Todorović, CIHEAM-BARI
13:00-14:30	Lunch	
14:30-17.00	Bluleaf® practical exercises on laptop and smartphone (e.g., login, installation of the app, creation of working scenarios, simulations, interpretation of results, etc.).	Mladen Todorović, CIHEAM-BARI
19.00 – 20.00	Dinner	

Thursday, 14th September 2023

Time	Programme	Speaker
08:30 – 09:00 Welcome coffee and registration		
09:00-11:00	Bluleaf® practical exercises on laptop and smartphone (e.g., login, installation of the app, creation of working scenarios, simulations, interpretation of results, etc.).	Mladen Todorović, CIHEAM-BARI
11:00-11:30 Coffee break		
11:30-13:00	Weather station equipment introduction and their function. Guidelines for correct installation of monitoring weather stations.	Giulio D'Amato *Sysman Progetti & Servizi*
13:00-14:30	Lunch	
14:30-17.00	Bluleaf® practical exercises on laptop and smartphone (e.g., login, installation of the app, creation of working scenarios, simulations, interpretation of results,etc.).	Mladen Todorović, CIHEAM-BARI; Giulio D'Amato *Sysman Progetti & Servizi*
19.00 – 20.00	Dinner	

Friday, 15th September 2023

Time	Programme	Speaker
09:00-13:00	Bluleaf® interactive session of an application using the real case studies from the project - final problem-solving session	Mladen Todorović,CIHEAM-BARI
13:00-14:30	Lunch	
15:00-17:00	Closing of the course – course evaluation, perspectives, concluding remarks and recommendations,distribution of the certificates. Maurizio Raeli, CIHEAM Bari Director Mladen Todorović, Generosa Calabrese, CIHEAM-BARI	

Saturday, 16th September 2023 – Departure home

More Photos from the Smart Farming Training

This project has received funding from the European Union's Horizon 2020
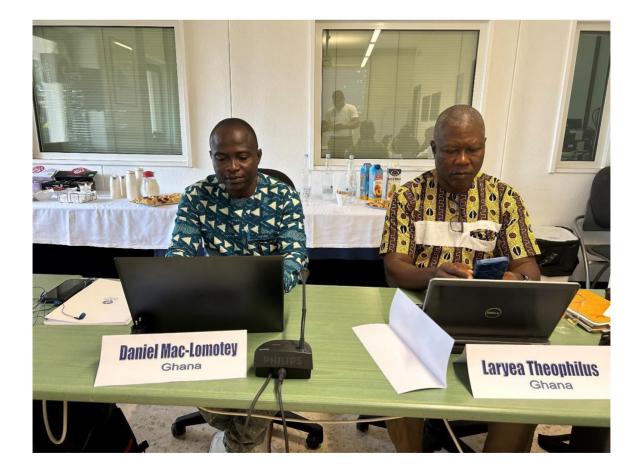research and innovation programme under grant agreement N° 861924

27

Daily Attendance Register

Attendance Sheet
[Smart farming training,
11 – 15th September 2023,
CIHEAM Bari, Italy

Surname/First name Nom/ Prénom	Country Pays	Monday 11.09.2023		Tuesday 12.09.2023		Wednesday 13.09.2023		Thursday 14.09.2023		Friday 15.09.2023
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning
SAUSSORE Stéphanie	FI									
ABDULLAH Karim										
Max-Lara Bajd Ghena										
Marvin Ahameth	SUDAN									
ESCORDAS AORINI	PORTUGAL									
ANIN - ADDEI E.	GHANA									
EFFAH FOSTER GHANA										
Henal ElSawey	Egypt									
Shacklad Sameh Egypt										
Sloma E. Nabeli	TUN									
Nadia Mjid	TUN									
Olfa Boussadia TUN										
Ahmad Bakir Germany										