



FP7-SPACE 2013-1 - Grant n° 606983

## User Board meeting

### User presentation and requirements

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# 1 Executive summary

This document reports a summary of the second User Board session held in Valencia the 26<sup>th</sup> of March during the First ERMES annual meeting.

The User Board session, led by Dimitris Katsantonis (DEMETER), was opened by ERMES user' presentations and followed by open discussion regarding the morning presentation of ERMES products and services (see figure 1).

## 2 List of participant to the User Board meeting

### 2.1 Spanish

- Santos Ruiz D.O.P VALENCIA RICE (CRDO)
- Cesar Alepuz – Farmer
- Concha Domingo – IVIA (Instituto Valenciano de Investigaciones Agrarias) – rice production unit
- Josè Blasco IVIA (Instituto Valenciano de Investigaciones Agrarias) - detection technology unit
- Lucia Peris Belenguer – TRAGSA (Empresa de Transformación Agraria, S.A)
- Rafael Peros Ruiz - TRAGSA (Empresa de Transformación Agraria, S.A)
- Piedad Subiranas Heredia TRAGSA (Empresa de Transformación Agraria, S.A)
- Arnaud Carrara – CEAM (Centro de Estudios Ambiental del Mediterraneo)

### 2.2 Italian

- Anna Callegarin: Ente Nazionale Risi
- Mr Carlo Franchino: Precision Farmer and deputy of Distretto agricolo "Risaie della Lomellina"

### 2.3 Greek

- Dimitrios Katsantonis: DEMETER
- Mr Christos Plastiras: Rice grower and rice crop service provider

### 2.4 Extra European

- Moses Abukari – IFAD (International Fund for Agricultural Development) – United Nations



**Figure 1: User board meeting (a 6 b). Moses Abukari – Africa (c), Dimitrios Katsantonis – Greece (d), Santos Ruiz – Spain (e) and Anna Callegarin – Italy (f)**

### 3 Recap of User board aim

The User Board (UB) is an important part of the ERMES project. It will represent the interests and points of view of the end-user. UB brings to the project the users' interests and helps to better shape ERMES services beyond the use cases directly addressed within the project. In fact, the members of the UB act as a sounding board for quality and relevance of the products and services developed.

Different End-Users (ERMES-User) have been identified and involved in the project at proposal stage by ERMES partners in each study area among public authorities and private operators of the agro-sector. ERMES-Users have been contacted exploiting relations consolidated in previous projects or taking advantage of existing local networks. During the first year of the project additional potential users have been involved. The User Board held in Valencia was also the opportunity to show to Spanish stake holder and operator of agro sector the opportunity from ERMES.

User Board had the aim of:

- discuss the products/tools participant had seen in the mooring presentation
- identify which products participant find more interesting to contribute to his work
- Help ERMES consortium in further defining characteristics of the products in terms of
  - Information content requested
  - Characteristics of the product
  - Timeliness of the product
  - How to access the information

### 4 Summary of information provided to users

Here follow the content of the presentation provided by Project Coordinator to better explain the participant what can be achieved participating as End User to the project.

#### 4.1 What does it mean to be an ERMES user

- Participate to the project by expressing interest in testing ERMES product and services
- Help us in better understand how the foreseen product can be of help in your work
- Work together to better develop the products for yours needs



- Evaluate the usefulness of the products/services we provide

## 4.2 What you get from ERMES

- Possibility to access all products and information developed in the project and use them for your work
- Possibility to directly collaborate with ERMES staff to get a full understanding of potentialities of space technology, ICT tools and crop modelling for agro-monitoring activities
  - «capacity building & technological transfer»;
- Possibility to use an innovative system for crop monitoring to support
  - Regional authorities in the implementation of agro-envir. policies
  - Union and farmers for local field inspection and management

## 4.3 What is required from you

- To formally express your interest and sign a «**service level agreement**» that specifies what we will provide to you
- To participate in the «Service Demonstration» phase by:
  - Interacting with us in the products development and fine tuning
  - Evaluating the usefulness of our products at the end of the 2015-2016 crop season and their potential use in your current work flow
  - Providing information/data useful for products development/validation

## 4.4 ERMES project status: from prototype to demonstration

### 4.4.1 First project year (2014)

- ERMES scientific partners have collect first draft of User requirements → develop the first prototype
- Some Users have already manifest their interest and specified what the would like to test from ERMES foreseen services for 2015-2016



## 5 User Presentation

### 5.1 Dimitrios Katsantonis: expectation from DEMETER and Greek farmers needs

D. Katsantonis and C. Plastiras showed in a combined presentation, due to the fact that Mr Plastiras does not speak English, the user requirements on the regional and local level, starting by defining what an end-user is. Furthermore, they described the regional and local rice service requirements. Also, they presented their needs concerning the final output of both services as a web interface portal and in the form of issued bulletins. Furthermore, an idea concerning the local service will be the development of an interactive smart application that could provide online in situ services. They concluded that if ERMES service is accurately developed would be of a great assistance of the rice sector even in the rice policy making level.

### 5.2 Moses Abukari: IFAD role and The Gambia request from ERMES

Moses Abukari presented IFAD mission and their activities in west Africa. Moses illustrated past works of IFAD exploiting Remote Sensing for agricultural applications (ESA project [http://www.esa.int/Our\\_Activities/Observing\\_the\\_Earth/A\\_helping\\_hand\\_from\\_above\\_for\\_The\\_Gambia](http://www.esa.int/Our_Activities/Observing_the_Earth/A_helping_hand_from_above_for_The_Gambia)). IFAD in ERMES is acting as facilitator for the relation with The Gambia ministry of agriculture. IFAD/The Gambia expectations regarding ERMES services are mainly related to: i) Estimation of rice Cultivated area; ii) Yield Estimation; iii) Analysis of irrigation patterns and single/double cropping areas and iv) Availability of weather forecasts

### 5.3 Alberto Crema (CNR-IREA) for Carlo Franchino (Italian Farmer): Rice Italian precision farmer expectation

Alberto Crema illustrated the activities conducted in Carlo Franchino's farm in 2014 in the ERMES framework and of expected activities for 2015. Alberto Crema presented the main expectations of the user (representing rice farmer) regarding ERMES products to be used in support to crop management: i) Identification of **areas with different vegetative vigor, useful to plan** Operations for correcting lack of germination, support top dressing during the season (1<sup>st</sup> and 2<sup>nd</sup> fertilization) and eventually support damage assessment; ii) Identification of **areas with constant pattern** through satellite **archive images** analysis useful for characterizing the different field/part of field of

the farm and supporting basal dressing and iii) **Availability of a smart-app to collect field data on his fields**, related to a database allowing him to keep track of the management practices and problems encountered in the different years

## **5.4 Santos Ruiz: tools to support inspection activities of CRDO and farmer management practices**

Carlos Ruis presented the main expectations of the user regarding ERMES product, which are related to: i) **Availability of tools (smart-app; geoportal) aiding in the field monitoring activities of CRDO operators**, allowing them to reduce time spent in the fields. Particular focus was given on the fact that the ERMES smart tools should allow to easily identify and reach specific fields according to official cadaster identifiers (SIGPAC); ii) tools able to get **reliable field-level yield estimations**; iii) Information on **potentially blast-affected rice fields** to be of aid to monitoring efforts, since rice blast reduces quality and low-quality production is refused by CRDO. Finally Santos indicated that **information on grain humidity in the field in specific moment would be of great help** in particular because this information is requested by mill company

## **5.5 Anna Callegarin (Ente Nazionale Risi): An Italian institutional user of the RRS**

Anna Callegarin presented the the importance of Italian rice agriculture and the institutional role of Ente Nazionale Risi in rice monitoring. Anna Callegarin mentioned that the ENR expectations regarding ERMES services, as already formalized in the SLA, and are related to: i) Rice crop extent (flooding date & duration); ii) Regional Yield forecasts; iii) Regional Yield and grain quality estimation and iv) Regional daily Meteorological maps

## 6 End user requirement summary

### Greek Actor

User	Desiderata/need	How it is performed now	Requirements	Feasibility	Research topic	ERMES product/service	Priority
DEMETER: interest as Greek agriculture research institute	Cultivated area	It is provided by OPEKEPE (Greek Payment Authority of Common Agricultural Policy Aid Schemes)**	Early estimate	High		Rice crop extent (EP_R1)	1
	Yield forecast	Not supporting activities	After the middle of August until September	Medium/high		Yield forecast and end of season estimation (EI_R2&R4)	2
	Risk alerts	Not supporting activities	In time for issuing warnings	Medium/high		Crop monitoring information and tools (EI_R1)	2
	Meteorological forecast	National or local weather forecasts	Frequent	Medium/high		Regional meteorological variable (EP_R4)	1
	Agro bulletin	Not supporting activities in national level	A cumulative bulletin in late August	Medium/high		Crop monitoring information and tools (EI_R1)***	1

\* Cultivated area from OPEKEPE is acquired through farmer declaration. In the begging of each cultivation period farmers have to go to the local offices of OSDE (Single Payment Applications). Using their VAT number they declare by submitting online the kind and the area of the cultivation. In the case of rented land, they have to submit the original rent contracts. For rice in our case submissions are carried out between March and the 15th of May. OPEKEPE already holds past satellite/aerial images as in most cases the rice paddies structure remains similar. Every year OPEKEPE checks out with new satellite/aerial images the integrity of the application data.

\*\*Ermes can provide information and tools for the redaction of agro-bulletin. These documents must be created by the local authority with a mandate/interest in that. ERMES consortium can contribute providing all the support for data interpretation and use of the tools provided.

## Greek Farmer

User	Desiderata/need	How it is performed now	Requirements	Feasibility	Research topic	ERMES product/service	Priority
DEMETER: expression of Greek farmer interest	Weed infestation	Visual inspection of the paddies	A rough estimation of weeds' infestation incidence in the paddies	Low	Very challenging. Potentially very high resolution data also from drone could be used to identify patches in the fields	none	2
	Yield map pattern	Limited application of NDVI tractor facilities	Provide info on field variability	Medium/high		Yield map pattern (EI_L1)	2
	N surface fertilisation timing assistance	Agro-sector support and Visual inspection of the paddies	In time	Medium		Biomass seasonal pattern maps (EP_L3) and EI_L1	1
	Abiotic stresses (low or high temperatures)	Visual inspection of the paddies in early stages	In time	Medium		Crop monitoring information and tools (EI_R1)	2
	Biotic stresses (Rice blast)	Weather forecast and/or visual inspection of the paddies	In time	Medium/high		Risk Alert (EI_R3)	1
	Quality estimates	No supporting activities	Before harvesting	Medium/high		Yield estimation and grain quality (EI_R4)	3
	Poor emergence	Visual inspection of the paddies	Early stages	Medium/high		Biomass seasonal pattern maps (EP_L3)	1
	Meteorological forecast	National or local meteorological forecasts	Frequent	Medium/high		Local Meteo variables (EP_L5)	2

## Italian Farmer

User	Desiderata/need	How it is performed now	Requirements	Feasibility	Research topic	ERMES product/service	Priority
Italian farmer	Support for basic fertilization	Support from agri support technician/consultant. Rarely soil measurements are performed	Provide info on field variability	High	-	Constant pattern (EP_L2)	
	Support for poor emergence	Visual inspection of the paddies	Maps at early stage (from emerge to tillering) that highlight pattern of low biomass	High		Seasonal Patter (EP_L3)	
	N surface fertilization	Support from agri support technician/consultant..	Information on plant status in key moment prior to top dressing fertilisation	Medium	Development of smart app to quantitative indicate Nitrogen level	Seasonal pattern (EP_L3) Identification of Spatio and temporal variability in the field	
		Specific management practices according to variety	Information on the moment	Medium		Model estimation of development stage (EI_L1)	
	Support for fungicide application against blast fungus	Support from agri support technician/consultant.	Rational information to highlight when the risk is high	Medium		Model estimation of blast risk (EI_L2)	
	Tools for field inspection and recording of agro-practises and/or constraints observed in the field	Visual inspection of the paddies	info acquired by smart app in a database available to be analysed	High		SMART APP and Web portal	

## Italian Authority

User	Desiderata/need	How it is performed now	Requirements	Feasibility	Research topic	ERMES product/service	Priority
ENR	Needs to provide figures of annual rice cultivated area for the different commercial varieties	From direct request to rice farmer*	Provide figure of cultivated area at mid july	High		Rice crop extent (EP_R1)	1
	Needs to acquire information on the agro-practices	-	Information available at mid July	High	Fusion of SAR and Optical data	Provision of flood dynamics for each available EO data**	2
	Provide yield estimation	From direct farmers declaration, acquisition of information in field by ENR technicians and statistical interpretation of data	Forecast in August and final yield at the end of September	High		Yield forecast and end of season estimation (EI_R2&R4)	1
	Information useful to analyze the crop season	From expert knowledge and farm visit	Meteorological data and risk indicator	High		Risk Alert (EI_R3) and Regional meteorological variable (EP_R4)	1
	Exploitation of web tools to access the information	-	Geoportal functionality			Geoportal and Crop monitoring information and tools (EI_R1*)	1

\* From personal communication of Bruno Marabelli (ENR, data manager) only 25 % of farmers provides information in July

\*\* Not foreseen as ERMES product. It will be generated to match End User request. It will be provided as separate layer and/or flag of EP\_R1

Service Level Agreement with Ente Nazionale Risi was already signed.

## Spanish Authority

User	Desiderata/need	How it is performed now	Requirements	Feasibility	Research topic	ERMES product/service	Priority
CRDO	Tools to assess if farmer work properly	obliged to visit an aleatory number of fields in order to prove that our farmers are working properly	-	High	-	Smart app and geoportal	
	To provide tools to indicate the rice fields that appear to be under risks in order to visit them for inspections	Field visit and visual assessment	Reduce time in field. Prioritization of intervention Standardization of data information	High		Seasonal pattern (EP_L3) Identification of Spatio and temporal variability in the field	
				High	-	Smart app and web interface to collect field data (EP_L6)	1
	Identification of variety	Field visit and visual assessment	Acquisition of information at field level Support to reach a specific field where inspection must be performed	Very Low		Smart app and web interface to collect field data (EP_L6)	
	Crop damages	Field visit and visual assessment		Low			
	Weeds	Field visit and visual assessment		Very Low			
	Lodging	Field visit and visual assessment		Medium			
	Yield Estimation	Self-declaration of the farmer Performed at the milling	Tools to support control Provide regional estimation for market	High		Yield estimation at regional level (EI_R4) Field level yield estimation (EI_L1)	



## Spanish Farmer (expressed by Santos Ruiz)

CRDO, that involve 1300 rice farmer in Valencian area, is representing also the interest of farmers

User	Desiderata/need	How it is performed now	Requirements	Feasibility	Research topic	ERMES product/service	Priority
Farmer	Assistance on fertilisation levels	Support from agri support technician/consultant.	Information on plant status in key moment prior to top dressing fertilisation	Medium	Development of smart app to quantitative indicate Nitrogen level	Seasonal pattern (EP_L3) Identification of Spatio and temporal variability in the field	
		Specific management practices according to variety	Information on the moment	Medium		Model estimation of development stage (EI_L1)	
	Support to rational use of pesticide for controlling Pyricularia (Rice blast)	Support from agri support technician/consultant.*	Rational information to highlight when the risk is high	Medium		Model estimation of blast risk (EI_L2)	
	Assessment of grain humidity as harvesting time indication (not less than 19%)	Grain humidity meters	Estimate grain humidity in field before paddy rice reach the mill companies	-	Test SAR technology to estimate in field grain humidity	-	None

\* Often farmers spray more than need to save their production. Strong economic and environmental problem.

## IFAD (Facilitator for The Gambia Ministry of Agriculture)

User	Desiderata/need	How it is performed now	Requirements	Feasibility	Research topic	ERMES product/service	Priority
IFAD	Agricultural area		Maps of cultivated area	High	Product specifically produce for The Gambia		
	Rice area		Maps of rice cultivated area	Medium/high		Rice crop extent (EP_R1)	
	Rice phenology/seasonal dynamics		Information on the seasonality of the rice production	Medium/high		Rice Phenology (EP_R2)	
	End of season yield estimation		Information on the seasonal rice production	Medium/high		Yield estimation at the end of season (EI_R4)	

Service Level Agreement with “The Gambia Ministry of Agriculture” is under revision in the legal part. IFAD will countersign the SLA and will act as facilitator of the activities between ERMES and The Gambia.

## 7 Other users

Other users, that not participated to the User Board in Valencia, have manifested their interest in participating to the ERMES project. Here is reported the status of the relation between ERMES and users.

### 7.1 Italy

#### Regione Lombardia - Servizio Fitosanitario

Regione Lombardia - Servizio Fitosanitario (Regional Plant Health Service) expressed its interest in participating to the project as End user. Servizio fitosanitario is required to monitor rice cultivations from European Union law

- COUNCIL DIRECTIVE 2000/29/EC of 8 May 2000 on protective measures **against the introduction into the Community of organisms harmful to plants or plant products** and against their spread within the Community
- COMMISSION IMPLEMENTING DECISION of 8 November 2012 as regards measures **to prevent the introduction into and the spread within the Union of the genus Pomaceo** (Perry) (notified under document C(2012) 7803) (2012/697/EU)
- DIRECTIVE 2009/128/EC of the European Parliament and of the council of 21 October 2009 **establishing a framework for Community action to achieve the sustainable use of pesticides**
  - Limitation to the use of herbicide Oxadiazon in «dry-sowed» rice fields in Lombardy Region, since alternative products can be used.

RL considers that ERMES products related to the monitoring of flooded areas can help in identifying extent and location of dry-sowing areas and in verify spatial distribution of monitored rice parcels, conducted by RL technicians, to check if these location are «representative» of the main characteristics of the rice cultivation areas.

RL provided to IREA a presentation to be used during the User Board to express their interest for ERMES project and products. In the Annex is reported the table of interest for Regione Lombardia.

Service Level Agreement with “Regione Lombardia” is under revision; a draft is circulating.

### “Distretto risicolo terre della lomellina”

The “Distretto risicolo terre della lomellina” invited ERMES coordinator to present ERMES potentiality at the official meeting of the group that involved all the farmers. Mirco Bochetti and Alberto Crema (IREA-CNR) participate to the meeting the 20<sup>th</sup> of March.

“Distretto” manifest the interest to support the project and support the direct participation of other farmers. Riccardo Braggio and Fulco Gallarati Scotti request to be involved and to received Local Rice Service information.

Service Level Agreement with the farmers will be defined according to their real interest similar to the one already signed with Carlo Franchino.

## **7.2 Greece**

There are several end-users that they have expressed interest in ERMES project and the developing service and products.

First of all DEMETER (Hellenic Agricultural Organization), believes that the derived information will be a step further to an intensive cultivation such as rice towards precision agriculture. Furthermore, if ERMES leads to the development of a reliable service will be a regional tool capable gfor the rice policy making.

Mr Christos Plastiras is a farmer, who owns a family business of 250 ha of rice cultivation, while the company offers professional management services to another 400 ha approximately. He showed a great amount of interest in specific issues such as N fertilization assistance, risk alerting and yield map patterns. He already signed a SLA.

Chalastra Cooperation B, has been informed by the Greek partner about the progress of the first year of the project. In fact they expressed their support and they are interested in a presentation of the ERMES service to its members (300 active rice growers). The event has to be scheduled accordingly.

The Local Organization of land Reclamation (TOEV) of Chalastra and Kalochori area has been briefed about the ERMES project. The president need to be informed properly, after an appointment been scheduled.

Kanakas Bros SA, is a rice trading company trading 20 to 30.000 tn of rice product every year. Dimitrios Kanakas, one of the owners has been briefed and he is interested in the regional and local rice services as they also cultivate rice.

Additionally, there are two major actors that are already briefed and they have expressed their interest. One is the Crop Production Directorate of the Ministry of Reconstruction of Production, Environment and Energy, Rural Development and OPEKEP the Greek Payment Authority of Common Agricultural Policy. It needs further contracts with the new administration as the 2014 one has been replaced by the government after the elections. The meetings have to be scheduled in Athens where is the base of both of them.

## 7.3 International

### AfricaRice

According to Reviewer suggestion ERME consortium as contacted AfricaRice to be involved in the experimentation conducted with IFAD and The Gambia in West Africa. Additional interest of AfricaRice have been taken into account and a SLA is already signed between SARMAP, on behalf of ERMES consortium, and AFRICARICE. In the Annex is reported the table of interest for Regione Lombardia.

### Portugal

ERMES project was presented during a visit of D. Katsantonis in Portugal, at a group of agronomist of the Aparroz-Agrupamento De Produtores De Arroz Do Vale Do Sado, Lda. The agronomists were very interested in the idea of testing the system and the services of ERMES. It was explained to them that the service will not be available during the project period. They agreed that they could validate the geo-portal and the smart application that will be kindly provided by the ERMES consortium.

## **Report ANNEX I**

### **Additional User requirements reported by Partners in the Valencia user board**

## Regione Lombardia (RL) - Servizio Fitosanitario

User	Desiderata/need	How it is performed now	Requirements	Feasibility	Research topic	ERMES product/service	Priority
RL	Information of rice agro-practises	Survey by in situ observation	Mapping of rice cultivated areas in relation to agro-practices (Dry vs Water sowing)*	High		Provision of flood dynamics for each available EO data**	1
	Biotic Risk Alert	Not performed	Information to support «early warning» bulletins;	High		Risk Alert (EI_R3) and Regional meteorological variable (EP_R4	1

\* Satellite rice crop/flooding mapping are considered useful to plan field operators work:

- e.g., relate rice cultivations positions with potential sources of phitosanitary risk (e.g., companies involved in production of aquarium plants)
- Relate rice cultivations with main rivers positions
- Verify spatial distributiun of monitored rice parcels to check if they are «representative» of the main characteristics of the rice cultivation areas
- ERMES product allowing monitoring of flooded areas can help in identifying extent and location of dry-sowing areas

\*\* Not foreseen as ERMES product. It will be generated to match End User request. It will be provided as separate layer and/or flag of EP\_R1.

Strong synergy with ENR requirements. Product will be generated on the same study area and discussed with both Regional Italian Users



## AfricaRice

User	Desiderata/need	How it is performed now	Requirements	Feasibility	Research topic	ERMES product/service	Priority
AFRICARICE	Annual rice extent in Senegal River Valley (SRV).	Photointerpretation of cloud free images from google earth	Maps of cultivated area from 2000-2014	Medium	Product specifically produced for Africarice*		
	Rice phenology/seasonal dynamics	Expert knowledge	Maps of crop dynamic from 2000-2014	Medium		Rice Phenology (EP_R2)	
	Flooded rice extent and frequency (2000-2014)**	Grey literature and expert knowledge		Medium	Product specifically produced for Africarice*		
	Rice area and seasonal dynamics **	Not performed	Information on the current season 2015	Medium		Rice crop extent (EP_R1)	

\* Side product of EP\_R2. Results need to be tested in African Environment. The product will be produced exploiting MODIS data archive

\*\* seasonal dynamics side product of Rice crop extent. The product will be produced if Sentinel 1 data will be available.

## Report ANNEX II

### SLA status

#### Greece

- Commitment with DEMETER as end user are covered by the Grant Agreement).
- SLA with Cooperation of Chalastra B, Kanakas and OPEKEPE is under discussion in the technical part. Drafts are circulating.
- SLA with Mr Christos Plastiras has been already signed

#### Italy

- SLA with Carlo Franchino was already signed
- “Distretto risicolo terre della lomellina” manifested is interest in the project. A formal meeting has been conducted with the general assembly the 20th of March. During Annual Meeting in Valencia the Representative of Distretto requested to the coordinator Project information to be send to Regione Lombardia to promote the collaboration.
  - Other two farmers from distretto (Riccardo Braggio ~ 200 ha and Fulco Gallarati Scotti ~ 300ha) manifested their interest in the experimentation. SLA will be discussed with them in May.
- SLA with ENR was already signed
- SLA with Regione Lombardia - Servizio Fitosanitario

#### SPAIN

- SLA with CRDO is under discussion in the technical part.
- Discussion with IVIA started after the Valencian Annual meeting

#### International

- SLA with AfricaRice was already signed
- SLA with The Gambia in under ministerial verification