



# **Intelligent Irrigation System for Low-cost Autonomous Water Control in Small-scale Agriculture**

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## **Deliverable D5.1**

*Definition of partnership framework program*

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## CONTRIBUTORS TABLE

DOCUMENT SECTION	AUTHOR(S)	REVIEWER(S)
SECTION 1	Dr. Hayat Lionboui	PR. CONGDUC PHAM
	Pr. Bouabdellah Kechar	
	Pr. Mohamed Benkhelifa	
	Dr. Abdellah Elaissaoui	
	Dr. Tarik Benabdelouahab	
SECTION 2	Dr. Hayat Lionboui	PR. CONGDUC PHAM
	Pr. Bouabdellah Kechar	
	Pr. Mohamed Benkhelifa	
	Dr. Abdellah Elaissaoui	
	Dr. Tarik Benabdelouahab	
SECTION 3	Dr. Hayat Lionboui	PR. CONGDUC PHAM
	Pr. Bouabdellah Kechar	
	Pr. Mohamed Benkhelifa	
	Dr. Abdellah Elaissaoui	
	Dr. Tarik Benabdelouahab	

## DOCUMENT REVISION HISTORY

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## EXECUTIVE SUMMARY

Deliverable D5.1 is dedicated to seeking partnerships with local stakeholders, water-related and economic actors in both Morocco and Algeria.

The partnership programs, in Morocco, Algeria, and Mediterranean level, will also form and animate the Stakeholders & Experts Advisory Committee (SEAC) to drive discussions, provide recommendations and create synergies.

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# 1. INTRODUCTION

The project "Intelligent Irrigation System for Low-cost Autonomous Water Control in Small-scale Agriculture" is a responsible cooperation and partnership action to create strong and lasting bridges between the different research disciplines, on the one hand, and between research and farmers and managers on the other hand. This makes this project an operational partnership and an effective action for the development of agriculture through intelligent management of irrigation water. The search for partnerships with local actors, economic and water-related actors in Morocco and Algeria, is one of the objectives of this project. This action would make it possible to remain close to the beneficiaries and to listen to the constraints & difficulties when optimizing the management of irrigation water.

The partnership programs, in Morocco, Algeria and at the Mediterranean level, will also define the Stakeholders & Experts Advisory Committee (SEAC) to lead discussions, provide recommendations and create synergies.

## 2. LOCAL STAKEHOLDERS & EXPERTS

### 2.1. Morocco

#### 2.1.1. Main Institutions involved in the irrigation management

##### **Provincial Direction of Agriculture - Berrechid (DPA):**

The Provincial Direction of Agriculture (DPA) is a public establishment endowed with civil personality and financial autonomy and placed under the supervision of the Ministry of Agriculture, Maritime Fisheries, Rural Development and of Water and Forests. The main missions of ORMVA are:

- Study and realization of hydro-agricultural and land development;
- Land and water management for agricultural use within its action zone;
- Management of hydro-agricultural equipment and water service provided to farmers;
- Agricultural development (promotion and intensification of agricultural development, supervision and incentives).

Contact: Mr. Nabil Koniti. Phone: (+212) 6 13 42 77 76. Mail: [nabil.koniti@gmail.com](mailto:nabil.koniti@gmail.com)

##### **National Office of the Agricultural Council (ONCA):**

The National Office of the Agricultural Council (ONCA) is responsible for piloting, coordinating and monitoring the implementation of the agricultural advisory strategy at the national level as well as applying the government's policy on agricultural advice through in particular:

- Agricultural advice,
- Support for professional organizations,
- Support for actions undertaken by other agricultural development actors,
- Acting as an interface between training and research.

Contact: Mr. Yassin Ebra . Phone: (+212) 6 66 91 47 89. Mail: [yassinebra.onca@gmail.com](mailto:yassinebra.onca@gmail.com)

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### Association of Irrigation Water Users (AUEA):

These are associations of farmers that have been formed to improve crop and water collective management, in order to:

- Make the investments of the State profitable;
- Maintain hydraulic infrastructure;
- Contribute, alongside public institutions to the animation, supervision and popularization of modern irrigation techniques;
- Administering, administratively, accounting and financially, development, operation, upkeep and maintenance activities.
- Gradually diversify its activities to make more use of irrigation water.

Contact: M. El Hillali Thami. Phone: (+212) 6 67 48 87 01.

### 2.1.2. National experts

**Mustapha Namous**, PhD, is a Professor of Geology at the Sultan Moulay Slimane University (USMS) since October 2016. He earned a Ph.D. in Geology from Cadi Ayyad University, Morocco in 2012. He has prior experience using GIS, remote sensing, and machine learning techniques to monitor and manage natural resources (water, soil, etc.) and natural risks. He has recently invested heavily in her research on natural resource modelling and water resource management using machine learning techniques. As a result, he has a number of scientific papers published in peer-reviewed journals.

Contact informations: (+212) 6 6210 60 39 Email: mustaphanamous@yahoo.fr

**Sliman Elhani**, PhD, holds a doctorate in Biology (Plant Ecophysiology), University of Granada, Spain (December 1999). He has been in a Post Doc position at INRA (French National Agricultural Research Institute, Grignon-France) (2007/2008), Postdoc at the University of Québec-Chicoutimi (2004/2006) and at INRA (French National Agricultural Research Institute, Nancy-France) (2001-2004). Recruited at INRA 2008, Dr. Sliman was responsible for research on irrigation and improving water use efficiency of the main crops practiced in the region. In this work, the approach used combines experimentation and modelling. He was responsible for the irrigation component in many projects funded and he has participated in several courses and training related to water resource management.

Contact informations: (+212) 6 65 09 10 97 Email: sliman\_elhani@yahoo.fr

**Aumeur El AMRANI** : Professor at the High School of Technology, University of Moulay Ismail of Meknes, Morocco. His current research areas concern thin films transistors, and photovoltaic solar cells as well as energy engineering applications. Aumeur El Amrani co-authored more than 50 peer-reviewed research papers, most of which discuss different aspects of modelling, simulation and experimental approaches for his research fields. In addition, he has a strong interest in the development of new architecture of different optoelectronic devices for smart power energy systems.

Contact informations: (+212) 6 70 20 10 68 Email: a.elamrani@umi.ac.ma



**Ezzahar Jamal** received his PhD degrees in micro meteorology and hydrology from the Faculty of Sciences Semlalia in 2007. He is currently a full professor at the National School of Applied Sciences, Department of Computer Science, Networks and telecommunications, Cadi Ayyad University, Safi. Since 2019, he joined the Center for Remote Sensing Applications, Mohammed VI Polytechnic University, as an affiliate professor. He is participating in several international experiments (AMMA (Niger), SUDMED (Morocco), PLEIADeS (Mexico), IRRIMED (France),...) and he is actively involved in several projects (PRIMA S1 and S2, H2020, ERANETMED...). Also, he is actually co-leader of IRRIWELL (Prima S1) and MOCTAR projects. His main research interests include the application of remotely sensed data in land surface–atmosphere models, particularly in arid and semiarid regions. He published more than 62 peer-reviewed papers. His h-index is 25 (Scopus: <https://www.scopus.com/authid/detail.uri?authorId=32667623300>).

Contact informations: (+212) 6 66 11 04 43 Email: [j.ezzahari@uca.ma](mailto:j.ezzahari@uca.ma)

## 2.2. Algeria

### 2.2.1. National experts

**Dr ABED Fatah:** Doctor in veterinary medicine. He was in charge of inspection at the level of the Ministry of Agriculture in the city of Adrar for several years. He has occupied several responsibilities: Liberal practitioner, CEO of agricultural input companies, director of poultry complex and farmer in seed. He is also a consultant chronicler at the level of the media Radio Oran + 70 programs on agriculture and rural economy at El Watan TV. Currently, he is president of the association Tamari (promotion of the rural society), vice-president of the agricultural chamber of the city of Oran, in charge of training, and technical director of the company SCCO specialized in cereals. He has animated several communications and seminars on rural economy, food security and rural employability at universities and local communities.

Contact informations: (+213) 7 70 43 82 31 Email: [dahlyam3@yahoo.fr](mailto:dahlyam3@yahoo.fr)

**Pr BENSLIMANE Mohammed :** full Professor at the Department of Hydraulic, University of Mascara (Algeria). Graduate of the Superior National School of Agronomy (ex INA) Algiers, specialty Agricultural Hydraulic. He has published several articles in international journals and conferences and has supervised PhD and Master students for several years. His area of interest includes: agricultural hydraulics, water resources management, irrigation, drainage.

Contact informations: (+213) 5 55 03 73 56 Email : [med\\_benslimane@yahoo.fr](mailto:med_benslimane@yahoo.fr), [med.benslimane57@gmail.com](mailto:med.benslimane57@gmail.com)

**Pr Mirta Teresinha Petry,** graduated in Agronomy from the Federal University of Santa Maria (1997), with a master's degree in Agronomy - Area of Concentration: Soil Biodynamics, from the Federal University of Santa Maria (2000) and a PhD in Soil Science from the same University in 2004. Adjunct Professor III, in the area of Water and Soil Engineering, in the discipline of Irrigation and Drainage, at the Federal University of Santa Maria. She participates in the Graduate Program in Agricultural Engineering, teaching the discipline of Localized Irrigation and participating in the disciplines of Sprinkler Irrigation, Soil-Water-Plant

Relationship. She participates in the Research Group "Water Management in Agricultural Systems" since its creation in 1997. Its area of interest encompasses : soil water dynamics, management of irrigated systems and use and propagation of information technology in agriculture. She has published several research papers on renewable journals and conferences.

Contact informations: Email: [mirta.petry@gmail.com](mailto:mirta.petry@gmail.com)

**Pr José Miguel Reichert:** Professor of soil physics at the Federal University of Santa Maria, in Brazil. Editor-in-chief of the Revista Brasileira de Ciência do Solo of the Brazilian Soil Science Society. Current research topics are soil-plant relationships in forest and crop production, soil hydrology and water availability to crops, agricultural soil mechanics and rheology (micromechanics), composition and functioning soil properties evolution in agroecosystems, and hydrology and erosion in paired, small rural watersheds. He has published several papers in indexed journals and conferences.

Contact informations: Email: [reichert.jm@googlemail.com](mailto:reichert.jm@googlemail.com)

## 2.2.2. Main Institutions involved in the irrigation management

The main Algerian agricultural institutions and structures potentially involved in the INTEL-IRRIS project are presented below.

**Direction of Agricultural Services (DAS) of Oran, Mostaganem and Relizane cities:** DAS is an administrative establishment responsible for the management and monitoring of several small scale farms in the Oran city. It has several branches geographically distributed in the city. It is affiliated to the Ministry of Agriculture and Rural Development in Algeria.

Table 1 - Information contacts of institutions involved in the irrigation management

Institutions	Contact	Phone number	E-mail
<b>DAS Oran</b>	Rehamnia Rachid	(+213) 6 71 63 23 41	<a href="mailto:dsa.oran@yahoo.fr">dsa.oran@yahoo.fr</a>
<b>DAS Mostaganem</b>	Boutaiba Benklaouz Mohamed	(+213) 7 70 53 86 54	<a href="mailto:boutaiba_m@yahoo.fr">boutaiba_m@yahoo.fr</a>
<b>CA Oran</b>	Houari Zedam,	(+213) 7 70 38 18 60	<a href="mailto:caworan@yahoo.fr">caworan@yahoo.fr</a>
<b>CA Mostaganem</b>	Toiti Abdallah	(+213) 7 71 45 48 60	<a href="mailto:Mosta_uow27@yahoo.fr">Mosta_uow27@yahoo.fr</a>
<b>CA Relizane</b>	Boukhrissa Nasr Eddine	(+213) 7 70 31 54 05	<a href="mailto:nasro_uow48@yahoo.fr">nasro_uow48@yahoo.fr</a>
<b>INSID</b>	Kradia Laïd	(+213) 5 52 86 82 78	<a href="mailto:kradia2003@yahoo.fr">kradia2003@yahoo.fr</a>
<b>INRAA</b>	Gacemi Abdelhamid	(+213) 7 76 20 20 22	<a href="mailto:abdelhamid_gacemi@yahoo.fr">abdelhamid_gacemi@yahoo.fr</a>
<b>Farmer association Oran</b>	Dr Abed Fateh	(+213) 7 70 43 82 31	<a href="mailto:dahlyam3@yahoo.fr">dahlyam3@yahoo.fr</a>

### 3. FARMERS SELECTED

#### 3.1. Farmers selected in Morocco

The first selected farms to be implicated in the project, in Morocco, are presented in the following table:

Table 2: First selected farms in Morocco

Smallholder	Area (ha)	Crop	Geographic coordinates		Village – Commune
			Latitude	Longitude	
Douah Rachid	13	Potatoes / Vegetables	33°20'35.8"N	7°29'58.2"W	Oulad Mhamed – Ben Mchich
Elhillali Thami	11	Potatoes / Vegetables	33°24'06.1"N	7°26'51.4"W	Louchacha – Oulad Ziyane
Bouamri Bouchaib	23	Potatoes / Maize	33°23'09.5"N	7°28'31.2"W	Ouled Ben Omar – Oulad Ziyane
Elmoutraji Ali	8	Potatoes / Vegetables	33°20'55.1"N	7°28'21.4"W	Oulad Mhamed – Ich Mchich
Experimental farm	1	Wheat	33°07'58.8"N	7°37'19.2"W	Sidi Alaidi – Sidi Alaidi

#### 3.2. Farmers selected in Algeria

The first selected farms, potentially involved in the project in Algeria, are presented in the following table:

Table 3: First selected farms in Algeria

Name of the farm	Smallholder	Quality	Area (ha)	Crop	Geographic coordinates		Contact informations
					Latitude	Longitude	
Farm of UMAB	MAAMAR	Responsible	65	Cereal, forage and tree crops	35°53'29.92"N	0° 4'57.38"E	(+213) 7 91 10 23 13
Farm of Sidi Ali	BOUAMRANE Mohamed	Owner	48	Cereal, forage and tree crops	36° 5'15.55"N	0°28'22.43"E	(+213) 7 98 67 61 89 mohimenebelhadj@gmail.com

Farm of INSID	KRADIA Laïd	Lead Engineer	34	Cereal, forage and tree crops	35°43'38.01"N	0°27'56.33"E	(+213) 5 52 86 82 78 kradia2003@yahoo.fr
Farm of INRAA	GACEMI Abdelhamid	Director	65	Cereal, forage and tree crops	35°55'34.00"N	0°45'36.77"E	(+213) 7 76 20 20 22 abdelhamid_gacemi@yahoo.fr
Farm of Ain Turk1	Boualem Hassan	Owner	10	Fig trees crop	35°44'27.86"N	0°46'37.32"O	(+213) 5 53 02 23 56
Farm of Ain Turk2	ELHADJ Mohamed Cherif El Habib	Owner	10	Tomato and eggplant crops	35°44'34.07"N	0°46'39.73"O	(+213) 6 71 92 46 25
Farm EL GHAZALI	Mr Salim	Owner	14	grape cultivation	35°42'27.88"N	0°48'40.46"O	(+213) 6 61 63 75 00
Farm of Bousfer	TOUZI Belkacem	Owner	12	Fruit and vegetable growing	35°42'21.93"N	0°50'11.37"O	(+213) 7 70 78 41 71

## ACRONYMS LIST

Acronym	Explanation
DPA	Provincial Direction of Agriculture
ONCA	National Office of the Agricultural Council
AUEA	Association of Irrigation Water Users
UMAB	Université Abdelhamid Ibn Badis de Mostaganem
DAS	Direction of Agricultural Services
INSID	Institut National des Sols , de l'Irrigation et Drainage
INRAA	Institut National de la Recherche Agronomique d'Algérie
CA	Chamber of Agriculture

## PROJECT CO-ORDINATOR CONTACT

Pr. Congduc Pham

University of Pau

Avenue de l'Université

64000 PAU

FRANCE

Email: [Congduc.Pham@univ-pau.fr](mailto:Congduc.Pham@univ-pau.fr)

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