Adaptation to **Cli**mate Change of the **M**editerranean **A**gricultural **S**ystems

ACLIMAS

SWIM (Sustainable Water Integrated Management) - Demonstration Project – Water and Climate Change

"European Neighborhood and Partnership (ENP) financial co-operation with Mediterranean countries"

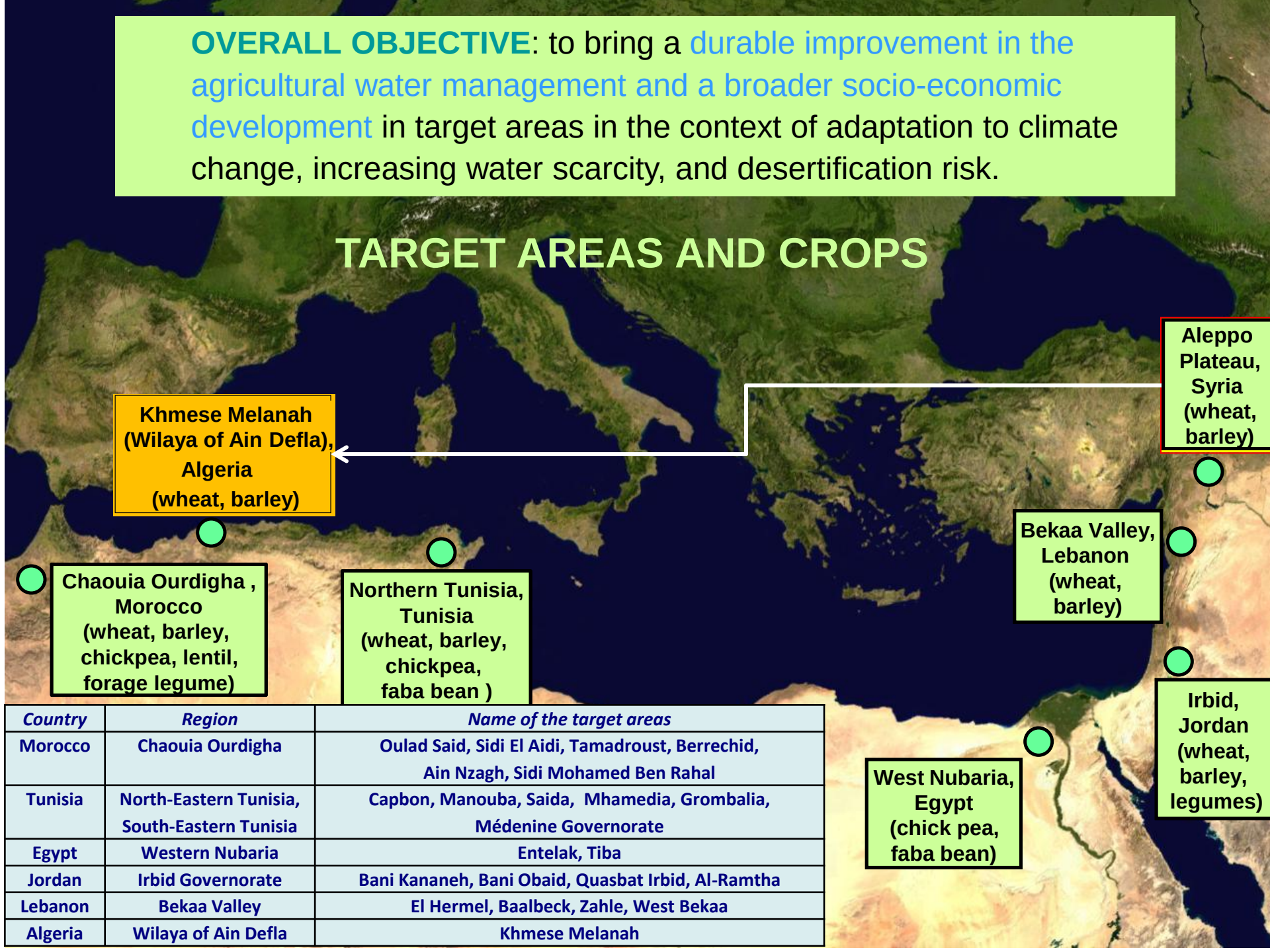
Mladen Todorović, CIHEAM-IAMB

+1

3d SWIM Coordination Meeting, Athens, 11 October 2013

OVERALL OBJECTIVE: to bring a durable improvement in the agricultural water management and a broader socio-economic development in target areas in the context of adaptation to climate change, increasing water scarcity, and desertification risk.

TARGET AREAS AND CROPS



Country	*Region*	*Name of the target areas*
Morocco	Chaouia Ourdigha	Oulad Said, Sidi El Aidi, Tamadroust, Berrechid, Ain Nzagh, Sidi Mohamed Ben Rahal
Tunisia	North-Eastern Tunisia, South-Eastern Tunisia	Capbon, Manouba, Saida, Mhamedia, Grombalia, Médenine Governorate
Egypt	Western Nubaria	Entelak, Tiba
Jordan	Irbid Governorate	Bani Kananeh, Bani Obaid, Quasbat Irbid, Al-Ramtha
Lebanon	Bekaa Valley	El Hermel, Baalbeck, Zahle, West Bekaa
Algeria	Wilaya of Ain Defla	Khmese Melanah

Specific Objectives

- To improve the initial conditions (local offices, stations, and demonstration fields) for lasting promotion of sustainable agricultural practices in target areas.
- To demonstrate the applicability for the selected combinations of genotypes and water management practices (including water harvesting and conservation tillage) at demonstration fields;
- To adapt/stabilize agricultural production through large scale on-ground implementation of the best performing genotypes and water harvesting/management practices;
- To evaluate the on-ground sustainability of the proposed adaptation measures considering the economic, social and environmental dimensions at farm level;
- To train local farmers and growers on the application and implementation of proposed management practices;
- To disseminate the results of the action through the thematic guidelines, brochures, field days, seminars, video material and a dedicated web page.

- Target groups:
  - Farmers, growers, breeders, policy makers, water/irrigation managers, local seed companies, agricultural advisers.
- Final beneficiaries:
  - All rural society, local farmers communities and associations, water user's associations, governments, environment
- Estimated results:
  - Improved water productivity in agriculture and more stable agricultural production
- Main activities:
  - Demonstration, replication, on-ground implementation, dissemination, training, sustainability evaluation.

Partnership

P1 International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM-IAMB)

P2 International Centre for Agricultural Research in the Dry Areas (ICARDA)

P3 Institut National de la Recherche Agronomique (INRA), Morocco

P4 Institut National Agronomique de Tunisie (INAT), Tunisia

P5 West Nubaria Rural Development Project (WNRDP), Egypt

P6 National Center for Agricultural Research and Extension (NCARE), Jordan

P7 Lebanese Agricultural Research Institute (LARI), Lebanon

P8 Centro Euro-Mediterraneo per i Cambiamenti Climatici (CMCC), Italy

P9 Consiglio Nazionale delle Ricerche - Istituto per i Sistemi Agricoli e Forestali del Mediterraneo (CNR-ISAFOM), Italy

P10 Universitat de Barcelona (UdB), Spain

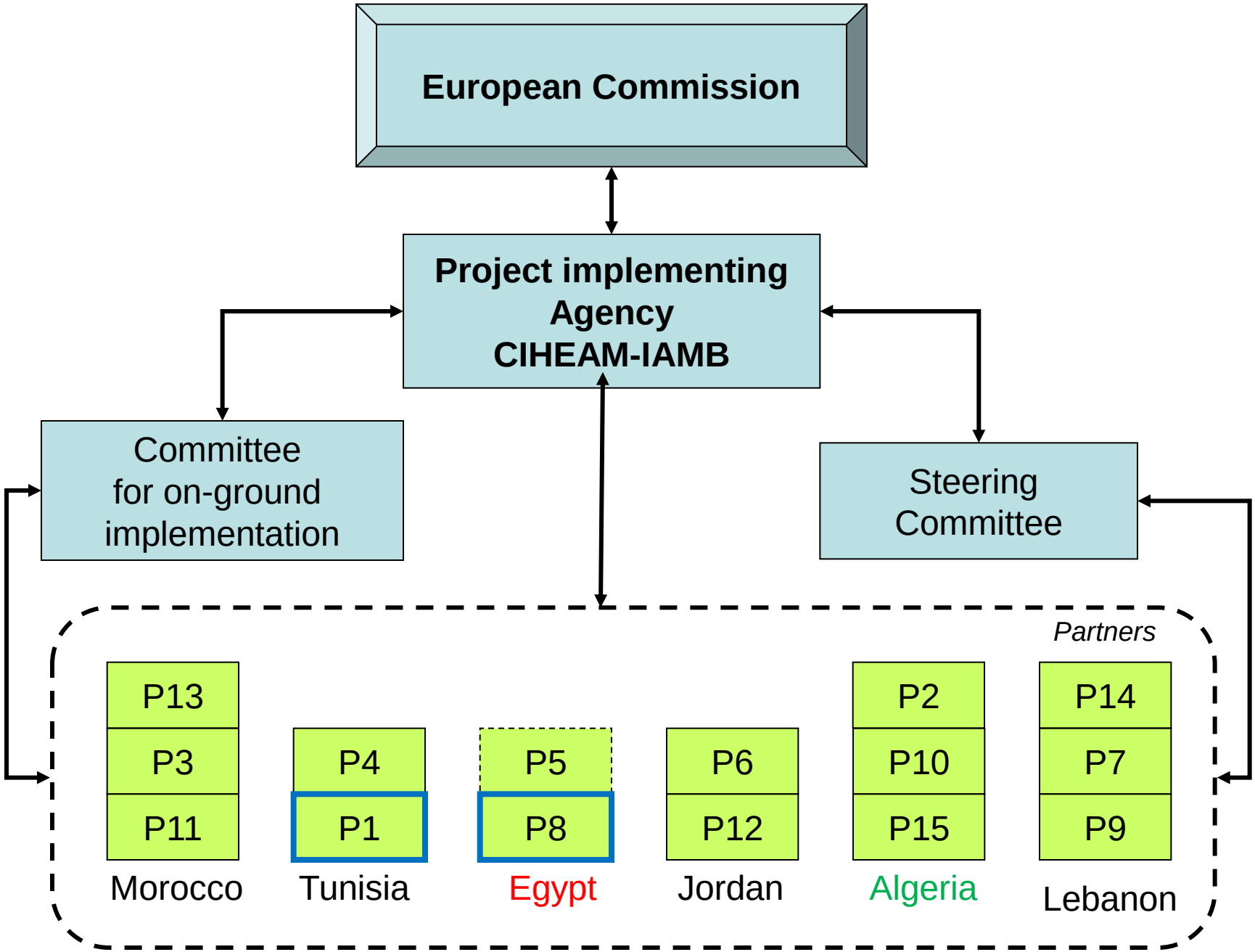
P11 Universitat de Lleida (UdL), Spain

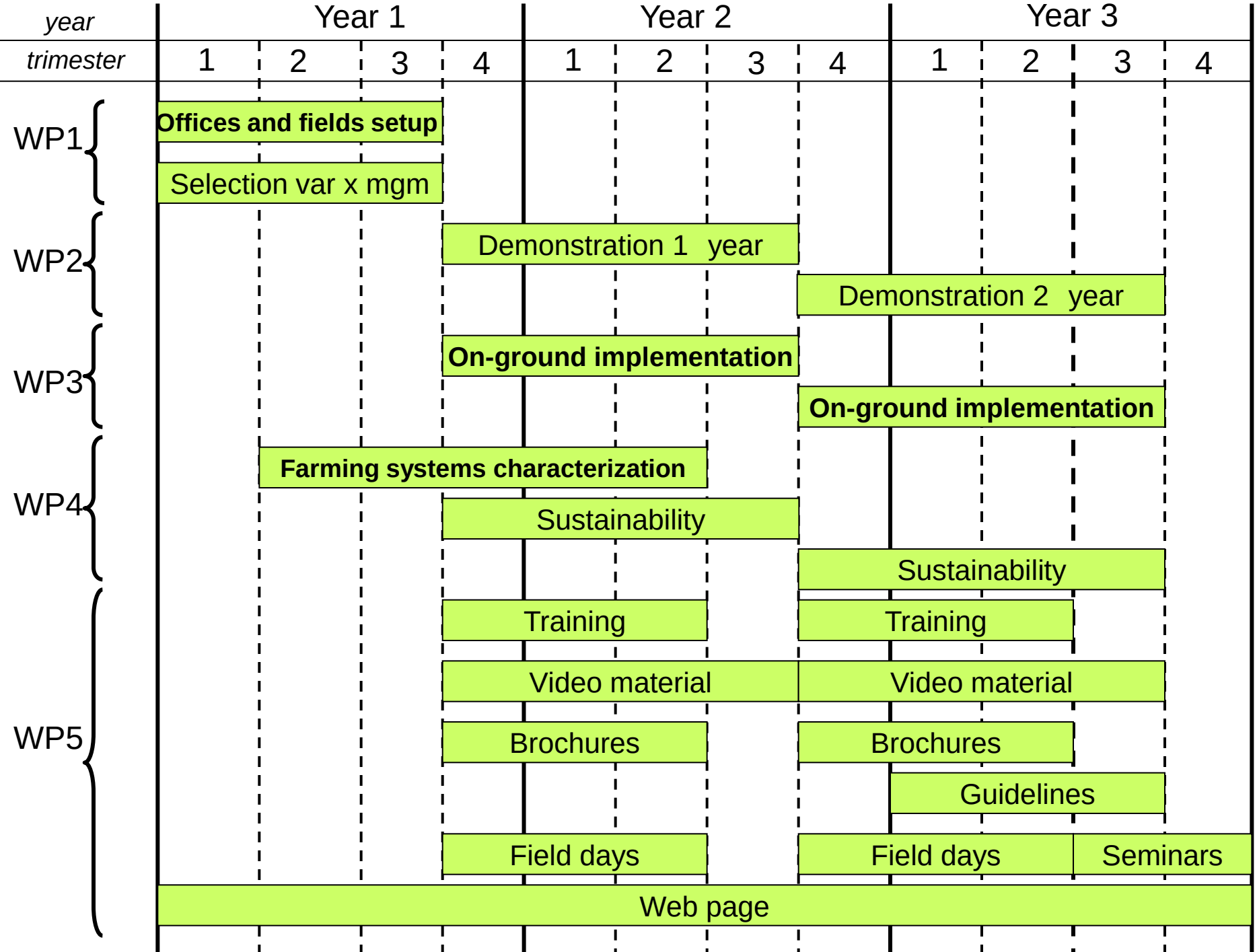
P12 University of Nottingham (UNOTT), United Kingdom

P13 Agriculture Environement et Developpement, pour l'Avenir (AGENDA),NGO,Morocco

P14 Association of the Friends of Ibrahim AbdEl Al (AFIAL), NGO, Lebanon

P15 Technical Institute of Field Crops (ITGC). Algeria


European Commission
Project implementing Agency CIHEAM-IAMB
Committee for on-ground implementation
Steering Committee
Partners
P13
P3
P11
Morocco
P4
P1
Tunisia
P5
P8
Egypt
P6
P12
Jordan
P2
P10
P15
Algeria
P14
P7
P9
Lebanon


year
Year 1
Year 2
Year 3
trimester
1
2
3
4
1
2
3
4
1
2
3
4
WP1
Offices and fields setup
Selection var x mgm
WP2
Demonstration 1 year
Demonstration 2 year
WP3
On-ground implementation
On-ground implementation
WP4
Farming systems characterization
Sustainability
Sustainability
WP5
Training
Training
Video material
Video material
Brochures
Brochures
Guidelines
Field days
Field days
Seminars
Web page

The expected direct outputs

- 6 demonstration fields with agro-meteorological stations, other equipment and Excel-based irrigation scheduling tool;
- 2 years of testing (at least 48 combinations of genotypes and water management practices);
- 24 training courses and 600 farmers, technicians and water managers trained;
- 60 field days with the participation of 1200 local stakeholders;
- 2 years on-ground implementation of the best performing varieties and water harvesting and management practices in a surface area of at least 240 ha with the involvement of at least 120 farmers;
- 2 guidelines, 24 brochures, 6 seminars, 180 minutes of video material, etc.
- *Social and economic impact*:
  - support of the local communities to market a quality durum wheat (in Lebanon and Morocco) and chick pea (in Morocco) products and
  - promotion of the women cooperatives for durum wheat transformation to several types of couscous on downstream value chain (in Morocco)

Demonstration fields, crops and management

- Morocco – Sidi El Aydi Experimental Station of Institut National de la Recherche Agronomique of Settat (wheat, chickpea, faba bean); crop rotation, tillage practices, and nitrogen input
- Tunisia – Mornag station of the Institut National Agronomique de Tunisie (durum wheat – supplemental irrigation and precision sowing, barley – supplemental irrigation with saline water, chickpea – winter-spring sowing and faba bean – planting density)
- Egypt – Al-Esraa wa Al-Meraag Training and Extension Station of the Ministry of Agriculture, located in Entlak area in Nubaria (chickpea and faba bean); water (salinity) input and timely sowing
- Jordan – Maru Agricultural Research Station (wheat, barley) water harvesting, conservation tillage, timely sowing
- Lebanon – Lebanese Agricultural Research Institute (LARI), in Tal Amara (wheat and barley); supplemental irrigation, conservation tillage and timely sowing
- Algeria – Bassami Aljelali (governmental) pilot farm managed by ITGC (bread and durum wheat, barley); supplemental irrigation, fertilizers application

INDICATORS	M12	M22	M36	Plan
• n° of equipped offices;	4	4		6
• n° of meteo stations acquired and installed	1	3		6
• n° of cars acquired	0	1		6
• n°, type and purpose of other facilities acquired;	1	3		6
• n° of combinations of genotypes and management practices tested	30			48
• n° of farmers implemented selected genotypes and management practices	36			120
• surface where selected genotypes and mgm practices are implemented [ha]	108.9			240
• Improved yield per hectare compared to the traditional cultivation	20-30% (26%)			
• Improved water productivity compared to the traditional cultivation	30-50% (49%)			
• n° of farming systems described (WP4)	2	4		6
• n° of farms and implementation scenarios considered (WP4)	4	8		12
• n° of courses organized	0	6		24
• n° of farmers and other stakeholders trained	0	131		600
• n° of field days organized	0	12		60
• n° of stakeholders participated	0	410		1200
• n° of videos prepared	3	27		36
• duration of videos [minutes]	6	105		180
• n° of brochures prepared , printed and distributed (1500)	1	9		24
• n° of guidelines prepared distributed	0	0		360
• n° of seminars organized	0	0		6
• n° of participants of seminars	0	0		180
• n° of visitors of web page	971	3174		

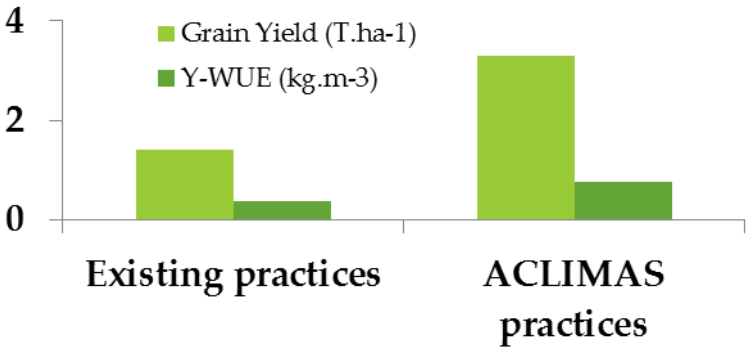
Indicators

Indicator	Lebanon	Jordan	Morocco	Tunisia
Varieties & mgm	16	30	21	12
Courses	1(25)	2(45)	1(19)	2(42)
Field days	3(49)	4(201)	2(109)	3(51)
Farmers	8	8	10	10
Surface area, ha	20	18.9	48	22
Yield	+26%		20-30%	
Y-WUE	+49%		30-50%	

Farmer 1: Ali El Attar (Bekaa Valley, Lebanon

Variety x Supplemental irrigation x Conservation tillage

Barley: Baladi variety



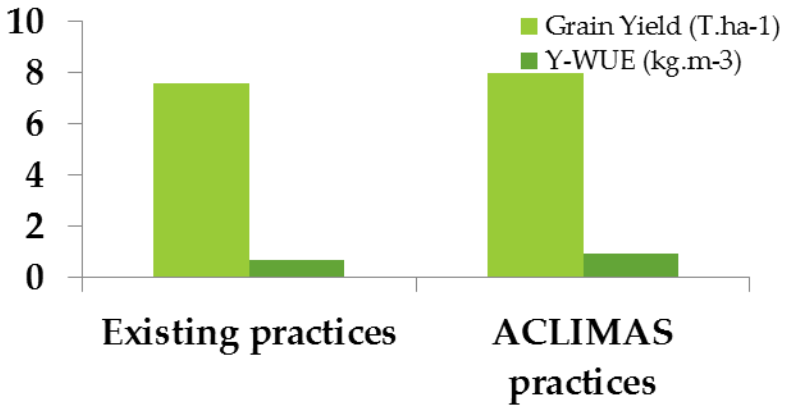
Yield: 1.4 versus 3.3 t/ha
Y-WUE: 0.36 versus 0.75 kg.m-3
Water from I and P: 387 versus 437 mm
Irrigation: 0 versus 50 mm

Barley: Rihane variety

Farmer 3: Zeki El Tarchichi (Bekaa Valley, Lebanon)

Variety x Supplemental irrigation x early sowing

Wheat: Lahn variety



Wheat: Icarasha variety

Yield: 7.6 versus 8 t/ha
Y-WUE: 0.68 versus 0.95 kg.m-3
Water from I and P: 1120 versus 840 mm
Irrigation: 400 versus 120 mm

المعهد الوطني للبحث الزراعي
Institut National de la Recherche Agronomique

Field day: 2
Sidi M'hammed Ben Rahal (Morocco)

- Date: February 12, 2013
- 11 scientists from INRA
- 60 participants (farmers, extension services, Ministry of agriculture departments, NGO's etc..

- Subject:
  The importation of crop Rotation in conservation agriculture

CRRA-Settat
Dr. Hassan Ouabbou

المعهد الوطني للبحث الزراعي
Institut National de la Recherche Agronomique

Leaflet
Field day: Sidi M'hammed Benrahal (Morocco)

د. إبراهيم البوسفي في مداخلته في اليوم الإعلامي

د. ابراهيم البوسفي باحث في أمراض النباتات، تكلم عن ضرورة التدبير المدمج للزراعات. بحيث يمكن هذا التدبير من زراعة عكرة و عظلة جرعات البذور المستعملة و من معالجة الأعشاب الطفيلية في الوقت المناسب و طرح الأسمدة المناسبة في الوقت المناسب أيضا مع اعتماد تحليل قبلي للتربة لمعرفة حاجياتها من المواد المعدنية.

و أكد د. البوسفي أن التدخلات الخاصة بمقاومة الأمراض يجب أن يكون جزءا من هذا التدبير المدمج للزراعات. بحيث أن اختيارات الحبوب في الأمراض الفطرية و التي ترتكز في الغالب على استعمال البذور المقاومة و اعتماد الدورة الزراعية لتكسير دورة الأمراض و عدم اللجوء لبعض الدواء، لا يمكن أن تكون ذات فعالية إلا عبر التدبير المدمج للزراعة.

ز. عبيل، باحثة في تسميد التربة

الباحثة زهور عبيل، تطرقت إلى دور تدبير عملية التسميد و دراسة حالة التربة من ناحية مكوناتها من المواد العضوية و كذلك حالتها الفيزيائية من خلال التحاليل. كما أكدت هذا الدور خاصة عند الانتقال من الفلاحة بالحرث إلى الزرع المباشر. و تم أخذ عينات من كل الحقول التجريبية لهذا الغرض. كما أبرزت عبرات نظام الزرع المباشر في تحسين جودة التربة و تركيبتها و المحافظة عليها من الضياع و تتابع الباحثة مستويات هذا التحسين بالحقول التجريبية التي تخضع لنظام الزرع المباشر في إطار دراسة تأقلم نظم الفلاحة بالمتوسط مع التغيرات المناخية.

د. بشرى العامري، باحثة في إنتاج الأعلاف

و أكدت د. بشرى العامري، باحثة في إنتاج الأعلاف على مزايا الدورة الزراعية التي تدخل فيها خلائط الأعلاف. فهي من جهة تحسن جودة الأرض بسبب القطيات التي توجد فيها و بسبب تعاقب الزراعات المختلفة. كما أنها توفر للفلاح أعلاف حالية التغذية دون اللجوء إلى السوق و تكاليفه الباهضة. كما أنها تمكن الفلاح من تجنيب قطيعه فترات حرجة قد تسبب في ضعف إنتاجيته. حسب قول د. العامري، لا يمكن للحروف الذي لم يتلق تغذية كاملة في صغره أن يعطي مردودية جيدة مهما تلقى من تغذية فيما بعد.

P6

A leaflet about the field day was printed and widely disseminated

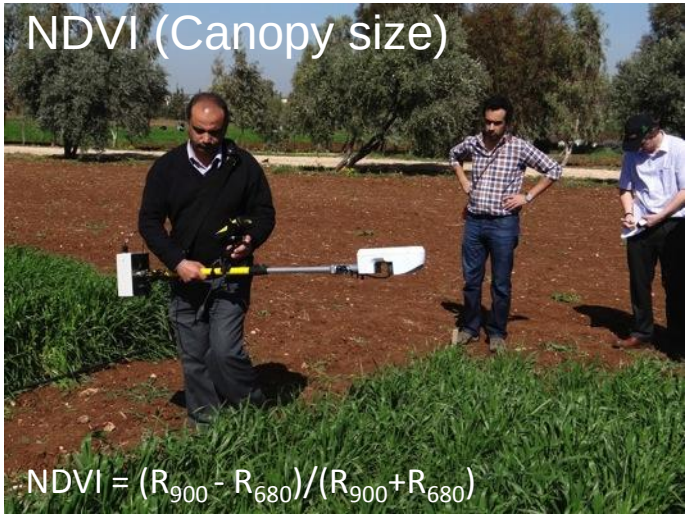
CRRA-Settat
Dr. Hassan Ouabbou

Canopy Sensors Workshop (Jordan)

20+ attendees
(NCARE & Uni Jordan)

The University of Nottingham

UNITED KINGDOM · CHINA · MALAYSIA



Field days in Jordan

المعهد الوطني للبحث الزراعي
Institut National de la Recherche Agronomique

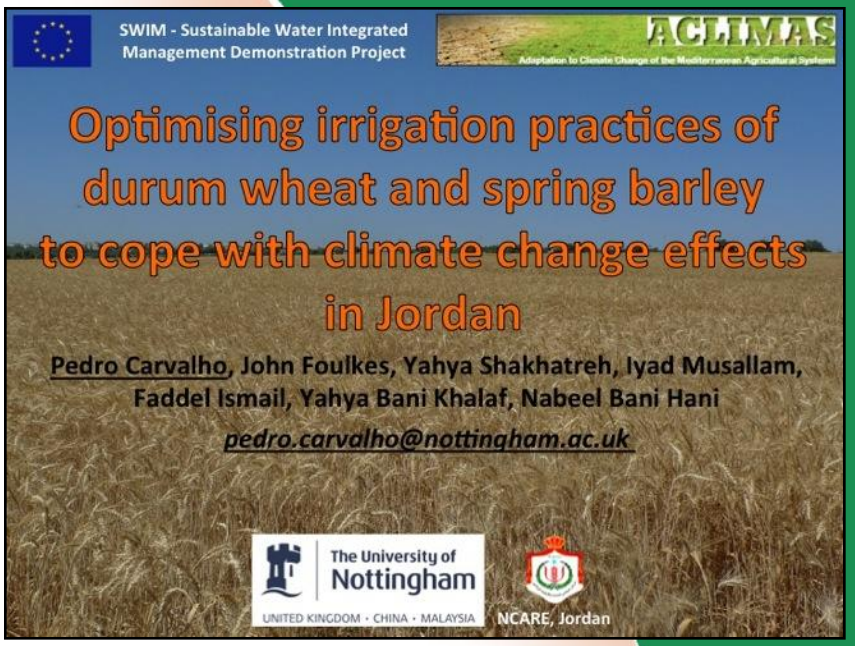
On-ground implementation of the best performing genotypes and management practices (Morocco)

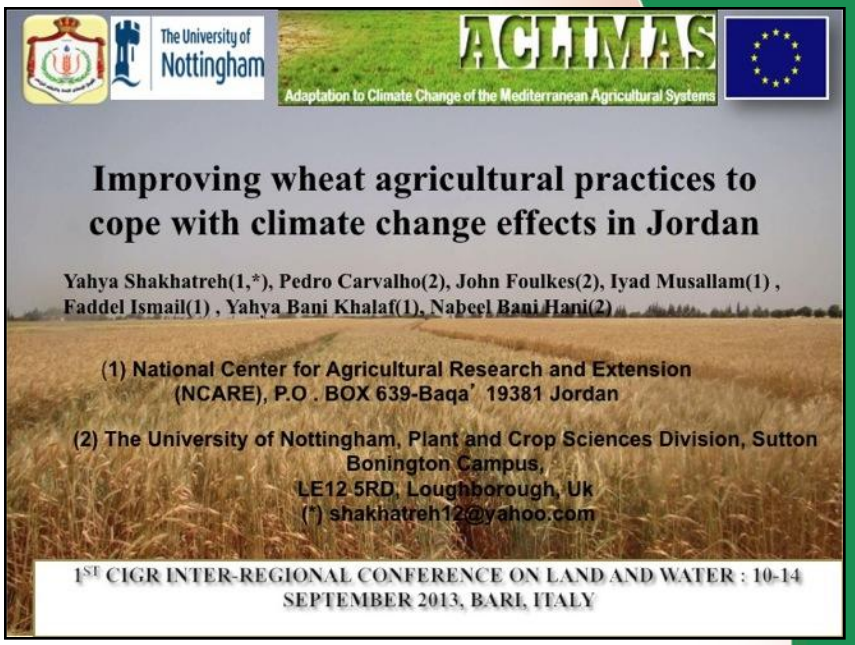
Site Nº	Site	Main Farmer name	Other Farmers involved	Surface (ha)	Previous Crop	previous Tillage system	crops sown and area (2012-2013)
1	Sidi Boumehdi	Lekbir El Kamel	50	4	Bread wheat	Conventional	2 ha Durum wheat; 2 ha forage-mixture
2	Sidi Mohammed Ben Rahal	Mouhcine El Hassani	30	3	Durum wheat, Canola; Forage (Pea)	Under No Till (NT) for 1 year	1 ha Durum wheat, 1 ha Canola, 1 ha Forage crop
3	Souaka	Zitouni Bayoud	15	6	Bread wheat	Conventional	2 ha Durum wheat, 3 ha canola, 1 ha forage
4	Toualet (Lahyout)	Mohamed Hatimi	20	4	Durum wheat	Conventional	2 ha Durum wheat, 2 ha canola
5	Gdana	Hamid Moufaoued	30	4	Fallow	NT > 5 years	2 ha Durum wheat, 2 ha Chick Pea
6	Oulad Said	Toubane Barradi	10	4	Fallow	NT 4 years	2 ha Durum wheat, 2 ha Chick Pea
7	Ain Nzagh	Mohamed ben Zhour	10	7	Bread wheat	NT 9 years	3 ha Durum wheat, 2 ha Canola, 2 ha forage
8	Tamadroust	Said Lahrichi	20	7	wheat	NT 2 years	4 ha Durum wheat, 3 ha Canola
9	Jemaa Riah	Mustapha Aabid	10	4	Fallow	Conventional	2 ha Durum wheat, 2 ha Canola
10	Oulad Said	Mohamed Rochdi	10	5	Cereal	conventional	1 ha Durum wheat, 2 ha Canola, 1 ha peas
TOTAL		10	205	48	-	-	48

Scientific dissemination at the international level

‘1st CIGR Inter-Regional Conference on Land and Water Challenges’

Bari, Italy, 10-14 September 2013





Regional (Mediterranean) scale impact

Bari, Italy, 10-14 September 2013

Adapting to climate change: testing possible measures to stabilize wheat and barley yields in a Mediterranean environment

- **Marie Therese Abi Saab** (1), Rossella Albrizio (2), Musa Nimah (3), Pasquale Giorio (2) Mohamed Houssemeddine Sellami (2) , Suzi Rouphael (1), Ihab Jomaa (1) , Randa Massaad (1) , Salim Fahed (1) , Rabih Kabalan (1) , Chafic Stephan (1) , Marica Abi Nader (3)

- (1) Lebanese Agricultural Research Institute
- (2) National Research Council of Italy, Institute for Agricultural and Forestry Systems in the Mediterranean
- (3) Association of the Friends of Ibrahim Abdel Al

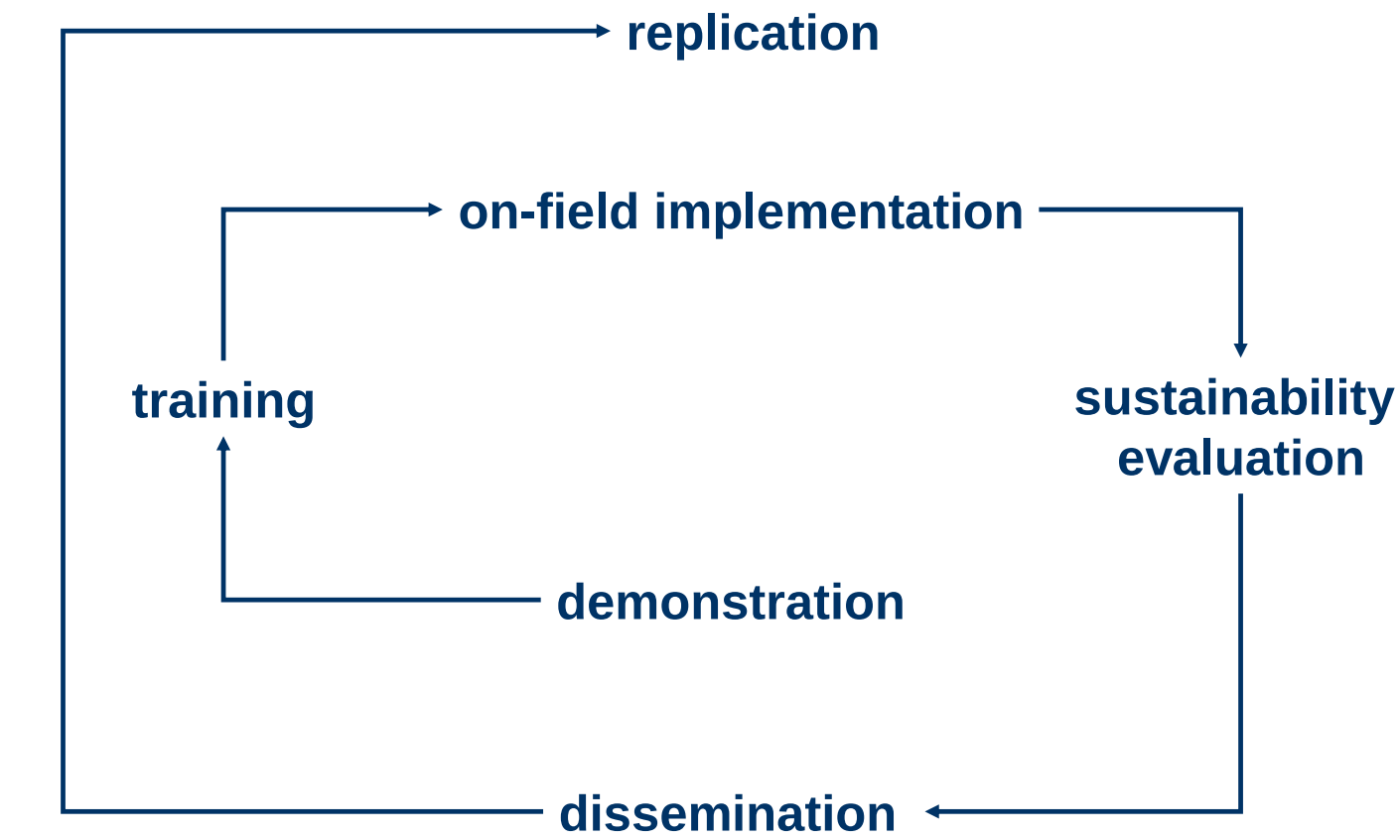
On-going activities, 2013

Year 2013													
	Semester 1						Semester 2						
Activity / Month	1	2	3	4	5	6	7	8	9	10	11	12	Implementing body
1st year demonstration activities (data collection)													P2-P7 with support of P1, P8-P14
1st year on-field implementation													P2-P7 with support of P1, P8-P14
1st year demonstration activities (reports preparation)													P2-P7 with support of P1, P8-P14
1st year on-field implementation (report preparation)													P2-P7 with support of P1, P8-P14
Farming system characterization													P1 and P8 with support of P2-P7, P13-P15
Training organization and reporting													P2-P7 and P15 with support of P1, P8-P14
Field days organization and reporting													P2-P7 and P15 with support of P1, P8-P14
2nd year demonstration activities (setup and data collection)													P2-P7 and P15 with support of P1, P8-P14
2nd year on-field implementation													P2-P7 and P15 with support of P1, P8-P14
Ex-ante sustainability analysis													P1 and P8 with support of P2-P7, P13-P15
Brochure preparation and distribution													P1-P7 with support of P8-P15
Video material preparation													P1-P7 with support of P8-P15
Web site update and maintenance													P1 with support P2-P15
Annual and committees meetings													P1 with support P2-P15

Planning of activities for 2014

Year 2014													
	Semester 1						Semester 2						
Activity / Month	1	2	3	4	5	6	7	8	9	10	11	12	Implementing body
2nd year demonstration activities (data collection)													P2-P7 with support of P1, P8-P14
2nd year on-field implementation													P2-P7 with support of P1, P8-P14
2nd year demonstration activities (reports preparation)													P2-P7 with support of P1, P8-P14
2nd year on-field implementation (report preparation)													P2-P7 with support of P1, P8-P14
Ex-ante sustainability analysis													P1 and P8 with support of P2-P7, P13-P15
Training organization and reporting													P2-P7 and P15 with support of P1, P8-P14
Field days organization and reporting													P2-P7 and P15 with support of P1, P8-P14
2nd year demonstration activities (setup and data collection)													P2-P7 and P15 with support of P1, P8-P14
2nd year on-field implementation													P2-P7 and P15 with support of P1, P8-P14
Guidelines preparation													P2-P7 and P15 with support of P1, P8-P14
Seminars organization and reporting													P2-P7 and P15 with support of P1, P8-P14
Brochure preparation and distribution													P1-P7 with support of P8-P15
Video material preparation													P1-P7 with support of P8-P15
Web site update and maintenance													P1 with support P2-P15
Annual and committees meetings													P1 with support P2-P15

ACLIMAS strategy



Field days, seminars, web, videos, brochures, conferences

Major challenges, problems encountered, means to overcome

- Political and security uncertainties in some target countries created difficulties to plan and to complete some of the activities (e.g. Egypt – partnership agreement and acquisition of equipment; Tunisia – installment of equipment and organization of field days; Lebanon – organization of field days and harvesting in Bekaa Valley) – driven by external factors
- Complex administrative setup of some institutions and national legislation delay/impede the use of budget – overcome through the transfer of financial management to CIHEAM-IAMB
- Transfer of activities from Syria to Algeria (addendum, 26 July 2013)
- Possibility to run the activities initially planed in Egypt in some other country (addendum, 26 July 2013)
- An extension of the project duration of 12 months could be necessary to achieve all expected direct outputs and to reach project overall and specific objectives

ACLIMAS

Adaptation to Climate Change of the Mediterranean Agricultural Systems

www.aclimas.eu

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