SUSTAINABILITY ASSESSMENT and MONITORING

Morocco, Jordan and Lebanon case studies

IAMB and CMCC-CIP

Final International Meeting,

15-17 December 2015, Cairo, Egypt

Project funded by the EUROPEAN UNION

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GOAL

- disseminate value of proposed options as climate change adaptation strategy

  →**very important to test uptake of measures at a broader scale**

BENEFICIARIES

- local stakeholders: farmers, water users associations, NGOs, local government extension services
- local and national decision-makers (incl. governmental research institutions)

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The “Bruntland Commission”

- in 1983 the UN General Assembly set up the World Commission on Environment and Development (WCED) chaired by Ms Gro Harlem Bruntland
- The results were published in a book: ‘*Our common future’* (1987), in which the most cited definition of Sustainable Development is provided:

"(D)evelopment that meets the needs of the present without compromising the ability of future generations to meet their own needs” **(p.43)**

WCED, 1987

- Decision problems related to Natural Resources Management are characterised by high levels of complexity and dynamics
- …they show also conflicting socio-economic interests
- Multiple competences are needed for problem solving
- Robust scientific methods and information are often at least partially lacking
- Global change issues impose new requirements in terms of modelling capabilities and scenario analysis
- Gaps are evident at the interface between science and policy making

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Indicators of Sustainable Development (ISD):

- **are** observed value representative of a phenomenon of study, by usually aggregating different and multiple data,
- **can** allow better communication and accessibility to information by bridging the gap between the producer and user of information
- **are** important tools to communicate ideas, thoughts and values: 'We measure what we value, and value what we measure'
- **provide** a means of measuring, monitoring and reporting on progress towards sustainability

EEA, 2003

Sustainability analysis of WHAT

- Innovation: combination of genotypes and agricultural practices
- In a long term perspectives
- Considering trade-offs among environmental, social and economic performances

  Assessing robustness of proposed options

Sustainability analysis WHERE

- **The selected farming systems** per target area

Sustainability analysis HOW

- **Comparison** of existing farming systems with proposed alternative ones, through selected indicators in a participatory multi-criteria decision support system framework
- Scenarios: with and without options; present and future

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TASK 1: Farming systems characterisation

ACTIVITIES:

- Collection of data and documents
- Preparation of desk reports
- One on-site visit per target area: to validate the data and information, and to start the elicitation of local stakeholders' objectives
- Selection of farming system/s

DELIVERABLE

Country reports on the characterization of the selected farming systems

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Task 2 Sustainability Analysis

ACTIVITIES:

- Elicitation of local stakeholders' objectives
- Design of the knowledge base
- Selection of indicators (priorities)
- Collection of quantitative data
- Identification of data gaps and solutions
- Preliminary qualitative assessment of farming systems and/or scenarios

Sustainability Analysis

- An Integrated Indicator Table (IIT) has been developed to collect data and to allow a comparison compare among the case studies for the final analysis of sustainability.
- The IIT for ACLIMAS project is based on initial communication with the involved research partners.
- For each case study, a selection of indicators is identified depending on the specific conditions on the ground and time-series data availability.

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sustainability pillar	main issues discussed	indicators
ECONOMIC: competitiveness of agricultural sector	• agricultural income and its variability • input cost and their availability • competitiveness	yield stability
		production costs
		farm income
		labour demand
SOCIAL: rural life viability and policy coherence	• social insecurity for farmers and their families • decline in food availability • role of women in agricultural	land abandonement
		straw availability
		household food security
		access to machinery
		likelihood of adoption
		incentives
		subsidies
ENVIRONMENTAL: natural resources management	• soil erosion problems • water resources scarcity and quality deterioration • agricultural polluters for the environment	soil erosion
		water consumption
		agrochemicals consumption
		diesel consumption

data processing and results

- MOROCCO: training workshop March 2014 in Settat: The meeting was organized by INRA. 27 participants + 9 ACLIMAS; 18 questionnaires completed
- JORDAN: case study field visit in April 2014. The meeting was organized by NCARE; 8 out of 11 were interviewed
- LEBANON: case study field visit in April 2014: The meeting was organized by IRAL. All the targeted farmers were interviewed in Lebanon

- Given the difficulties to reach a quantitative assessment farmers were asked to express a qualitative evaluation of **"ACLIMAS Options" ….**
  - **…or in terms of** how much in percentage they noticed change **when the "ACLIMAS Options" were practiced**
  - **….or in terms of** scores and weight assigned **to the different indicators**

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MOROCCO the following combinations are adopted:
new variety × conservation agriculture
new variety × conservation agriculture × rotation × fertilization

JORDAN the following combinations are adopted:
new variety
new variety × conservation agriculture
new variety × early sowing

LEBANON the following combinations are adopted:
new variety
new variety × supplemental irrigation × conservation agriculture
new variety × supplemental irrigation × early sowing
new variety × supplemental irrigation

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Morocco

- Evaluation of parameters (1-5)
- Weighting of parameters
- Scores
- Sustainabilty of the assessed options

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NAME:	INSTITUTION:		FARMER: yes ☐ no ☐	
1. How will the single criterion perform in no-till and till soil management practices? In the matrix below cross the appropriate value to express the validity of each management practice (columns) with respect to each of the criteria (rows), according to the scale of ratings on the right				
THEME	**CRITERIA**	**NO-TILL**	**TILL**	
Management of natural resources	Soil Erosion	1 2 3 4 5	1 2 3 4 5	
	Water Consumption	1 2 3 4 5	1 2 3 4 5	
	Agrochemicals Consumption	1 2 3 4 5	1 2 3 4 5	**RATINGS**
	Diesel Consumption	1 2 3 4 5	1 2 3 4 5	1=very poorly
Viability of rural life	Straw availability	1 2 3 4 5	1 2 3 4 5	2=negatively
	Contribution to Household Food Security	1 2 3 4 5	1 2 3 4 5	3=neutral
	Feasibility	1 2 3 4 5	1 2 3 4 5	4=positively
Competitiveness of agricultural sector	Yield Stability	1 2 3 4 5	1 2 3 4 5	5=very positively
	Production Costs	1 2 3 4 5	1 2 3 4 5	
	Farm Income	1 2 3 4 5	1 2 3 4 5	
	Labour Demand	1 2 3 4 5	1 2 3 4 5	
2. Which is the relative importance of each criterion when trying to increase farm productivity in the long term? Read carefully the criteria's list. You have 100 points to distribute among the criteria The most important criteria receive the highest score. The total score must add up to 100.				
THEME	**CRITERIA**	**WEIGHTS**		
Management of natural resources	Soil Erosion			
	Water Consumption			
	Agrochemicals Consumption			
	Diesel Consumption			
Viability of rural life	Straw availability			
	Contribution to Household Food Security			
	Feasibility			
Competitiveness of agricultural sector	Yield Stability			
	Production Costs			
	Farm Income			
	Labour Demand			
		SUM=100		
3. If you are a farmer: had you already tried no-till before ACLIMAS? Yes ☐ No ☐				

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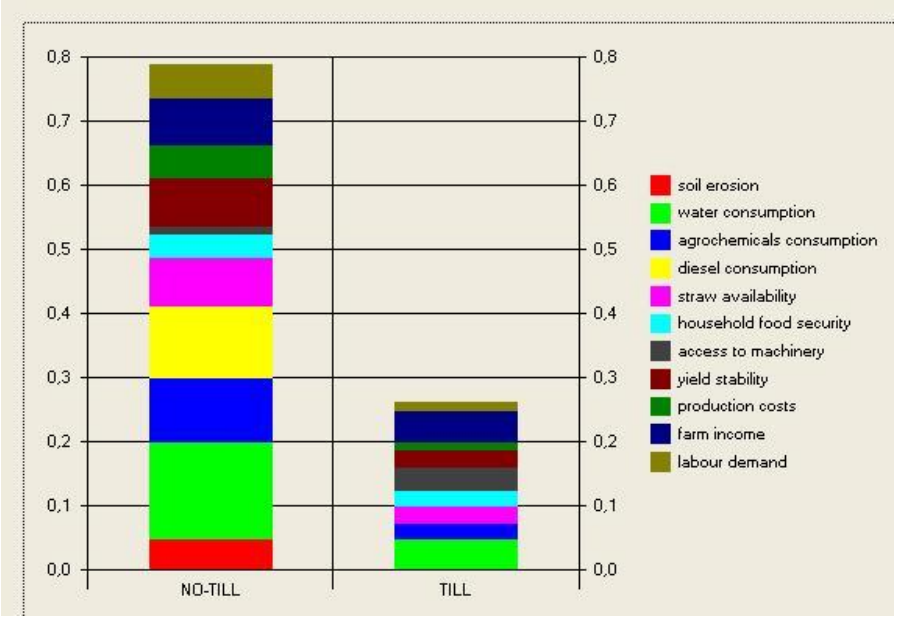
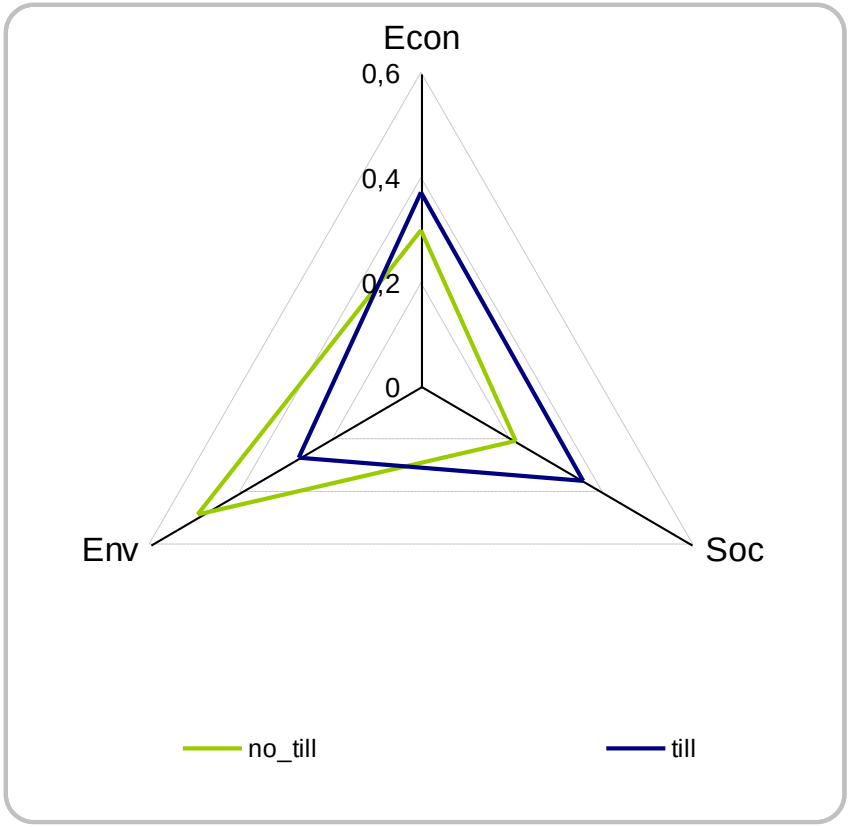
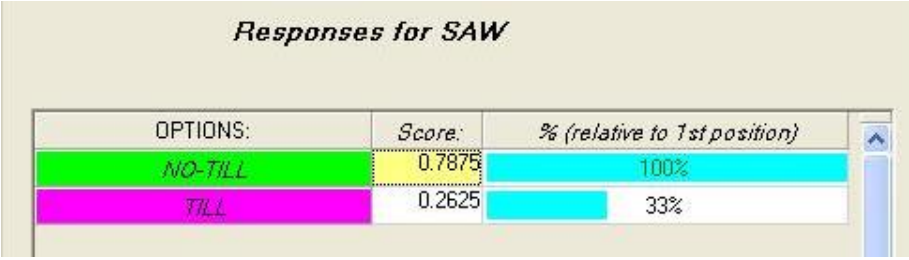
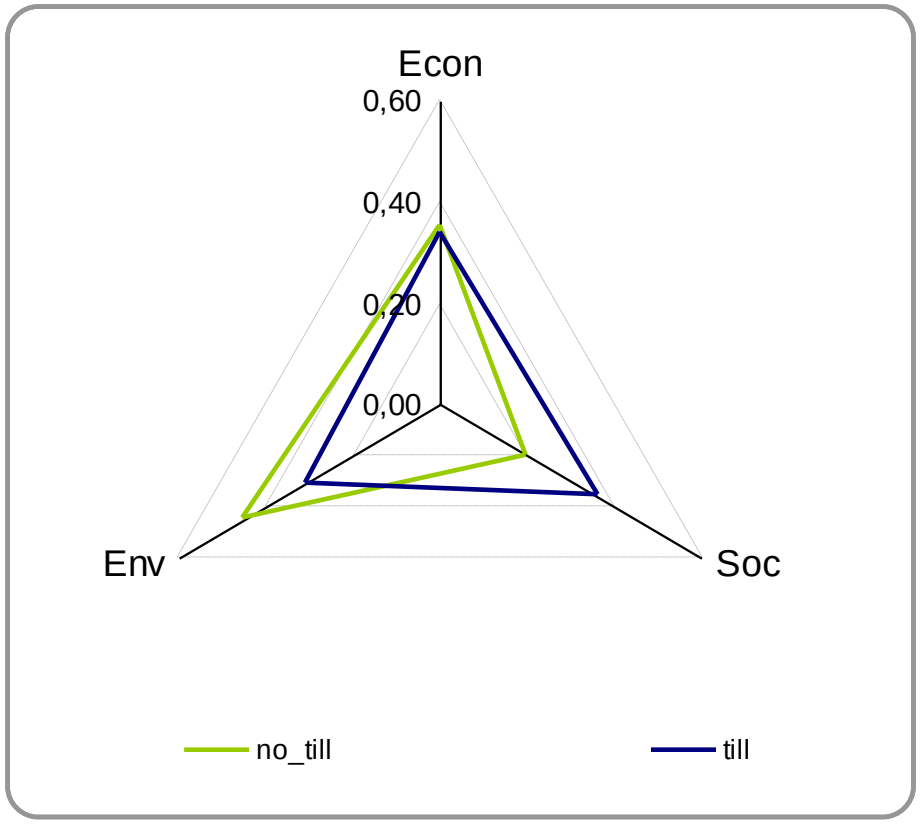
Morocco


0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0,0
NO-TILL
TILL
soil erosion
water consumption
agrochemicals consumption
diesel consumption
straw availability
household food security
access to machinery
yield stability
production costs
farm income
labour demand


Econ
0,6
0,4
0,2
0
Env
Soc
no_till
till


Responses for SAW
OPTIONS:
Score:
% (relative to 1st position)
NO-TILL
0.7875
100%
TILL
0.2625
33%

Morocco



Environmental sustainability increases mainly as effect of no till practices implemented which reduced soil erosion and diesel consumption.

Social sustainability lowers for the negative effects on labour demand

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Jordan & Lebanon

- Evaluation of parameters (0-100%)
- Frequency distribution and Average
- Sustainabilty of the assessed options

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THEME	QUALITATIVE CRITERIA	2012										2013										2014									
Management of Natural Resources	Soil Erosion	10	20	30	40	50	60	70	80	90	100	10	20	30	40	50	60	70	80	90	100	10	20	30	40	50	60	70	80	90	100
	water Consumption	10	20	30	40	50	60	70	80	90	100	10	20	30	40	50	60	70	80	90	100	10	20	30	40	50	60	70	80	90	100
	Fertiliser Consumption	10	20	30	40	50	60	70	80	90	100	10	20	30	40	50	60	70	80	90	100	10	20	30	40	50	60	70	80	90	100
	Energy Consumption	10	20	30	40	50	60	70	80	90	100	10	20	30	40	50	60	70	80	90	100	10	20	30	40	50	60	70	80	90	100
Viability of Rural Life	Land Abandonment	10	20	30	40	50	60	70	80	90	100	10	20	30	40	50	60	70	80	90	100	10	20	30	40	50	60	70	80	90	100
	Food Security	10	20	30	40	50	60	70	80	90	100	10	20	30	40	50	60	70	80	90	100	10	20	30	40	50	60	70	80	90	100
	Likelihood of Adoption	10	20	30	40	50	60	70	80	90	100	10	20	30	40	50	60	70	80	90	100	10	20	30	40	50	60	70	80	90	100
Competitiveness of Agriculture	Yield Stability	10	20	30	40	50	60	70	80	90	100	10	20	30	40	50	60	70	80	90	100	10	20	30	40	50	60	70	80	90	100
	Crop Price	10	20	30	40	50	60	70	80	90	100	10	20	30	40	50	60	70	80	90	100	10	20	30	40	50	60	70	80	90	100
	Production Cost	10	20	30	40	50	60	70	80	90	100	10	20	30	40	50	60	70	80	90	100	10	20	30	40	50	60	70	80	90	100
	Farm Income	10	20	30	40	50	60	70	80	90	100	10	20	30	40	50	60	70	80	90	100	10	20	30	40	50	60	70	80	90	100
	Labour Demand	10	20	30	40	50	60	70	80	90	100	10	20	30	40	50	60	70	80	90	100	10	20	30	40	50	60	70	80	90	100
Policy Coherence	Incentives	10	20	30	40	50	60	70	80	90	100	10	20	30	40	50	60	70	80	90	100	10	20	30	40	50	60	70	80	90	100
	Subsidies	10	20	30	40	50	60	70	80	90	100	10	20	30	40	50	60	70	80	90	100	10	20	30	40	50	60	70	80	90	100

The measurement of indicators is estimated through the percentage change the farmers noticed (we circle the correct answer from 0 to 100%) for each year of the project between the "traditional" *versus* "ACLIMAS" techniques.

A second table is to added for any other comment or constraint.

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إسم المزارع	
المنطقة	
المساحة المزرعة	
المساحة ضمن المشروع	

هل مارست هذه التقنيه قبل المشروع	لا	نعم

عدد السنوات	

الموضوع	QUALITATIVE	2012/2013										
إدارة الموارد الطبيعيّة	تفكك التربه	0	10	20	30	40	50	60	70	80	90	100
	استهلاك المياه	0	10	20	30	40	50	60	70	80	90	100
	استهلاك الكيماويات	0	10	20	30	40	50	60	70	80	90	100
	استهلاك الطاقه	0	10	20	30	40	50	60	70	80	90	100
جدوى الحياة الريفيّة	التخلّي عن الزراعة	0	10	20	30	40	50	60	70	80	90	100
	الامن الغذائي	0	10	20	30	40	50	60	70	80	90	100
	اعاده ممارسه التقنيه	0	10	20	30	40	50	60	70	80	90	100
القدرة التنافسيّة للزراعة	استقرار المحصول	0	10	20	30	40	50	60	70	80	90	100
	سعر المحصول	0	10	20	30	40	50	60	70	80	90	100
	تكلفه الانتاج	0	10	20	30	40	50	60	70	80	90	100
	دخل المزرعه	0	10	20	30	40	50	60	70	80	90	100
	الطلب علي اليد العامله	0	10	20	30	40	50	60	70	80	90	100
تماسك السياسات	التسهيلات	0	10	20	30	40	50	60	70	80	90	100
	الدعم	0	10	20	30	40	50	60	70	80	90	100

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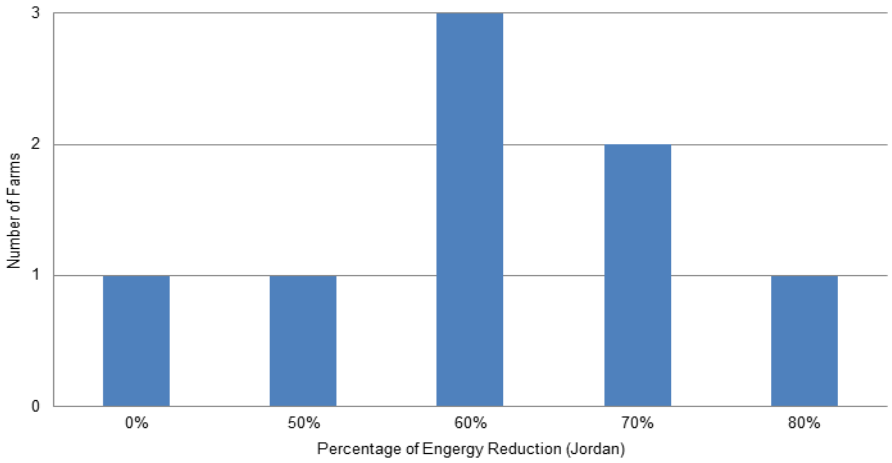
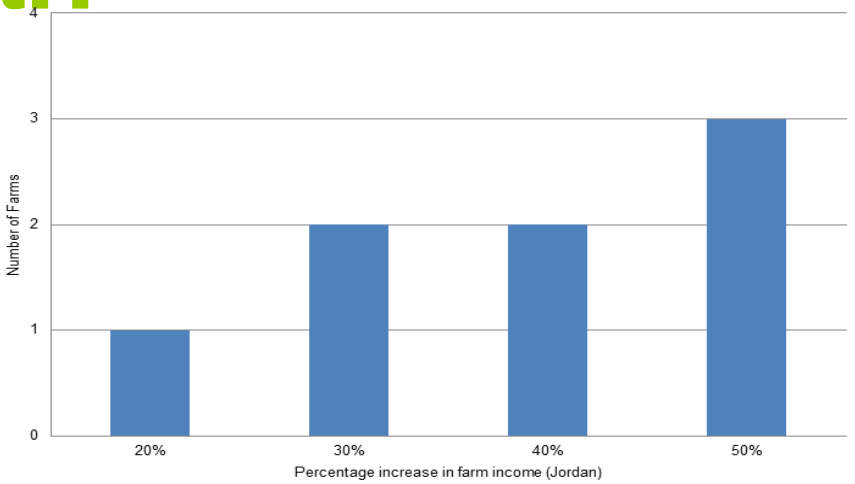
Jordan





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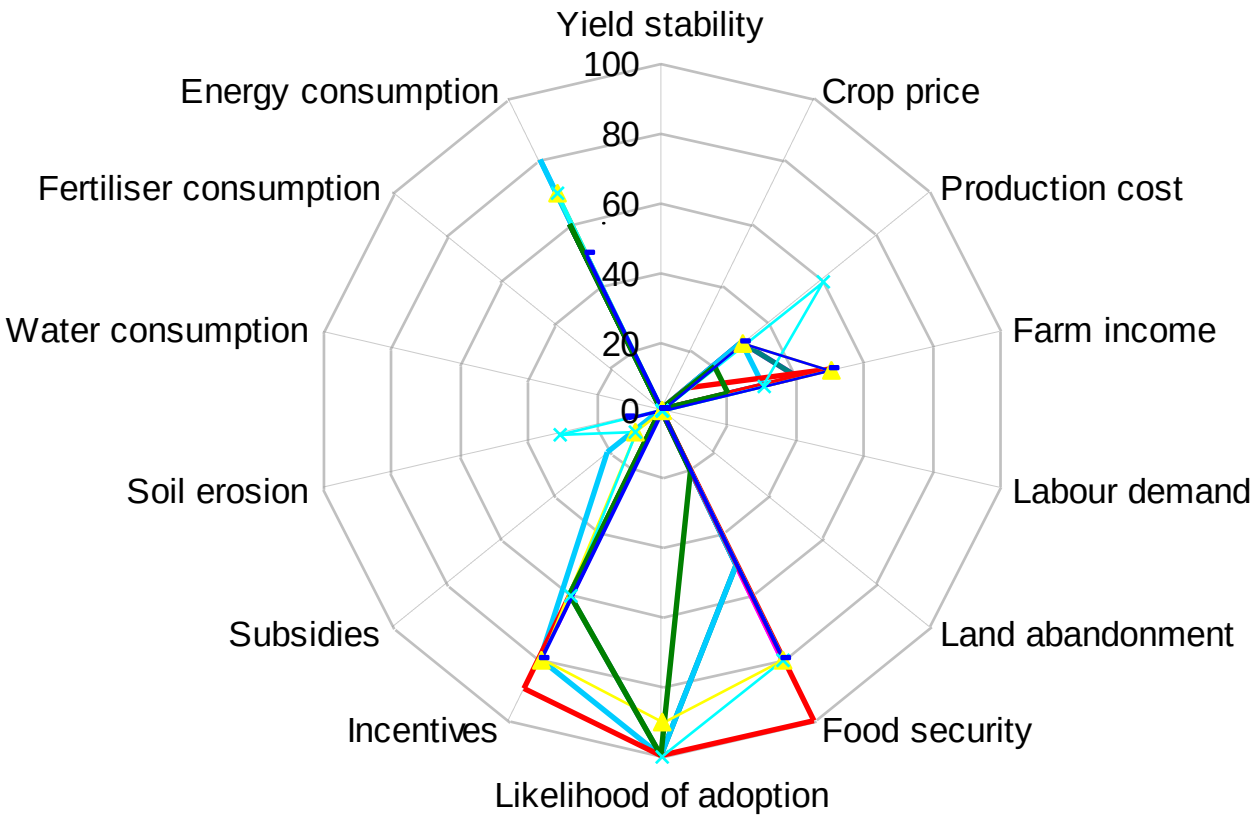
Jordan

The highest responses in Jordan were for Social sustainability indicators.

Environmental sustainability increases mainly as effect of reduced energy consumption.

Economic sustainability also increases since production costs are expected to decrease and, conse-quently, farm income is expected to increase.



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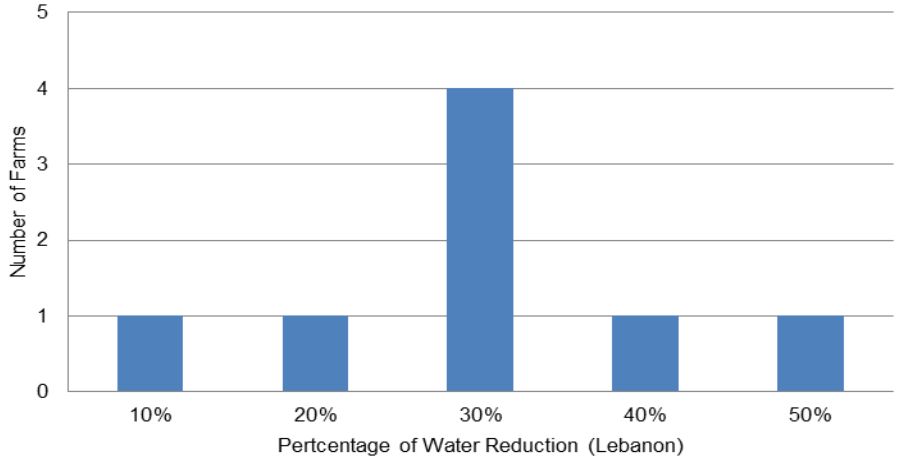
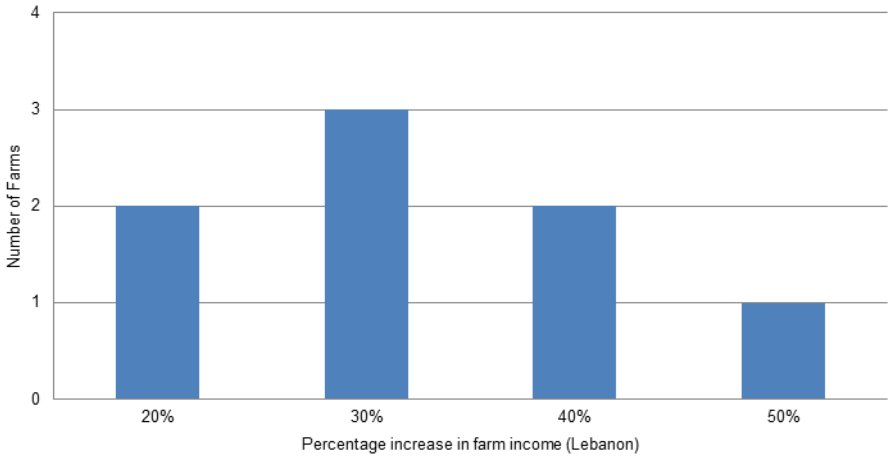
Lebanon





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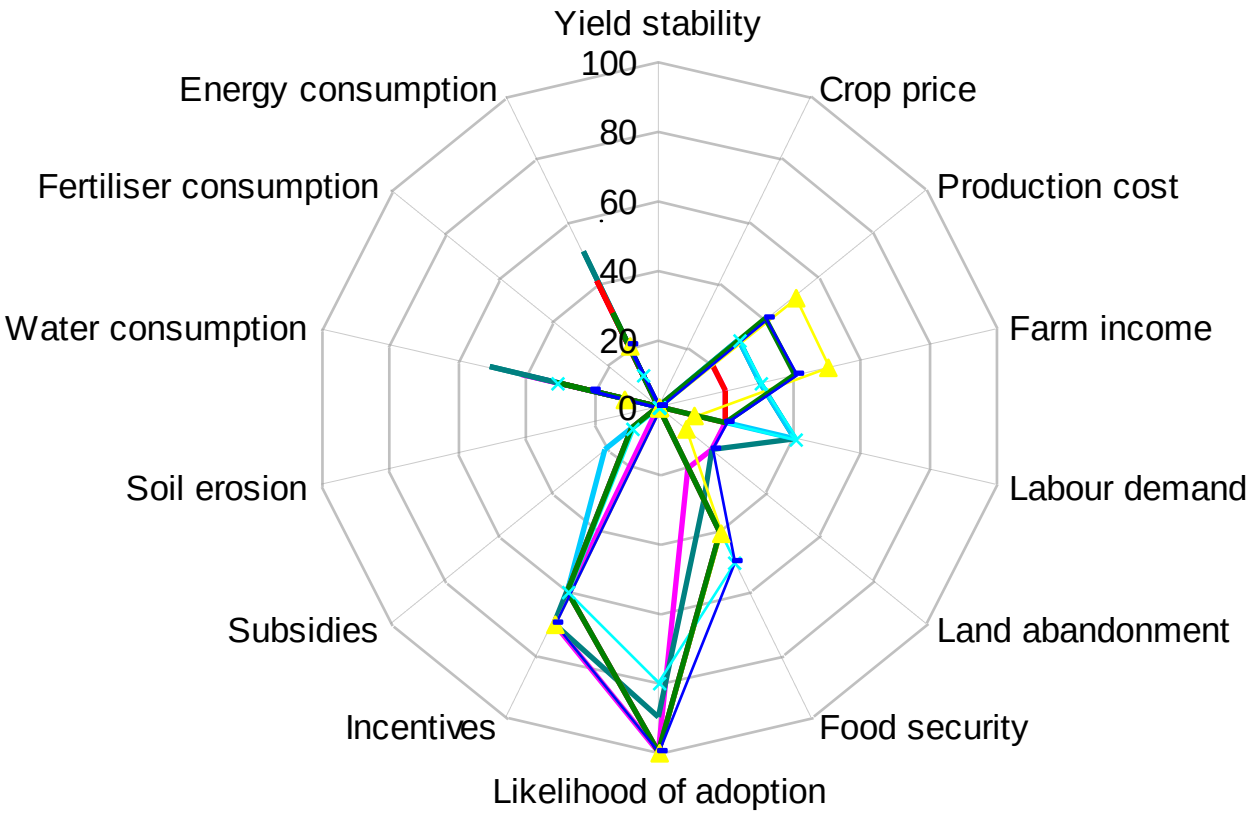
Lebanon

The highest responses in Lebanon were for Social sustainability indicators.

Environmental sustainability increases mainly as effect reduction both in water consumption and in energy consumption

Economic sustainability also increases.



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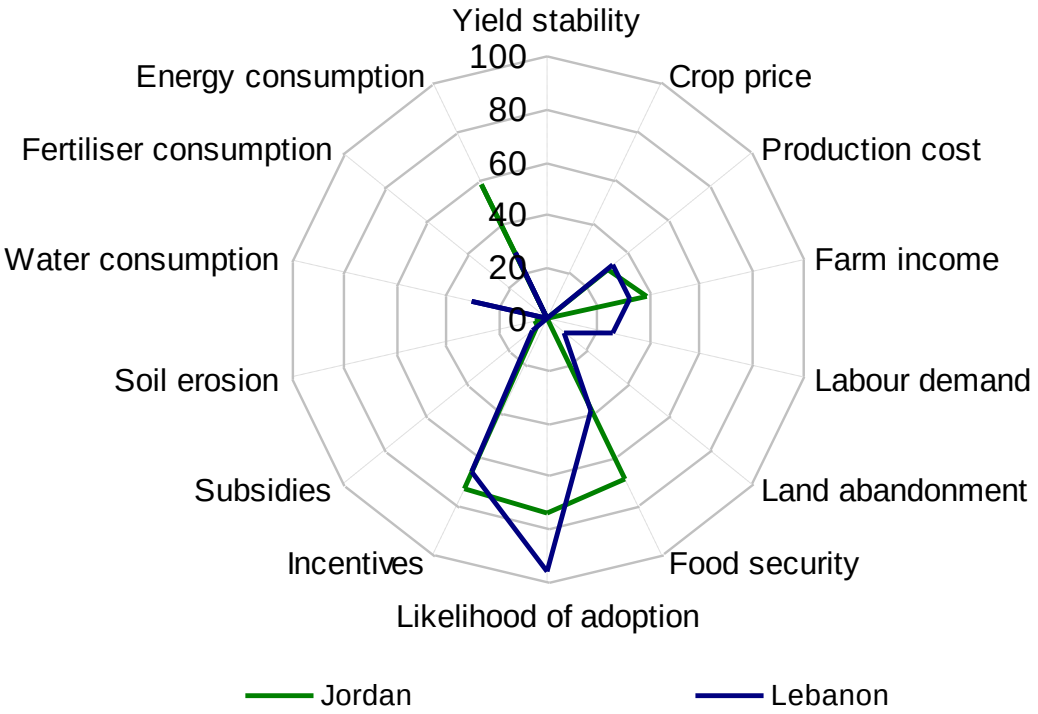
- Likelihood of adoption was higher in Lebanon.
- The positive economic performance would increase the competitiveness of cereal production compared to other crops in the area, thus the likelihood of adoption.
- Notwithstanding the potential positive effects of “Aclimas” practices, evident environmental improvements would need time to be noticed by farmers.



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- 'ACLIMAS practices' showed to increase the three dimensions of a sustainable development.
- They have high rate of acceptability and a big potential of transferability. However, farmers are worried about the "post-project" since they are afraid not to be able to continue growing adopting these practices.
- The Sustainability Analysis approach can be used for similar assessments in the future to cover all the farmers who participated in the project over different cropping seasons to capture the sustainability in a longer term.

THANK YOU
FOR YOUR ATTENTION

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