PROGRESS REPORT

Local knowledge of pastoral and agro-pastoral communities for managing uncertainties in south-eastern Tunisia: the case of Béni Khédache (BK)

IRA team

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INTRODUCTION

This progress report try to summarize major activities carried out within the research action titled: "Local Knowledge and innovation" conducted by the IRA team with the collaboration of ICARDA in the area of Beni Khedache, Oum Zessar watershed, located in the Governorate of Medenine, south-east of Tunisia (CRP-DS Beni Khedache site). It was elaborated within the framework of the CGIAR program CRP-DS on Dryland Systems led by ICARDA[1].

The action aims also to document the local knowledge of pastoral and agro-pastoral communities for managing uncertainties through an across disciplines approach. The objective of this action is to improve technology transfer to farmers and agro-pastoralists to achieve better food security, health practices, and livestock using better policies, market access, financial tools and extension systems.

1. Activities and achievements within the research action in 2014

1.1. Basic survey and adaptation of the questionnaire

The data collection from the study field is based specifically on the methodological proposals of the CRP1.1 program (baseline survey). The basic questionnaire developed by IRA team was adapted then to the local context from the questionnaire conceptualized by ICARDA within the research activities on vulnerability analysis *(cf. annex, the parts of local knowledge and innovation, knowledge transfer and coping strategies are colored in blue)*. With the general characteristics of the households and their production systems, the gender analysis, the food security and the sustainability of the system in general, this basic questionnaire integrates parts which deal with the local knowledge and innovation (regarding agricultural practices and livestock management), the transfer of knowledge and coping strategies.

1.2. Collection of primary data

This step consists on collection of data and statistical informations on the study site and the local population, in order to build the sampling method, but also to analyze

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[1] CRP1.1 aims at improving the wellbeing of the poor rural communities, conserve vital natural resources, and empower smallholder farmers and pastoralists to cope with inherent climatic variability and climate change. In North Africa and West Asia, research will improve technology transfer to farmers and agro-pastoralists to achieve better food security, health practices, and livestock using better policies, market access, financial tools, and extension systems.

the socioeconomic conditions and the local knowledge about agricultural activities and livestock in the study site.

In fact, several projects and research programs have been conducted in the study site in partnership with several national and international research institutions. These research programs have a rich database, such as the history of rural people and their territorial dynamics (JEFFARA program), production systems and uses of resources (ROSELT/OSS, WAHARA), management of resources (AFROMAISON), adaptation to climate change (ACCCA). A part of these data will be useful to analyze, for some groups of households, the agro-pastoral dynamics and the changes in production systems, the uses of resources and coping strategies. A number of Local, regional and national statistics, but also studies and researches carried out in the framework of thesis, masters, etc. are also valorized to enrich the local knowledge and innovation analysis.

1.3. Sampling method for the basic survey

Several considerations have been taken into account on determining sample size mainly the spatial distribution, production system typology and gender. The structure and the spatial distribution of the sample are presented by table 1 and figure 1.

Geophysical areas	Man	Women	Total Sample
Upstream (Beni Khedache district)	37	30	67 (53%)
Middle stream (Medenine North district)	24	7	31 (24%)
Down stream (Sidi Makhlouf district)	24	5	29 (23%)
Total	85	42	127 (100%)

Table 1: Sample structure by region and sex
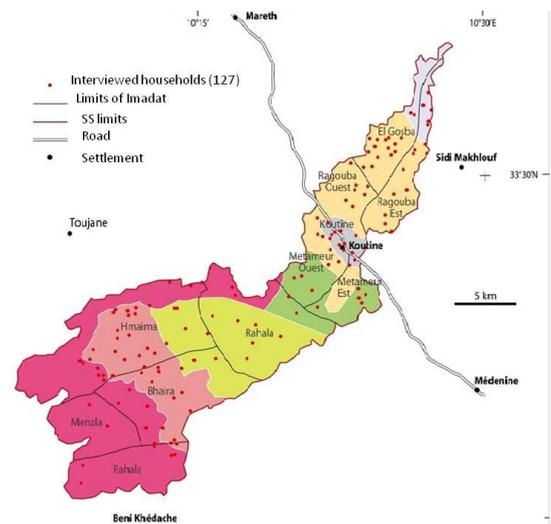
Figure 1: Spatial distribution of the sample of households (basic survey)

1.4. Information and mobilization of authorities, local and regional actors and logistical organization of the field study

The field investigations have been preceded by a step of information and mobilization of local and regional actors, and resource persons to ensure their participation in the whole work of data collection. The regional authorities have been informed on the objectives of the work and invited to support the survey work.

1.5. Training of the investigators (interviewers)

A group of 9 investigators from IRA Medenine, IRA Tataouine, CRDA of Medenine and associations (Jeunes de Zammour, ADESM and Yanabii (girls) of Beni Khedache) have followed a training on the sampling and questionnaire by IRA team to be familiar with. These interviewers have done the first tests surveys of 5 households in the region of Beni Khedache.

1.6. Conduct of the investigation

After reproduction of the questionnaire and preparation of lists of households and substitutes for each administrative unit (imada), field investigations were begun. The baseline surveys were carried out in two times of a total duration of approximately one month. The first investigation was carried out in June 2014 and the second in August 2014. The only difficulties to point out are those relating to the location of households, particularly in the mountainous areas. To cover the dispersed habitat, it has been necessary to make long transects. Only 6 households have denied the investigation. Statements of geographical coordinates (GPS points) of sites of residences have been also undertaken.

1.7. Focus group and multi stakeholders workshops

Several meeting and workshops were also carried out by the team of IRA, within the CTV of Beni Khedache (Cellule Territoriale de Vulgarisation) with the relevant actors in the management of the rangelands of Dhahar and in the management of agricultural private lands in Jeffara (the leader of the CTV, a manager in the forests direction, an engineer from the CRDA, a responsible of the GDA Beni Khedache, a member of the management board). These development actors have a large experience and knowledge in the region of study. They have actively participated in

the construction of a spatialized database (status, users and types of use of rangelands, etc.). The tool used to achieve this work is the Participatory GIS. With this tool we carried out a collective schematization of various plans of information on a topographic background and a google map covering the entire study area. A cartographic work will follow this work using the Arcview and ArcGIS tools. These meetings were followed by a transect carried out on the field with a member of the GDA and of the management board. During this transect, the team has been able to see all the landscapes of the Dhahar (rangelands, vegetation, sand bars, degraded areas, wells, cisterns, herds, livestock farmers, guards, etc.) and was able to take the GPS points of the main water points (wells, drinking fountains, large underground storage tanks, etc.).

1.8. Data entry and preliminary socioeconomic data base in SPSS format providing

After the field investigations, the data gathered on the basic questionnaire were verified and codified by IRA team. A series of measures had been taken before data

entry. These measures have mainly concerned the preparation of variables bar (610 variables for the basic survey). For the part of local knowledge and innovation there are 76 variables. The collected data were then entered on the "SPSS" statistic software by the team of specialists on data entry.

1.9. Master Degree IAMM-IRA

A Master Degree IAMM-IRA has been carried out within the period May-September 2014 at IRA by Mss. Dorra BEN SEDRINE, in the framework of the action « Local Knowledge and innovation », CRP1.1 project. This Master has as title : "*Impact des politiques foncières sur le fonctionnement et la vulnérabilité des systèmes agro-pastoraux: Cas du sud-est tunisien*".

CIHEAM-IAM de MontpellierMontpellier SupAgroUniversité Montpellier 3

Master

Territorialités et développement

Mention Développement durable et aménagement

Parcours
Sociétés rurales, territoires et gestion des ressources naturelles (SOTERN)

Finalité : Recherche

Impact des politiques foncières sur le fonctionnement et la vulnérabilité des systèmes agro-pastoraux: Cas du sud-est tunisien

Elaboré par : *BEN SEDRINE Dorra*

Encadré par : Dr.BESSAOUD Omar
:Dr.FETOUI Mondher

Septembre 2014

2. Planning activities 2015

- Surveys by questionnaire, informal tools (Focus groups, Gender, etc.) and ICT tools to document and describe everyday's life identify local knowledge, perception and vision on:

  o Traditional governance : Traditional rangeland management and agricultural practices

  o Agricultural and pastoral activities

  o Range livestock production system

  o Herd's mobility

  o Conflicts

  o Coping and adaptation strategy Climate Change

- Data entry, cleaning and statistical analysis

- Reporting

- Short Scientific movie on "Pastoralists Way of Life" (15' to 26')

- Dissemination: Attending of scientific events

  o Oral presentation to the international seminar on livestock and wildlife in arid and desert environments, SIEFAD, 16-18 December, 2014, Djerba, Tunisia ;

  o Submission papers to "X International Rangeland Congress (IRC) " Saskatoon Canada, 17-22 July 2016

ANNEX

QUESTIONNAIRE BASELINE SURVEY FOR CRP 1.1 "DRYLAND SYSTEMS"

PART A: GENERAL

Questionnaire Number   _____

Country name: _____

State name: _____

PART B: RESPONDENT AND HOUSEHOLD HEAD'S BACKGROUND

Name & Surname: _____

Age: I_____I

Marital status: (1=Married, 2=Single, 3=Divorced, 4=Widow, 5= Other (specify)_____)

Education level: (1=illiterate, 2=koranic school, 3=primary school, 4=secondary school, 5=university) : ----------------

Born Location:_____

Farming experience (years): _____,

Main occupation (major source of income): _____

Secondary occupation: _____

The person who make decision on:

	Agriculture aspect	Consumption expenditure	Investment
Sexe (1. male, 2. femelle)			
Age			
Marital status			
Education level			
Principal activity			
Secondary activity			

Relationship to the HH head (Son/daughter/wife)			

PART C: Demographic characteristics of the household

C1 Family size

	Total	≤7 years old	8-15 years old	15 – 65 years old	> 65 years old
Male					
Female					

C2 Number of household members who:

- Earn income :   Male _____   Female_____
- can read and write _____   completed elementary_____   above elementary _____

C3: Family labor contribution to own farm

- C3.1 Total number of family members working on family farm   _____
- C3.2 Number of male family members working on family farm   _____
- C3.3 Number of female family members working on family farm   _____
- C3.4 Division of labour on agricultural activities (as % of their total time spent):

	Total (% out of total time)	Land preparation	planting	weeding	Herbicide & pesticide application	Fertilizer application	harvesting	Seed cleaning	Seed treatment	Livestock tending	Processing livestock products	Crop marketing	Livestock marketing
Men													
Woman													
Boys													
Girls													
Total													

PART D: CAPITAL FINANCIE, PHYSIQUE ET SOCIAL

D1. Access to land

Items	Propriety before 50 years			Current propriety			Observations (raisons of change)	Future strategy (sale, division, purchase,..)
	Total (ha)	Rainfall (ha)	Irrigated (ha)	Total (ha)	Rainfall (ha)	Irrigated (ha)		
Total area								
inherited								
Purchased								
Owned by Mogharsa								
Communal land								

Area planted in orchards: I_____I ha

Number of plots? I_____I

Soil type (code A) I_____I

Soil fertility (code B) I_____I

Slope (code C) I_____I

Distance to your home (km) I_____I

Main crop (code D) I_____I area / ha I_____I

Other crops…………...............………………………area/ha…………………....................................……

- Code A: soil type: 0= black 1= red, 2=brown, 3=gray, 4= other specify _____
- Code B: Soil fertility: 1=Good, 2=Medium, 3=Poor
- Code C: Slope: 1=flat, 2= gentle slope, 3=steep slope
- Code D: Harvest: 1 = olives, almonds = 2, 3 = figs, 4 = Other fruit trees, 5 = annual crops, 6 = Other (specify)

D2. Livestock

Are you breeder? I__I   yes 1 ; No 0

If ,yes

CRP Dryland Systems Béni Khédache site

	Number	Change in number over the last 10 years and the reasons (in%)	Race 1= local, 2= improved,	Production	Number of animals sold / year	Average price
Sheep (head)						
Goats (head)						
Camels (heads)						
Cattle (heads)						
Small livestock (chickens)						
Small animals (rabbits)						
Beekeeping (Hives)						
Equidae (horses, donkeys).						

D3-Production and Needs of Families: consumption, storage, sale

	Production	Self consumption %	stored %	sold %	Selling price (DT/unite)	Household consumption			Purchasing price (DT/unite)
						Number of days of consumption /an	Quantity	% purchased	
Cereal (Kg / year)									
Olive oil / (kg or liter / year)									
Almonds (Kg / year)									
Figs (Kg / year)									
Fruits (Kg / year)									
Vegetables (Kg /									

year)								
Meat (Kg / year)								
Eggs (unit / month)								
Milk (liters / month)								
Honey (Kg / month)								
Fish (kg / month)								

What are the factors that hinder / facilitate the storage of crops?

………
………
………

What are the main pests that affect crops and yields?

	Cereals	Olives	Almands	Figs		
insects						
Diseases						

Please indicate the followed methods of control

………
………
………

Please estimate the loss in production

	Cereals	Olives	Almonds	Figs	
Loss in production (%)					

D4. Income (main sources of household income (Jan-Dec 2014)

Source of income	Total income (DT/year)	Woman contribution	The contribution of the member of the households
Farm income			
Farming labour			
Livestock			
Non-farm activities	Precise:…………………… Contribution:……………	Precise:…………………… Contribution:……………	Precise:…………………… Contribution:……………
Renting (land, tank, Tractor, building, etc.)			
Migration			
Retreat			
Subsidies			
Other: ----------------			

Average yields obtained by farmer for the following crops

Year	Wheat	olives	almonds	Figs				
Normal year								
Bad year								
Best yield obtained during the last 10 years								

During the last 10 years, how many years were

-Normal years   -------- Years

-Bad (dry) yeas   ------- Years

-Good years   ----- Years

PART E. SYSTEM VULNERABILITY AND AGRICULTURE PRACTICES

E1. Agriculture production and commercialisation

What are the main problems of agriculture in your community?

Problems	Causes	Proposed solution

Have you received technical training in farm management? I__I 1. Yes 2. Not

Where do you find training opportunities and technical information?

…….………………
……
………

How this technical training helps to increase the yield of your farm?

……
……

   If not, why?

……
……

What are the distribution channels that you use for different products and why?

Goods	Channels	Reasons for this choice
Vegetable goods		
Animal goods		
Other		

E2. Animal feeds

Percentage contribution of each feed type during each month of the year?

| | 2013 | | | | Contribution of each type of feed (%) | | | | | | | | | | | |
	Unit (1=tons,	Total amount	Amount purchase	Price per unit	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	July	Aug
rangelands	Specify the location and type (private, public)															
Thatch																
Concentrated																
Khortan																
Olive pomace																
Other																

Please indicate the main problems related to animal feeding:

……
……
……

E3. Food Security and the sustainability of the agro-pastoral farming system

Contribution of local products by total consumption per year

Item	Dry year (%)	Normal year (%)	Rainy year (%)
Cereals			
Legumes			
Fruits			
Oils			
Sheep, goat or other red meat			
Poultry and eggs			
Fish			
Milk/yoghurt/other dairy			
Bread			

Which product can insure food security and the sustainability of the agro-pastoral farming system in the future?

For your family

……
……

For   the   region   :
……
……

Have you any idea to enhance the value chain (marketing) of these products?

……
……

Did you use credit or other financial resources to optimize the family-farm system?

……
……

What are the constraints on access to these resources?

……
……

LOCAL COPING MECHANISMS USED BY HOUSEHOLDS AND COMMUNITIES

Major shocks encountered

Over the past ten years have you observed	Observed? 1=Yes,0=No	Frequencies (in the last 10 years	What did you about it (adaptation strategies)? **Code A**
Extremes (rain or drought)			
Drought succession			
Temperature fluctuation high			
Change in soil quality (salinity and decrease/increase in soil moisture, …)			
Depletion and quality of groundwater (quantity, salinity,…)			
Major changes in crop pattern (surface, yields, disease, …)			
Major changes in livestock asset (Number, disease, death, mobility, feed)			
Major changes in market (value chaine)			
Major changes in farm treasurer (investment, income)			
Food insecurity/shortage			
Decline in consumption			
Decline in health			

Code A: 1. Did Nothing, 2. Left land fallow, 3. Sold part of land for alternative, 4. Leased out part of land for alternative/leased in, 5.Sold livestock (sheep, goats, cows, etc), 6. Provided supplemental irrigation

7. Invested in farm ponds (water harvesting structures), 8. Change in cropping pattern, 9. Followed improved crop production practices, 10. Additional information gained, 11. Any other adaptation measure

12. Change in planting date; 13= adopted drought tolerant varieties; 14= changed the composition of my livestock (more hardy animals and less of others), 15. Borrowed money from relatives/others, 16. Relying on assistance from government/ngos, 17. Less food consumption or changed food habits, 18. Shifted to non-farm employment, 18. Out migration to cities, 19. other

PARTIE F. LOCAL KNOWLEDGE AND INNOVATION

F1. Farming practices

Item	Local knowledge		New technologies	Information sources (Code A)
	Fruits trees	**Crops**		
Land preparation (cropping calendar, Equipment & machinery, soil types)				
Plantation (Variety, seeds, planting methods, seed treatment)				
Fertilizer use (methods used, costs, quantity)				
Control plants (size, types, quantities of herbicides, cost)				
Irrigation (methods, access to water, equipment, water tower, plant needs, price)				
Harvest (timing, method, machine, costs, use,)				
Production (quantity, quality, constraints, vulnerability ....)				
Storage (Methods, requirements, timing ...)				
Marketing (Methods, destination market intermediaries, access ...)				

Code A : 1.Family (father, brother, sister, etc.), 2.personnel knowledge, 3.Radio/TV, 4. Research, 5.Extension services (dissimination), 6.NGOs, 7.GDAs, 8.Associations, 9.SMS, 10.Friends neighber, 11.other (specify) :…………...…………

F2. Livestock management

	Local knowledge	New technology and innovative ideas	Information resources (Code A)
Animal feeding			
Livestock mobility			
Animal health			
Commercialisation			
Other :………………			

F3. Knowledge transfers

- Your opinion concerning knowledge transfers from father to son ?: …………………………………………………………

………
………
……

- From public services to farmer?: ………………………………………………………………

………
………

- From research institute to farmers?: ………………………………………………………………

………
………

PART G. GENDER ANALYSIS

Sharing decision:

The person who is called the head of the household is: Male __ Female____;

Could you please specify the principal roles of women, men and youth in your community?

Women	Men	Youth

Please to specify the roles of women and men in new technologies adoption? Please to give examples?

………

………

G2. Sharing of agriculture tasks

Activities	Women	Men	Youth	External labor
Soil preparation				
Selection and purchase of equipment				
planting				
Choice and purchase of varieties				
Seed management (purchasing, processing ...)				
sowing				
Application of fertilizer				
Choice of fertilizer at planting				
Choice and application of methods				
Weed control				
Application of herbicides				
Choice of herbicide				
Purchase of water				

irrigation				
harvest				
Storage and storage management				
Management of family consumption				
Sale of agricultural products				
Other activities:				

G3. Sharing of breeding activities

Activities	Women	Men	Youth	External labor
Purchase, sale				
shelters				
supply				
watering				
medical treatment				
Herd mobility				
Production management				
Other activities:				

PART H. AGRICULTURE POLICIES

H1. Agriculture policies and rural development impacts

Have you contributed to or benefited from the implementation of agricultural policies? I__I 1.Yes 2.No

How satisfied are you with the effectiveness and added value of agricultural policies?

In your field?

      1-satisfied   2-Partially satisfied   3-Unsatisfied .

why? _____

In your region ?

      1-satisfied   2-Partially satisfied   3-Unsatisfied .

why? _____

How satisfied are you with the implementation of pastoral development policy and agriculture and rural policies?

1-satisfied   2-Partially satisfied   3-Unsatisfied .

why? _____

H2. Enabling Policies

Please, circle the number corresponding to your opinion in Statements 1 to 5 below:

1 = Strongly Disagree 2 = Disagree 3 = Not sure 4 = Agree 5 = Strongly Agree.

1	The national pastoral development policy and agriculture and rural policies have enabled you (smallholder farmers) to earn remunerative profits through greater input use through improved agronomic efficiency	1	2	3	4	5
2	The national policy has promoted balanced application of input consistent with the agronomic requirements in various agro-ecological zones based on soil testing	1	2	3	4	5
3	There are effective policies in place that enforce an enabling legal and regulatory framework for ensuring good quality of input to farmers	1	2	3	4	5
4	The government enforces quality control of inut through a market legal and regulatory framework that is adopted, legislated and implemented by appropriate authorities	1	2	3	4	5
5	Rank the following aspects of quality control:	1	2	3	4	5
	a. Government inspectors undertake periodic quality control of subsidized input for production	1	2	3	4	5
	b. Government inspectors undertake periodic quality control at market outlets	1	2	3	4	5
	D. Input samples are drawn by inspection officials for laboratory analysis	1	2	3	4	5
	d. There are guidelines for proper labeling of subsidized input	1	2	3	4	5
6	There is an enabling macroeconomic environment that contributes to stabilization of farm gate prices of input to a level that promotes wider adoption and increased input use by farmers	1	2	3	4	5

PART I. COMMUNICATION BORROWING AND ACCESS TO CREDIT

I1. Source of information on varieties/agronomic practices/livestock husbandry/prices/etc.

	During the past 12 months, where did you get information about your farming?	Who benefit from this information	Did this information help you in your farming and selling decisions?
	1-Source of information 2-Not a source of information	1-Husband 2-wife 3-Sons 4-Duaghters	1-Yes 2-No
Demonstration trails			
Radio/TV			
Direct contact with traders			
Farmers' organizations			
Extension workers			
SMS system/mobile phone			
Neighbors/friends/relatives			
Information boards at local agricultural offices			
Personal knowledge			
NGOs			
International development organizations			
Other source -----------------			

I2. Borrowing and Access to Credit

Have you used credit?   I____I   1. yes 2. no

Why ?

………
……
………

If yes, what are the main sources you usually use for borrowing?

Informal source   2-Formal source

Amount: I_____I DT

Years: I_____I

Interest rate: I_____I %

Maturity date: I_____I

What are the main problems faced by women and men in the process of borrowing and repayment?

Woman	Men

GENERAL OBSERVATIONS, COMMENTS, SUGGESTIONS

………
………
………

………
………
………

End of the questionnaire

Inquisitor name: …………………………………………………… **Date of interview:** ………………/…………………… /2014