

# Value chain analysis and actors mapping: Case of Tunisia



INITIATIVE ON  
Agroecology

Boubaker Dhehibi, Asma Souissi, Aymen Frija, Hassen Ouerghemmi, Veronique Alary, Zied Idoudi, Udo Rudiger, Mourad Rekik, Mohamed Zied Dhraief, Meriem Oueslati Zlaoui, Rihab Mejri, and Mourad Ouji

December 2023



Cover photo: Eighty-year old woman sorting olives (Rihab Mejri/ WP3 Tunisian team).

The objective of this report is to analyze, mapping and select the main value chains with potential to integrate the agroecological principles in Tunisia. Based on the secondary data, rapid value chain analysis, focus group discussions at the living labs and participatory approach with the main stakeholders, three value chains were identified in Siliana and Kef governorates: olive oil, sheep meat and honey. The VC assessment according to agroecological principles conducted with the main actors places the olive oil VC as the major value chain with agroecological character. In this sense, an olive oil business model was proposed to encourage the olive producers of SMSA to produce a labeled olive oil to improve their revenues, enhance livelihoods and create a system of values that includes land (terroir).

### **Disclaimer**

The views expressed are the authors' own and do not necessarily reflect those of ICARDA, CGIAR, IRESA, INRAT, or any research and development partners involved in this research program. Personal information, including name, business title, e-mail, phone, images, and GPS points included in this report, have been authorized in writing or verbally by the data subjects.

The CGIAR initiative Transformational Agroecology across Food, Land and Water Systems develops and scales agroecological innovations with small-scale farmers and other food system actors in seven low- and middle-income countries. It is one of 32 initiatives of CGIAR, a global research partnership for a food-secure future, dedicated to transforming food, land, and water systems in a climate crisis.

<https://www.cgiar.org/initiative/agroecology/>

# Value chain analysis and actors mapping: Case of Tunisia

ICARDA Team

Boubaker Dhehibi, Asma Souissi, Aymen Frija, Hassen  
Ouerghemmi, Veronique Alary, Zied Idoudi, Udo Rudiger,  
and Mourad Rekik

Tunisian Team

Mohamed Zied Dhraief, Meriem Oueslati Zlaoui, Rihab Mejri,  
and Mourad Ouji



INITIATIVE ON  
**Agroecology**



# Contents

<b>Acknowledgments</b>	<b>4</b>
<b>Acronyms</b>	<b>4</b>
<b>Abstract</b>	<b>6</b>
<b>Introduction</b>	<b>8</b>
<b>1</b>	<b>Descriptive national statistics on Kef and Siliana governorates ..... 9</b>
1.1	General characteristics on Kef governorate ..... 9
1.2	General characteristics on Siliana governorate ..... 11
<b>2</b>	<b>Value chain selection at the living labs level ..... 13</b>
2.1	Context and objective ..... 13
2.2	Methodology ..... 13
2.3	Results ..... 14
<b>3</b>	<b>Value chain selection through participatory approach ..... 18</b>
3.1	Context and objective ..... 18
3.2	Methodology ..... 18
3.3	Results from the participatory approach ..... 19
<b>Conclusion: Proposed business model</b>	<b>34</b>
<b>References</b>	<b>35</b>
<b>Annexes</b>	<b>36</b>

## List of Figures

Figure 1.	Kef Governorate and its delegations ..... 9
Figure 2.	Location of Siliana Governorate ..... 11
Figure 3.	Frequency of respondents for the selection of VC in both locations ..... 22
Figure 4	Mapping of the honey value chain (Kesra location) ..... 23
Figure 5.	Main features of the sheep value chain in Kef ..... 25
Figure 6.	Main features of the olive oil value chain in North West of Tunisia ..... 27

## List of Tables

Table 1.	Main agricultural speculations in the Kef region in 2020 (in Ha) ..... 10
Table 2.	Main livestock production in the Kef region in 2020 (in Ha) ..... 10
Table 3.	Main agricultural speculation in Siliana region in 2020 (in Ha) ..... 12
Table 4.	Main livestock production in Siliana region in 2020 (in Ha) ..... 12
Table 5.	Characteristics of the living lab in the study areas ..... 13
Table 6.	Main value chain selected at the living lab level according to the importance of economic, social and environmental aspects ..... 15
Table 7.	Agroecological practices revealed by the farmers of living labs ..... 16
Table 8.	Agroecology principles applied to the main VC at the living labs ..... 17
Table 9.	Main reasons for value chain selection in the study area ..... 20
Table 10.	Agroecology principles applied to the selected value chains ..... 29



# Acknowledgments

The authors gratefully acknowledge the involvement and participation of all the farmers in the living labs and the different partners involved from all engaged institutions (CRDA, OEP, ONH, GIVLAIT, Different agricultural associations, etc.) who provided insight and expertise that greatly assisted the research during the focus group discussions.

## Acronyms

APIA.....	Agricultural Investment Promotion Agency
AVFA.....	Agricultural Extension and Training Agency
CEPEX .....	Center for the Promotion of Exports
CRDA.....	Regional Commissariat to the Agricultural Development
DGPA.....	Directorate-General for Agricultural Production
GIVLAIT....	Interprofessional Grouping for Red Meats and Milk
GIZ .....	German Agency for International Cooperation
Ha.....	Hectare
ICARDA	International Center for Agricultural Research in the Dry Areas
INRAT .....	National Institute of Agronomic Research of Tunis
MA .....	Ministry of Agriculture, Hydraulic Resources and Maritime Fishing
ODESYANO .....	Northwest Development Sylvo-Pastoral Office
OEP .....	Office of Livestock and Pasture
ONH .....	National Office of Olive Oil
SMSA.....	Mutual Society for Agricultural Services
SWOT .....	Strengths Weaknesses Opportunities Threats
TND .....	Tunisian dinar
VC .....	Value chain









## Working Document

### Abstract

This research work was implemented under the CGIAR Initiative on “Transformational Agroecology across Food Land and Water Systems” in the frame of the WP3 “Inclusive Business Models and Financing Strategies” led by the International Center for Agricultural Research in the Dry Areas - ICARDA. The aim of the work package 3 is to develop an inclusive Business Model that facilitates the agroecological transition through potential value chains.

The objective of this report is to analyze, map and select the main value chains with potential to integrate the agroecological transition. The methodology is based on the secondary data analysis, rapid value chains analysis, agroecological assessment, focus group discussions and participatory approach with the main stakeholders. This report is organized in four sections: Section 1 provides an overview of the descriptive national statistics on Kef and Siliana governorates. Section 2 presents the results obtained from the focus group discussions conducted at the living lab level. Section 3 analyzes, maps, and selects the main value chains with potential to integrate the agroecological principles. A SWOT analysis is also performed in this section and finally, section 4 concludes and provides a proposed business model value chain.

As mentioned, a participatory approach was adopted through 4 focus group discussions at the living lab level and at the value chain level with all the relevant stakeholders through the organization of two workshops in Kef and Siliana governorates. The first focus group took place on October 5th, 2022, in El Kef (GDA Sers Rural Women) followed by three others focus groups on Siliana where the living lab is represented by SMSA ‘Ankoud El Khir’, SMSA ETTAWEN and SMSA Kouzira. These focus groups were organized on November 1st, 2nd, and 3rd, 2022. The selection of the value chains by the members of the living lab was done according to a global evaluation matrix prioritizing the value chains based on a set of predefined criteria (economic, social, and environmental) of impact and feasibility.

In the second step of the participatory approach, two workshops on main value chains identification, prioritization and actors mapping took place on December 8th and 15th, 2022 in Siliana and El Kef (North-West Tunisia). The number of participants was 33 and 30, respectively, in Kef and Siliana.

The results of the focus group discussions have revealed that the main value chains selected are cereal, olive oil and sheep. Honey VC and Fig tree VC were also chosen. In the plenary sessions of the workshops, the attendants were asked to choose the value chains the most adapted to the region based on economic, social, and environmental criteria and three VC were chosen: The olive oil and sheep in Kef and the olive oil and honey in Siliana.

In terms of added value, olive oil VC and Honey VC have a great potential to valorize local products especially in Siliana. Sheep meat VC allows the small breeders to have a regular income. It is an activity anchored in the traditions of the region and with important social values (meat lamb consumed in the periods of celebration).

Different agroecological practices such as rotation, crop diversification, forage association, inputs reduction, recycling, etc., are revealed by the farmers interviewed during the focus group discussions.



## Working Document

The 13 agroecological principles applied to the five value chains selected by the participants are discussed and identified during the focus groups.

Finally, the business model proposed based on the participatory approach with the main stakeholders in both locations is olive oil labelling. The objective of the business model is to encourage the olive producers of SMSA to produce a labeled olive oil to improve their revenues, enhance livelihoods and create a system of values that includes geographic location.

## Working Document

### Introduction

The agricultural and agri-food sector is the main source of income in rural areas and plays a social safety net in some regions of the country (M. de Lattre-Gasquet et al., 2017). The role of agricultural and agri-food systems is to ensure food security, stability, income generation and economic growth; however, we are facing nowadays systems that are failing, economically deficient with negative environmental impacts and unsustainable productivity (gas emissions, pollution, overexploitation).

In this context, new agroecological practices are emerging. They are based on the mobilization of the ecological functionalities of agrosystems, the optimization of natural processes, and the wise management of resources. However, agroecology cannot be reduced to a set of technical practices. Indeed, this approach is a paradigm shift that addresses citizens' and consumers' concerns about nutrition, health, ecosystem health, equity, social and environmental responsibility (Altieri and Toledo, 2011; Rosset et al., 2011; Nyéléni, 2015; Côte et al., 2019).

Agroecological practices build on, preserve, and enhance organic and ecological processes in agricultural production, reducing the use of commercial inputs (such as fossil fuels and agrochemicals) and creating more diverse, resilient, and productive agricultural ecosystems (HLPE, 2019). The objective of this process is to transform actual food systems into more sustainable and equitable systems using biodiversity, natural processes, and recycling. The aim is to reduce the impacts on the environment and to increase resilience of farming systems leading the agroecosystems or food systems to become more environmentally and economically sustainable and socially equitable (Quintero and McCarteney, 2021). This process is based on 13 principles obtained from the High-Level Panel of Experts on Food Security and Nutrition (HLPE, 2019) setting the ground towards agroecological transition.

It is in this framework that the Agroecology initiative was implemented by the CGIAR for 7 countries. The overall objective of the Agroecology initiative project is to redesign existing farming systems into more agroecological systems for seven countries: Burkina Faso, India, Kenya, Lao PDR, Tunisia, and Zimbabwe. As a result, these systems will be more resilient to climate change and able to face and overcome adverse and unpredictable events while ensuring food security and sustainable farmers' income. It is in this context and within the framework of the work package 3 "Inclusive business models and financing strategies" that this study is developed. The aim of the work package 3 is to develop an inclusive Business Model that facilitates the agroecological transition through potential value chains at the living labs level.

The objective of this report is to analyze, map and select the main value chains with potential to integrate the agroecological principles. The methodology is based on the secondary data, rapid value chain analysis, agroecological assessment, focus group discussions and participatory approach with the main stakeholders. This report is organized in three sections: Section 1 provides an overview of the descriptive national statistics on kef and Siliana governorates. Section 2 presents the results obtained from the focus group discussion conducted at the living lab level. Section 3 analyzes, maps, and selects the main value chains with potential to integrate the agroecological principles and finally, section 4 concludes and provides a proposed business model value chain.



## Working Document

# 1. Descriptive national statistics on kef and Siliana governorates

## 1.1. General characteristics on Kef governorate

Located in the north-west of the country, Kef governorate is an area between Tunisia and the Maghreb countries along the Algerian border (Figure 1). It covers an area of 5,081 square kilometers, representing 3.2% of the national area and about 30.7% of the northwest region. The Kef governorate has a population of around 243,156 according to the 2014 census (2.2% of the country's total population). This population is also more rural (43.5%) than the Tunisian population with an average of 32.2% (RGPH, 2014).

The agricultural and fishing labor force represents about 14.6% of the total labor force (ODNO, 2017). Kef represents 10% of the national cereal production, 3.4% of milk and about 7% of red meat (ODNO, 2020) which makes the region an important contributor to national food security.



**Figure 1.** Kef Governorate and its delegations (CRDA, 2020)

The semi-arid climate of western and southwestern Kef is particularly dry. Annual precipitation is estimated to range between 300 and 600 mm (ODNO Kef, 2020), providing water to several dams, including the Meleg Dam and the Tessa River.

Kef governorate is a traditional agricultural region, starting from an extensive system integrating cereal crops and small ruminants, with an extension of the irrigated areas counting today around 16 600 ha. Four main plant speculations are practiced: cereals, olive trees, fruit trees, vegetable crops, which vary in terms of allocation from one delegation to another (table 1).

## Working Document

**Table 1.** Main agricultural speculations in the kef region in 2020 (in Ha)

Delegation	Cereals	Vegetables	Forages	Olive trees
The Kef Est	19830	616	2480	5439
The West Kef	10050	25	1400	3105
Dahmani	31700	01	2255	4264
Tejerouine	22960	-	3595	7895
Sers	18700	200	5049	6305
Ksour	17100	-	4100	3345
Djrisa	9170	01	1214	995
KalaatSnen	15870	-	1690	2741
KalaatKhesba	10960	-	211	1719
Nebeur	13560	1012	1690	7310
Sakiet Sidi Youssef	20050	70	4141	5033
Touiref	6950	550	1800	2660
<b>Governorate</b>	<b>196900</b>	<b>2475</b>	<b>29625</b>	<b>50810</b>

Source: ODNO, KEF 2020

Concerning animal production, the livestock sector has a strategic position in the regional economy by contributing to the coverage of 70% of the governorate's needs in meat and milk products. Three major animal speculations are developed in the governorate: ruminant breeding (sheep, goats, and cattle), poultry breeding and beekeeping (Table 2).

**Table 2.** Main livestock production in the kef region in 2020 (in Ha)

Delegation	Ovine (Female producer)	Bovine		Goats (Female producers)	Beekeeping		Poultry (Thousand units)
		Local and crossbreed	Pure Race		Traditional Hives	Modern hives	
The Kef Est	45000	1600	150	5600	04	326	
The West Kef	19500	157	322	2330	10	580	75
Dahmani	35000	367	432	3000	27	725	-
Tejerouine	32350	132	234	3255	47	1395	-
Sers	42615	474	531	3418	-	200	-
Ksour	41500	500	195	1900	30	440	-
Djrisa	9000	45	14	1800	22	132	-
KalaatSnen	49885	120	94	12460	426	445	-
KalaatKhesba	9000	01	09	1500	30	560	18
Nebeur	20530	992	112	2505	58	1437	-
Sakiet Sidi	24600	360	-	5060	20	654	-
Touiref	16100	355	250	715	20	654	-
<b>Governorate</b>	<b>34508</b>	<b>5103</b>	<b>470</b>	<b>43543</b>	<b>674</b>	<b>7684</b>	<b>93</b>

Source: ODNO, KEF 2020

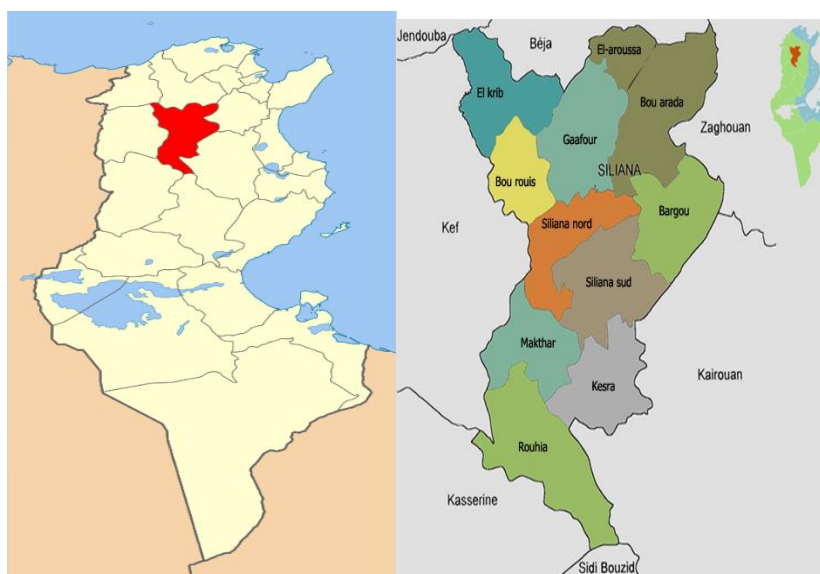


## Working Document

### 1.2. General characteristics on Siliana governorate

The governorate of Siliana is in the region of the upper Tell of the north-west of Tunisia (Figure 2). It is bounded by 7 governorates (Beja, Jendouba, Kef, Sidi Bouzid, Kasserine, Kairouan and Zaghouan), making it an area of passage between the North-West and the center of the country.

Siliana covers a total area of 4,642 km<sup>2</sup>, representing 2.8% of the country's surface area and 28% of the total area of the North-West region. Its population is 223,087, among them 57% are rural. The agricultural labor force represents 27.2% of the total labor force (INS, 2014).



**Figure 2.** Location of Siliana Governorate (CRDA, 2020)

The governorate is characterized by a continental climate distinguished by fluctuating temperatures and frequent winds with an average annual rainfall of 500 mm in the heights and 300 mm in the plains. There is a large cereal plantation in the north of the governorate while in the center and south there are small trees, cereal or fodder farms based mainly on mountain farming and extensive livestock farming. Five main plant speculations are practiced: cereals, olive growing, fruit trees, fodder, and vegetable crops, which vary in terms of allocation from one delegation to another (Table 3). The irrigated perimeters in the governorate of Siliana cover a total area of 18707ha, including 61% of public irrigated perimeters and 39% of private irrigated perimeters (CRDA Siliana, ODNO, 2020).

## Working Document

**Table 3.** Main agricultural speculation in Siliana region in 2020 (in Ha)

Source: CRDA Siliana, ODNO, 2020

Delegation	Cereals	Olive trees	Arboriculture	Forages	Leguminous	Vegetables	Total
<b>Siliana Nord</b>	16350	5673	315	5600	225	210	<b>28373</b>
<b>South Siliana</b>	18450	8295	713	6000	358	200	<b>34016</b>
<b>Bouarada</b>	13000	10606	170	3650	300	200	<b>27926</b>
<b>Gaafour</b>	14600	9164	473	5400	580	290	<b>30507</b>
<b>Lâroussa</b>	16800	5508	684	5700	363	330	<b>29385</b>
<b>El Krib</b>	12250	4918	625	5400	292	240	<b>26425</b>
<b>Bourouis</b>	12450	9850	401	4700	550	225	<b>28176</b>
<b>Makthar</b>	13650	6545	1161	1750	60	80	<b>23246</b>
<b>Bargou</b>	14000	6756	731	6000	137	220	<b>27844</b>
<b>Kesra</b>	8000	7259	866	1050	5	60	<b>17240</b>
<b>Rouhia</b>	20300	6790	2025	550	20	160	<b>29845</b>
<b>Governorate</b>	<b>159850</b>	<b>81369</b>	<b>8164</b>	<b>45800</b>	<b>5590</b>	<b>2215</b>	<b>302983</b>

Livestock farming plays a strategic role in the regional economy by helping to meet the governorate's needs for meat and milk products. Two major animal speculations are developed in the governorate: ruminants (sheep, goats, and cattle) and beekeeping (table 4).

**Table 4.** Main livestock production in Siliana region in 2020 (in Ha)

Delegation	Ovine (Female producer)	Bovine		Goats (Female producer)	Goats (Female Unit)	Beehives	
		Local and crossbreed	Pure Race			Modern	Traditional
<b>South</b>	22940	1190	740	2680	2680	650	35
<b>Siliana Nord</b>	21830	200	1080	2340	2340	850	40
<b>Bouarada</b>	28350	750	500	1040	1040	1800	28
<b>Gaâfour</b>	24300	646	162	345	345	1600	20
<b>Krib</b>	24290	2050	2300	2340	2340	900	30
<b>Bourouis</b>	27350	1690	530	895	895	1300	40
<b>Makthar</b>	34005	1600	460	2895	2895	1700	170
<b>Kesra</b>	28360	257	175	5660	5660	2300	120
<b>Rouhia</b>	48590	722	531	16695	16695	200	300
<b>Laâroussa</b>	15350	390	185	1450	1450	2400	45
<b>Bargou</b>	24635	695	507	3660	3660	2500	50
<b>Governorate</b>	<b>300000</b>	<b>11990</b>	<b>7170</b>	<b>40000</b>	<b>40000</b>	<b>18000</b>	<b>878</b>

Source: CRDA Siliana, ODNO, 2020



## Working Document

## 2. Value chain selection at the living labs level

### 2.1. Context and objective

The first activity of WP3 of the CGIAR initiative "Transformational Agroecology across Food, Land, and Water Systems" consists in selecting and validating value chains with high economic, social, and environmental potential, by living lab/study area.

### 2.2. Methodology

One field visit-community visioning took place on October 5th, 2022, in El Kef and three focus group discussions at the three components of the living lab in Seliana (SMSA 'Ankoud El Khir', SMSA ETTAWEN, SMSA Kouzira) were organized on November 1st, 2nd and 3rd, 2022 to identify the main value chains with agroecological character. The selection of the value chains by the members of the living lab was done according to a global evaluation matrix prioritizing the value chains based on a set of predefined criteria (economic, social, and environmental) of impact and feasibility.

The characteristics of the living lab are presented in table 5.

**Table 5.** Characteristics of the living lab in the study areas

Living lab's Farmer associations	Location	Creation date	Members	Agricultural activities
<b>SERS Rural women (GDA)</b>	Sers, Kef	2015	6 members 55 adherents	Livestock: small ruminant farmers (with less than 20 sheep and goats) represent 20% of the members, farmers with between 20 and 35 head represent 60% and 20% are large farmers. Cattle farmers with less than 8 cows represent 60% of the members, more than 35% have between 8 and 15 cows and less than 5% of the members have more than 15 cows Cereal crops: the average size of members' farms is between 2 and 2.5 ha in irrigated areas and/or 3 ha in rainfed areas. All have less than 10 ha. Some of them rent land. -Beekeeping, poultry, saffron and vegetable production
<b>Kouzira (SMSA)</b>	Kesra, Siliana	2020	117 members 126 beneficiaries	Arboriculture: fig trees, olive trees, cherry trees. The olive trees are planted in collective lands. Beekeeping activity Cereals: most members own between 0.5 and 5 ha (diversified family farming). 20% of the members have more than 5ha; all have access to irrigation (natural source in the village) less than 5% have more than 200ha (irrigated)

## Working Document

<b>Ettawen (SMSA)</b>	Chouarnia-Makther, Siliana	2017	129 members 500 beneficiaries	Arable crops: wheat and barley Livestock: fattening and lamb breeding (cattle and small ruminants) on average 80% of the members have between 20 and 50 heads of small ruminants and about 4 cows Olive trees: (an average of 150 tree per farmer). 80% of the members own or rent less than 20ha (rainfed), 15% of the members own more than 20ha (rainfed) of which 5% have more than 200ha (irrigated)
<b>Ankoud El Khir (SMSA)</b>	Rhahla–Gaafour, Siliana	2022	30 members 100 beneficiaries	50% of the members have a minimum of 5 or 6 ha (rainfed). Others have between 15 and 20 ha (rainfed). Livestock: only 5 members have between 1 and 3 cows. More than 50% of the members are small ruminant breeders (average of 50 animals) Cereal crops: wheat Olive trees: between 100 and 400 trees for each member

### 2.3. Results

#### Arguments for choosing the value chains

The results of the focus group discussions conducted at the living lab level based on the economic, social, and environmental aspects have revealed that the main value chains selected are cereal, olive oil and sheep meat for all the living labs. Honey VC and Fig tree VC were also chosen by the SMSA Kesra “Kouzira” (Table 6). In terms of value added, olive oil VC and Honey VC have great opportunities to valorise specific and local products especially in Siliana. Sheep meat VC allows the small breeders of all living labs to have a regular income by selling the lambs throughout the year. It is an activity anchored in the traditions of the region and with important social values (meat lamb consumed in the periods of celebration).

## Working Document

**Table 6.** Main value chain selected at the living lab level according to the importance of economic, social, and environmental aspects.

		Cereal VC	Olive oil VC	Sheep meat VC	Fig tree VC	Honey VC
<b>SERS Rural women (GDS)</b>	Economic aspect	Selling to cereal office Use of straw for animal feed	Regular income By-products valorisation Interesting selling price	Sources of revenues Production cost suitable for breeders		
	Social aspect	Social value (family cohesion)	Traditional activity Family cohesion	Family work force (know-how inherited between generations)		
	Environmental aspect	Rainfall crop	Use of the by-products For feed animal Soil fixation	Organic fertilizer		
<b>Kouzira (SMSA)</b>	Economic aspect	Large area Selling to cereal office	Small area Collective land	Opportunities to invest Crop-livestock integration	Added value Attractive market Opportunities to invest By-products valorisation	Added value Attractive market Opportunities to invest By-products valorisation
	Social aspect	Nutritional value Women participation Strategic crop	Family labour Nutritional value Creation jobs	Family labour Farmer to farmer exchange Celebration events	Adapted to the farm system	Healthy product Self-medication Family labour
	Environmental aspect	Adapted to the region climate (rainfall)	Soil fixation Use of olive by-products	Manure	Adapted to region climate	Pollination Improve biodiversity
<b>Ettawen (SMSA)</b>	Economic aspect	Selling to cereal office	Attractive price Opportunities to invest	Stable earning		
	Social aspect	Valorisation of cereal products	Health and nutritive product	Farmer to farmer exchange		



## Working Document

		(traditional products: couscous, pasta, etc.)		Social value of sheep meat Lamb of Aïd		
	Environmental aspect	Adapted to climate region	To avoid erosion Recycle by-products	Organic manure		
<b>Ankou d El Khir (SMSA)</b>	Economic aspect	Selling to cereal office	High added value	interesting selling price in the Aid period Varied marketing channel		
	Social aspect	Social value (harvest)	Traditional and healthy product	Social values of sheep meat (celebration events)		
	Environmental aspect	Rainfall crop	Soil fixation Resilient crop	Organic manure		

Source: Focus group discussions, 2022

### Agroecological assessment

Different agroecological practices such as rotation, crop diversification, forage association, inputs reduction, recycling, etc., are revealed by the farmers interviewed during the focus group discussion at the living labs (table7). Several agroecological practices have been introduced by ICRADA in the farmers' production system through research projects such as the CLCA project.

**Table 7.** Agroecological practices revealed by the farmers of living labs

Agroecological practices	
Cereal VC	Rotation, conservation agriculture, crop diversification, permanent crop, fallow land
Olive tree VC	Inputs reduction, manure, recycling by-products, The benches
Sheep VC	Forage association ((Triticale + barley + oats), water save, manure, fallow land
Fig tree VC	Traditional product "Chriha"
Honey VC	Traditional beehive "Jebih" Improve biodiversity (planting sulla and acacia)

Source: Focus group discussions, 2022

The 13 agroecological principles applied to the five value chains selected by the members of living labs are presented in Table 8.

## Working Document

**Table 8.** Agroecology principles applied to the main VC at the living labs

Principles	Selected value chains (cereal, olive tree, sheep, fig tree, honey)
<b>1. Recycling</b> Does your organization engage or promote the recycling of inputs or outputs within the company and with your partners?	Recycling opportunities in the olive value chain (leaves, trunks, etc.) Recycling wool Wax recycling
<b>2. Input reduction/replacement</b> Does your organization engage or promote the reduction or elimination/replacement of purchased inputs for agricultural production?	Water saves in the sheep value chain Inputs reduction in the olive value chain Decrease/ stop the use of pesticides
<b>3. Soil health</b> Does your organization engage or promote the management of organic matter and soil biological activity?	Conservation agriculture, rotation Crop diversification, manure, Olive plantations help floor fixing, Planting sulla and acacia, forage association
<b>4. Animal health</b> Does your organization ensure animal health and welfare?	Certified inseminator, vaccination, aeration, and hygiene of stable, traditional practices,
<b>5. Biodiversity</b> Does your organization maintain and enhances the diversity of species, functional diversity and/or genetic resources?	Genetic potential in the olive crops, planting acacia and Sulla, pollination (honey VC), intercropping
<b>6. Synergy</b> Does your organization enhance positive ecological interactions and complementary in the agroecosystems? (Animals, crops, trees, soils, and water).	Integration crop-livestock (sheep VC) Recycling olive byproducts to feed animal Planting sulla and acacia to improve the agro ecosystem (Honey value chain)
<b>7. Economic diversification</b> Does your organization promote productive and income diversification on farms?	Diversified agricultural activities Different use of the product (olive oil, Honey) Different use of the by-products (cereal, olive oil, honey)
<b>8. Co-creation of knowledge</b> Does your organization enhance co-creation and sharing of knowledge? (Local, scientific innovation, farmer to farmer exchange)	Exchange of olive varieties between farmers Farmer to farmer exchange at the community level Sharing of knowledge between the members of association
<b>9. Social values and diets</b> Does your organization contribute to building healthy, diversified and culturally appropriate diets,	Traditional and social product (lamb meat) Local product (Fig tree) Creation of a label (olive oil)

## Working Document

based on identity, tradition, social and gender equity of local communities?	High nutritional value (olive oil and honey) Healthy product (olive oil and honey)
<b>10. Fairness</b> Does your organization support dignify and robust livelihoods for all actors in the food system (trade, employment, intellectual property rights, transparency)?	Beekeeping and olive oil guarantee a decent income Beekeepers, olive oil producers and breeders have a suitable social place in the community Solidarity and respect between producers and consumers (Olive oil VC and Honey VC)
<b>11. Connectivity</b> Does your organization ensure proximity and confidence between producers and consumers?	Proximity and confidence between producers and consumers (Honey and Fig tree VC)
<b>12. Land and natural resource governance</b> Does your organization strengthen institutional arrangements to include the recognition of farmers as managers of natural and genetic resources?	Positive influence of SMSA on the biodiversity (planting sulla and acacia) Conservation of local varieties (olive oil VC) Conservation of local breeds (sheep VC)
<b>13. Participation</b> Does your organization encourage participation in decision making, decentralized governance and or local management of food systems?	No participation (sheep VC) Participation in the decision making for the management of Kesra mountain (Honey VC)

Source: Focus group discussions, 2022

## 3. Value chain selection through participatory approach

### 3.1. Context and objective

Two workshops on value chain identification, prioritization and actors mapping took place on December 8<sup>th</sup> and 15<sup>th</sup>, 2022 in Siliana and el Kef (North-West Tunisia) as part of the project “Transformational Agroecology across Food, Land, and Water systems” and more specifically of work package 3 “Inclusive business models and financing strategies”. These workshops were simultaneously organized by ICARDA and INRAT.

The objective of these workshops is the identification and selection of agroecological value chains in the study area following a participatory approach with all relevant stakeholders. The aim is the co-creation of a common value chain vision with an identification of the main stakeholders and the linkages between the different steps of the value chain. As part of the objective of the workshops, participants were tasked to identify strengths, weaknesses, threats, and opportunities for the selected value chains after the first roundtable with all the stakeholders.



## Working Document

### 3.2. Methodology

The methodology adopted in the workshops is as follows:

1. Presentation of the project “Transformational Agroecology across Food, Land, and Water systems”.
2. Presentation of the results on the identification and selection of agroecological value chains obtained at the level of the living lab.

3. Organization of a plenary session for the choice of two value chains with a strong potential for integrating the principles of agroecology among the potential value chains in the study region (Sheep, cereal, honey, olive oil and figs). In this context, two questions were asked:

(1) Based on the economic, environmental, and social criteria which value chain is the most suitable for the region?

(2) Among the value chains chosen by all the stakeholders present in the workshop, what are the two main value chains with a strong potential for integrating the principles of agroecology?

In this session, flash cards were distributed to the participants to write their arguments towards the choice of the value chain based on economic, social, and environmental criteria. After selecting the most cited value chain, the participants present in the session were given the instruction to choose only two value chains with a strong potential for integrating the principles of agroecology.

4. Organization of two working sessions in parallel on the two selected value chains in which participants must characterize and analyze the different stages of the chain, map the value chain, identify opportunities and threats, and assess the agroecological principles.

The invited stakeholders came from different backgrounds, farmers attended but also private sector and public institutions such as OEP, CRDA, ONH, GiFruit, etc., were present.

### 3.3. Results from the participatory approach

#### Arguments for choosing the value chains

Based on the results obtained in the living lab in Siliana and in El Kef and on the literature review on national statistics, six value chains were selected for these regions. These latter are Olive oil VC, Sheep VC, Honey VC, Cereal VC, Fig tree VC and Medicinal and aromatic plants VC.

In the plenary sessions, the attendants were asked to choose among these value chains which one were the most adapted to the region based on economic, social, and environmental criteria and two VC were chosen: **The olive oil and sheep** in Kef and **the olive oil and honey** in Siliana (Table 9).

The “olive oil value chain” was the most requested by the participants for economic, social, and environmental criteria in both workshops. In economic terms, the olive oil value chain presents important opportunities especially in terms of creation of added value and valorization of olive oil through quality. Olive is spread over a large area in Siliana and El Kef and is in constant expansion compared to cereal growing. The olive oil market is expanding due to the increase in local and international demand and the attractive price of olive oil. Regarding the social aspect, olive oil is a noble product, symbolic for consumers and farmers. Olive oil strengthens the cohesion between family members, especially during the harvest (holiday period) and offers employment opportunities in the region at the various levels (production, harvesting, processing, marketing). The region of Siliana and Kef also has a high technicality of farmers in the production of olive trees. At the environmental level, olive growing is a resilient crop that adapts well to climate change using less inputs, energy, water and is non-polluting. This crop contributes to the balance of the ecosystem in the study areas. In terms of recycling, olive oil is an agroecological crop that values the by-products such as olive margine, leaves and trunks of the olive tree.

## Working Document

**Table 9.** Main reasons for value chains selection in the study area

	<i>Olive oil VC</i>	<i>Sheep VC</i>	<i>Honey VC</i>	<i>Cereal VC</i>	<i>Fig tree VC</i>	<i>Medicinal and aromatic plants VC</i>
<i>Location</i>	<i>Siliana and Kef</i>	<i>Kef</i>	<i>Siliana and Kef</i>	<i>Siliana and Kef</i>	<i>Siliana</i>	<i>Kef</i>
<b><i>Economic aspects</i></b>	<ul style="list-style-type: none"> <li>-Low production costs compared to other crops</li> <li>-High potential to increase small farmers' incomes</li> <li>-Olive tree area is increasing compared to cereals</li> <li>-Attractive price of olive oil at national and international level</li> <li>-Opportunities for product valorization (label)</li> <li>-High-quality product</li> <li>-Increasing demand for olive oil</li> <li>-Large area of olive trees</li> <li>-Strategic product in the national and international levels</li> <li>-High olive tree productivity (internationally and locally)</li> <li>-Different olive oil use (food, cosmetic, wood objects, etc.)</li> <li>-High revenues from smallholders especially for women</li> </ul>	<ul style="list-style-type: none"> <li>-Opportunities for job creation (shepherd)</li> <li>-Improve farmers income</li> <li>-Valorization of by-products (wool, leather)</li> <li>-Sources of revenues for a lot of households</li> <li>-Reduce animal feed (Integration crop-livestock)</li> <li>-High breeding rate (know-how of women)</li> <li>-High consumers demand all year long</li> <li>-Production cost suitable for breeders</li> </ul>	<ul style="list-style-type: none"> <li>-High value added</li> <li>Increase household income</li> <li>-Expanding market</li> <li>Opportunities for product valorization (label)</li> <li>-High productivity of honey</li> <li>-High consumer demand</li> <li>-Opportunities to sell in international and national market</li> <li>-Important source of revenues</li> <li>-Low production cost</li> <li>-Different uses of honey (cosmetics, medicines)</li> </ul>	<ul style="list-style-type: none"> <li>-Large area of cereal</li> <li>-Potentialities to increase yield and income by adopting innovative technologies</li> <li>-Revenues are guaranteed because the cereal office is the buyer</li> <li>-Strategic crop</li> <li>-Large area of barley crop (integration crop-livestock)</li> <li>-Valorization of cereal products (traditional products: couscous, pasta, etc.)</li> <li>-Contributes to food security</li> <li>-Use of straw as animal feed</li> </ul>	<ul style="list-style-type: none"> <li>-Increase annual income of farmers</li> </ul>	<ul style="list-style-type: none"> <li>-High value added of this activity</li> <li>-Valorization of natural resources</li> <li>-High consumer demand</li> <li>-Low production cost</li> <li>-Products diversification</li> <li>-Regular production</li> <li>-High income</li> </ul>
<b><i>Social aspects</i></b>	<ul style="list-style-type: none"> <li>-High level of farmer's technicity</li> <li>-Experience of farmers</li> <li>-Noble tree</li> <li>-Increase family cohesion (family labor)</li> <li>-Jobs creation especially for women during harvest season.</li> <li>-Improve farmer's income</li> <li>-Collaboration with all stakeholders in the value chain</li> <li>-Reduce rural migration</li> <li>-Family cohesion during the harvest season</li> </ul>	<ul style="list-style-type: none"> <li>-Encouraging the sheep activity among the young farmers</li> <li>-Jobs creation</li> <li>-Improve family well-being (improve HH revenues)</li> <li>-Social values related to sheep breeding in the region</li> <li>-High technical skills of local breeders</li> <li>-Contribution of all the family members in</li> </ul>	<ul style="list-style-type: none"> <li>-Noble product</li> <li>-Farmers are gathered in associations (diffusion of know-how and technologies)</li> <li>-Opportunities for job creation</li> <li>-Healthy product (children, old persons)</li> <li>-Social values of honey</li> <li>-Improve beekeepers' well-being</li> <li>-Less time consuming</li> </ul>	<ul style="list-style-type: none"> <li>-Cereal-based diets (rich in proteins)</li> <li>-Valorization of products at household level: traditional food products (couscous, semolina, etc.)</li> <li>-Jobs creation especially for women</li> <li>-Valorization of local varieties</li> <li>-Production of local products</li> </ul>	<ul style="list-style-type: none"> <li>-Farmers are gathered in associations</li> </ul>	<ul style="list-style-type: none"> <li>-Jobs creation for mountain inhabitants</li> <li>-Reduce rural migration</li> <li>-Women job creation</li> <li>-Improve family livelihoods</li> </ul>

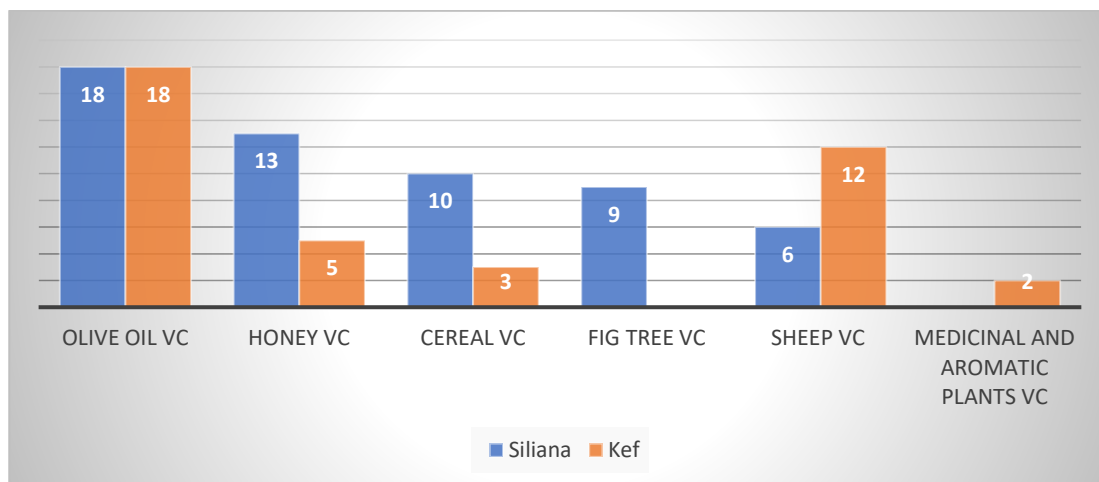
## Working Document

	<ul style="list-style-type: none"> <li>-Social values related to the cultivation of olive trees</li> <li>-Local diets</li> <li>-Olive crop is part of the heritage</li> </ul>	<ul style="list-style-type: none"> <li>sheep breeding activity</li> <li>-Noble product</li> <li>-Main product during celebrations (Aid, weddings, etc.)</li> <li>-Family work force (know-how inherited between generations)</li> <li>-Sharing knowledge between breeders</li> <li>-Reduce rural migration</li> <li>-Provide income for women through wool sales</li> </ul>	<ul style="list-style-type: none"> <li>compared to other agricultural activities</li> <li>-Enhance trusting relationship between producers and consumers</li> </ul>			
<b>Environmental aspects</b>	<ul style="list-style-type: none"> <li>-A resilient crop</li> <li>-Minimal use of energy</li> <li>-Non-polluting crop</li> <li>-Contributes to a balanced ecosystem</li> <li>-Water-saving cultivation</li> <li>-Favorable climate for olive trees cultivation</li> <li>-Adaptation to climate change (local varieties)</li> <li>-Valorization of by-products (margin, leaves and wood for animal feed, wood charcoal, soap)</li> <li>-Conservation of local olive varieties (Chetoui)</li> <li>-Reduced use of pesticides and fertilizers</li> <li>-Reduce the greenhouse effect</li> <li>-Soil fixation (olive trees plantation is a mean to avoid erosion)</li> </ul>	<ul style="list-style-type: none"> <li>-Integration crop-livestock</li> <li>-Organic fertilizer</li> <li>-Adaptation to environment</li> <li>-Less water demanding</li> <li>-Compost valorization</li> <li>-Improve soil fertility</li> <li>-Sheep adapted to climate change</li> </ul>	<ul style="list-style-type: none"> <li>-Fruit tree pollination</li> <li>-Conserve biodiversity by tree planting (acacia, etc.)</li> <li>-Improve biodiversity</li> <li>-Balanced ecosystem</li> <li>-Non-polluting activity</li> </ul>	<ul style="list-style-type: none"> <li>-Decrease of the use of pesticides by integrating innovative technologies (local varieties)</li> <li>-Use of innovative technologies to conserve soil erosion</li> </ul>	<ul style="list-style-type: none"> <li>-Soil conservation</li> <li>Water - conservation (use of water-saving methods)</li> <li>-Improve biodiversity</li> </ul>	<ul style="list-style-type: none"> <li>-Erosion control</li> <li>-Soil conservation</li> <li>-Pests and diseases control</li> <li>-Agro ecological products (natural cosmetic products, organic herbal tea, etc.)</li> <li>-Use of by-products as a compost</li> <li>-Biodiversity conservation (forest conservation)</li> </ul>
<b>Other aspects</b>	<ul style="list-style-type: none"> <li>-Genetic material conservation</li> <li>-Valorization of olive tree by-products (margin, tree leaves, tree trunks, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>-Promoting forage association</li> <li>-Straw valorization</li> </ul>				



## Working Document

Among 33 and 30 participants respectively in Kef and Siliana, 18 have chosen olive oil value chain in both locations as the best value chain with high potentialities to integrate agroecology principles (Figure 3).



**Figure 3.** Frequency of respondents for the selection of VC in both locations

Selected value chains mapping, SWOT analysis

- Honey value chain analysis in Siliana (Kesra)

Beekeeping is an interesting activity in the area, particularly for the inhabitants in the forest region. The number of beehives in the sectors of Kesra, Hammam and Bouabdellah is 1140, 98% of which are modern. There is also an organic bee farm in the sector of El Garia Nord. The sector of Kesra is particularly interesting for its melliferous production from the numerous almond and cherry trees that are planted there.

The key information related to honey VC at Kesra location are:

- ☐ Number of beekeepers in the delegation of Kesra: 121
- ☐ Quantity of honey produced in the delegation of Kesra: 18000 kg at a rate of 9kg/hive/year
- ☐ Quantity of honey produced in the sector of Kesra: 2400 kg
- ☐ Quantity sold by the producers of the sector of Kesra: 2160 kg
- ☐ The production cost of a hive is 150 TND/year
- ☐ The wholesale price of honey is 70 TND/kg at the SMSA

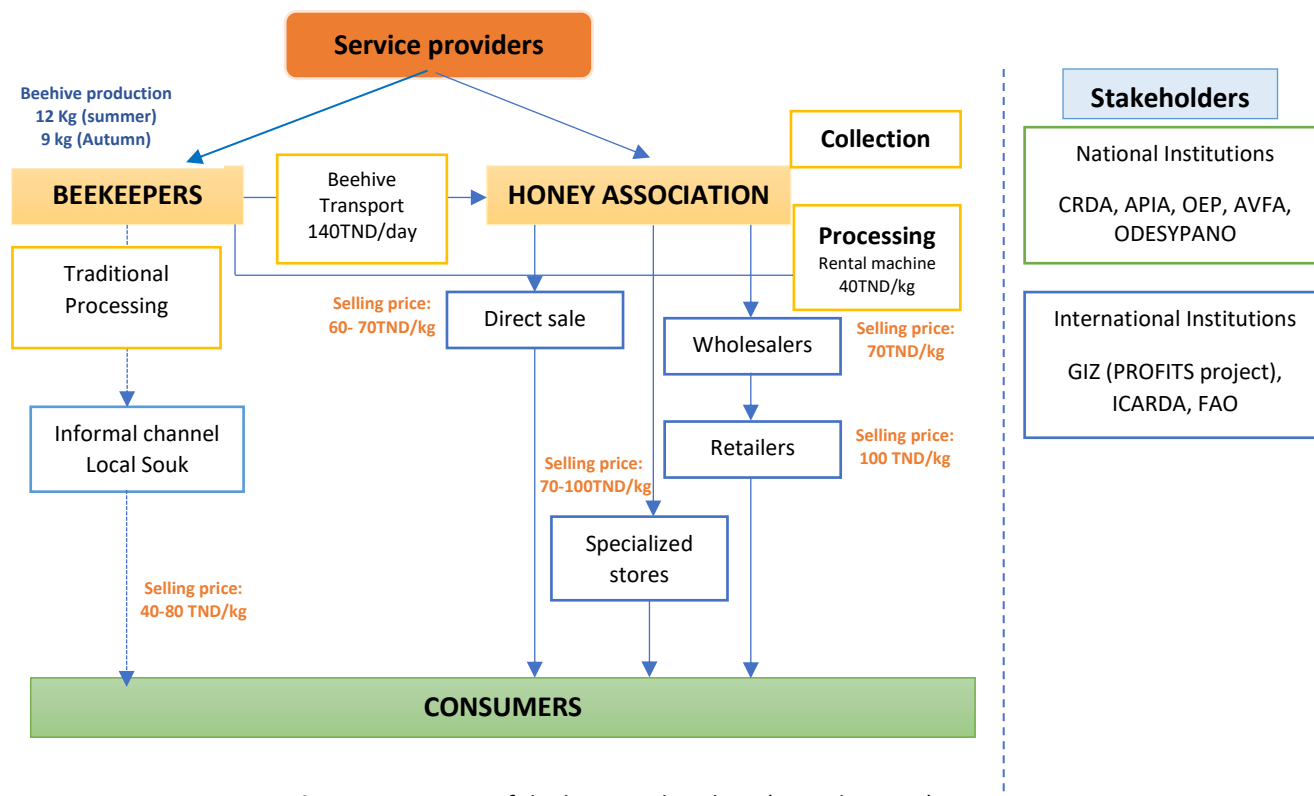
The main national institutions involved in the honey value chain are the extension service (AVFA), the regional commissariat to the agricultural development (CRDA), the national office of olive oil (ONH), the Office of Livestock and Pasture (OEP), Northwest development Sylvo-Pastoral Office (ODESYANO) and the Agency for the Promotion of Agricultural Investments (APIA).

The sales circuit for beekeeping products is based essentially on the local market through direct sales in one kg glass bottles purchased on the market and with a price of at least 40 TND/kg.

The honey market is attractive and expanding, especially as Kesra is a mountainous zone which offers a specific taste and a good quantity of honey. Considering the characteristics of the area and the presence of the SMSA with its developed network, selling the product should not be a concern for the

## Working Document

farmers. Nevertheless, the SMSA would like to establish contractual relationships with specialized sellers such as modern food distribution or exporters (Figure 4).



**Figure 4.** Mapping of the honey value chain (Kesra location)

### ✓ SWOT analysis for the honey value chain

Honey VC has more opportunities than weaknesses. Indeed, in Siliana, beekeepers are highly invested in this practice through equipment, tradition, and know-how. Being in farmers' associations, help them to share knowledge and information. Besides, beekeeping has positive environmental effects, and it helps in agricultural production through pollination.

Concerning the weaknesses, this activity suffers from a lack of specialized means of transport for the beehives, the lack of laboratory analysis and the unavailability and inaccessibility of input materials (such as packaging).

When it comes to the opportunities, this value chain has an easy access to the local market, there is a high demand from consumers, a lot of by-products are made such as wax, pollen, royal jelly, the market is also in constant expansion and finally honey can be stored for a long time without damage. Concerning the threats, respondents cited the fragileness of the ecosystem with low rainfalls but also a fierce competition with cheaper honey available in the market and honey fraud.

#### ▪ Sheep meat value chain analysis in Kef

The core functions of the sheep value chain in Kef include input supply, production (farmers, breeders, and fatteners), intermediaries, processing (butchers, abattoirs), marketing (market access and

## Working Document

channels) and consumption. All these functions are coordinated by regulatory actors especially OEP, GIVLAIT and CRDA (Figure 5)

Intermediaries are an important player in the value chain to the extent that they can intervene at various links and capture a significant margin. Two types of intermediaries are identified:

The permanent intermediaries who practice this activity throughout the year and are specialized in the purchase and marketing of sheep products between regional markets and the markets of major cities,

Occasional intermediaries who practice this activity only in the period of Eid el Idha and have also other professional activities (agriculture, trade, etc.).

The sheep production in Kef has several marketing channels which link production to final consumption through several stakeholders (Figure 5). The number and type of actors vary from one distribution channel to another. There are long channels and short channels, it depends on the selling season and the type of product sold (lamb in the period of Eid or chopped meat). A single stakeholder can play different roles; he can be breeder, butcher, and intermediary. The calculation of the profit margin is difficult because the product can go through several agents before reaching the final consumer. The main marketing channels identified are:

- **Sheep purchased by individual consumers:** This marketing channel is the shortest since consumers may buy their sheep at the period of Eid El Idha or festive occasions at the farm. Sheep producers are breeders, breeders-fatteners, or fatteners; they can sell their lambs at the time of Eid in the different markets in the region.
- **Sheep slaughtered at butcheries:** This marketing channel is longer than the first since the butcher sells chopped meat. Butchers buy in most of the cases carcasses of animals which does not exceed 20kg. The butchers have several options. They can buy from small farmers who sell their animals several times a year to earn money and/or from intermediaries to fatten lamb during two or three months and/or they buy carcasses at the slaughterhouse of Kef and/or at the sheep market in kef governorate.
- **Sheep transported to markets:** Major cities are supplied with sheep from Bahra community in two ways: At the time of Eid, breeders from the community of Bahra sell their lambs in the markets of major cities and their products are highly demanded. The market of Tunis is the most important for breeders from Kef because sheep price is very interesting. Outside the period of Eid El Idha, sheep from Kef are transported to slaughterhouses of big cities and they are also highly demanded. Butchers can at the time of Eid become intermediaries and sell lambs on the markets of major cities together with their family members. Restaurants and hotels can contract with the butchers in the region for regular delivery in sheep meat.
- **Sheep purchased by other farmers:** Farmers buy sheep to increase the number of heads or for replacement. Prices vary depending on sheep breed.



## Working Document

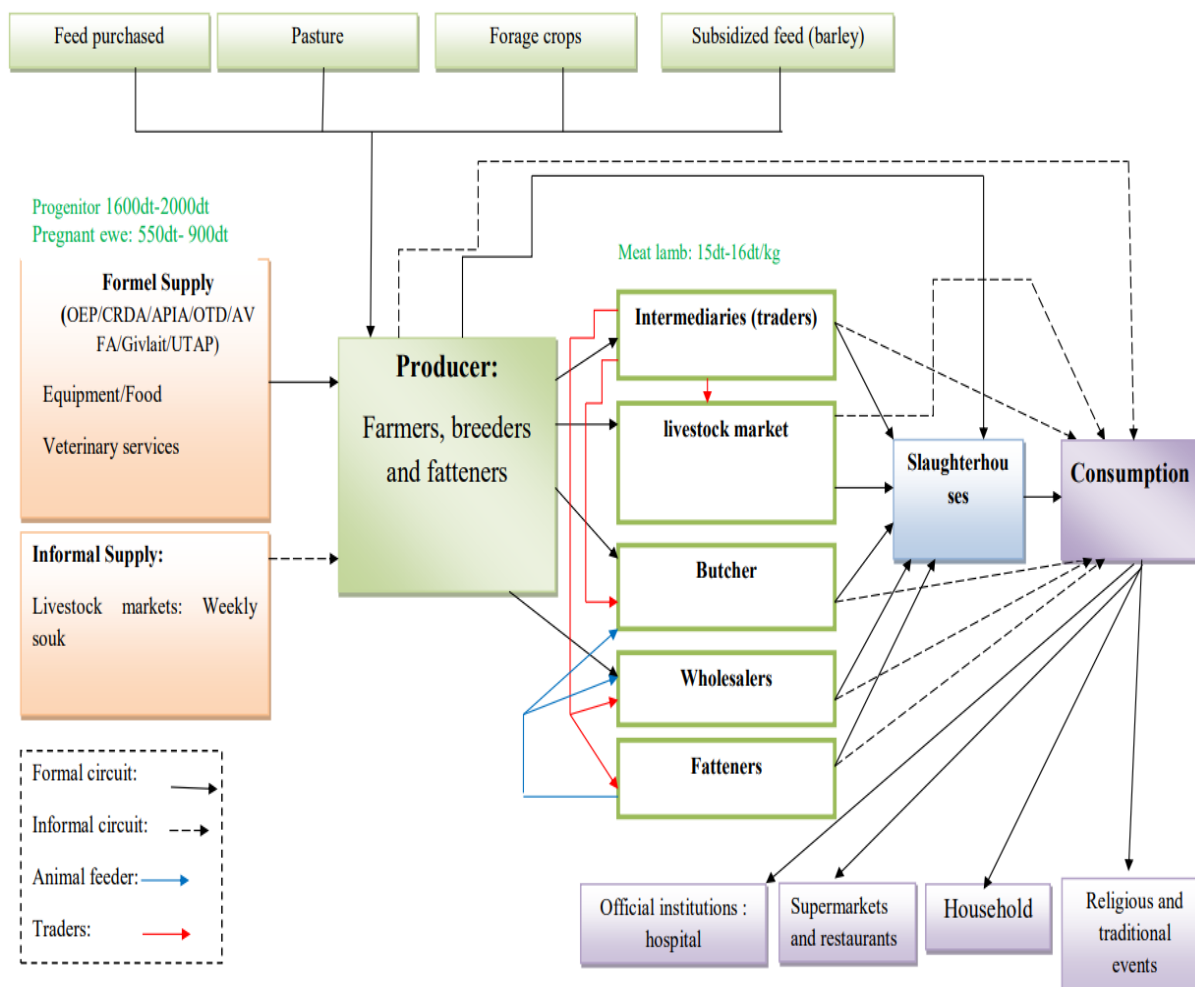


Figure 5. Main features of the sheep value chain in Kef

### ✓ SWOT analysis for the sheep meat value chain

Sheep value chain in the region of El Kef has strengths, they concern the fact that this activity is embedded in the habits of the breeders, it has low production costs; sheep are not sensitive to the diseases; there is always a high consumer demand; it provides income when needed for the breeder; there is an integration crop-livestock and a high technical skill for women.

Concerning the weaknesses, respondents in the workshop cited overgrazing; the risk of consanguinity; an unbalanced feed intake; the unavailability of feed because of the degradation of rangelands; the increase in the price of feed; the low quality of the forages; a low valorization of by-products and a low productivity.

Concerning the opportunities, there is a possibility of label creation for goat in Bahra location (meat with high conservation characteristics).

For the threats, there is a genetic erosion of local breed; an unorganized sheep value chain (added value captured by intermediaries); a negative impact of drought on pasture resources and a decapitalization in sheep herd.

## Working Document

### ■ Olive oil value chain analysis in North-West of Tunisia

The value chain analysis was conducted in a participatory manner and led to the identification of several constraints and opportunities for developing the sector.

Historically, the olive sector is one of the most ancient traditional sources of income and livelihood in Tunisia, particularly to the rural poor households. Olives provide seasonal work, giving potential for increasing the household income, it can be grown traditionally and without any advanced technology. In Siliana, the olive oil value chain is well organized, it is characterized by relatively small producers who market their produce through wholesalers or through other farmers.

The input supply concerns private nurseries for the olive tree plants and the providers of fertilizer especially for large olive plantations. In Siliana, there are 8 million olive trees planted in 88000 Ha, the production in 2022 is estimated at 28000 T. At the production level, the olive is sold at 2,5 TND/Kg to intermediaries and to other farmers coming from different regions especially from Sfax. Then the intermediaries sell the olives to the oil mills at the price of 3,5 TND/Kg and some quantities of olives go to the storehouses. Olive by-products such as margin, leaves and wood are sold in the local market. From the oil mill, the olive oil is sold at 14 TND/Kg, and it needs 4kg of olives to have one liter of olive oil.

Olive oil is sold to retailers and wholesalers who commercialize it in the local market or abroad. The exporters mainly demand bulk shipments of olive oil, packed traditionally in large containers.

In the region of el Kef, the olive oil value chain is well organized and is characterized by relatively small producers. The input supply concerns private nurseries for the olive tree plants which sell the tree at the price of 3 to 5 TND; the providers of fertilizer especially for large olive plantations; the water rented cisterns because the region suffers from a low rainfall and farmers need to rent water cisterns from privates to provide some water.

At the production level, there are 50810ha planted with olive trees with a production estimated in 2022 to 18699 T. Most of the land is planted with the variety "Chetoui", which is well adapted to the region. Pruning of olive trees cost between 2 and 6 TND/tree, tillage cost 25 to 30 TND/hour. The harvest is done traditionally in this region. The products obtained are olives, leaves for animal feed and wood.

The olives are sold between 2,5 and 3 TND/Kg at the production level. The sale of the total harvest can be done before the harvest season at the price of 25000 TND/Ha or after the harvest to intermediaries, private, oil mills or to other farmers coming from other regions.

Then the intermediaries and private sell the olives to the oil mills at the price of 3,5 TND/Kg and some quantities of olives go to the storehouses and the other to retailers. There are 12 oil mills in El kef, among them two are organic. From the oil mill, the olive oil is sold at 15 TND/Kg to local vendors and wholesalers. Olive oil is then commercialized in the local market or abroad. The exports are mainly in bulk for 95% of the exported oil.

Public institutions intervene all along the olive oil value chain in the North-West region, they can be considered as a support or service provider for the sector. These organizations concern the extension service (AVFA), the different ministries (agriculture, trade, industry), the regional commissariat to the agricultural development (CRDA), the research centers and stations, the center for the promotion of exports (CEPEX), the national office of olive oil (ONH), the olive institute. The olive oil value chain is also supported by the development projects, the financial institutions, and the private investors (Figure 6).

## Working Document

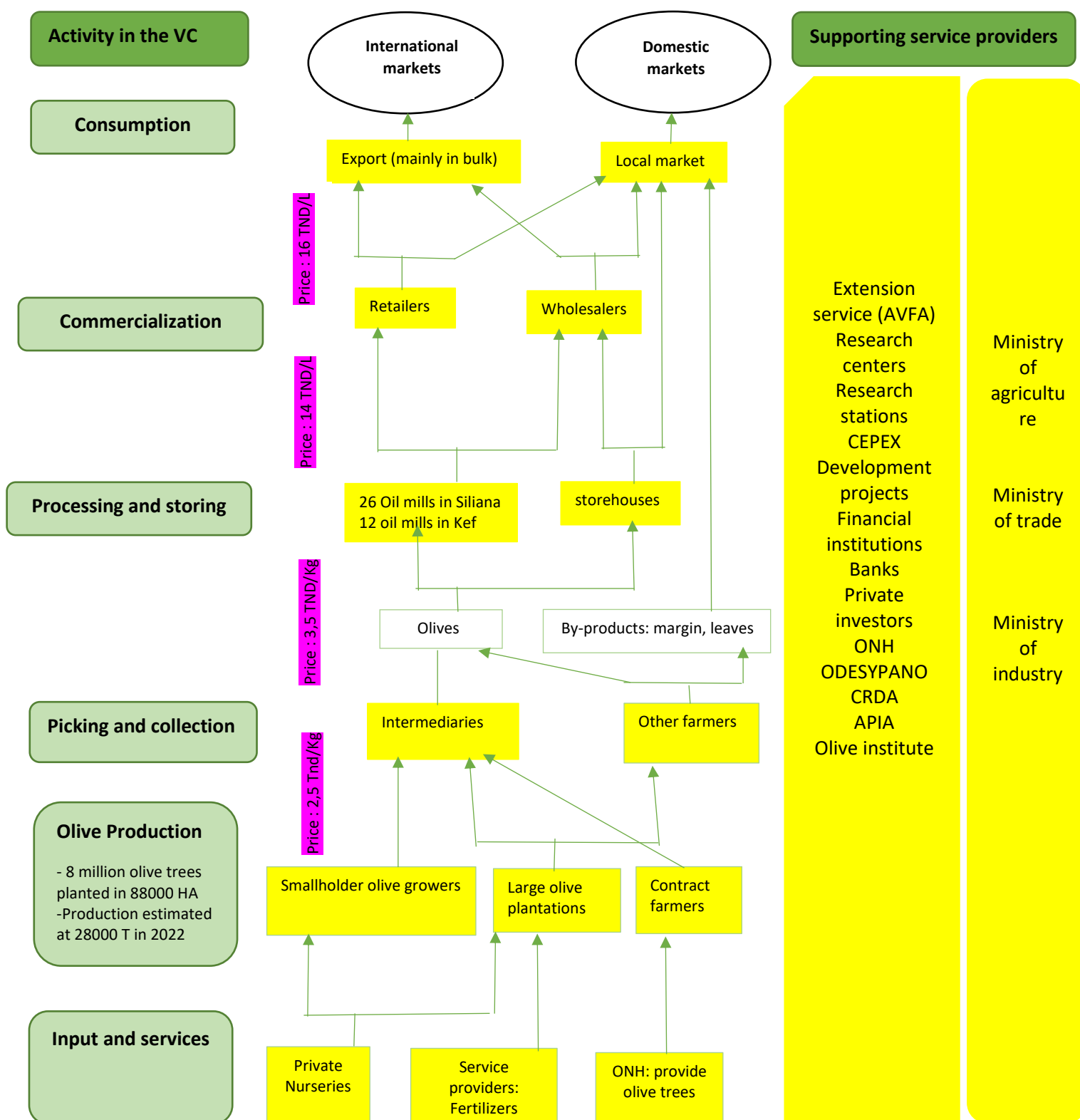


Figure 6. Main features of the Olive oil value chain in Northwest of Tunisia

✓ SWOT analysis for the olive oil value chain

## Working Document

As shown in table 9, there are a lot of strengths in the olive oil value chain, they concern the existence of several modern oil mills in the region with a distribution throughout the territory of the governorate of Siliana, the presence of autochthonous varieties (Oueslati). Besides, olive is a culture not demanding in water and adapted to the area and it is a non-perishable product.

Concerning the weaknesses, the olive tree is sensitive to the alternation which leads to a lower productivity. There is an insufficient application of the technical package with a lack of availability for the workforce during the harvest and a lack of skilled workforce labor. This sector suffers also from a low success rate of new plantations, a sensitivity to some diseases (tuberculosis) and a low valuation of by-products.

For the opportunities, olive oil value chain is a culture suitable for conversion into organic and ecological. There are different development projects involved in the promotion of this culture with a possibility of creation of a label. This speculation is adapted to changing climatic conditions, profitable and expanding because of the increase of the demand for olive oil, especially on a global scale.

Finally, for the threats, there is an absence of an organized market for olives, an absence of valorization of oils from the area (packaging, brand) and a possible degradation in the ecosystem due to a bad management of the olive water (margine). There is also an insufficient professional organization, a limited funding by the Government and a large part of the production is processed outside the governorate.

In the region of El Kef, the strengths of the olive oil value chain are related primarily to the local variety of olives “Chetoui” which concerns 80% of the total orchards. It is a well-adapted type of olives to the regional climate and soils. Secondly, olive oil VC is a source of income for farmers, it also provides jobs especially during harvest season. Thirdly, olive oil VC can integrate agroecological principles and it is also possible to valorize by-products (leaves for animal feed, margins, wood).

The olive oil VC suffers also from some weaknesses. They concern the lack of skilled olive growers and oil millers; an insufficient application of the technical package; the lack of availability for the workforce during the harvest and the lack of skilled workforce labor; the lack of olive oil valorization because it is commercialized in bulk without packaging; the lack of quality control of olive oil and finally the lack of farmer’s associations.

For the opportunities, olive oil value chain is a culture suitable for the region and is adapted to local climatic conditions; it can be a solution to erosion and in the long term there is a possibility of creating a label (Olive llass) and finally there are different development projects that are involved in the region. Regarding the threats, climate change effects with low rainfall and higher temperatures will certainly affect this VC on the long run; there is also appearance of new diseases; a lack of valorization of the by-products and an insufficient professional organization (dominance of the intermediaries).

### ✓ Agroecological assessment

The stakeholders present in the workshops were asked if the olive oil, honey VC and sheep meat VC can integrate the agroecological principles. The 13 principles applied to the selected value chains are presented in Table 10.



## Working Document

**Table 10.** Agroecology principles applied to the selected value chains

Principles	Olive oil value chain	Honey value chain	Sheep value chain
<b>1. Recycling</b> Does your organization engage or promote the recycling of inputs or outputs within the company and with your partners?	Recycling opportunities in the olive value chain: <ul style="list-style-type: none"> <li>- Shredding of wood</li> <li>- Wood used as livestock feed (food blocks)</li> <li>- Composting (Cutting brunches, leaves, margins)</li> <li>- Charcoal (energy)</li> <li>- Pomace used as livestock feed</li> <li>- Use of olive water as fertilizers</li> <li>- Use of wood in the manufacture of small tools</li> </ul>	Recycling opportunities in the Honey value chain: <ul style="list-style-type: none"> <li>- Wax recycling</li> <li>- Recycle of old wooden boxes</li> <li>- Recycle of the honey bottle after consumption</li> </ul>	Recycling opportunities in the sheep value chain: <ul style="list-style-type: none"> <li>- Wool</li> <li>- Leather</li> <li>- Compost</li> </ul>
<b>2. Input reduction/replacement</b> Does your organization engage or promote the reduction or elimination/replacement of purchased inputs for agricultural production?	<input type="checkbox"/> Olive tree is an undemanding culture concerning the inputs <input type="checkbox"/> Use of compost and margine. <input type="checkbox"/> Introducing legume crops as manure: Reduction of soil preparation. <input type="checkbox"/> Good soil management reduces disease: Underuse of pesticides	<input type="checkbox"/> Use of traditional method (fight plant disease) <input type="checkbox"/> Replacement/ planting trees <input type="checkbox"/> Decrease/ stop the use of pesticides	<input type="checkbox"/> Use of the compost instead of chemical products <input type="checkbox"/> Crop rotation <input type="checkbox"/> Low energy consumption for sheep activity
<b>3. Soil health</b>	<input type="checkbox"/> Olive plantations help floor fixing <input type="checkbox"/> Erosion control.	<input type="checkbox"/> Fruit trees pollination <input type="checkbox"/> Planting the Sulla (increase soil fertility)	<input type="checkbox"/> Produce compost

## Working Document

Does your organization engage or promote the management of organic matter and soil biological activity?	<input type="checkbox"/> Improves the soil quality (manure). <input type="checkbox"/> Improves soil structure and texture.	<input type="checkbox"/> Increase permanent crop	<input type="checkbox"/> To avoid transhumance from other regions (stop diseases) <input type="checkbox"/> Adopt crop rotation (fallow – forage) <input type="checkbox"/> Integrate legumes in agricultural production system
<b>4. Animal health</b> Does your organization ensure animal health and welfare?	<input type="checkbox"/> Olive tree can serve as an animal shelter <input type="checkbox"/> It is used as a livestock feed <input type="checkbox"/> A source of bee feeding	<input type="checkbox"/> Choosing the location of the hives according to the season <input type="checkbox"/> Planting Sulla	<input type="checkbox"/> Use of lime for cleaning stable <input type="checkbox"/> Vaccination of animals <input type="checkbox"/> Stable aeration <input type="checkbox"/> Use insecticides for pests <input type="checkbox"/> Painting sheep head with Henna (to avoid disease “El Homra”) <input type="checkbox"/> Selecting the sheep breed with black head for reproduction
<b>5. Biodiversity</b> Does your organization maintain and enhances the diversity of species, functional diversity and/or genetic resources?	<input type="checkbox"/> There is a various genetic potential in the olive crops <input type="checkbox"/> Can be planted with other trees (almond, pomegranate). <input type="checkbox"/> Can be used as windbreaks to protect other corps.	<input type="checkbox"/> Reasoned pasture management <input type="checkbox"/> Planting Acacia tree <input type="checkbox"/> Planting Carob tree <input type="checkbox"/> Protect the Crown plants in the mountain of Kesra	<input type="checkbox"/> Introduce legumes <input type="checkbox"/> Planting Acacia tree, Medicago Arboria, Atriplex, etc. <input type="checkbox"/> Planting Cactus, ray-grass
<b>6. Synergy</b> Does your organization enhance positive ecological interactions and complementary in the agroecosystems? (Animals, crops, trees, soils, and water).	<input type="checkbox"/> There is an ecological interaction between production units <input type="checkbox"/> Improves water retention capacity.	<input type="checkbox"/> Bee keeping has a positive impact on biodiversity (conservation of the natural resources in the Kesra mountain)	<input type="checkbox"/> Two times of grazing for sheep: in Spring (fallow) and in summer <input type="checkbox"/> Use chopper for the cactus valorization

## Working Document

	<input type="checkbox"/> Provides Food for livestock (sheep). <input type="checkbox"/> Water and soil conservation.	<input type="checkbox"/> Beekeeping has a positive impact on the livestock (Sulla plantation) <input type="checkbox"/> Encouraging the plantation of different species of trees	<input type="checkbox"/> Forage association (cactus, brandishes of the olive tree, barley, etc..)
<b>7. Economic diversification</b> Does your organization promote productive and income diversification on farms?	<input type="checkbox"/> Olive tree provides an income diversification through: <input type="checkbox"/> Procuring income in winter <input type="checkbox"/> Olive is a non-perishable product, and can be sold at any time <input type="checkbox"/> by-products can provide additional income <input type="checkbox"/> Valorization of sub-products improves the farmer's income. <input type="checkbox"/> If the farmer follows the technical package the productivity will improve	<input type="checkbox"/> Diversification of farm income between crops (fig tree, olive tree, forage, etc.) and livestock (sheep, beekeeping, poultry, etc.) <input type="checkbox"/> Off farm incomes	<input type="checkbox"/> Selling different products (wool, lamb, goat, compost, forage)
<b>8. Co-creation of knowledge</b> Does your organization enhance co-creation and sharing of knowledge? (Local, scientific innovation, farmer to farmer exchange)	<input type="checkbox"/> Transfer of knowledge (know-how) <input type="checkbox"/> Exchange of olive varieties between farmers <input type="checkbox"/> Co-creation of knowledge can be realized in case the farmers are in an association (SMSA, GDA)	<input type="checkbox"/> SMSA Kesra promotes co-creation and sharing of knowledge between their adherents <input type="checkbox"/> PROFITS project: diffusion of innovative technologies to Kesra beekeepers <input type="checkbox"/> Farmer Field School: Sharing knowledge with development agents (CRDA) and development institution (ICARDA)	<input type="checkbox"/> Sharing knowledge in association (SMSA, GDA) <input type="checkbox"/> Veterinary and extension services to keep information <input type="checkbox"/> Participation in development project to adopt new technologies (CLCA project, GIZ project, etc.) <input type="checkbox"/> Sharing knowledge with neighboring breeders

## Working Document

<p><b>9. Social values and diets</b></p> <p>Does your organization contribute to building healthy, diversified and culturally appropriate diets, based on identity, tradition, social and gender equity of local communities?</p>	<input type="checkbox"/> Local product <input type="checkbox"/> Creation of a label <input type="checkbox"/> High nutritional value <input type="checkbox"/> Healthy product <input type="checkbox"/> Included in dietary habits and medications. <input type="checkbox"/> Conservation material (used for pickling).	<input type="checkbox"/> Honey is considered as a healthy and cultural product <input type="checkbox"/> Social value of the beekeeping activity <input type="checkbox"/> Different uses of the product (healthy product (improve immunity), food product, cosmetic product)	<input type="checkbox"/> Sheep activity represents a social value for the community <input type="checkbox"/> Sheep activity integrates cultural value (celebration diets) <input type="checkbox"/> Culinary festival (Borzgane) in may celebrating traditional food <input type="checkbox"/> Lamb meat has a social value
<p><b>10. Fairness</b></p> <p>Does your organization support dignify and robust livelihoods for all actors in the food system (trade, employment, intellectual property rights, transparency)?</p>	<input type="checkbox"/> Improves family income <input type="checkbox"/> Olive oil VC guarantees decent livelihoods in case there are large areas planted or in case there is intercropping.	<input type="checkbox"/> Beekeeping guarantees a decent income <input type="checkbox"/> Beekeeper has a suitable social place in the community <input type="checkbox"/> Solidarity between beekeepers and consumers	<input type="checkbox"/> The value added is captured by intermediaries at the end of the value chain
<p><b>11. Connectivity</b></p> <p>Does your organization ensure proximity and confidence between producers and consumers?</p>	<input type="checkbox"/> Sales circuits are short <input type="checkbox"/> Purchase at the farm, at the oil mill <input type="checkbox"/> Total lack of connectivity between the institutions in the value chain structures. <input type="checkbox"/> Lack of trust between producer and consumer. <input type="checkbox"/> An electronic platform on the internet needs to be established	<input type="checkbox"/> Direct sale of the product to consumers <input type="checkbox"/> The name “Honey of Kesra” gives a sign of trust between producers and consumers <input type="checkbox"/> Small packaging of honey (200 g) for a category of consumers <input type="checkbox"/> High quality of the honey produced by Kesra SMSA	<input type="checkbox"/> Presence of intermediaries between producers and consumers
<p><b>12. Land and natural resource governance</b></p>	<input type="checkbox"/> Institutional support <input type="checkbox"/> Sector regulation	<input type="checkbox"/> SMSA Kesra has a control and guidance mission	<input type="checkbox"/> Exploitation of private grazing



## Working Document

<p>Does your organization strengthen institutional arrangements to include the recognition of farmers as managers of natural and genetic resources?</p>	<p><input type="checkbox"/> Presence of specialized organizations (ONH, IO)</p> <p><input type="checkbox"/> Land division due to inheritance.</p> <p><input type="checkbox"/> Inadequate use of water resources.</p> <p><input type="checkbox"/> Depletion of water resources</p>	<p>towards the natural resources in the community</p> <p><input type="checkbox"/> Beekeepers encourage the plantation of Carob and Acacia trees.</p>	<p><input type="checkbox"/> Participation in the OEP program to improve private grazing (planting tree, Sulla, cactus, etc.)</p>
<p><b>13. Participation</b></p> <p>Does your organization encourage participation in decision making, decentralized governance and or local management of food systems?</p>	<p><input type="checkbox"/> There is a small participation through support organizations (ONH, CRDA, IO, ODESYPANO)</p> <p><input type="checkbox"/> Negligible involvement in decision making.</p> <p><input type="checkbox"/> Negligible involvement in olive variety choices.</p>	<p><input type="checkbox"/> SMSA of Kesra has a positive influence on the decision making of the mountain management.</p> <p><input type="checkbox"/> Consultation with local authorities</p>	<p><input type="checkbox"/> No participation in the decision making</p>

## Working Document

### 4. Conclusion: proposed business model

The objective of WP3 is to identify the potential for co-developing/upgrading business models in the selected value chains through the integration of HLPE's agroecological principles. To reach this objective, a rapid value chains analysis and an agroecological assessment were used on the main agricultural and food value chains in the North-West of Tunisia. In addition, a participatory approach was adopted through 4 focus group discussions at the community level (living lab in Siliana and El Kef) and with all the relevant stakeholders at the value chain level through the organization of two workshops in Kef and Siliana.

Based on the secondary data and on the participatory approach, the main value chains selected according to economic, social, and environmental aspects were olive oil, cereals, sheep, fig tree and honey for Siliana and Olive oil, sheep, cereals, honey, and medicinal and aromatic plants for Kef. The two workshops conducted with the main stakeholders in Kef and Siliana have identified the olive oil VC as the main value chain with great opportunities to integrate agroecological principles.

Compared to other VC, the olive oil VC has a high potential to improve resource efficiency by the reduction of inputs use (water, chemical inputs, etc.) and the recycling opportunities for the by-products (margine, leaves, and branches). Indeed, olive oil VC contributes to strengthen the resilience by improving soil fertility (soil erosion control), biodiversity (enhance functional agro-biodiversity), synergy (recycle olive by-products for animal feed) and economic diversification (different uses of the product and by-products). In terms of social equity/responsibility, olive oil VC has social values and diets. Olive oil is considered by all stakeholders as a noble product with a very long tradition. Public and private institutions, development institutions and research institutions are involved in the olive oil VC to share knowledge to olive producers grouped into associations to promote an olive oil product with a high quality.

Tunisia had always been known as one of the leaders in the olive oil production worldwide, unfortunately most of the olive oil is exported in bulk without any differentiation. There is a great potential in creating a label for the olive oil from the North-West of Tunisia which will contribute to the creation of a positive territorial, socioeconomic, and cultural externalities. Labelling the olive oil will improve the connectivity in ensuring the proximity and confidence between olive producers and consumers. This label could be organic or a designation of origin like the Protected Denomination of Origin whose qualitative characteristics are essentially or exclusively dependent on the geographic setting in which they are produced.

The business model proposed based on the participatory approach with the main stakeholders in both locations is olive **oil labelling**. The objective of the business model is to encourage the olive producers of SMSA to produce a labeled olive oil to improve their revenues, enhance livelihoods and create a system of values that includes geographic origin (terroir).

## Working Document

### References

- Altieri, M.A., amp; Toledo, V.M. 2011. The agroecological revolution in Latin America: rescuing nature, ensuring food sovereignty and empowering people. *Journal of Peasant Studies*, 38(3): 587-612.
- Côte, F. X., Poirier-Magona, E., Perret, S., Roudier, P., Rapidel, B., Thirion, M. C. 2019. The agro-ecological transition of southern agriculture (p. 368). Quae editions.
- CRDA Kef Commissariat Régional de Développement Agricole. 2020. Technical report in Kef.
- CRDA Siliana Commissariat Régional de Développement Agricole. 2020. Technical report in Siliana.
- De Lattre-Gasquet, M., Moreau, C., Elloumi, M., Becher, L. B. 2017. Towards a scenario “Agro-ecological land uses for a diversified and high-quality food and a territorialised food system” in Tunisia in 2050. *OCL Oilseeds and fats body and lipids*, 24(3).
- HLPE. 2019. Agroecological and other innovative approaches for sustainable agriculture and food systems that enhance food security and nutrition. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome.
- INS National Institute of Statistics. Recensement Général de la Population et de l'Habitat. 2014.
- Nyéleni 2015. International Forum for Agroecology. Nyéleni Centre, Sélingué, Mali. 24-27 February 2015.  
<http://www.foodsovereignty.org/wp-content/uploads/2015/10/NYELENI-2015-ENGLISH-FINAL-WEB.pdf>
- ODNO Office de Développement du Nord-Ouest. 2017. Gouvernorat de Siliana en chiffre.
- ODNO Office de Développement du Nord-Ouest. 2020. Gouvernorat de Siliana en chiffre.
- Quintero M, Maccartney M, 2021. Transformational Agroecology across Food, Land, and Water Systems. Proposal September 28, 2021.
- Rosset, P.M., Sosa, B.M., Jaime, A.M.R., amp; Lozano, D.R.A. 2011. The Campesino-to-Campesino agroecology movement of ANAP in Cuba: social process methodology in the construction of sustainable agriculture and food sovereignty *The Journal of Peasant Studies*, 38(1): 161-191.doi:10.1080/0306150.2010.53858

## Working Document

### Annex 1: Siliana workshop's photos





## Working Document



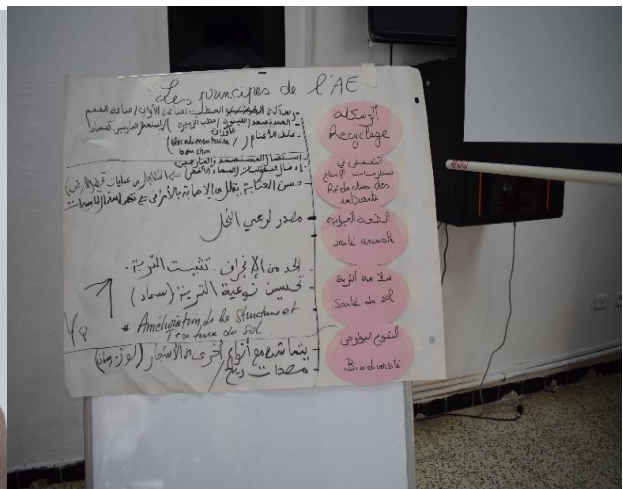
## Working Document

### Annex 2: El Kef workshop photos





## Working Document



## IMPLEMENTED BY



**Boubaker Dhehibi & Asma Souissi:** Natural Resources Economist / Research Associate - Agricultural Economics, RALSP-SEP-ICARDA, Tunisia: [b.dhehibi@cgiar.org](mailto:b.dhehibi@cgiar.org) / [a.souissi@cgiar.org](mailto:a.souissi@cgiar.org)

**Aymen Frija:** Agricultural Economist (Economic Modeling), RALSP-SEP-ICARDA, Tunisia: [a.frija@cgiar.org](mailto:a.frija@cgiar.org)

This research work was implemented under the CGIAR Initiative on “Transformational Agroecology across Food Land and Water Systems” in the frame of the WP3 “Inclusive Business Models and Financing Strategies” led by the International Center for Agricultural Research in the Dry Areas - ICARDA (<https://www.icarda.org/>) (Agreement # 200302).

CGIAR is a global research partnership for a food-secure future. CGIAR science is dedicated to transforming food, land, and water systems in a climate crisis. Its research is carried out by 13 CGIAR Centers/Alliances in close collaboration with hundreds of partners, including national and regional research institutes, civil society organizations, academia, development organizations and the private sector. [www.cgiar.org](http://www.cgiar.org)

**We would like to thank all funders who support this research through their contributions to the CGIAR Trust Fund:**

[www.cgiar.org/funders](http://www.cgiar.org/funders)

To learn more about this Initiative, please visit <https://www.cgiar.org/initiative/agroecology/>

To learn more about this and other Initiatives in the CGIAR Research Portfolio, please visit [www.cgiar.org/cgiar-portfolio](http://www.cgiar.org/cgiar-portfolio)

© 2023 CGIAR System Organization. Some rights reserved.

This work is licensed under a Creative Commons Attribution-Noncommercial 4.0 International Licence (CC BY-NC 4.0).



INITIATIVE ON  
Agroecology