SOCIO-ECONOMIC DEVELOPMENT OF SOUTH-EASTERN TUNISIA SOME ELEMENTS OF REFLECTION ON FARMS AND LOCAL DYNAMICS IN SIDI MAKHLOUF AREA

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ABSTRACT

Sustainable development in dry areas in Tunisia are under pressure, which seriously Threatens their sustainability. As a result, they are viewed as economic goods that require new analytical approaches and innovative management tools, going beyond unidimensional and fragmentary approaches. In this research we assess development policies impacts on living condition improvement of the local population, which might assist decision makers to adopt policies that guarantee a balanced and sustainable development. this work focuses on presenting the situation of the region of Sidi Makhlouf (South-East Tunisia) through a field survey as well as bibliographic research and work meetings.

KEYWORDS : *Sustainable development, family farming, Tunisia.*

1. INTRODUCTION

The prosperity of the nations depends today on many studies, on three main axes namely; economic development, social development and environmental development, in other words sustainable development. In this context, the sustainable management of natural resources is seen as a tool for ensuring sustainable development and improving the population's quality life. Indeed, any natural resource management strategy generally allows the realization of several projects and programs, notably the rehabilitation of irrigated perimeters, water and soil conservation works, basic infrastructure and agricultural development which has a direct impact on the improvement of living conditions and consequently the fight against poverty. This work is interested in an arid zone which is in the Tunisian south-east.

2. OBJECTIVES

The objective of this work is to know how smallholder farming reacts with its conditions, its modes of access to land, resources, and finance and its different destinations, the problems of development of their agricultural production systems.

3. METHODOLOGY

The methodological approach reflects a desire to study in depth the practices and characteristics of existing agricultural activity systems. It is a question of defining a set of indicators making it possible to identify the various types of systems and to characterize them. The second choice is that of favoring a systemic and modeling approach, resulting from theoretical and bibliographic scanning, as well as field surveys to properly lead to this study.

Field trips were made to better orient and refine the sampling. They allow contact with farmers to facilitate the investigation and prepare psychologically since the investigation is quite long. The sampling affected the various existing agricultural sectors. The list of individuals to be surveyed is extracted from the mother population with representation percentages determined with the

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participation of technical services and resource people in each area. Our sample is described in Table 1:

Table 1: Distribution of the samples investigated

Types of farmers	Number of surveys by category
Farmer-herders	15 (< 20 sheep heads)
Farmers-fishermen	15
Farmer in private irrigated area	10
Farmer in public irrigated area	5
Rainfed farmer	15

4. STUDY ZONE

The Sidi Makhlouf area covers an area of 66,900 ha. It is bounded to the north by the Mediterranean Sea, to the west by Oued Ezzes, to the south by the angle of two delegations Medenine-north and Medenine-south, and to the east by part of the Boughrara plain. The delegation is part of the Jeffara natural region which covers Medenine, Ben Guerdane, Zarzis and Djerba and which is characterized by an arid climate. However, the territory of the region is quite varied in terms of landscapes with, the plains of Boughrara covered with olive trees, in the North and Center a lagoon system (wetlands) and in the south an arid steppe zone hilly by the flows which flow into the Oued of Fedja (figure 1).
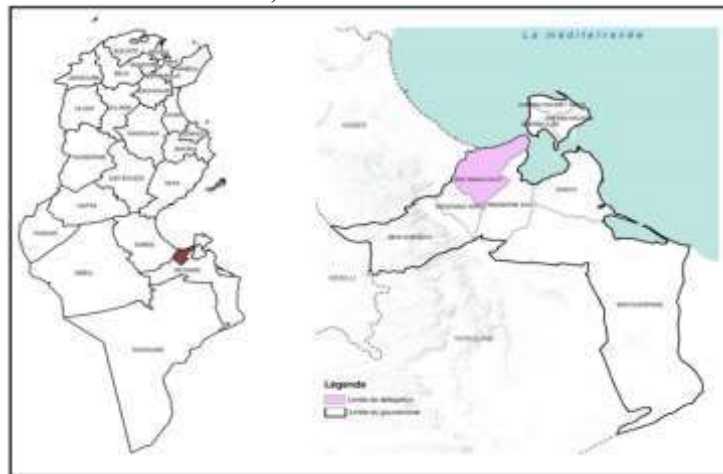

Figure 1: Location of the study area (Source: our conception, 2019)

The Sidi Makhlouf delegation is made up of 11 sectors. It has 25,206 inhabitants (5.95% of the population of Medenine governorate). The largest proportion of the population resides in the Amra sector (17%) followed by Sidi Makhlouf (12.2%). The least populated area is El Grine with only 3.85% of the population. The average population density is low. It is around 37 inhabitants per km².

Sidi Makhlouf experienced significant growth between 1984 and 1994 with an annual average growth rate of 2.95%. From 1994, the delegation's population stabilized around 25,000 with a slight variation in the rate of increase, which hovered around 0. From 2004 to 2014, the region's population increased by 1,478 people. The migration balance of the delegation is negative, it is (-175) migrants. Despite the low weight of migrants, internal migration is the main factor behind the deficit in net migration. Family support and employment are the main causes of migration from Sidi Makhlouf. The migratory balance, slightly in deficit, does not in itself explain the demographic decline of the delegation. Regarding illiteracy, with 29.34%, the delegation recorded the highest rate in the governorate of Medenine (16.6%). However, with an enrollment rate of 92.73% in primary education, the delegation is characterized by a low enrollment rate in higher education with only 28.28% of enrollment in the 19-24 age group.

Regarding the unemployment rate, it is particularly high in the delegation (18.75%) in comparison with the average of the governorate of Medenine (15.09%) and the national average (14.82%). Despite their low proportion, higher education graduates are those who suffer the most from unemployment with an unemployment rate of 48.72%.

4.1. Economy with rural character

With regard to occupation, Sidi Makhlouf has 5,925 employees, most of whom work in the construction and public works (29.35%),

administration (18.84%) and agriculture (15.88%) sectors. reflecting a rural economy with a high dependence on public sector wage rent. The local economy is essentially based, in the productive sectors, on agriculture through the exploitation of water and soil resources. Employing 15.88% of working people over 15 years old (941 working people). The agriculture and fishing sectors constitute the main productive sector in terms of jobs in the delegation. The agricultural area useful in Sidi Makhlouf covers 64,727 ha, 53% of which is located largely in the Southwest and 45% of cultivable land mainly in the Northeast. Most of the cultivable land is used for arboriculture (92% of the cultivable area), with olive trees (23,705 ha) first followed by fig trees (206 ha) and almond trees (126 Ha). The delegation also contains a potential of 438 ha of irrigable land of which 374 ha are irrigated distributed over three public perimeters (54 ha irrigated) and 550 private perimeters (320 ha irrigated). Irrigated production mainly concerns vegetables (8,130 tonnes), fodder (730 tonnes) and cereals (46 tonnes).

Regarding breeding, it is extensive. It is mainly based on sheep (23,000 heads), goats (22,000 heads) and camels (430 heads). As a productive sector, the fishing practiced in the delegation is a coastwise fishing based on the exploitation of 200 boats including 70 motorized. In 2015, fishery production reached 365 tonnes, including 149 tonnes of shellfish, and 216 tonnes of coastal fishing. The area is mainly characterized by the production of shellfish. At this level Sidi Makhlouf is the main producer of this marine product in the governorate of Medenine with a rate higher than 60%.

4.2. A strategic geographic position

The Sidi Makhlouf delegation is not landlocked. Along the N1 (Tunis - Ras Jdir) and crossed by the R116 (Mareth - Houmt Essouk Djerba), it is located less than 90 minutes from the main economic centers of the region: Medenine, Gabès, Zarzis, Djerba, Ben Guerdane and Tataouine. However, despite its general accessibility, the village of Sidi Makhlouf is relatively set back from the main classified highways and is only accessible by paved rural roads.

In terms of road infrastructure, the region has nearly 305 km of roads of which 212 km are paved. Most of the roads are paved rural roads with a high density of roads to the north and south in the densely populated areas.

5. RESULTS

5.1. Typology of agricultural holdings

The method used to analyze the data collected by survey questionnaire made it possible to conduct a typology of the concerned farms. The socio-economic analyzes of the survey results are based on SPSS statistical analysis software. The main ACP component analysis method has made it possible to identify a typology of these same farms. This typology made it possible to characterize the different groups of farmers with homogeneous specificities and common behavior. This method is based on 11 variables and is described in Table 2.

Table 2: Descriptive statistics

Variables	Mean	SD
irrigated area	1,85	4,265
number of plots	2,9	3,096
total cereal area	1,79	2,454
Share of dry arboriculture	0,7479	0,43272
number of hectares received by inheritance	10,6667	13,18
	100,3	147,84497
number of dry olive trees	1,19	3,4
total area of vegetable crops	16,7	29,44763
Total sheep population	7, 3167	13,50768
Total number of goats	0,8999	0,24951
Share of female family labor	0,7722	0,91677
Share of usable agricultural area		

Source: our results by SPSS

5.2. Principal component factor analysis (PCA)

The Kaiser-Meyer-Olink test is around 0.624, it is an acceptable value to indicate that there is a statistical factor solution which represents the relationships between the variables.

Bartlett's Sphecite test, around 55 dll with significance, we can conclude that there is a correlation between the chosen variables.

For the quality of representation, we note that all the extractions are greater than 0.5 which consequently favors the retention of these variables (Table 3).

Table 3: Quality of representation (Extractionmethod: Analysis by Main Component)

	Initial	Extraction
Irrigated area	1,000	0,768
Vegetable area	1,000	0,651
Sheep population	1,000	0,522
Goat population	1,000	0,630
Inherited area	1,000	0,773
Plants trees in dry	1,000	0,729
Number of plots	1,000	0,779
Cereal area	1,000	0,769
Share of family labor	1,000	0,771
Part of trees in dry	1,000	0,894
Share of usable area	1,000	0,624

Source: Our calculations by SPSS

The calculation results of the total Variance explained result in four factors to be retained with cumulative extraction amounts of the order of 28.68%; 51.92%; 63.51% and 71.91%.

Regarding the Component Matrix after rotation. The variables to be used for each component have been identified and see if there is a well-defined correlation to orient our typology according to the share of each variable on each component (Table 4). These results led to the identification of two groups of farmers.

Table 4: Matrix of components after rotation

	Components			
	1	2	3	4
Irrigated area	0,851	0,015	-0,185	0,093
Vegetable area	0,834	-0,016	-0,289	0,015
Sheep population	0,805	0,075	0,189	-0,282
Goat population	0,800	0,174	0,275	-0,161
Inherited area	0,092	0,872	-0,010	0,063
Plants trees in dry	0,013	0,830	-0,099	-0,176
Number of plots	-0,058	0,776	0,070	0,200
Cereal area	0,159	0,615	0,248	-0,240
Share of family labor	0,086	-0,062	0,774	0,116
Part of trees in dry	-0,416	0,284	0,603	0,116
Share of usable area	-0,120	-0,022	0,193	0,917

Source: CPA result.

5.3. Farmer groups: characteristics and functioning

Group 1: domestic family farmers

This type includes 33 farmers. The heads of farms in this group are distinguished in terms of socioeconomic characteristics by an average age of 52 years with a minimum of 24 years and a maximum of 88 years. The average number of dependents of the head of household is 5, with a maximum of 16 and a minimum of 2 for the overall sample. Furthermore, the family size in the first type of population varies between 2 and 11 with an average of 5 individuals with a standard deviation of 2.

Regarding the level of education of farmers, it should be noted that 54% have a primary level, 21.7% have a secondary level, while only 8.3% have followed their higher education. For the Type 1 population, the literacy rate is around 22.2%.

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Regarding the production system, this group has the smallest farm size, with an average area of around 1.09 ha with a standard deviation of 1.612 and a maximum of 5 ha. 84.8% of type 1 resides on their farms. These farmers practiced agriculture as their main activity and are very attached to their farms. The main activities of the group 1 sample are mainly related to agriculture, trade, public and private service, and retirement. However, agriculture is the most prevalent for 50% of this type.

The rain-fed agriculture system runs dry behind the benches as well as in the open field is based on trees, mainly olive growing and cereal cultivation. The results of the surveys show that the olive tree is considered to be the main agricultural activity in the study area compared to other fruit trees (fig, pomegranate, almond, apple, apricot, palm, table vine, etc.). In this same group, farmers have from 0 to 770 olive trees, with a standard deviation of 168. The cereal area varies between 0 and 15 ha with an average of 1.5 ha for the overall sample.

Regarding animal production. According to the results of the survey, we note the dominance of sheep and goat farming while camel and equine farming is low. Livestock is a primary activity on the majority of the farms in question along with cereal and arboriculture. Sheep and goat farming is carried out semi-intensively with an average herd size between 0 and 184 heads with an average of 16.7 heads per flock for sheep. For goat farming, the average size of the herd is 7 heads with a maximum of 62 heads per herd in the overall sample.

Group 1 is made up of small and medium breeders, since the herd of sheep varies between 0 and 40 heads and that of goats varies between 0 and 17 heads. Due to the aridity of the climate and the semi-intensive driving mode, the breeders in the study area are under high feed loads. The results of the survey show that the average feedstock for group 1 is estimated at 27.64 TD / head and 254.3 DT / head relatively for the rainy and dry years. During a dry year, these charges vary between 145.96 and 500 dt / head while in a rainy year, they vary between 70 and 250 DT / head.

Group 2: marketed family farmers

This type includes 27 farmers. The average age of household heads is 54.42 years with a minimum of 36 years and a maximum of 75 years. The average number of dependents of the head of household is 5, with a maximum of 16 and a minimum of 2 for the overall sample. Furthermore, the family size in the second type of population varies between 3 and 16 individuals with an average of 5 individuals and with a standard deviation of 2.

Regarding the production apparatus of this group, The main activity of farmers is mainly related to agriculture, and trade. Agriculture is the most dominant for 75% of the members of this group.

The rain-fed agriculture system, which runs dry behind the benches, is based on arboriculture, mainly olive growing and cereal cultivation. Survey results show that the olive tree is considered the main agricultural activity in the study area compared to other fruit trees such as fig, pomegranate and almond trees. The second group of operators surveyed has an average of 97 feet of olive trees with a standard deviation of 198.

Regarding animal production. In group 2, animal husbandry is a primary activity on the majority of the farms in question along with cereal and arboriculture. Sheep and goat farming is carried out semi-intensive with an average size of 26 sheep heads and 13 goat heads.

Given the aridity of the climate and the semi-intensive driving mode, the breeders in the study area are subject to high feeding loads. The results of the survey show that the average feedstock for group 2 is estimated to be 134.94 dt / head and relatively 310 dt / head for the rainy and dry years. During a dry year, these loads vary between 120 and 210 dt / head while in a rainy year, they vary between 70 and 250 dt / head.

5.3. Difficulties announced by the farmers surveyed

Natural constraints: Sidi makhlouf is an arid and dry area with scarcity of water and soil resources. It is marked by poor water quality with a salinity of 5g / l.

Social and economic constraints: the major social constraint posed by the individuals of the two groups surveyed is linked to the rural exodus in the search for sources of income. The abandonment of young people from farming is a problem announced by 60% of farmers. In this area, agricultural work is strenuous with low incomes, support and supervision services in rural areas are absent. However, the results of the surveys show that the second group of farmers suffers from emigration, and the lack or even absence of the agricultural labor force.

The results of the investigations showed that the two groups of operators had a funding problem. In fact, 80% insisted on the high costs linked to energy, the lack of finance, the high cost of renting land and the high price of irrigation water. Also, these economic constraints are linked to the low selling price of their agricultural product.

Technical and political constraints: The political constraints declared by all of the farmers in the global sample are translated by communication and extension problems, by the absence of aid and subsidies combined with an ineffectiveness of agricultural and rural policy actions in the region.

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6. CONCLUSION

In Sidi Makhlouf region, the agricultural and rural worlds show a socio-demographic intensity where agriculture continues to occupy a significant share of assets and are subject to climatic constraints, where the scarcity of water and soil resources is combined with an uneven distribution of these resources. The rural development process in this delegation is a slow and long process. Therefore, sustainable development policies must be designed for long periods. Furthermore, while obeying the directions and priorities of global policies, this rural development process must adapt to local contexts which are very diverse. A typology work resulted in two different groups of farmers, which reflects diversity on the scale of each group. These groups are described as follows:

Group 1: domestic family farmers: These farmers cultivate small areas of cereals. They are small breeders with an average size of 8.63 heads for the sheep herd and 2.81 heads for the goat herd. The main destination of their products is self-consumption. These farmers practiced farming to meet and cover their main food needs, especially cereals and some vegetables for home consumption and to cover the cost of feeding animals. This group of farmers is characterized by rain-fed agriculture in the majority of cases where there is little investment and intensification.

Group 2: family farmers traded: These farmers farm large areas of cereals. They can reach 15 ha. The main destination of their products is the market. These farmers are upset by the lack of agricultural labor. This is a part of peasant households, who are familiar with agricultural production techniques, not only begin to produce for their own family consumption but also seek to develop a commercial exploitation. The tools to achieve this objective include increasing production, intensifying production through capital and input investments, expanding cultivated areas and diversifying production on the basis of commercial crops. However, the development of "commercial" type farms, outside of family request technical knowledge, also requires significant financial capital and a socio-economic and institutional environment encouraging private investment.

Thus, we can say that despite of the effort made by the State in terms of investment, the region has not benefited in recent decades from structuring investments able to transform significantly the structure of its economy. As a result, it has not been able to achieve good economic and social performance, as has been observed through a socio-economic diagnosis with a representative sample of the population of the Sidi Makhlouf region.

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