Abstract
To understand the mechanisms of adaptation of olive cultivation in the urban environment, we propose in this paper to explore the agricultural dynamics even in cities. We are interested in all aspects of olive growing in urban areas, whether amateur or commercial kind, such as for example practiced in urban and suburban groves. Our case study is the city of Sfax, located in the south of Tunisia and characterized by its high rate of urban expansion. Olive growing areas are however still represent 22% of the municipal area. While the commercial olive is in decline, recreational agriculture driven by urban dwellers and nature lovers, multiply there since fifteen years. These results are analyzed as part of a systemic approach to put into perspective the different dynamics observed.

1. Introduction

Urban olive cultivation was defined as an agriculture which have a geographical and functional relation with the city (Aubry and Ba, 2011). She stages a variety of actors practicing professional or unprofessional type of agriculture, generating or not of incomes (Mundler et al., 2014). Their profiles and their status are heterogeneous. In Europe, urban agriculture is mainly studied in terms of the development of parks or gardens. Despite the lack of works and researchs, the commercial urban agriculture is still a spatial reality of African cities and especially of Mediterranean cities. In this article, we propose to analyze olive growing intra-city as a system. The systemic approach makes it possible to understand the adaptation mechanisms of olive cultivation in the urban environment. We focus on all components of olive cultivation in Sfax, whether amateur or commercial nature, such as those which are practiced in urban olive grooves or public irrigated areas. We are approaching the dynamics through analysis of its areas, actors, producers, distributors, consumers and officials of the agricultural profession. Our case study is the city of Sfax, first producer in olive oil and 2nd Tunisia city with 955 421 inhabitants. Since 1980, Sfax is characterized by a strong urban expansion. Olive growing areas so there are highly stressed as a land reserve for urbanization. So, despite the urban pressure, agriculture remains in the city in multiple forms with specific functions.

2. Concepts and Methods

To get around the difficulty of analysis, which comprises taking separately the agriculture as an object of study in the urban context, or conversely the city as an object of study incorporating agricultural activities. We use the systemic analysis of city and agriculture relations. The concept of "sustainable agri-urban system" meets this objective of a balanced analysis between urban and agricultural dynamics. It means all the relationships and interactions between olive actors, olive activities and urban areas, contributing to include olive growing activities in an urban sprawl context. To describe and represent the system of relations, we relied on the approach of the arrow diagram provided below to represent the processes involved in the operation of an area system locally and regionally (fig.1).
To collect data for mapping the agri-urban system of Sfax, we have collected information into three categories: spatial information and olive-growing places in the urban area; informational materials about actions, projects and policies olive; and a series of qualitative interviews with farmers and the institutions which concerned with urban olive growing. Our study consider also the relationship evolution between urban area and olive groves in the metropolis of Sfax.

Consider the town like a closed system allowing the analysis of olive growing city relations is a methodological step and not an end in itself. Because the observed dynamics represent always a local translation of larger or older phenomena involving all levels of geographical analysis, from global to local. However, we hope that this systemic approach reveals many processes necessary to understand the complex dynamics of olive cultivation in urban areas. To realize this, we will present first the nature of the areas and actors of olive cultivation in Sfax. Then we will analyze the interactions between agriculture and the city that our field survey allow to identify. We conclude with the construction and discussion of a systemic representation of olive cultivation in Sfax.

3. Areas and actors of urban olive cultivation
Olive-growing areas represent 22% of the area of Sfax. They are, for the great majority, divided into little areas in the peripheries of the city. They alternate with the olive groves of the neighboring communities. The most important cultivations are: fruit trees and cereals. The gardening relictual is however still exist, particularly in irrigated orchards and in public irrigation perimeter (fig. 2). Some agricultural areas are protected by a natural or agricultural zoning established by the government as a part of its development plan. However, a part of them is located in development area and will have to disappear in the medium term if the urbanization continues to grow like the city El Moez, Sidi Mansour and Thyna. They are occupied by olive trees in combination with legumes. Wasteland and abandoned olive groves, especially in western suburban area of Sfax and near the airport, show the regression of the olive areas in recent decades. Besides the many little areas on the outskirts of the communal territory, some olive parcels still exist in the residential district. These relics of parce
demonstrate the olive past feature of the city. They are occupied by gardening, small groves and breeding to support the urban and suburban demand by fresh products.

Most growers cultivating agricultural areas described above are mostly older, with an average age above 50 years. They appear mostly a pessimistic view on the future of urban agriculture. However, some inheritor producers counting among the youngest of these farmers, point out that olive growing represent a landscape amenity which guarantee its sustainability. The producers still resist to urban pressure by diversifying their activities to ensure their profitability, expanding sales in short circuits, pluriactivity and multifunctionality.

In addition to the areas of commercial agriculture, several family olive groves and orchards are scattered throughout the territory of Sfax. Farmers practice mainly a hobby and recreational functions and we talk about "hobby farming". This innovative form of olive growing in landscape and recreational dimension serves as a green lung for the urban area. Other forms of cultivation have relocated in rural areas to minimize stresses and urban pollution. Managed by senior executives, these farms provide the olive oil to the wholesale markets and the packing plants.

This panorama of farmland teaches us that the commercial feature of olive growing is still present in the city, but its sustainability is threatened by urbanization. In addition, professional actors surveyed, such as the Regional Office for Agricultural Development and the Regional Delegation of Equipment and Housing (land development institution) don’t show any particular interest in this urban agriculture, considered that agricultural stakes are played in suburban areas, and the hobby cultivation, has no place in urban areas, where urbanization is pregnant and the price of land is very expensive.

According to an official: " agriculture has no opportunity in the city. Against the urban expansion, there is a little opportunity for agricultural development ".

But the urban areas without agriculture is not an area that enhances the quality of life. A city giving a way only to urban activities is not attractive, but must develop a recreational and hobby farming.

Source: CGDR, Atlas Grand Sfax 2013

Fig. 2. Urbanization and principal districts of Sfax
Although olive groves and producers are still present in urban areas of Sfax, their activity is therefore little regarded by urban and agricultural institutional actors. If the commercial olive cultivation areas are the subject of uncertainty about their future, a leisure cultivation promoted by the citizens and the municipality (green space, parks, etc.) is expanding. These actions are indeed first and foremost the nature of many environmental and social projects. These activities of hobby farming and self-consumption place the olive tree as a management tool of urban spaces. The managers of municipal services of green areas and urban planning don’t show a particular interest for this kind of agriculture. They consider it like a business of farmers business; rather they have a vision consumption. According to the head of the maintenance of green areas of Sfax: "Until farmers are there to maintain the spaces, the city let them. She can’t maintain everything, it is a way to protect spaces. This is a private interest against collective interest ".

Although the little investment of the municipality in the problem of urban agriculture, the first signals of interest for agriculture appear through the projects of development of the recreation areas (fig.3).

Fig .3 : Aerial view of the gap between urban space and agricle in Sfax

4. Urban olive growing seen as a dynamic system, evolving

A double movement occurs around urban olive growing, as a result of the global systemic crisis, the exponential growth of cities, and the olive growing crisis on the Tunisian coast. On one hand, the areas of the commercial olive growing due to urban pressure regress; strong uncertainties about the sustainability of urban groves. Substitution of traditional crops and local varieties by foreign varieties associated with other crops such as cereals and legumes are still operates on agricultural areas (fig. 4). Temporary agriculture is thus established through this substitution. The regression of the commercial olive cultivation is however accompanied by the resistance and adaptation of certain farmers.
Fig. 3. Olives and legumes in the residential area of Sfax.

Furthermore, urban policies for sustainable development and the growing interest of citizens to agriculture have emerged in recent decades. These dynamics are reflected in Sfax as in other coastal towns by the development of subsistence agriculture and especially recreational form in the green areas and urban orchards. These farming areas were born from the city request, expressed sometimes individually, and sometimes through social movements claiming green spaces, recreation and nature. These movements reveal a highly militant character, leading to conflicts of use and conflict of interest. Other conflicts involving residents protesting against the urbanization projects like the NIMBY syndrome (Not In My Back Yard) (Rogge, 2009), which confront the inhabitants to the public policy. Several studies and investigations have attempted to study the nature of man's relationship with the environment, its role in the regulation or not of the problems of agriculture in urban and suburban situations. Beard and Dasgupta (2006) treated the Indonesian case from initiatives of actors in rural and urban areas; Lardon et al. (2008) compared the France and Brazil. But many researchers connect the place and value of agricultural land to the roles of the people in local planning and land use planning; Planchat-Henry (2008) worked on landscapes to build collectively the PLU (Local Development Plan) in Billom, a commune of the Puy-de-Dôme - France. Other studies have focused on the social consequences of spatial modes of organization. Banzo and Valetta (2006) worked on the "open space" of the agglomeration of Bordeaux. Rouge (2007) studied the relationship of the actors with their life and mobility spaces in the Toulouse region (Rautenberg et al. 2000; White, 2009). Different situations of tension and conflict can be identified and may arise in this report urban / agriculture. These conflicts underscore the complexity of this report and encourage governments to develop actions implementing the form of "agricultural planning".

The renewed interest in the olive tree as a tree of decoration and design on roadsides and in front of houses, reflects the development of other forms of agriculture and especially the success of urban olive growing.

Our results allow to diagram system components that "make working" the agricultural activities in Sfax. We distinguish two subsystems relatively tight. The subsystem of the olive cultivation leisure, strongly articulated at the municipal prosecution, residents and associations engaged in these gardening and maintenance. This subsystem is a positive dynamic. It differs from the subsystem of the commercial olive growing which experiencing a downward trend. Ignored by the local politics, excepted some economic areas that benefit from protection in the urban plan, commercial agriculture adapts as it can to the land insecurity and the temporary enhancement of cultivated areas with an uncertain future.
The interdependencies between the two subsystems: olive growing and urban system appear reduced. Our analysis identifies multiple interfaces: the first is based on the principle of participatory urban planning has raised awareness of the presence in the urban areas of olive growing, and offer them retain or redevelop them for gardening activities via short and regulated circuits of marketing. The second is related to the social movements that are expressed around a challenging urban projects by densifying the city in housing at the expense of green spaces. Some of those movements claim the maintenance of mixed spaces combining nature, agriculture and recreation areas.

5. Conclusion
While urbanization still has as a direct consequence to the disappearance of the majority of olive grove in urban and suburban areas in Sfax, it also generates a need for nature where spaces are olive areas find meaning. The demand of nature by the inhabitants, the resilience and the adaptation of some farmers to the urban context, contribute to question the government on the issue of agriculture, and especially olive groves. Beyond a programmed decline of olive growing in the city, our results show the existence of agricultural dynamics in nature underpinned by initiatives led by actors in both agricultural and urban. They reveal that the olive is growing as a mosaic of spaces and forms, as a component of the city, a component whose durability is related to the balance of dynamic playing wide spaces and actors, whether agricultural or urban.

References