



African J. of Economic and Sustainable Development

ISSN online: 2046-4789 - ISSN print: 2046-4770

<https://www.inderscience.com/ajesd>

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DOI: [10.1504/AJESD.2025.10067800](https://doi.org/10.1504/AJESD.2025.10067800)

Article History:

Received:	03 January 2024
Last revised:	28 March 2024
Accepted:	01 April 2024
Published online:	02 December 2024

Urban agriculture between territorial anchoring and challenges of urbanisation: case of Guersif City (Eastern Morocco)

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Abstract: Faced with the rise of a neoliberal economy, urban agriculture is being put into contention with other, more profitable activities. Preserving urban agriculture in Guersif represents a real challenge for the city's various stakeholders. This article attempts to account for the decline in agricultural land in the town of Guersif, which is subject to galloping urbanisation, especially following the promotion of the town to the status of provincial capital following Morocco's administrative division in 2009. Based on sociological surveys of urban farmers, consumers, and local decision makers in Guersif, and assisted by technical data from the 1954 topographical map and sentinel-2 satellite images, this study identifies and quantifies the rate of loss of agricultural land between 1954 and 2021.

Keywords: urban agriculture; territorial anchoring; Guersif; urbanisation; surveys.

Reference to this paper should be made as follows: Elyaagoubi, M. (2025) 'Urban agriculture between territorial anchoring and challenges of urbanisation: case of Guersif City (Eastern Morocco)', *African J. Economic and Sustainable Development*, Vol. 10, No. 1, pp.1–10.

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1 Introduction

According to the Food and Agriculture Organization of the United Nations (FAO), urban agriculture is a strategic solution to the challenges of urbanisation. It differs from peri-urban agriculture, which is located on the outskirts of cities in areas in contact with the rural environment (Valette et al., 2013). Aware of the role of this activity in the urban-rural balance and in helping to build sustainable cities, Morocco's Department of Regional and Urban Planning has identified project areas for the promotion and

development of urban agriculture in two Moroccan cities with great agricultural potential such as Agadir and Beni Mellal. This is an ambition expressed by the department, which aims to prepare the future of these areas by 2040 as part of a national sustainable urban planning programme.

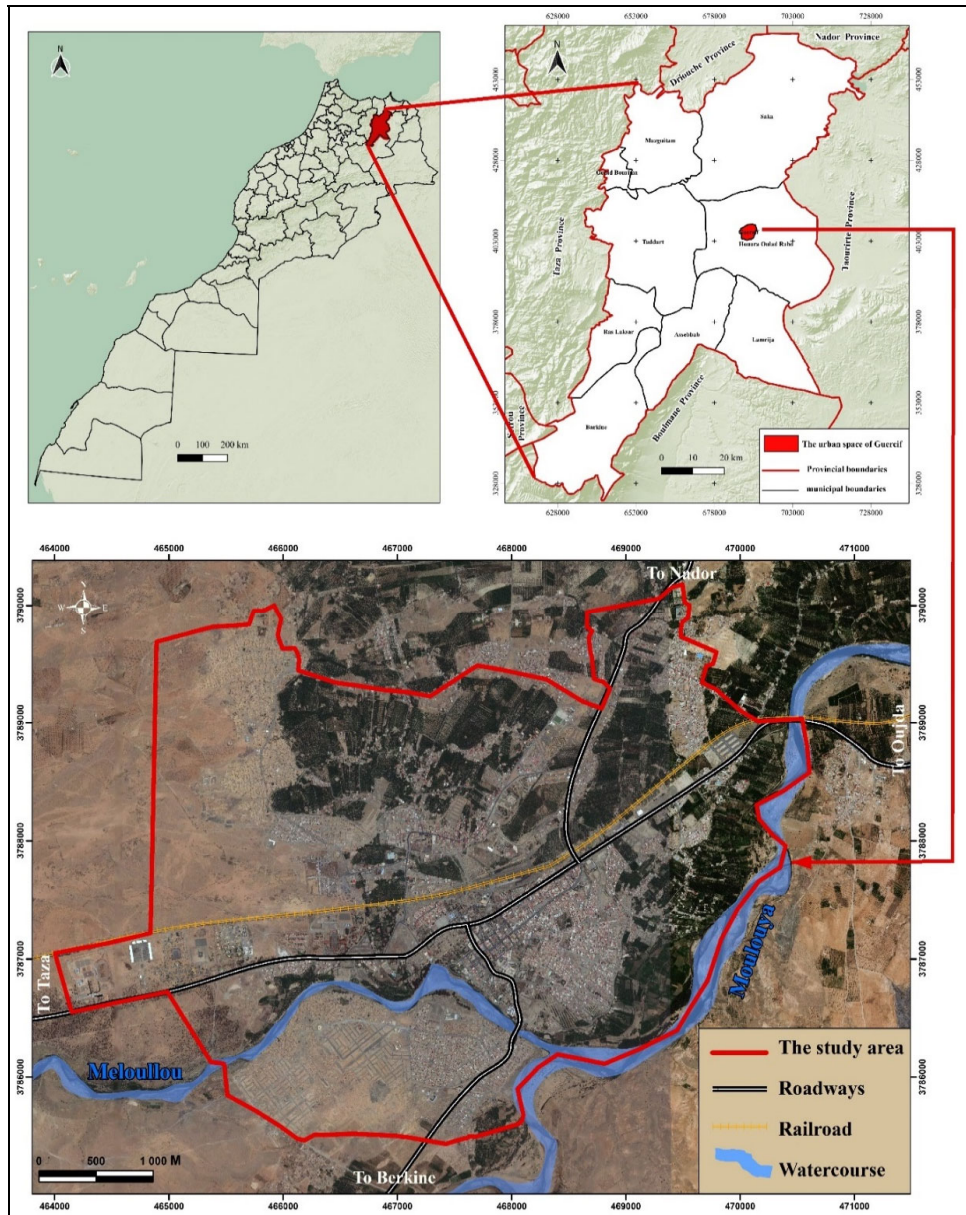
Although it has been described as an emerging practice in urban agriculture, in the case of Guersif it is a well-established activity. In fact, around 1920, the French protectorate authorities created an administrative post as a means of mobilising agricultural labour, and Guersif subsequently developed into an agricultural centre. It was not until 1992 that this centre was first established as a municipality, and then in 2009 that it finally acquired the status of provincial capital. As the administrative status of the town changed, agriculture gradually lost momentum, but it is still very much present in Guersif town, and the farms that still exist bear witness to the roots of this activity. Furthermore, according to the High Commission for Planning, the population of Guersif town is expected to grow significantly by 2030, reaching 163,321 inhabitants. The corollary of this demographic boom will be a frantic trend towards urbanisation, which will take place at the expense of agricultural land in the towns or on the outskirts, resulting in the permanent loss of invaluable agricultural potential. Morocco loses “nearly 22,000 ha of arable land annually in relatively favorable regions, due to urbanization, overexploitation of the soil, and the use of inappropriate ploughing techniques” (Akesbi, 2006). The potential impacts of this situation will be felt in terms of food requirements, pressure on natural resources, the production of waste deposits, etc. The development issues at stake in the city of Guersif must take into account urban agriculture as a multifunctional and supportive practice that is well rooted in the city’s history. A significant proportion of poor households could benefit from it (Temple and Moustier, 2004), and the contribution of urban agriculture to the economic development of the city of Guersif is more than assured. However, it turns out that agricultural land scattered around the urban perimeter in interstitial spaces is highly coveted by property developers, encouraged by policy measures adopted by the town’s municipal council. The aim of this article is to report on the agricultural production system in the town of Guersif and its impact on the urban economy. It also aims and to quantify the loss of agricultural land over the last six decades in the urban perimeter of Guersif City which covers an area of almost 1,950 hectares.

2 Materials and method

In order to account for the extension urban of the town of Guersif at the expense of agricultural land, a retrospective study was carried out using a set of geographical documents and tools, including the topographical map of Guersif (1/50,000), drawn up by the Department of Land Conservation and Topographical Works in 1954. This map enabled us to identify the initial occupation of the land and provided a reference for determining changes since then using satellite images for various periods. The use of images provided by the Sentinel-2 satellite has allowed us to differentiate between the different types of urban land cover in 2021, and the calculations made using the geographic information system permits to quantify the proportion of each type of land cover and thus estimate how they have changed over the period studied. Finally, it should be noted that the city’s current urban perimeter has been used as the framework for these

calculations, regardless of the various administrative divisions to which the city has been subject.

Figure 1 Administrative situation of the study area (see online version for colours)



Source: 2009 provincial boundaries, Urban Plan, Guersif 2015 and Landsat 2019 satellite image

2.1 *Study context and agricultural situation in Guersif*

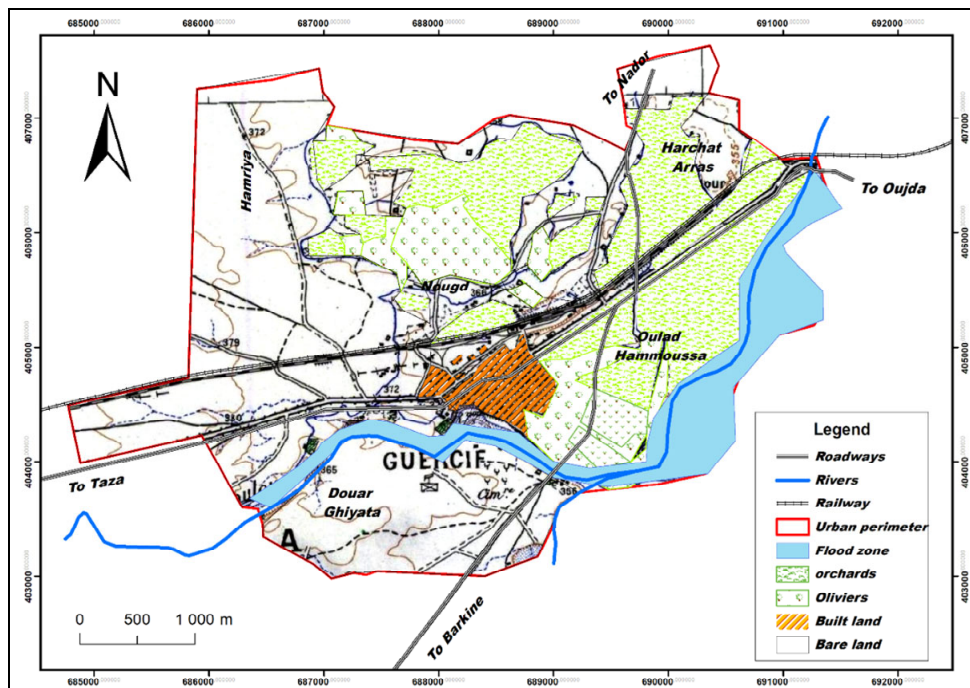
The town of Guersif, the provincial capital, is located on a plain of the same name at an altitude of 378 m above sea level. It lies in north-east Morocco in a transition zone between two corridors: the Taourirt corridor to the east and the Taza corridor to the west, and between the lower and middle Moulouya basin (Figure 1). It enjoys a strategic geographical location at the centre of a triangle whose apexes are towns of major importance in the national urban fabric (Oujda, Nador and Fès). Created by the dismemberment of the province of Taza following the administrative division of 2009, Guersif has been part of the oriental region since 2015. The town is unique in that it is the only urban centre in a vast province (over 7,300 km²) made up of nine other communes, all of which are rural. It is completely surrounded by the neighbouring commune of Houara Oulad Rahou.

Urban agriculture in Guersif concerns land scattered around the urban perimeter. It is particularly evident in the olive tree sector. Sheep, cattle, and goat rearing are also practiced in the town as a complementary option combined with agriculture. A field survey of 40 urban farmers, carried out in 2019 as part of a thesis on urban growth in the town of Guersif, aimed to provide information on the characteristics of farms ranging in size from 1 to 5 hectares, as well as the production system in the town. The estimated annual farm income (Gregoire, 2012) for each farm was deduced on the basis of the marketing activities of the cultivated products sold in the town's weekly 'souk' (large trading area). In addition, the future of this activity in Guersif was the subject of interviews with various types of stakeholders (Benabed and Dugue, 2014), in order to clarify the grey areas relating to the challenges facing agricultural land, in competition with other more profitable activities due to land speculation and the growing demand for land suitable for urban development.

2.2 *Illustration of losses of agricultural land*

At a time when the practice of urban agriculture is being encouraged in most of the world's cities, it is paradoxically experiencing a marked decline in Guersif due to a conflict over land use between two antagonistic forces: urbanisation and agriculture. The continued practice of agriculture is more than ever in doubt in the town of Guersif, since the local policy pursued by the local council is practically dissuasive with the introduction of a tax on undeveloped land. Yet the role of urban agriculture in Guersif, in addition to its economic impact, can help combat climate change and promote the development of biodiversity. This is the challenge that the city of Guersif must overcome in order to position itself in its local and regional context.

The topographical map of Guersif (Figure 2), drawn up in 1954 by the Ministry of Agriculture and Agrarian Reform, shows the predominance of agricultural land devoted to orchards, olive groves and vineyards. The built-up area is very small compared with the amount of bare land.

Figure 2 Land use in the study area in 1954 (see online version for colours)

Source: Topographic map of Guersif (1/50,000) of 1954 (Ministry of Agriculture and Agrarian Reform, Directorate of Land Conservation and Topographic Works, Map Division - Rabat.

3 Results and discussion

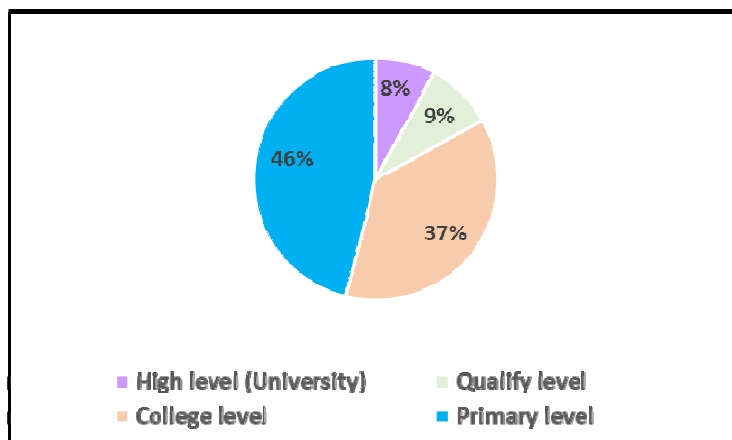
3.1 Farmers: an acceptable level of education

Because education creates skills and can have a significant effect on agricultural production, we thought it's appropriate to report on the level of education of farmers in the city of Guersif. This is a good indicator of the practices to be adopted to develop urban agriculture in a fragile ecological context marked by aridity and successive years of drought. The respondents can at least read and write, and the predominant level of education is primary (Figure 3). Other urban farmers have obtained a university degree, and work in the civil service alongside their farming activities. The farms are family-run, and curiously, these farmers are no longer supervised in agricultural matters because they have not received any training in this area.

The surface area of urban farms in Guersif is gradually increasing from the town centre to the outskirts at the edge of the urban perimeter. It has to be said that urban farms are more in demand for a change of use in favour of urbanisation. These farms benefit from irrigation water from the rivers that run through the town (the Moulouya and the Meloullou) and a system of canals (*séguías*) that run through the urban perimeter ensures this and helps maintain urban agriculture in Guersif. Farming in the town of Guersif helps to ensure food security for city dwellers and enhances the town's environmental setting

(Zasada, 2011). Agricultural activity is divided between various types of crops (Table 1), but is essentially centered on the olive tree, which accounts for a significant proportion of the activity of the farmers surveyed. Some of the produce is intended for consumption by the farm manager's household, and most of it is sold to towns in the eastern region (Taourirt, Oujda) and even further afield (Fez, Marrakech).

Figure 3 Educational level of farmers surveyed (see online version for colours)



Source: Field survey 2019

Table 1 Distribution of crop types in Guersif

<i>Crop type share</i>	<i>(%)</i>
Olive growing	55
Fruit plantations (apricot trees)	15
Forages	10
Market gardening	20

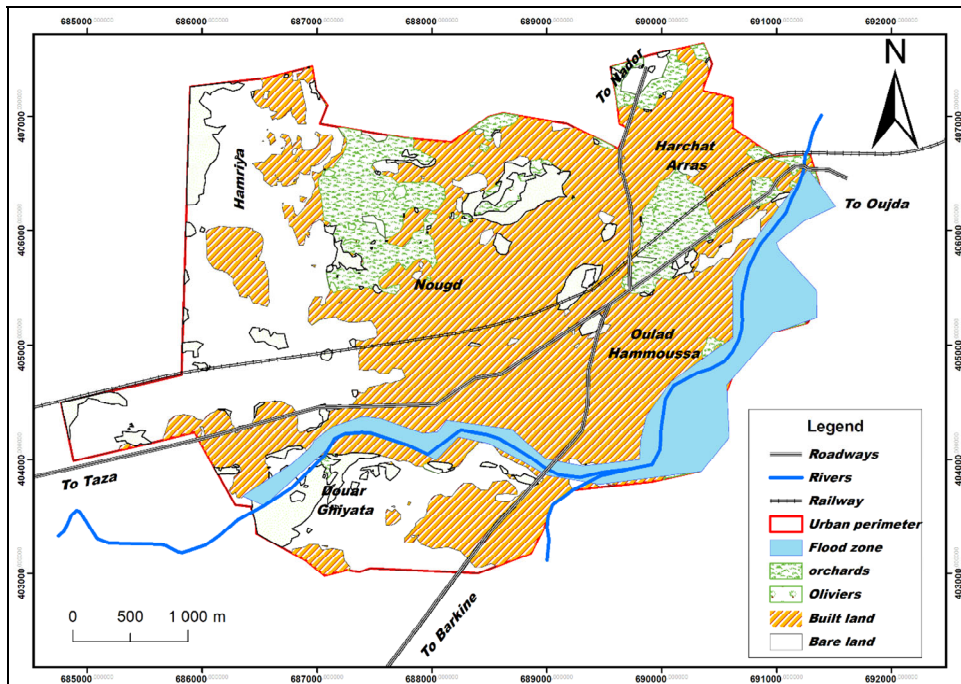
Source: Elyaagoubi (2023)

The olive-growing sector is considered to be a local brand, and every year a regional trade fair is held in Guersif to promote olives sector. The added value in the urban economy is revealed during the period of the fair by an economic stimulus that translates into job creation. Other market garden produce (radishes, mint, parsley, lettuce, beetroot, and green beans) are sold at the town's weekly souk, providing a significant income for farmers. According to farm managers, the average annual income is estimated at 30,000.00 dirhams per hectare. This amount far exceeds the legal minimum wage in the agricultural sector, which the scale revised in 2020 set at some 28,977.00. The combination of farming and livestock rearing, especially cattle rearing, enables farmers to sell their milk and thus have another source to supplement their income. As a result, urban agriculture is not only a survival strategy for the poor, but also a lucrative investment for wealthy city dwellers (Schilter, 1991).

3.2 Urban agriculture in Guersif: constraints and difficulties

The artificialisation and disappearance of agricultural land are becoming increasingly pronounced in the town of Guersif. All analyses agree that the land market is the vector of urban hegemony and that the price of land (current or anticipated) is a determining factor in the transformation of peri-urban spaces and agriculture (Jouve and Elloumi, 2003). The study reveals that the urban sprawl of Guersif town (Figure 4) has taken place on bare land, but also on land that was originally agricultural, mainly olive groves. The results obtained from the documents used reflect this reality.

Figure 4 Land use patterns in Guersif City in 2021 (see online version for colours)



Source: Guersif development plan 2015 and Sentinel-2 image of 2021

Table 2 Changes in land cover types between 1992 and 2019

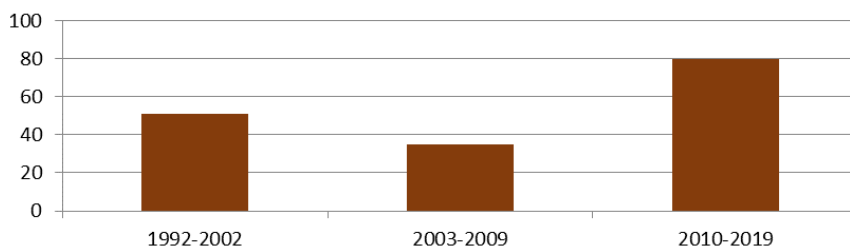
Land cover type	1954 topographic map data		2021 Sentinel-2 satellite image data	
	Surface area in km ²	Share of total surface area of urban perimeter	Surface area in km ²	Share of total surface area of urban perimeter
Bare land	9.78	50.15%	7.53	38.61
Agricultural land	9.21	47.23%	3.53	18.10
Built-up land	0.51	2.62%	8.44	43.28

Source: Topographic map (1/50,000) and Sentinel-2 satellite image for 2021

Changes in land use patterns in Guersif show a clear decline in agricultural land. Indeed, over the period studied, urbanisation has led to an increase in built-up areas on bare land, but also at the expense of agricultural land. In 2021, the proportion of agricultural land within the urban perimeter was 18.10%, compared with 47.23% six decades earlier, and an agricultural area of 5.68 km² was lost forever.

Because of this, an additional surface area of almost 8 km² has become the land base for development operations in the town. The change in land use in Guersif and the conversion of the initial use is justified by many reasons. The administrative promotion of the city to the rank of provincial capital in 2009 led to a pressing need for land for the establishment of external administrative services of the State (Education, Health, Equipment, etc.). In addition, the demographic boom and immigration have increased the demand for housing and equipment for the city's population. In addition, and faced with the rise of a neoliberal economy, agriculture in the city is put into contention with other more profitable activities, especially after the massive entry into play of international migrants (Elyaagoubi, 2023) in the animation of the local land market. Finally, the impact of climate change on the area whose climate is arid and precipitation does not exceed 160 ml per year are all dissuasive factors for the development of agricultural activity in the town of Guersif. Urbanisation has led to an increase in the number of authorisations (Figure 5) issued by the competent authorities to subdivide land that was originally agricultural. Since the promotion of the town to the status of provincial capital, the number of subdivision permits issued by the municipality of Guersif has reached 80 between 2010 and 2019.

Figure 5 Change in the number of allotments authorised in Guersif between 1992 and 2019 (see online version for colours)



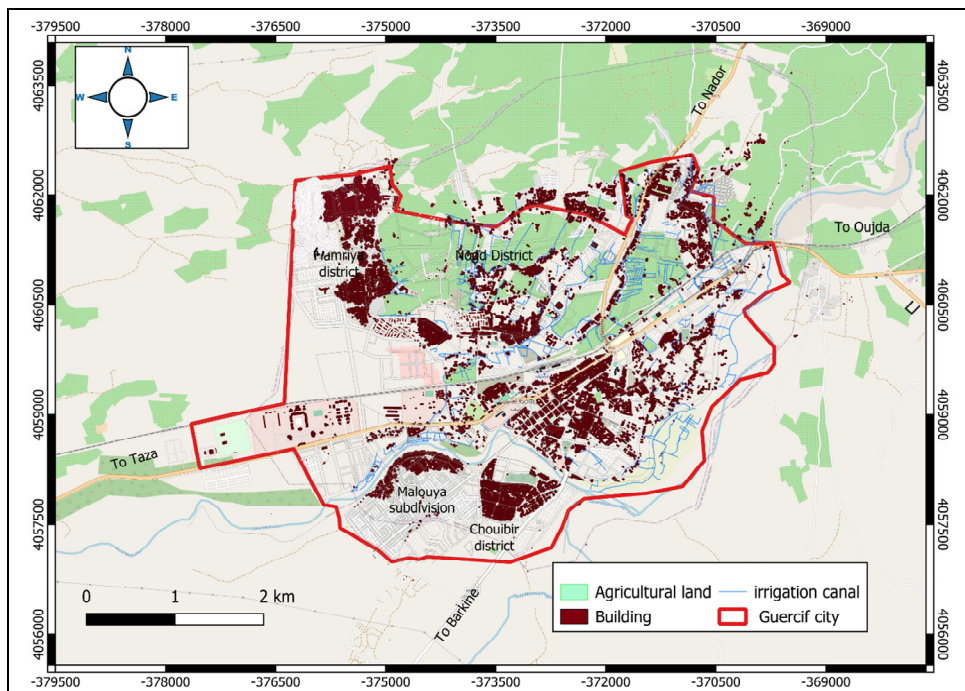
Source: Municipality of Guersif-Urban planning division, 2019

In terms of profitability, urban land dedicated to the construction of housing that will be sold or rented out at a later date is generally better valued than the use of the same land for agricultural purposes. The sustained and irreversible urbanisation of the town of Guersif, partly at the expense of agricultural land, has not succeeded in becoming a public problem, likely to raise questions about the urban phenomenon and its consequences (Valette and Philifert, 2014). In addition, local public policy uses regulatory measures to discourage the preservation and promotion of agricultural land. In fact, the tax payable to municipal services on unbuilt land provides for a sum of 40,000.00 dirhams per hectare to be paid for the last four years, the equivalent of 160,000.00 dirhams to be paid. The larger the area of agricultural land, the higher the tax, a measure that is putting urban agriculture in Guersif in difficulty. Local notables who are members of the municipal authorities (Navez-Bouchanine, 2003) are behind the artificialisation of agricultural land in favour of housing programs or urban amenities.

These transformations have induced a situation of transition and adaptation for the population. The results of the survey carried out in the neighbourhoods surrounding the farms show that the apprehension of the transformation of the neighbourhood varies depending on the representation of the place, strongly marked by identity values and resident practices which relate more to the rural world. The population surveyed emphasises in almost the same proportions the socio-economic and ecological advantages of urban agriculture on the one hand and the knock-on effects of urbanisation on the other. This double apprehension is accompanied more by uncertainties, even worries, than opportunities regarding the future of agriculture in the town of Guersif.

A synthetic map of the development of agricultural areas in Guersif (Figure 6) established on a recent OpenStreetMap background (2021) reflects the land use conflict between urbanisation and agriculture. The scattering of irrigation canals 'saguia', a hydraulic heritage specific to Guersif City in the urban perimeter, recalls the initial agricultural vocation of urbanised land.

Figure 6 Extension urban and shrinkage of agricultural area (see online version for colours)



Source: Guercif Development Plan 2015 and OpenStreetMap image of 2021

4 Conclusions

This study has shown that urban agriculture in Guersif is an important activity in the local economic fabric on the one hand, and that urban sprawl is taking place on agricultural land on the other. The imbalance of the local environment is strongly revealed by the continual loss of vegetation in an arid climate. The appearance of heat islands in the town

of Guersif is one of the consequences of the ecological imbalance caused by artificial development. The preservation of nature in the city enables its sustainable development, hence the need to maintain urban agriculture (Banzo, 2009).

Moreover, the successive administrative promotions of the territory of the city of Guersif have not been without impact on the loss of agricultural land. The pressing need for infrastructure has led the State to build public facilities on land that was once agricultural. Speculation and the interests of local players and notables have led to an opaque but highly dynamic and profitable land market. The absence of an urban policy capable of guiding urban sprawl and integrating agriculture as an element of territorial planning, and the introduction of a tax on undeveloped land, are all factors that raise questions about the sustainability of urban agriculture in Guersif in the short and medium term.

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