

11TH CTV

back to the sense of the city

PATTERNS OF NON-PLANNED OCCUPATION OF THE PERI-URBAN TERRITORY OF THE HUERTA DE MURCIA, 1929-2015

García Martín, Fernando M.

PhD Student. Assistant Professor

fernando.garcia@upct.es

+34 627 791 673

Ros Sempere, Marcos

PhD in Architecture. PhD Professor.

marcos.ros@upct.es

+34 661 500 160

Technical School of Architecture
Polytechnic University of Cartagena
Paseo Alfonso XIII, nº 50. 30203 - Cartagena. Spain.
+34 868 071 266
+34 868 071 228

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Abstract

The peri-urban area of the Huerta de Murcia, around the city of Murcia, in southeast Spain, fundamentally dedicated to agriculture, has undergone a process of peri-urbanisation during the past 40 years, caused by un-regulated construction.

This agricultural area of about 10,000Ha originates from the ninth century, and is linked to an extensive network of canals channelled from the Segura River. This long-established irrigation system provides a much divided and fragmented agrarian morphology.

Most building has been carried out over the last 4 decades, mainly of family housing but also of holiday properties, and this construction has not been regulated, resulting in a spontaneous phenomenon of dispersed occupation.

Despite an apparent spontaneity and disorder in this occupation, this study uses an analysis methodology based on ortho-photographic series and cadastral data to show the existence of occupancy patterns, which vary over different periods.

The analyses of these patterns, in addition to a proposed classification, are the main subjects of the study, and will show how goals and methodologies for intervention and action may be set up.

Introduction

This report consists of a study of informal occupation by housing and other construction in the Huerta de Murcia, a phenomenon which is clearly visible especially since the 1980s. In the

second decade of the 21st century, this peri-urban dispersion around the city of Murcia has reached a level that is of great concern, as the original agrarian landscape has been transformed into rural-urbanised land with a very high residential population, yet with no guarantee of the minimum conditions applicable to urban areas, and endangering its use as viable agricultural land.

The study begins with a global analysis of the area of the Huerta de Murcia, divided into homogenous units of land, for which a study is carried out using combined data from the ortho-photographic series available on the SitMurcia website (www.sitmurcia.es) and cartographical cadastral data.

Using both sources of information and GIS software, the aim is to obtain a global image of all construction in the area during the different historical periods shown by the ortho-photographic collection.

The methodology applied in the study allows qualitative and quantitative conclusions about the analysed phenomenon to be analysed. The objective of this report is to present the results of the qualitative analysis, which will demonstrate conclusions on the determining factors of this disperse growth and establish graphic, geographical, urban and social patterns that have marked the occupancy phenomenon in the Huerta during different periods. This information will be presented alongside the principal quantitative values of the process, which will produce a global framework of the phenomenon according to periods and areas.

The final objective is to determine a series of proposals for intervention, with the aim of reversing or at least stopping this unsustainable process that can only lead to the area becoming a 'diffuse city' (Indovina, 2000).

Geographical and cultural context

The Huerta de Murcia is a natural area located close to the city of Murcia, in southeast Spain. The land was originally used for agricultural purposes in 825 AD following the Arabic colonisation of Spain, and an irrigation system was created around the Segura River, which runs through the valley where the city of Murcia was built.

The complex irrigation network, over a thousand years old, created an agricultural landscape of high cultural, aesthetic and patrimonial value, in the face of an arid climate interspersed with torrential rainfall. The area has been the focus of numerous studies in the last forty years, both geographical (by Calvo, Andrés, Serrano, Zapata, and Sempere), and more recently, urban (by Cano, García, Ros, and Roselló).

The urban-rural dichotomy of the landscape has existed for longer than a thousand years, and endured throughout a continuous process of transformation, which until well into the middle of the 20th century was dominated by the rural and agricultural activity. But the 1960s saw the beginning of two significant phenomena that would break the status quo and champion urban development.

One change was the unprecedented growth of the urban footprints of the city of Murcia and the urban centres located within the area of the Huerta. This growth has continually expanded the urban landscape of the thousand-year-old city, and is the same phenomenon that has affected practically all Spanish cities during this period, due to migration from the countryside to the

cities and a spectacular increase in population, and to the improvement in economic, social and political conditions.

The other influence was a slow, invisible but inexorable process that grew from the lifestyle changes of the population. City residents wanted a more relaxed life, and acquired the wealth to obtain the transport that brought the freedom to live where they wanted, and so they found desirable locations in the Huerta, just a short distance from the city, but where they could feel in touch with the countryside and its rural customs.

The Huerta de Murcia also forms a part of the irrigation systems of the valleys of the Segura and Guadalentín Rivers, which make up one of the most extensive cultivated areas in Spain. The different irrigation systems connect with others throughout the valleys of the region and link with the numerous urban populations of the Mediterranean arch (Lorca, Murcia, Orihuela, Elche, Alicante and other towns), to form one of the most important peri-urban areas of the Mediterranean.

Figures 1-2. Peri-urban context of southeast Spain. Area studied: Huerta de Murcia



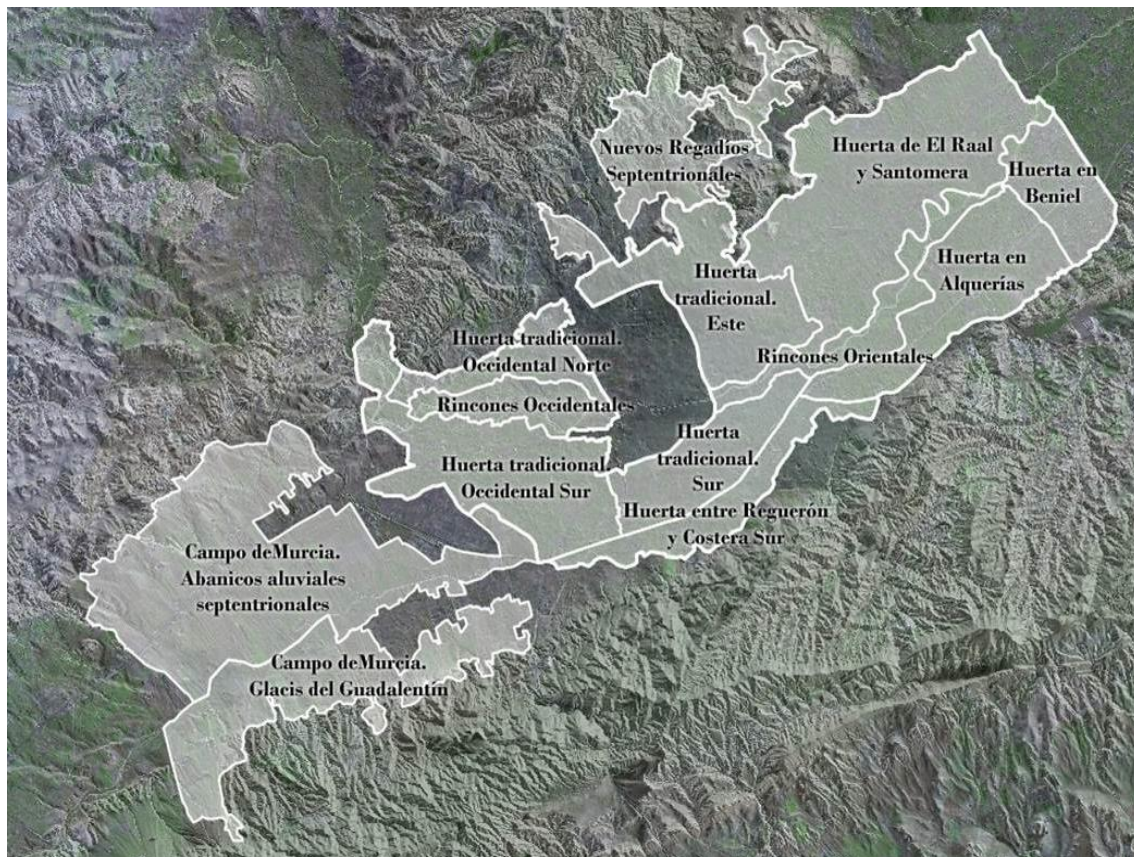
Source: Created from SITMurcia images (www.sitmurcia.es)

There have been few studies until now that have analysed this as a global phenomenon, although some partial studies have been carried out, and these can be compared with similar studies of other European regions (by Calvo, 1972; Ferrario, 2009; and Entrena, 2005).

Agrarian morphology and units of land

The agrarian morphology of the Huerta de Murcia is a product of the long-term transformational process of the units of land that began in the 9th century. Geographical studies (Calvo, 1972) have tended to apply morphological factors to divide the Huerta into three areas.

However, in 2011, the Landscape Strategy for the Region of Murcia defined fifteen homogenous units of land within the area of the Huerta de Murcia, based on an earlier study by Mata Olmo conducted in 2004. For each unit constituting factors were established: geoformations, hydrography, vegetation coverage, use of the terrain, elements of the agrarian structure, settlements, and road networks. Indicators of quality were also determined, providing measures of the quality or vulnerability of the landscape.

Figure 3. Units of land in the Huerta de Murcia

Source: Created from the Land Atlas of the Region of Murcia

This study applies the criteria for these established units of land as they relate to the traditional morphology of the Huerta, which is fundamentally determined by the characteristics of the agricultural plots, factors related to the possibility of occupancy and change of use, as well as regulations governing urban planning.

Methodology

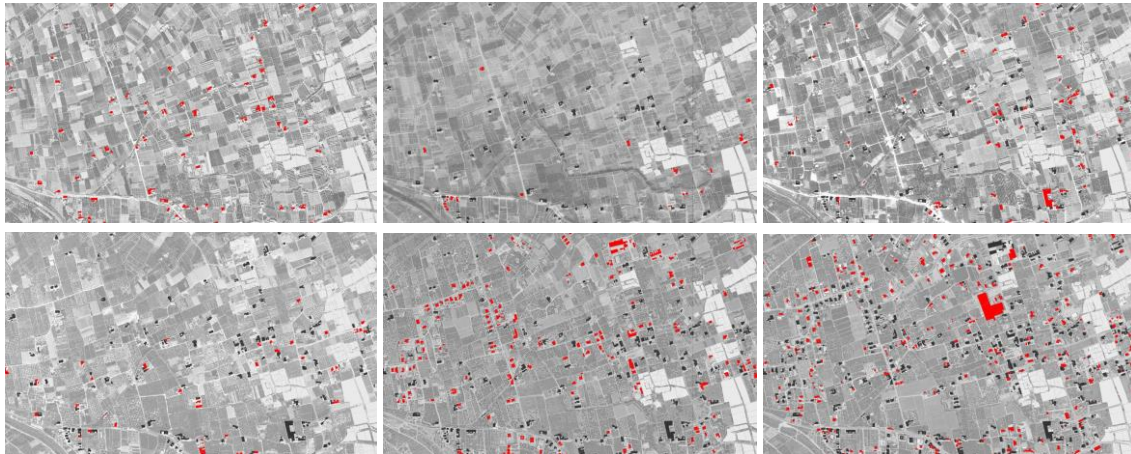
The research was initiated with a pilot study (by Ros and García in 2012) which analysed a section of the western Huerta. This study formed the first stage of the project, and served as a trial for the methodology techniques used to study the patterns and causes that have marked the transformation of the Huerta de Murcia.

The study was carried out using the ortho-photographic series, and a follow-up study was carried out manually according to date of construction and the relevant plots of land. Once all the data had been extracted, the areas of land, and the graphic and urban patterns, were studied numerically by period (CONAMA, 2012).

The second stage of the project expanded the area of study to cover the whole of the Huerta de Murcia, from the Contraparada dam to Vereda Real on the border with Alicante. The recent transformation process of the Huerta de Murcia has been analysed, taking into account only the

land that maintains its traditional agricultural usage and excluding urbanised land (towns and suburbs) and land categorised for urbanisation in the General Plan, which has already been classified as urban by the Land Registry Department. Such urban land has been excluded because it denotes the complete substitution of rural land for land dedicated to a new urban purpose. The study aims to analyse only the 'transformation' and not the 'substitution' of the uses of the land of the Huerta.

Figures 4-9. Analysis of housing by period, western Huerta



Source: Created from SITMurcia images (www.sitmurcia.es), 1928-1946-1954-1981-2001-2015.

Having determined the area of study and the relevant landscape, the methodology was set as the following:

- Downloading ortho-photographs of the study area (Sitmurcia portal), from 1928, 1946, 1956, 1981, 2002, and 2015.
- Downloading Shapefile land registry maps corresponding to the study area, including important data on the height of buildings, and using GIS¹ software to ascertain the areas of agriculture, construction, and occupancy.
- Integrating the maps, and assigning each building in the registry (once confirmed as correct) to the oldest point at which it appears in the ortho-photographs.
- Comparing the maps with the ortho-photographs of the equivalent year for individual analysis.
- Extracting quantitative data, creating data tables and encoding graphics and numeric tables.

A second process consisted of localising growth patterns in different areas of the Huerta in different periods, using a subjective analysis of maps with buildings of different periods, with the aim of establishing systemised hypotheses to establish proposals for future work.

¹ Open source gvSIG Geographic Information System software was used for the study. (www.gvsig.com).

Information obtained

The most relevant data extracted from the global study is presented below:

Table 1. Numerical data of occupancy by period and accumulated construction

	1928	1946	1956	1981	2002	2015					
	SURFACE (before 28) (m ²)	SURFACE (m ²)	Annual Increase by period (%)	SURFACE (m ²)	Annual Increase by period (%)	SURFACE (m ²)	Annual Increase by period (%)	SURFACE (m ²)	Annual Increase by period (%)		
El Raal and Santomera	36,498	30,697	4.67%	33,949	5.05%	108,166	4.28%	249,498	5.68%	237,801	3.99%
Alquerías	5,977	15,177	14.11%	22,813	10.78%	50,747	4.62%	88,487	4.45%	114,645	4.81%
Eastern Corners	11,692	6,978	3.32%	12,132	6.50%	30,983	4.02%	22,343	1.72%	36,837	3.37%
East Murcia	19,888	5,931	1.66%	21,623	8.38%	43,770	3.69%	98,631	5.15%	104,583	4.24%
Between Reguerón and Coste	24,383	137	0.03%	10,545	-	43,730	4.99%	56,236	3.40%	76,899	4.38%
West (south)	72,392	9,884	0.76%	52,666	6.40%	91,733	2.72%	119,325	2.51%	228,460	5.08%
Western corners	18,988	22,502	6.58%	16,387	3.95%	47,082	3.25%	41,480	1.88%	81,992	4.31%
West (North)	21,253	5,369	1.40%	28,382	10.66%	29,509	2.15%	61,168	3.45%	90,392	4.77%
South	40,854	2,802	0.38%	19,406	4.45%	38,124	2.42%	81,961	3.86%	119,232	5.01%
Total Huerta de Murcia	251,925	99,476	2.19%	217,903	6.20%	484,039	3.40%	819,129	3.70%	1,090,994	4.48%
Accumulated area:		351,401	2.19%	569,304	6.20%	1,053,344	3.40%	1,872,473	3.70%	2,963,467	4.48%

Source: Created using the methodology described

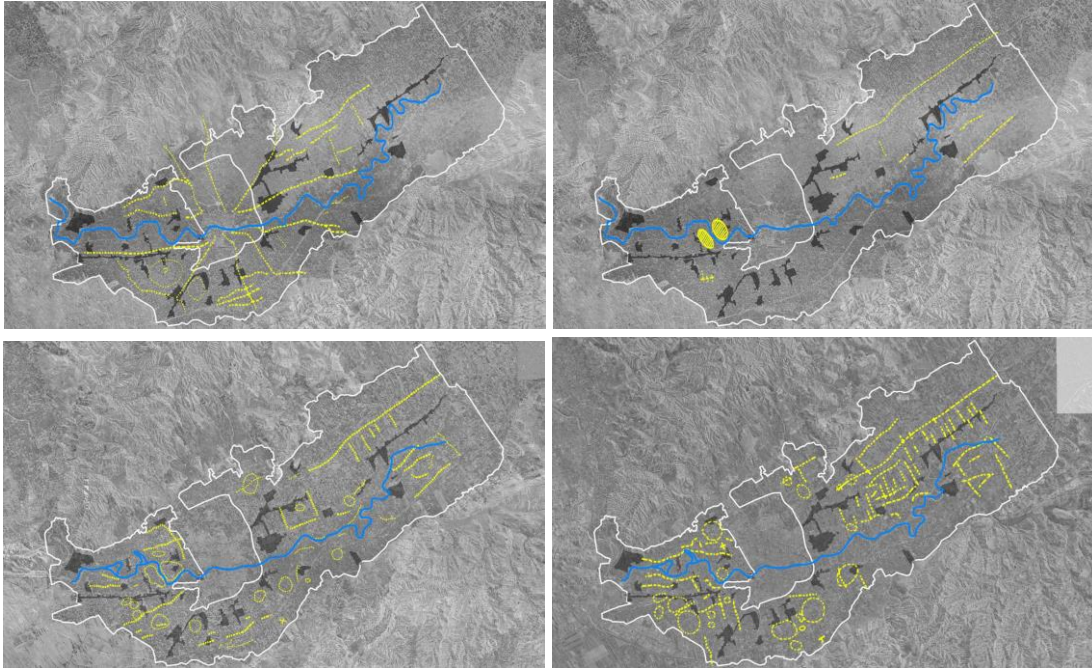
- The total land area taken up by buildings in the Huerta de Murcia (excluding the areas previously detailed) has increased from 251,925m² in 1928 to 2,963,466m² in 2015, which is almost eleven times the occupancy of land existing in 1929.
- By carrying out an analysis of the occupied (and construction) areas by period, and extrapolating the information according to year, it was observed that, notwithstanding the initial situation when hardly any areas were occupied, after 1956 a continual annual increase of occupied land was established of around 4% on the total occupancy of the previous year.
- Although these percentages remain stable, the accumulation of buildings contributes to a twenty-fold increase of the net land area where there is annual construction in each period.
- It is notable that despite the apparent saturation of some areas of traditional rural land, during the period from 2002 to 2015 the rate of growth was slightly increased each year. This trend was reflected in all areas, including the most saturated.
- The relationship between areas of occupancy and areas of construction remains constant in practically all the analysed series. The value of this relationship (construction m² / occupancy m²) is around 1.26 – 1.28.
- This data is notably similar in practically all the homogenous units of land analysed.

Patterns of occupancy

Once the principal numerical data was demonstrated, it was compared with the patterns of occupancy observed through the different historical periods, which were obtained using the individual yearly maps (see the methodology detailed above) and a system of visual analysis of

the trends in the new housing constructed in each period (housing marked in red in figures 4 to 9).

Figures 10-13. Patterns of occupancy by period in the global study



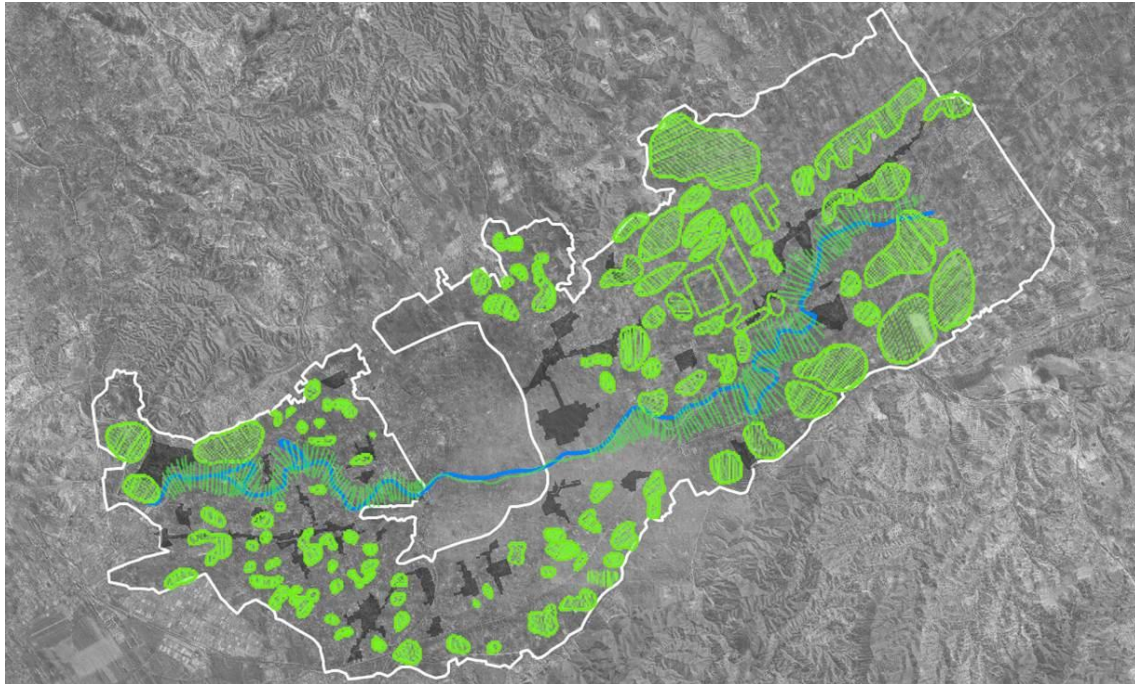
Source: Created using the methodology described. Patterns 1928, 1956, 1981, and 2002

Patterns by homogenous areas of the Huerta de Murcia

This visual observation and the creation of the pattern revealed the following results:

- In 1928 the housing found initially is localised along two linear areas: the principal roads and pathways of the Huerta, and the main irrigation routes and waterways.
- In 1956, owing to the periods during and after the Civil War, there is almost no significant growth in dispersed housing. Housing is located mostly on the principal roadways, although homogenous areas of dispersion are starting to appear in the west.
- In 1981 the increase is significant, localised mainly in the homogenous areas of dispersion in the western and southern Huerta, and around a network of secondary roadways leading off the main roads in the eastern Huerta.
- 2002 shows the greatest saturation of all the growth stages, with housing appearing along a second line of main roadways, on secondary roadways, and even along a third set of roads. Individual housing also appears in homogenous dispersion in large areas of the south, due to the saturation in the west.

It is almost impossible to create a pattern of occupancy in the photo for 2015, as there is a combination of all the previous patterns in almost all the analysed areas of the Huerta.

Figure 14. Pattern of pockets of remaining rural area in 2015

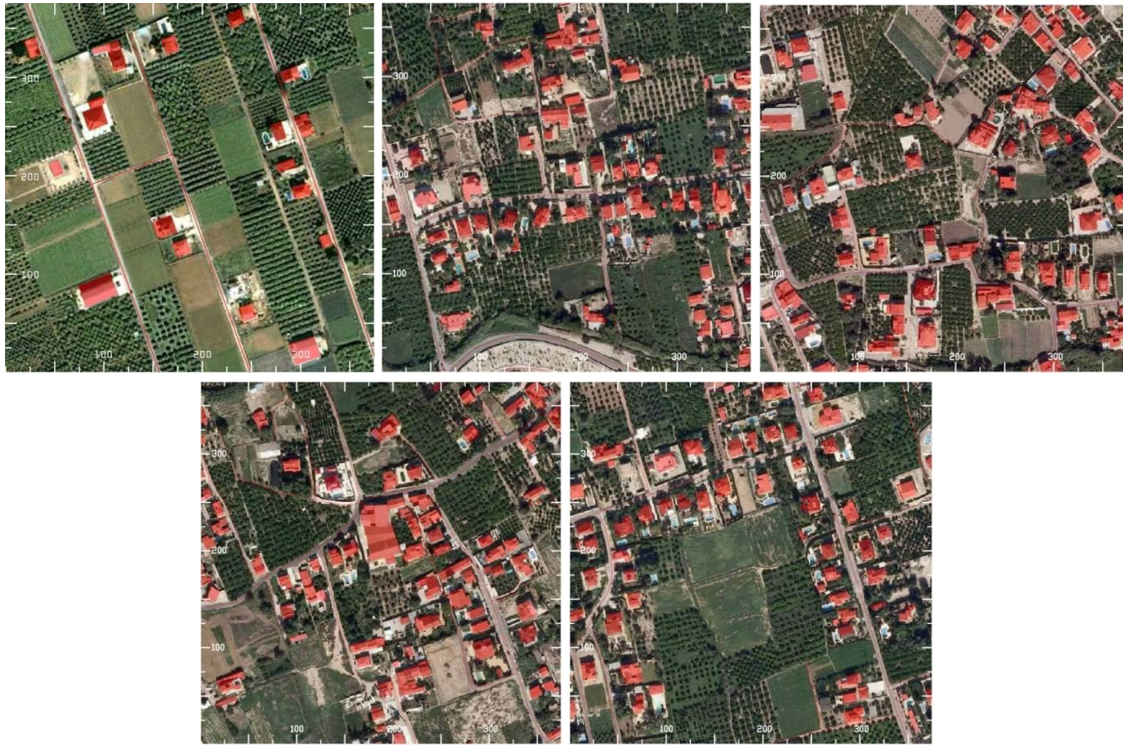
Source: Created using the methodology described

For this reason, the study was finalised in 2015 with an analysis of the areas of 'productive rural land' that have reasonably subsisted until the present day, and which might possibly become new agricultural land in the future, if the current process of disperse occupancy in the Huerta de Murcia can be stopped, either by urban regulations or by inspection and control.

This land currently consists of a scattering of unconnected rural areas, smaller in the west and south and larger in the east, which could be used as a base to implement strategies for urban, ecological, social or patrimonial projects for the Huerta de Murcia.

Individualised typological patterns

From the visual observation of localised areas and successive stages of configuration, the following patterns were also extracted showing the development of dispersed occupancy, which are repeated across the analysed region, although some prevalence of certain areas is shown. Up to five different possible distribution trends for housing produced over a period of time have been identified, as shown by figures 15 to 20:

Figures 15 - 20– Individualised patterns of dispersed occupancy

Source: Created from the methodology described. (1.- Specific dispersion in the east; 2.- Linear dispersion in the west; 3.- Homogeneous dispersion in the west; 4.- Specific grouping on road intersections; 5.- Linear dispersion around a roadway enclosing a pocket of rural land)

1. Random and homogeneous dispersion of housing in the east, which shows a dispersion pattern that is more regular and geometric, as housing is localised along the gridwork of roadways.
2. Linear dispersion in the west – groups of housing on the edge of a main roadway, creating continuous lines of housing on both sides of the roadway.
3. Homogenous random dispersion in the west – groups of housing distributed randomly on main and secondary roads, waterways and other locations, due to the accumulated building saturation in the west.
4. Specific grouping at road intersections – groups of houses are created, which finally constitute a factor of the rural population, and even produce commercial activity and individual characteristics.
5. Linear dispersion creating enclosed pockets – producing non-productive pockets of rural land, enclosed by the linear distribution shown in pattern 2.

Figures 21-24. Outline of patterns of occupancy

Source: Created using the methodology described.

Conclusions

The analysis of the generated and processed data and information, assessed according to quantitative numerical, and graphic morphological strategies, demonstrates the following conclusions:

1. The dispersion of occupancy of the peri-urban territory of the Huerta de Murcia is a occupancy model that has been created spontaneously, by the individual activities of inhabitants who have established new (first and second) homes, in accordance with the studied migration trends from the closest urban centres (Murcia and its suburbs).
2. This model of occupancy has been sustained over time and perpetuated historically, and includes some periods of greater extension, but which since 1928 has not seen any recession or deceleration, and has produced an average annual increase of 4% of the occupied area throughout this period.
3. The analysed phenomenon and its comparison with the range of urban regulations in the city of Murcia (the 1978 General Plan and the 2001 General Plan for Town Planning), show that the model of dispersion sits on the margins of the regulations, which in turn clearly indicates a high level of defiance of urban laws and the permissiveness of the authorities in respect to the phenomenon described.
4. Although the process has been spontaneous, the described patterns of occupancy are formed, which while stable, undergo small developments during each time period, and pass through the following stages:
 - a. Occupancy along the principal roadways of the urban landscape.
 - b. Occupancy along secondary roads, waterways, and a second line of principal roadways.

- c. Small specific groupings, on road intersections with linear occupancy.
 - d. Areas of homogeneous dispersion (mainly in the west).
 - e. The creation of pockets of unoccupied rural land, following the continuous dispersion of occupancy.
5. The current existence of the aforementioned unoccupied pockets of rural land offers the principal opportunity for future projects focussed on stabilising the process, and on maintaining an agricultural, rural and cultural environment that can co-exist with the new peri-urban areas, accommodating their own agricultural-related production and leisure activities, which could include the following:
- The integration of the unoccupied pockets of land in the European Network of Green Infrastructure, as defined by the European Commission (Ros, 2014).
 - The promotion of agricultural economy, highly-specialised cooperatives, global ecological agriculture, local markets and high-quality specialist products.
 - The acquisition and rent of plots for urban leisure, in places close to urban centres.
 - The creation of sustainable educational agricultural systems, linked with education centres for young children and teenagers, to develop the green economy and sustainable management of the area.
 - Promotion of the existing irrigation network, for touristic and leisure purposes.
6. All the above demonstrated conclusions point clearly towards one resolution, and that is the inexorable and urgent need to draw up a Special Plan for the Comprehensive Protection of the Huerta de Murcia, which includes the specified proposals in addition to further proposals that would result from its creation.

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