Chapter

The Degraded Insular Landscape in the Urban-Rural Interface – Application to the Urban Agglomeration of the South of the Island of Tenerife

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Abstract

The urban agglomeration of the south of Tenerife is characterized by its accelerated and explosive conformation since the tourist boom of the 80s of the last century. This speed has caused radical landscape changes that have had environmental, economic, social, and spatial repercussions. We try to extract those landscape patterns that characterize this urban model but also to analyze and quantify the landscape degradation of the urban-rural transition zones existing between the tourist and non-tourist nuclei. Through the cartographic and graphic method, typical of spatial thinking and regional geographical analysis, we combine multiple components that characterize and synthesize the substance of the abiotic, biotic, and cultural elements. As a result, we have a diagnosis where the centrality of the tourist nucleus brings together economic activity, the movement of people and vehicles, but at the same time, allows the development of other former rural-based nuclei, transforming them into residential ones, as well as the explosion of buildings dispersed between them. We propose that planning should be based on the landscape patterns that characterize it, starting from the corridor that links the urban centers of the agglomeration.

Keywords: degraded landscape, urban sprawl, soil sealing, green corridor, eco-corridor, urban agglomeration, compact city

1. Introduction

In a finite space such as an island, the fragmentation of the landscape [1, 2] induces a growing deterioration, mainly due to the abandonment of the agricultural space and the increase of urban dispersion [3]. In Tenerife, this process is more severe, when in the last 30 years hardly any new urban plans adapted to the social, economic, and environmental reality have been drafted. Instead, there have only been adaptations to new regulatory texts applied to old territorial and urban plans. Among many consequences, there is a disruption of biodiversity and natural capital flows, but also a break in the continuity of the structures of the cultural paleo-landscape. This pattern is recurrent in many cases, but "studying cities is a

never-ending process there is always more to learn" [4]. If we say that an urban agglomeration is built from a central urban core and a series of smaller peripheral urban centers that are under its influence, perhaps we are not making a big difference, but if its expansion is channeled through its network of road corridors that stretch the built-up space, while at the same time, buildings are constructed between the interstitial spaces indiscriminately, the perceived landscape is not only fragmented but, in many cases, it has deteriorated. The rural-urban interface is not defined. Beyond the large nuclei that make up the urban agglomeration of the south, there are multiple population swarms of all kinds: medium-sized nuclei, scattered micronuclei, many clandestine and self-built, individual scattered buildings, urbanizations, all glued between the industrial agricultural space and the abundant abandoned agricultural space. If we add to this problem that this process has an explosive character, forged in just two decades, 1970–1990 and that we are facing a model of urban agglomeration linked to the implementation of the massive and fordist tourist industry [5], we believe that it is a space that has enough entity to investigate what has happened in its past [6] to explain its present, but above all, and this is where we are, to monitor the changes that will occur in the future.

But can this urban typological model be considered a city? Possibly we cannot yet consider it as a consolidated urban structure, but yes, it is in the process of conformation. If we look at the projection of its planning, we would say that it could be, in the future, the largest in the Canary Islands. The large central urban nucleus, Los Cristianos-Las Américas-La Caleta (Arona-Adeje), can be considered the driving force of the tourist industry in Tenerife, although there are authors who consider that, although it does not have a direct relationship with the phenomenon of industrialization, it did affect all settlements, being a modifying factor of the first magnitude [7]. The numerous studies developed in Spain between the 80s and 90s of the last centuries on this phenomenon are considerable and use typologies such as enclave, nucleus, and even call conurbation to the whole Mediterranean coast. The evolutionary process of these enclaves or nuclei goes from being simple tourist urbanizations to tourist cities creating specific urban spaces destined for recreational consumption [8]. The south of the island of Tenerife could be considered, on an insular scale, a large conurbation, which is related to the rest of the island, but also to other national and international scales. This same idea overlaps with its immediate past. Agricultural activity took the leading role in the change, when the export of crops became the first great socio-spatial modifier of the south, between the 40s and 50s of the twentieth century. The arrival of water for irrigation (Canal del Sur S.A.) and the implementation of thousands of hectares of irrigated crops, generated a large labor supply, causing the movement of the insular and regional working population [6]. But the physical characteristics that made the farms ideal were also ideal for tourism, generating a dialectic for the soil, the water, and the worker [9]. In this relationship, undoubtedly, the weight has shifted to the side of the tourist industry. The price of land, the speed of profit, the large economic margins, etc., as demonstrated by Víctor Martín, turned agrarian income into urban income [10]. Small, medium, and especially large landowners put up for sale thousands of hectares of land, in many cases wasteland and unproductive land, but close to the sea. The property map changed from physical properties (individuals) to different corporate legal figures. The owners of rural land changed legal figures from individuals to corporations. But even today, in its urban perimeter both activities coexist, although, spatially, agricultural production is displaced more towards both extremes NW and SE, freeing land in the perimeter closer to the large and medium urban centers (**Figures 1** and **2**).

The tourist landscape is a product, as in the rest of Spain, of mass tourism linked to the sun and the coast, which began in the 1960s, centered on the Mediterranean arc and the Balearic and Canary Islands. In our case, it is developed from the 60s in a

punctual way in traditional coastal settlements: El Médano or the sale of large plots of wasteland along the coast that allow the promotion of Ten-Bel. But it was not until well into the 1980s that the tourist nucleus was formalized, combining tourist infrastructures (hotels, apartments, beaches, ports, shopping centers, leisure infrastructure, industrial estates, etc.) with the original small settlements, to which many other scattered, illegal, and non-formal settlements were added, spreading

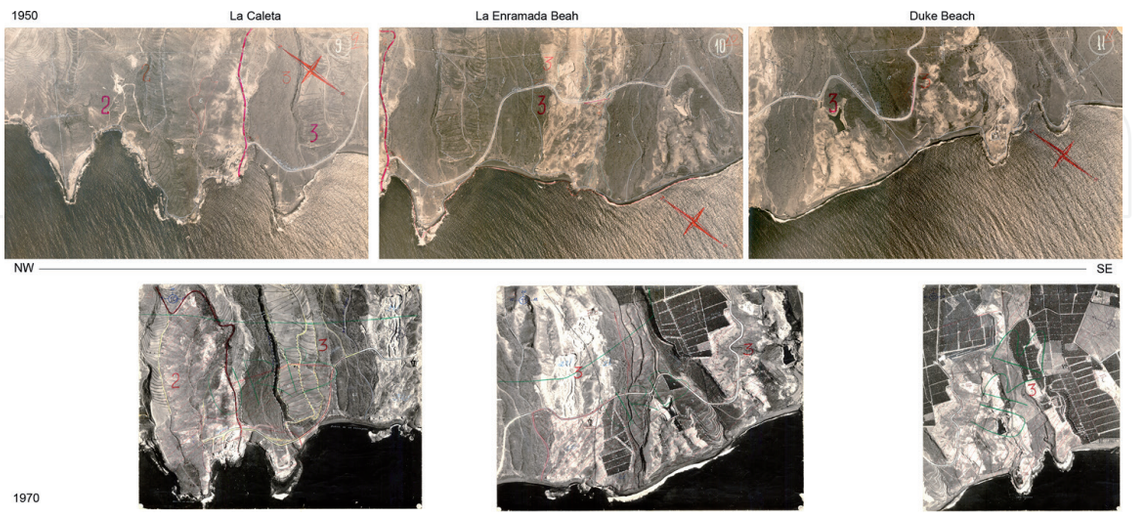

Figure 1.
Landscape of the 1950s and 1970s. Model of transformation from rain-fed agriculture to irrigated agriculture for export. Municipality of Adeje: La Caleta de Adeje (Photo 9), Playa de la Enramada (Photo 10), and Playa del Duque (Photo 11). An area with residual rain-fed agriculture where some small water catchment dams can be observed in the courses of the ravines. Source: 1956 Cadastral Orthophotography, Aerial photograph 1970, and Island Council of Tenerife.

Figure 2.
Urban agglomeration in the Playa del Duque sector (Costa Adeje). 2003. Source: Island Council of Tenerife.

in all directions, following the conception of the processes of the classic ecological system and based on the processes of expansion-aggregation and invasion-succession [11]. The processes of invasion-succession are sustained, when they do not find equivalent resistance, in those cases the type of space occupation is substituted by another. In the south of Tenerife, especially in the coastal areas, the substitution of the agrarian landscape is evident, but also, following H. Gibbard, there is a change in the local population dimension, in the ethnic composition, social stratification, economic activities, residential mobility, the affectation of residential areas, administrative activity, creation of jobs in suburban areas, etc. [11].

Following the ecological method [12] proposed by the Chicago School in the 60s of the last centuries, we could check if the construction of the urban agglomeration in the south of Tenerife followed sustainable patterns adapted to its nature, or on the contrary if it has been built without these logics. That is why we start in this work, from a deterministic point of view, since the urban agglomeration that we analyze is developed from a key environmental justification, the sun, and the sea. Therefore, there are two abiotic and environmental facts of first level, the coast, and the climate. But we also look for cultural components that are the ones that explain the events in a very short timeline. Between them is the whole biotic set that threads them together. This is the transition zone; it is the possible eco-corridor that should be designed.

Our intention is to show a work conceived from spatial thinking.

2. Objectives

This work has two fundamental objectives. On the one hand, to characterize the landscape of the urban agglomeration in the south of the island of Tenerife, placing emphasis on the space occupied by the interface between the different population centers that make it up. It is in these spaces where the different models of growth will be developed, and therefore where it is necessary to intervene on the basis of a landscape policy. On the other hand, it is necessary to construct a method applicable and reproducible to other agglomerations through the combination of multiple landscape components, as well as using different spatial scales, sources, and data models. Therefore, the cartographic and graphical method is substantial.

3. Methodology

Based on spatial thinking, typical of regional geography, we use qualitative and quantitative analyses of spatially based components and variables, following criteria of geographic information processing [13]. To support this method, we use graphics and cartography, supported by geospatial analyses that combine vector data models with raster data models [14]. To do so, it is necessary to proceed with the work by defining the different spatial units of analysis, in this case ranging from a point (location of an activity or the gauging of traffic intensities) to a region (regionalization understood as the sum of municipal entities that share resources and management services). In the middle of this range appear the landscape units [15–17] that are structured from the integrated relationships of abiotic, biotic, and cultural components and that clearly define their identity [18, 19], and functioning. Our study area falls within this pattern and differs from other large island landscape units, such as the metropolitan area or the north. To discover these patterns, it is necessary to follow phases of information processing, that is, at the time of inventory, at the time of processing, and at the time of communication of the results. Clear patterns of graphic semiology [13, 20]. In

each of these phases, we proceed to perform qualitative and quantitative analyses of components and variables to characterize their keys [21].

The sources used are multiple. Starting from a general literature review on landscape concepts [15, 22] and their different characterizations [21], spatial distribution measurements [2], and management proposals, catalogs, plans, catalogs, etc. [18, 23]. Strategic concepts of territorial and urban planning, such as the European Territorial Strategy [24] based on the polycentric [24], compact city [25], sustainable [25], and resilient [26, 27] design solutions through ecological and green corridors or green open space [28]. Supported with applied research on the specific region in the geographical field where the hard relations of man in that environment are highlighted but at the same time his adaptation to it. From the slow historical transformation of this space, a vertiginous speed of change took place, first in agriculture, then in tourism, in the second half of the 20th century. In the 1990s, the Geography Department of the University of La Laguna carried out projects, books [9], exhibitions [29], dissertations [6, 30], and theses [10, 31, 32] related to this phenomenon. This space had a great scientific interest, which continues today with new challenges [33]. This work is framed within this line. Cartographic sources: The open data revolution [34] of geographic information allows researchers and analysts of the territory to have a volume of data that were not available until very recently, which is why, from the point of view of the selection processes of sources are directed toward the problems we address, seeking methods of analysis-synthesis that allow us to systematize the multiple relationships that characterize the landscapes. "In the treatment of geographic information, there are three perfectly related and inseparable levels characteristic of any language: data, information, and communication" [20]. The role of spatial data infrastructures in research is marking a new path toward knowledge and this we can implement in our research and results. In this sense, Cartográfica de Canarias (GRAFCAN S.A.), Instituto de Estadística de Canarias (ISTAC), Island Council of Tenerife, Cadastre, and LANDSAT8 support the data that we have converted into the information that we communicate following the following structure:

3.1 Inventory level

From a process of selection and debugging of data sources, we organized the information of this first level. We structure the study area, following landscape science, in thematic spatial components of abiotic, biotic, and cultural character. Each of them is modified in a process of transformation until the objectives of the same are obtained. The analysis of the inventory components will allow us in some cases to characterize the urban agglomeration and check where the conflicts are, in others, to build a space of synthesis were to project the connectors between the nuclei and their natural environments.

3.1.1 Abiotics

Environmental characteristics: From a DEM of the topographic base, we can have a map of insolation. This map, together with the DEM and the location of different meteorological stations, allows us to characterize one of the most important factors in the generation of the current landscape.

3.1.2 Biotic

From the LANDSAT8 satellite image and the combination of 543 NIR bands, we can classify in a supervised way the vegetation space of the bare space that covers the county analysis unit.

3.1.3 Cultural

This space is much more complex. We systematize topographic, cadastral, statistical sources, and raster and vector data models. Each one of them was built for particular purposes of different disciplines.

3.1.3.1 Population structure

We work with 2020 data from the municipal census and select the variables of population, average age, and foreign population. The objective, is to extract the weight of the different settlements and demonstrate which is the driving and attraction core of this urban agglomeration.

3.1.3.2 Structure of the built-up área

We combine topographic data at a scale of 1:5000 for the years 1964, 1987, 1996, and cadastral data of 2015. The objective, is to demonstrate the growth of frequency, dispersion-concentration, and accumulated area and by classes.

3.1.3.3 Road structure

We work on two variables, the main road network and gauging data from different control points of average annual intensities. The objective, is to demonstrate where are the weights of daily mobility of vehicles in the urban agglomeration.

3.1.3.4 Economic structure

Geolocation of economic activity: For punctual implantation, we differentiate the lodging space into different typologies and segregate it from other activities linked to tourism. The objective, is to demonstrate the weight of the economic location of urban centers.

3.1.3.5 Structure of the agricultural space

Using LANDSAT8, extract the cultivated space by means of supervised classification of 654 bands. The objective, is to know the distribution, frequency, and surface of this economic activity. It will serve in the processing phase to combine it in the construction of the geometry of a possible ecological corridor, green or refined eco-corridor.

3.1.3.6 Planning structure

We selected two subjective planning classifications in force, urban planning at the municipal scale of our area of analysis, and the delimitation of protected natural spaces. The objective, is to demonstrate the space projected and committed in the urban planning regulations and its capacity for compactness within the urban agglomeration. The protected natural spaces are those that must be linked through the green corridor with the planned and consolidated urban structures.

3.2 Level of treatment

The Corridor Island [35] as a spatial unit of synthesis. If we reduce the agricultural space and the island is compromised by planning, the result is the eco-corridor

island, in short, the unprotected abiotic and biotic space that must thread the urban-rural-natural interface with landscape criteria.

3.3 Level of communication

The whole spatial analytical process leads to a new, more precise unit of analysis: the eco-corridor. On this basis, it will be possible to articulate proposals for landscape integration in future territorial and urban developments.

4. Results

4.1 Inventory level

4.1.1 Abiotics

Environmental characteristics: Without going into the geomorphological and lithological basis that greatly differentiate the landscapes of the unit of analysis, and with a deeper study in this aspect will give us new keys to explain the places of the south, we will focus only on exposing the microclimates as a differentiating factor. Tenerife is a topographically extreme island, but its geographical position and altitude (3718 m) make it differential because it directly affects the generation of microclimates, and that in our study area is very significant. The south of Tenerife, like the rest of the island, from the historical point of view, had a clear settlement pattern, the places with water and fertile soil for agricultural production. For this reason, the humidity factor and the degree of sunshine were very important. Where the environment was less sunny and there was more humidity (**Figure 3**).

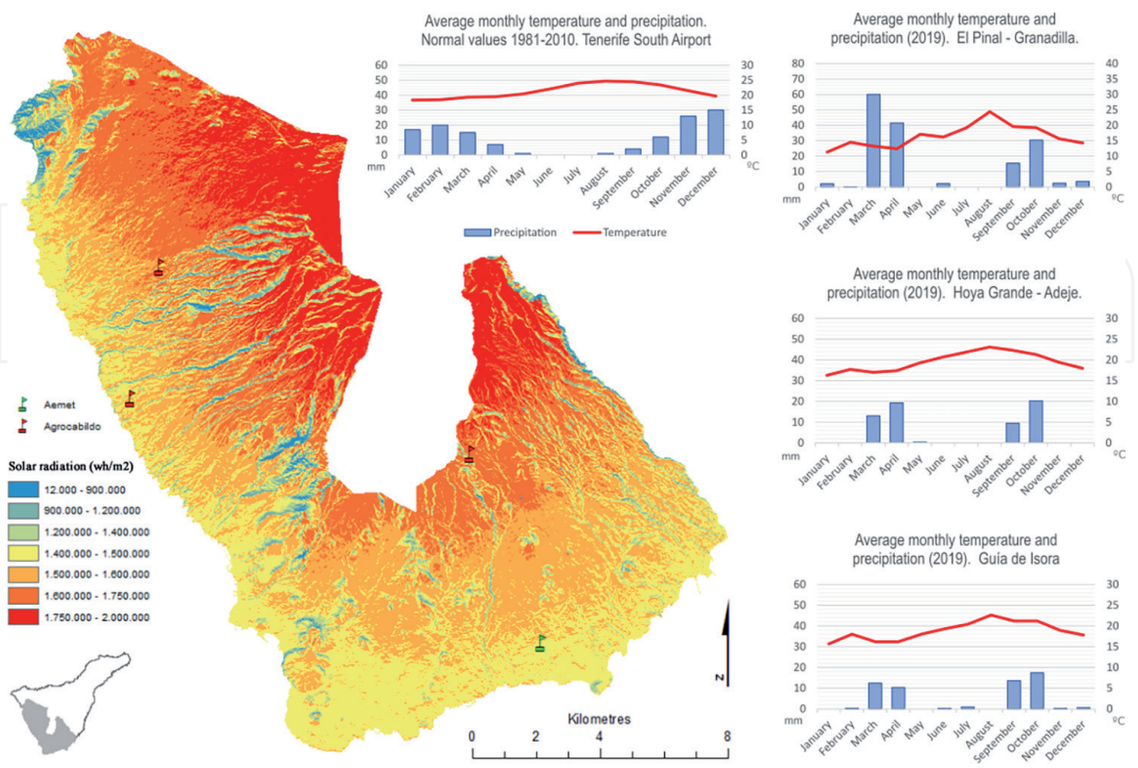

Figure 3.
Representative climograms of coastal and midland areas: (a) Tenerife Sur Reina Sofía Airport. Prolonged series. (b) Hoya Grande, Adeje, SW, elevation 130 m above sea level. (c) Pinal, Granadilla. SE, elevation 850 m. (d) Guía de Isora, SW, 476 m. Sources: AEMET and Agrocabildo. Elaboration: Mejías and Romeo.

These places were not on the coast, but in the middle zones of the island, the so-called "medianías," which range between 400 and 900 m of altitude. As can be seen in the figures, there are enormous differences in temperature and precipitation depending on the altitude, but there are also differences depending on the orientation and position within the island, and this aspect is marked by the wind, the insular space oriented to the SE is swept intensely by the trade winds N-NE to S-SE. On the other hand, the main urban development in the south of Tenerife is protected by the SW. Therefore, coast, light winds, and high insolation are a perfect combination for the development of this industry that formalizes the urban agglomeration of southern Tenerife (**Figure 3**).

4.1.2 Biotic

The vegetation in the area of analysis is irregularly distributed, but clearly has two patterns: the space at high altitudes is occupied by pine forests, broom, and the rest is made up of replacement scrub, often on abandoned cultivation areas, tabaibas, cardones, or balos. The environmental and cultural conditions of intervention in the lowlands make the vegetation very residual and irregular (**Figure 4**).

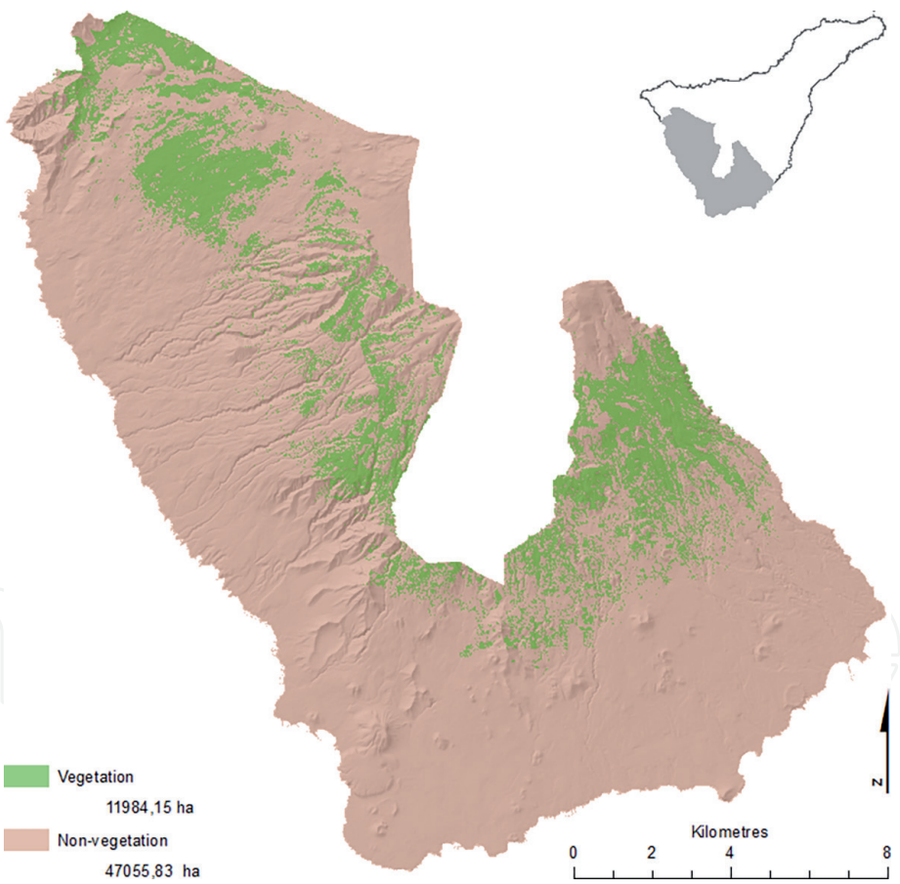

Figure 4.
Biotic synthesis. Source: LANDSAT8. Elaboration: Mejías and Romeo.

4.1.3 Cultural

4.1.3.1 Population structure

We selected the 2020 data. Administratively, the population information of the municipal census of inhabitants is distributed in municipalities, districts, and

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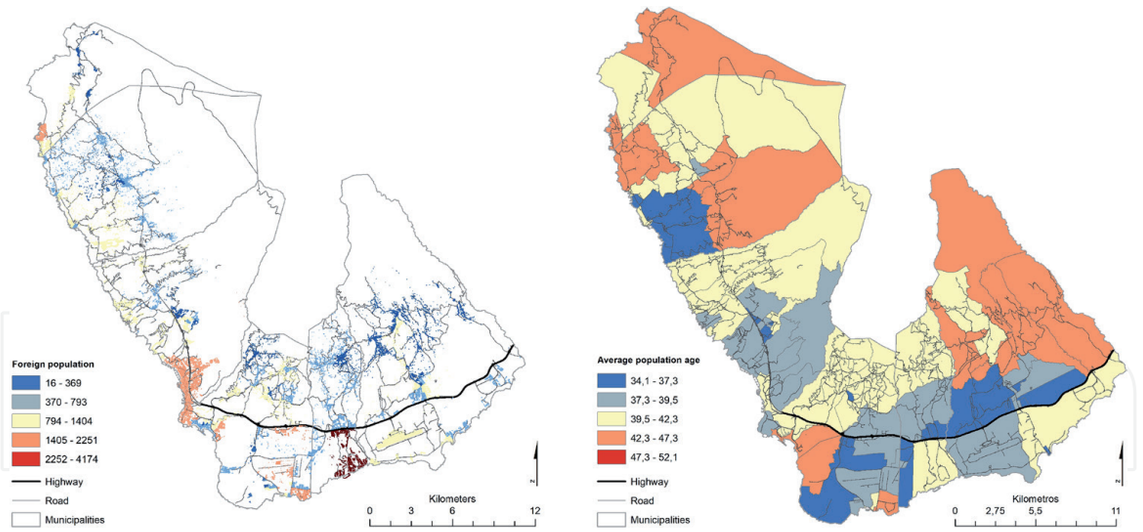
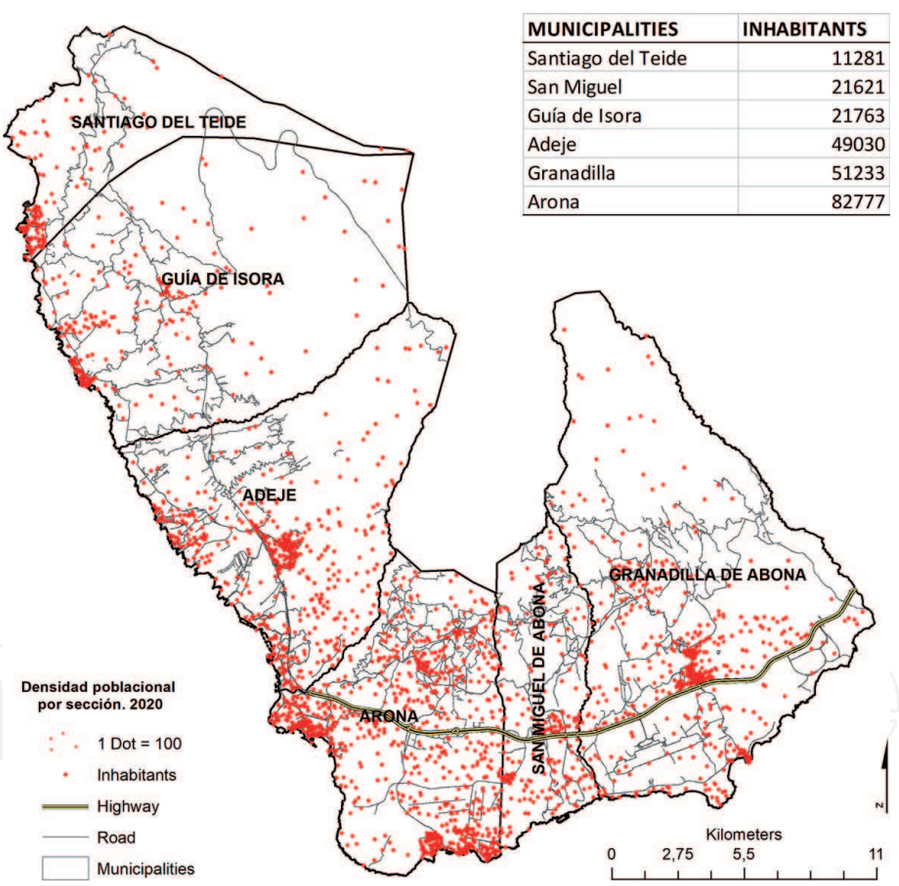


Figure 5.
Distribution of the foreign population by section (a). Population distribution by mean age class and section (b). Source: GRAFCAN S.A. Prepared by: Mejías and Romeo.



MUNICIPALITIES	INHABITANTS
Santiago del Teide	11281
San Miguel	21621
Guía de Isora	21763
Adeje	49030
Granadilla	51233
Arona	82777

Figure 6.
Distribution of population density by sections. Source: GRAFCAN S.A. Elaboration: Mejías and Romeo.

sections. In order to check the size of the urban agglomeration, we understand that the section offers us more precise information on population movements and we can better check the details of the distribution. The urban agglomeration of the south of Tenerife is inhabited by 244,191 registered persons and an annual transient (tourist) population of 4,601,793 persons. To check the human pressure on the region we must indicate that the total insular total of tourists accommodated in 2019 was 6,071,820, therefore 75% are accommodated in our unit [36]. Undoubtedly this population weight marks the characterization and dynamics of

this urban agglomeration. The analysis of this population component currently shows three very significant spatial and statistical patterns: the average age of the area is set at 40 years and its distribution by classes between 32 and 52 years. The gender balance (50.32 men/49.68% women), and the importance of the foreign population (34.85% of the total). Young population: The presence of population between 37 and 41 years of age is the majority group and they are distributed in the sections immediately surrounding the main urban nucleus, while the sections with older average age are distributed spatially between the traditional nuclei of the midlands and the traditional coastal nuclei of Los Cristianos and Las Galletas (Arona). Foreign population: The high percentage of the foreign population has a dispersed spatial distribution, it is distributed throughout the analyzed area, but without a doubt, the highest concentration occurs, first in the sections closest to the coast, secondly, in the central section of the largest urban center and its immediate surroundings, thirdly, there is a very significant section where the highest concentration of foreign residents occurs (**Figure 5**). Its location coincides with the proximity of the airport (Granadilla de Abona), the industrial park of Las Chafiras, and Los Abrigos (San Miguel) (**Figure 6**).

4.1.3.2 Structure of the built space

We combined topographic data at scale 1:5000 for the years 1964, 1987, 1996, and cadastral data of 2015. The objective, is to demonstrate the growth of frequency, dispersion-concentration, and accumulated area and by classes. The growth dynamics have three very clear phases. The starting point is 1964, the built-up space was in the midlands threaded by the southern general road and the growth to the coast did it by secondary roads to the coast, where were the jetties or coastal ports where all the goods entered and left. For this reason, the development of coastal settlements was minimal. The explosive growth occurred with tourism and the infrastructures created for its formalization: airport, 1978, widening of the TF-1 highway, after the inauguration of the airport, Ferry-Gomera line in 1975 [29]. The structure of the built space grows, but at the same time reduces the average surface area of each polygon, a clear indicator of building dispersion (**Figure 7**, **Table 1**).

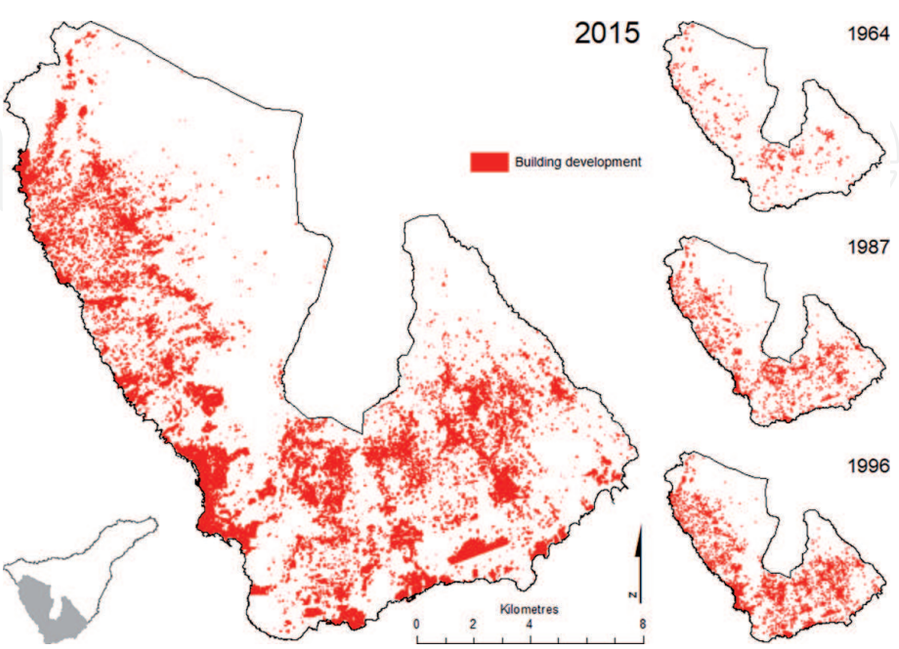


Figure 7.
Evolution of the built-up structure. 1964–2015. Source: GRAFCAN S.A. Island Council of Tenerife, Cadastre. Elaboration: Mejías and Romeo.

Year	Frequency	Area (Ha).	Polygon average (m^2)
1964	5353	123.4	230
1987	13,592	365.3	260
1996	26,568	564.3	210
2015	147,783	1467.6	90

Table 1.
Frequency, cumulative area, and the average size of the polygons of the built-up structure.

4.1.3.3 Road structure

The road structure is divided by hierarchy into a highway linking the metropolitan area of Santa Cruz de Tenerife with the south, which supports the weight of mobility in the region. The southern general highway, parallel to the previous one and with the same purpose, is to connect the island's capital with the south, but link the settlements in the middle of the island. Construction began in the middle of the 19th century and was not completed until the 80s of the 20th century. The structure of roads and secondary roads, many of them rural and unpaved, channel the scattered buildings. To demonstrate the weight of mobility and the centrality factor of the nuclei of the urban agglomeration, we constructed this heat map with the average annual mobility indexes, which indicates the majority weight of the main central nucleus and the axis, more to the E, between the industrial area of Granadilla, the new port, the airport and the urban nuclei of San Isidro and El Médano. This axis is becoming a new and powerful strategic pole of attraction (**Figures 7** and **8**).

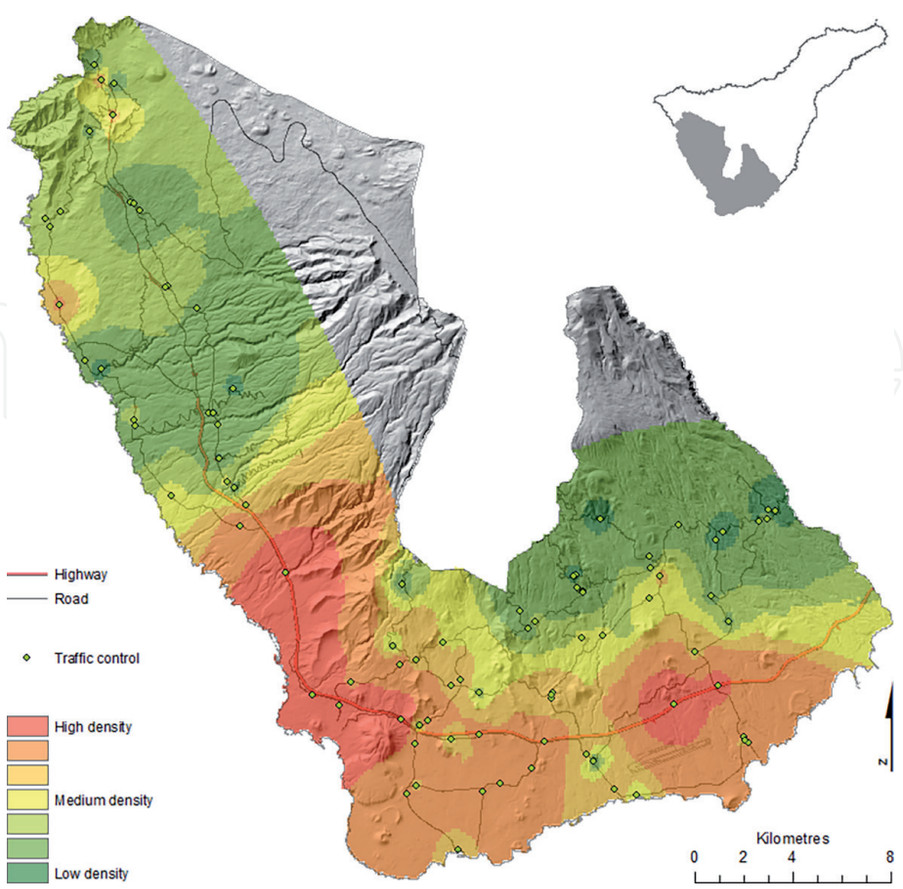


Figure 8.
Level of daily mobility index. Source: Island Council of Tenerife. Elaboration: Mejías and Romeo.

4.1.3.4 Economic structure

Geolocation of economic activity: Undoubtedly, the economic weight generated by the tourist industry is found in the central urban nucleus (Los Cristianos-Las Américas-La Caleta). We have extracted and classified the types of activity separating the lodging activity from the rest of the related activities. The former, in turn, is divided into the traditional hotels and aparthotels, on the one hand, and in the census of vacation homes, on the other, which, in the last decade, have experienced great growth, becoming a variant of the traditional fordist system described above. This has a very significant distribution, is located in the traditional coastal towns (Los Cristianos and La Caleta) and in the urbanizations of the upper coastal zone, exceptionally there are some on the coastline. Therefore, there begins to exist segregation of the lodging activity that we must consider in order to characterize the internal morphology (**Figure 9**).

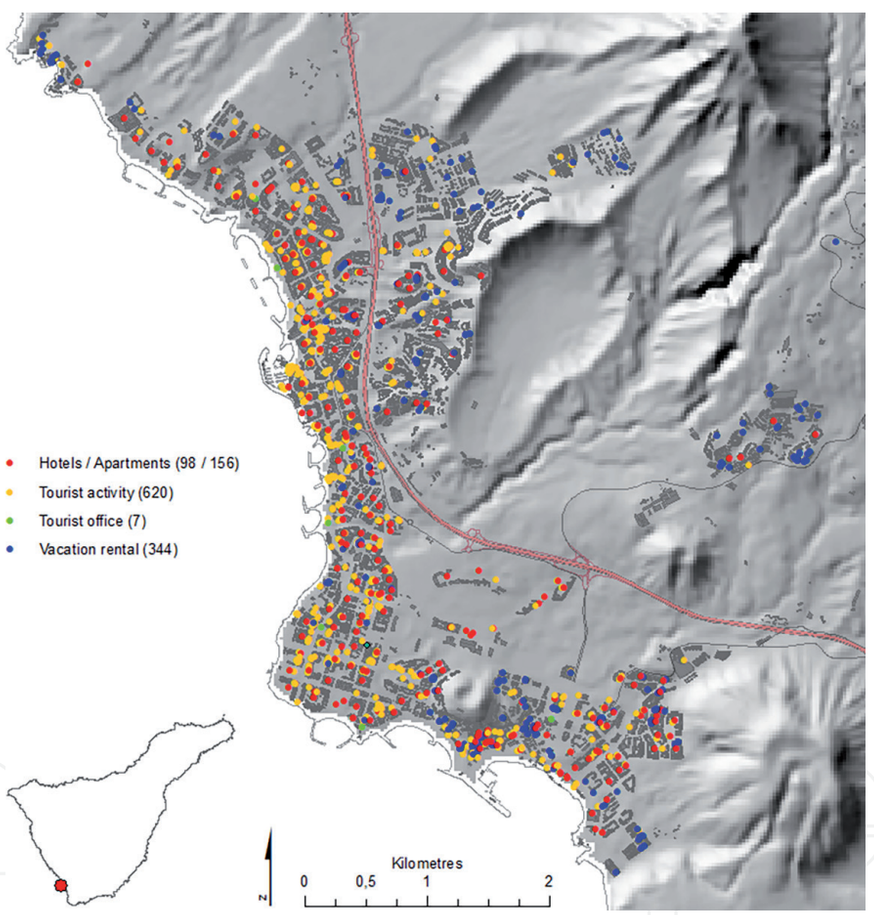


Figure 9.
Distribution of tourism economic activity by type. Detail of the central urban core. Los Cristianos-Las Américas-La Caleta. 2019. Source: Cabildo Insular de Tenerife. Elaboration: Mejías and Romeo.

4.1.3.5 Structure of the agricultural space

The southern landscape was transformed with the arrival of water for irrigation in the 40s and 50s of the twentieth century, the network of canals and secondary water conduction networks allowed the implementation of thousands of hectares of land for export crops (tomato and cotton, in the beginning, banana, mainly at present) [6]. Its current distribution is divided between the coast and the midlands and between the eastern and western sectors. Potatoes are grown in the midland areas of the eastern sector, cultivated on terraces covered with jable

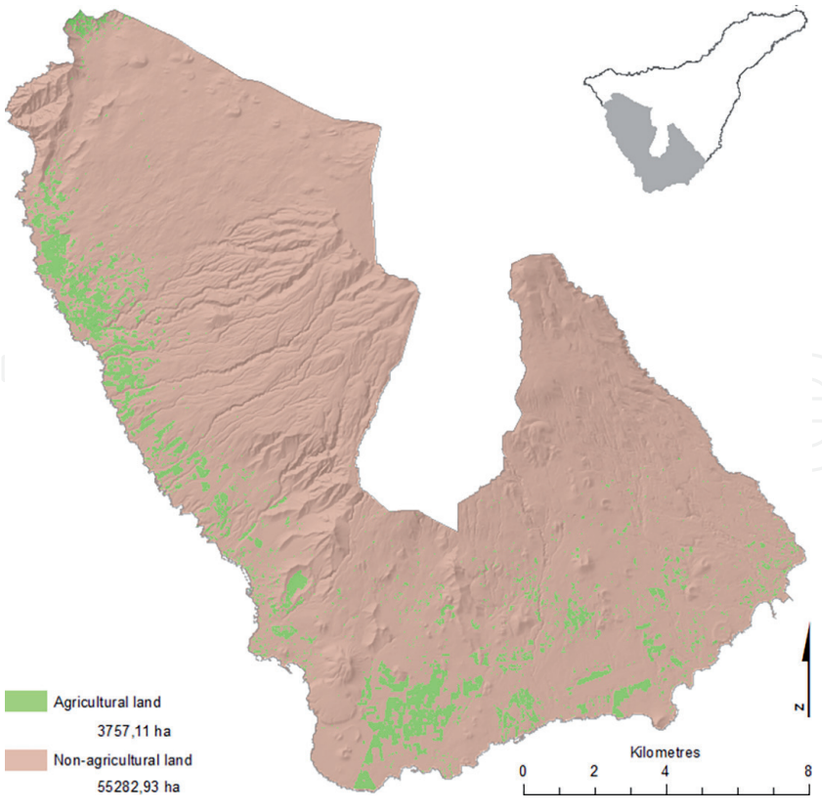


Figure 10.
Synthesis of the agrarian space. Source: LANDSAT8. Elaboration: Mejías and Romeo.

(pumice stone). The coast is mainly reserved for export crops, mainly bananas. The difference between the eastern and western sectors is that the former, which is windier, cultivate under glass, while the western sector, with less wind, cultivates mainly in the open air. This creates totally different landscapes. The construction processes of these agricultural structures are similar to the built structure, land clearing, creation of terraces, soil importation, construction of greenhouses and warehouses, irrigation network. Therefore, we are talking about industrialized agriculture. In the advanced stages of this production system, we have demonstrated processes of the creation of clandestine and self-built micronuclei inside this type of structure. It is a form of conversion of traditional rustic agrarian land to industrial land and then to residential land (**Figure 10**) [32].

4.1.3.6 Planning structure

Based on the current urban planning at the municipal scale, we want to show the urban projection of this urban agglomeration. This synthesis represents the urbanizable corridors. The tendency of the urbanistic model would have been continuity and compactness if, at the end of the 90's, some geomorphologic structures were not declared as protected natural space. This action, at the moment of greatest pressure, prevented this continuity, leaving a possible future connection by means of green corridors that link the nuclei with the surrounding agricultural space and the biotic space. This, at least, is our hope, as long as the design linked to the landscape is applied under the criteria of sustainability and resilience. The model we show (**Figure 10**), is the current planning and each of them has approvals from the late twentieth century and adaptations to the new rules of the early twenty-first century [37]. Meanwhile, the growth of urban sprawl at different levels of compaction was explosive (**Figure 11**). The large pockets of developable land give continuity to the

CLASS	FREQUENCY	AVERAGE Has.	AREA Has.
Suspend	1	701,8051	701,81
Land for development	85	34,4867	2931,37
Urban land	142	23,1604	3288,77
Rustic	1014	51,7585	52483,13

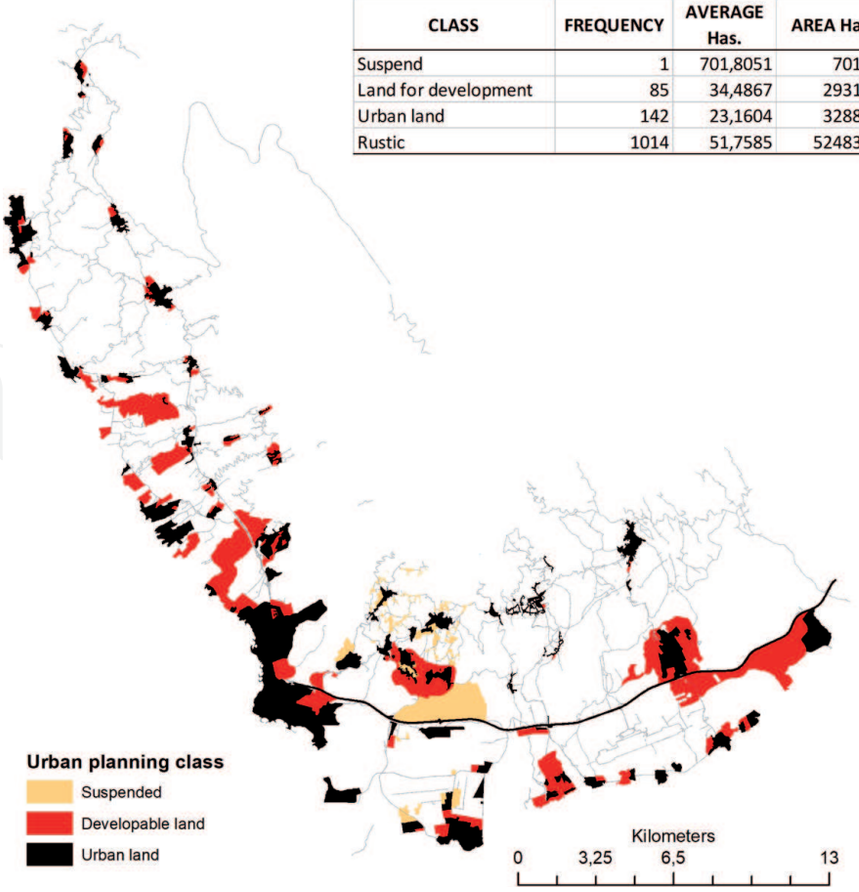


Figure 11.
The projected city. Source: GRAFCAN S.A. Elaboration: Mejías and Romeo.

TIPOLOGY	FREQUENCY	AVERAGE Has.	AREA Has.
Airport	1	162,44	162,44
Urban sprawl. Level 1	1460	0,21	307,05
Central urban core	12	52,66	631,97
Urban sprawl. Level 3	493	1,89	929,82
Urban sprawl. Level 2	2071	0,47	979,75
Urban core. Level 1	97	12,69	1231,12
Urban core. Level 2	21	67,91	1426,12

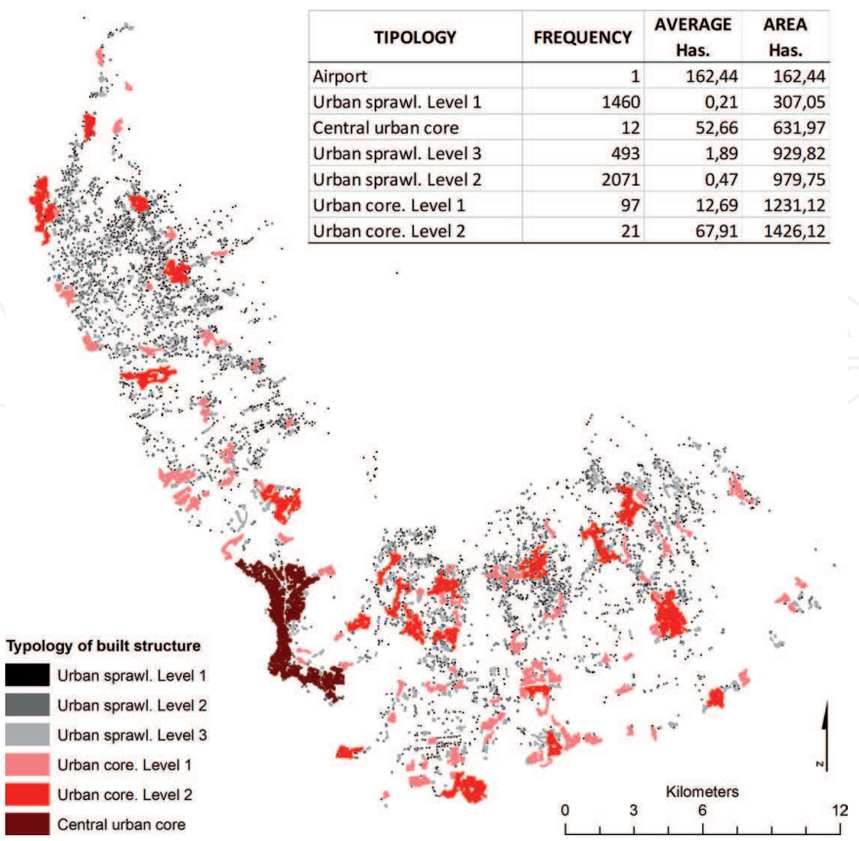


Figure 12.
Morphology of the built space. Levels of aggregation by area of influence (20 m). Source: Cadastre. Elaboration: Mejías and Romeo.

central urban core to the west, the traditional nuclei of medianías are projected in small sectors and the eastern axis of Puerto de Granadilla-San Isidro-Airport projects another large pocket. Arona, and especially the Valle de San Lorenzo, has suspended its urban projection, which was intended to bring together all this dispersed mass (**Figure 12**).

4.2 Level of treatment

Corridor Island [30] as a spatial unit of synthesis. The microanalysis we propose responds to what we have shown in the characterization. We finish as we started, a place as finite as the insular requires processes of spatial microsurgery, so we must refine the units of analysis. The corridor island that we proposed in the previous work, coordinated by Professor Mustafa Ergen [38] proposed a basic corridor island at the island scale. Analyzing larger scale areas allows us to build better models; this is our intention.

4.3 Level of communication

We must project from here the new corridor interface that links the urban agglomeration of the south of Tenerife. The same control that exercised the declaration of natural areas in the 80s will require doing it with new places, more than places, it is necessary to conserve landscapes. The result should help to make planning decisions. The refined eco-corridor will help to do this. We will implement new high-resolution data in the future to continue to monitor these processes (**Figure 13**).

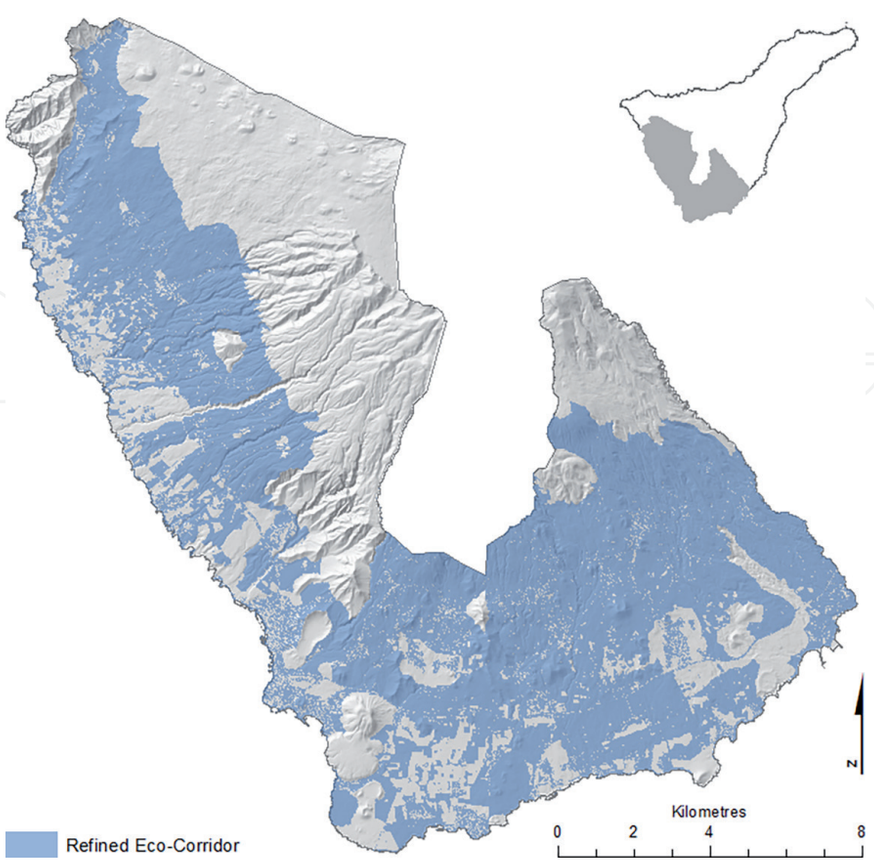


Figure 13.
Refined eco-corridor. Elaboration: Mejías and Romeo.

5. Conclusions

The urban agglomeration that we have tried to show you in this thematic sequence, tells the landscape evolution of an insular region that went in 30 years from oblivion to being a world reference. This perception is reflected and each of the moments of its evolution are impregnated in the landscape of the south. Even today, and despite the passage of time and the indiscriminate and indiscreet intervention of man, the structures of this society remain.

In this current moment of the pandemic by COVID-19, an event has occurred that a few months ago was unimaginable, the tourism machine stopped. The presence of tourists was reduced by 70%, hotels, and aparthotels, travel agencies, stores, schools, transport, airports, ports, were closed. They were prolonged in time. It has been 14 months now. This has shaken the economic structure but above all the social structure. Marginality, hunger, unemployment, and other social consequences denounce if this is the model to be resumed, what has already been called "return to normality." Undoubtedly, we cannot evaluate the effects at this moment, we will do it in the next months or years, but it is necessary to continue investigating the degree of affectation that the population, and therefore, the space of the urban agglomeration.

The analysis shown focuses on the idea of landscape thinking. Planning, managing, educating, and raising awareness in the landscape. It is necessary to interrelate abiotic, biotic, and cultural connections because they are parts of a whole in equilibrium. The imbalances caused by unidirectional decisions provoke crises. The Canary Islands are full of them. We must diversify, invest in what we are powerful in, the renewable energy industry has in the south the most precious source, the sun, and the wind, an industry that also competes spatially, but we have excellent cultural, patrimonial, and natural values. We must not create tourist bubbles. Is it possible to integrate all this, with respect for landscape values without degrading them? We will see.

Conflict of interest

The authors declare no conflict of interest.

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