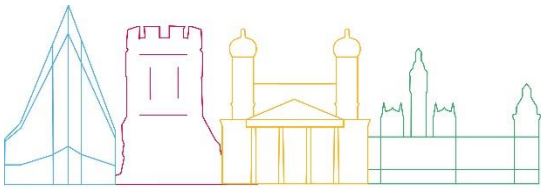
ARCH D3.3 City baseline report - Valencia

17 December 2021



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1. City profile

This section profiles the city of Valencia in general terms, and introduces the local areas where the ARCH focus sites are located. Information is provided at a city-wide level, in terms of land use, population demographics and economy, followed by a closer look at the area(s) in the immediate vicinity of the focus sites.

The sites in focus for the ARCH project in Valencia city are the Huerta and the Albufera. Both sites are cultural landscapes, located in the metropolitan area of Valencia, and essential elements of its long agricultural history. They are also considered as two of its key landscape features, together with the Turia river and the Mediterranean Sea [1], and major components of the city green and blue infrastructure. As shown in Figure 1, the Huerta surrounds the city, while the Albufera is located to the South of it. Both areas stretch into neighbouring municipalities. The Huerta is an agricultural area (mainly covered by arable crops), whose size has decreased considerably over the last decades as a result of urban and infrastructure development. Its irrigation system is a heritage artefact from the Arab tradition, based on eight major irrigation ditches, distributed throughout the municipalities. Since its creation, seven of those irrigation diches have been governed by the Water Tribunal, an institution that regulates the use of the flows and has been declared Intangible Heritage of Humanity due to its unique character. While the Huerta and other northern agriculture sites are known for oranges, artichokes and tiger nuts, among other arable crops, the southern agricultural sites which extend into the Albufera Natural Park cultivate centuries-old local rice varieties. The Albufera is one of the most important wetland areas in Spain, designated as a protected area under several international, national and regional agreements, as it brings food and other benefits to both fishers and rice farmers and it has a high ecological value.

Figure 1. Key landscape elements in the Valencia metropolitan area [1].

1.1. Land use

The total area of the municipality of Valencia is 138.35 km^2 [2]. In 2019, this area included 30.01 km^2 of cropland, 6.67 km^2 of forest (mainly in the “Devesa del Saler“ public woodland, within the Albufera Natural Park), and 102.48 km^2 classified as “Other land“ [2]. Representing about 22% of the total area, cropland is particularly important for the people of Valencia since in the municipality it is located either in the Huerta or the Albufera historic areas, and it is considered a key part of its historical, cultural and natural heritage [1]. The area made up of forest is only a small fraction of the total area, but likewise important not only because of its environmental value, but also because it is highly appreciated by Valencian people as a landmark for recreation and outdoor activities.

Cultivated land in the Valencia municipality has experienced little variation in the Albufera area during the last decades. However, the Huerta area decreased dramatically in the second half of the last century, not only in Valencia but also in the neighbouring municipalities, due to urban and infrastructure expansion. It is estimated that around 62% of the Huerta area irrigated by the historic seven hydraulic systems under the Water Court (“Tribunal de las Aguas”) has been lost since the 1950-71 period [1], despite its agricultural and historical value. Since 2003 there have been no major reductions in cultivated land (as shown in Figure 2), apart from slight declines in 2014 and 2018 [3]. However, urban development is currently planned on agricultural land in the Benimaclet district (a former village that has been incorporated into the Valencia municipality, located north-east of the city centre), which has caused high levels of public controversy and even academic discussion [4].

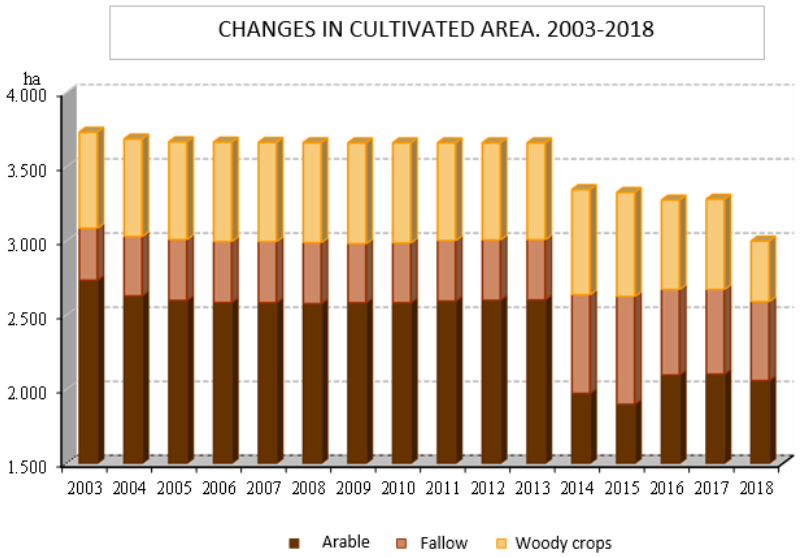


Figure 2. Valencia cultivated area. 2003-2018. Modified from [3].

1.2. Demographic features

1.2.1. Population density

Population density in Valencia is on average 8,055 inhabitants/km^2 [2]. The spatial distribution of the population in terms of place of residence is shown according to inhabitants per hectare in Figure 3 below.

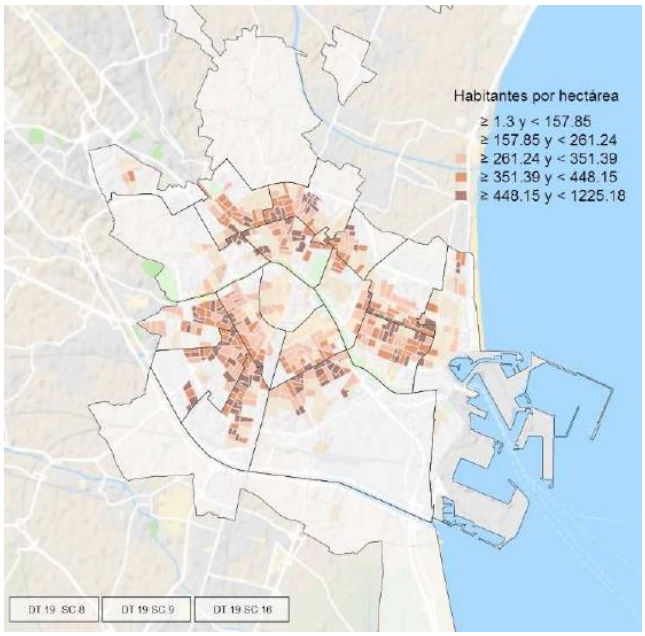


Figure 3. Population density in the city of Valencia [2].

1.2.2. Age and sex

Valencia has a population of 795,736 people (1/1/2019), with the majority female (417,305 females, 378,431 males) [2]. The evolution of the age demographic pyramid during the last century has changed radically as can be seen in Figure 4. The age pyramid has been reversed, as is the case in much of contemporary society. The majority of the population is aged 40-45 years old.

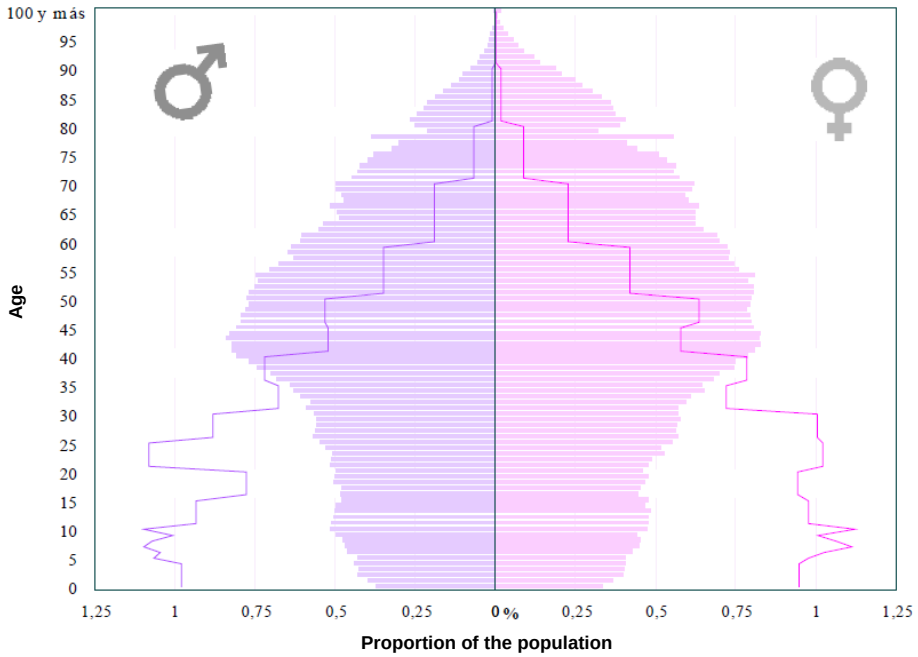


Figure 4. Population pyramid. Comparison 1900-2019 (1900: outline; 2019: solid) [2].

In the last seventy years the population has been growing overall in the city of Valencia, from half a million inhabitants to the current nearly 800,000 (see Figure 5 above).

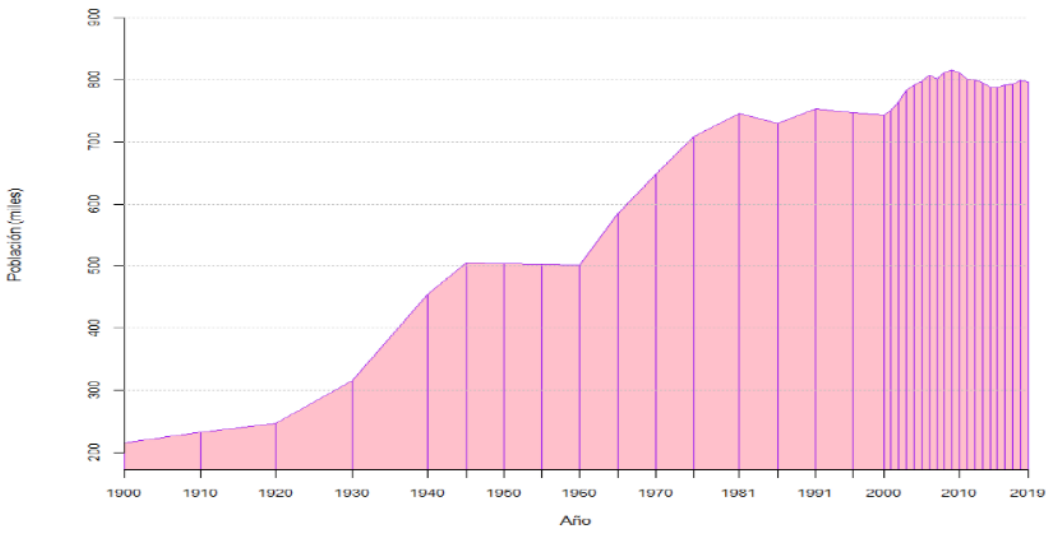


Figure 5. Census. 1900-2019 [2]

The population projection for the next years (2021, 2026 and 2031) by age and sex is shown in Figure 6. The portion of the population dependent on pensions is projected to increase, i.e. an increase of people no longer participating in the workforce (simultaneously reducing the city's economic growth potential), who will at the same time likely need care and special services. Since elderly people are likely to be vulnerable to the impacts of climate change, such as the effects of a heatwave, this projected demographic change is particularly relevant to the City's efforts to adapt to climate change.

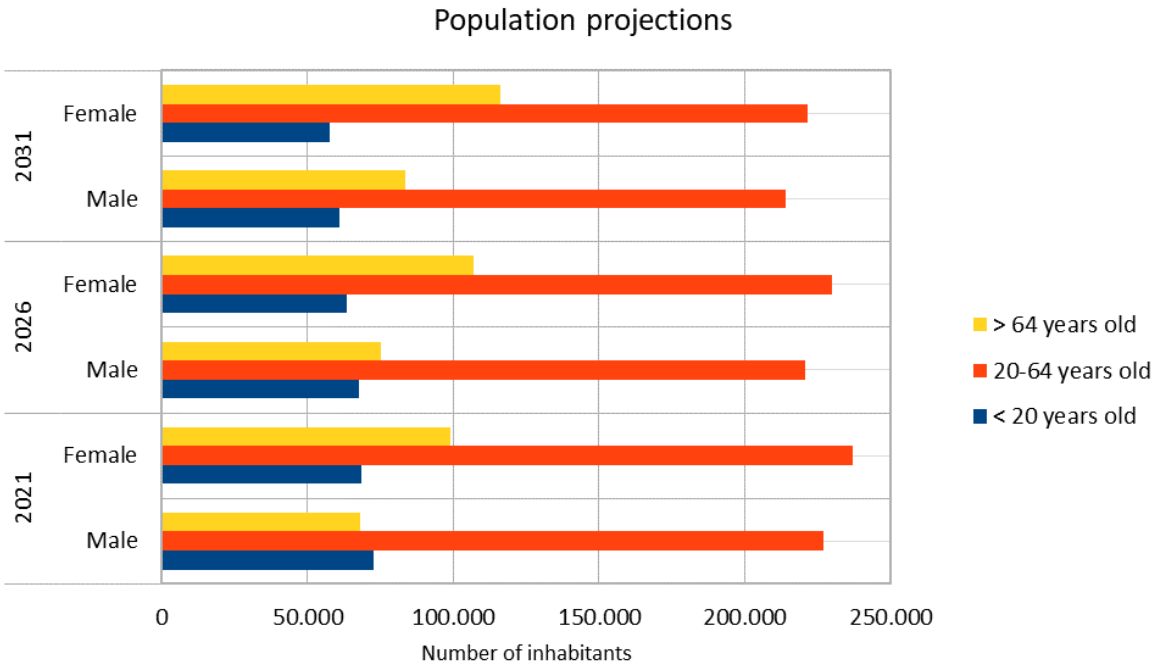


Figure 6. Population forecasts by sex and age in the city of Valencia. (Own elaboration from [3]).

The 2019 age distribution in the city of Valencia is shown in Figure 7 below, where percentages are always stated in relation to the total population size (795,736 inhabitants). Within the specified ranges, most of the population lies within the 45-64 interval. Males are in the majority within the 0-24 range, while females are more predominant at every other interval. The difference between genders is highest (2.75%) in the 65-84 range, i.e. there are over 21,000 more elderly women than men.

Age range	Total	Male	Female
0-5	4.85%	2.49%	2.35%
6-17	11.47%	5.88%	5.60%
18-24	7.02%	3.56%	3.46%
25-34	11.65%	5.76%	5.89%
35-44	15.31%	7.65%	7.66%
45-64	28.86%	13.78%	15.08%
65-84	17.62%	7.44%	10.18%
85+	3.22%	0.99%	2.23%

Figure 7. Valencia age distribution. 2019. Modified from [3].

The life expectancy (2015-2018 data) in Valencia is, as usual, higher for females (86.3) than for males (80.5) [2].

1.2.3. Population growth

Population change in the city of Valencia in recent years is summarised in Figure 8 and Figure 9 below. In the last 14 years, natural growth has decreased and even became negative since around 2013 [3] (-1,147 in 2018). No clear trend in net migration can be seen in Figure 9 for the period analysed, although net migration has increased from 2004 (from 10,538 up to 12,923 in 2018) [3] [5]. Total population change has been affected by these previous trends, alternating rises and falls, above and below the zero line. The last data available (2018) show a net population decrease (-2,763), taking into account not only natural change and net migration, but also other movements.

Population change (2018)	
Births	5,789
Deaths	6,936
Immigrants	40,231
Emigrants	27,308

Figure 8. Population change in the city of Valencia (2018). Modified from [2].

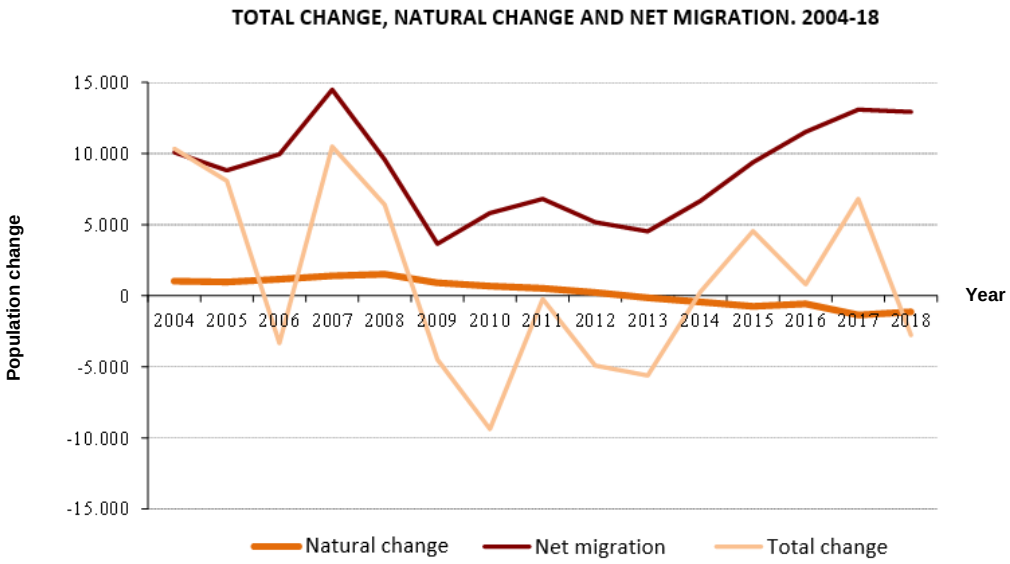


Figure 9. Population change in the city of Valencia (2004-2018). Modified from [3].

1.2.4. Vulnerable groups

Valencia uses the AROPE (at risk of poverty or exclusion) index to measure the risk of poverty and/or social exclusion, based on the sum of persons "either at risk of poverty, or severely materially deprived or living in a household with a very low work intensity" [6]. According to this measure, 29.8% of the population were at risk. This figure is higher than the average AROPE index calculated in the same year (2018) for both the whole Valencia province (26%) and the Valencia region (27.6%) [3], as well as higher than the national results for Spain (26.1%) [7]. Risk was higher within the male population (30%) than within the female population (29%), while 34.5% of the population under 16 was also found to be at risk [3].

Aside from use of the AROPE index, there is not a single valid definition of "vulnerable population groups" in the city of Valencia. On the contrary, several criteria are applied, such as those mentioned below, depending on the objective of the analysis or the organisation involved.

For instance, the Social Welfare Department of the city considers the following as priority beneficiary groups for their social intervention programs [8]:

- Immigrants, refugees and asylum seekers
- Homeless people or those suffering poor housing conditions
- Minor ethnic groups
- Prisoners and former prisoners
- People under addiction treatment
- Unemployed people
- Old people

- Women
- Infants, young people and families
- Young people with integration problems
- People with disabilities and dependent
- People with chronic and/or long-term diseases
- Other vulnerable groups and communities

In terms of vulnerability to climate impacts, the only vulnerable groups officially identified in Valencia found are those vulnerable to heat. At a regional level, an annual prevention and care programme (designed to prevent, minimise and otherwise address health problems related to extreme temperatures in the Comunitat Valenciana) was established in 2004 by the Regional Department of Universal Healthcare and Public Health. This programme is active between June and October every year [9]. While the programme is active, forecast temperatures for each area in the region are made available via web, together with advice, recommendations, and other information aimed to minimise the impacts on people from extreme heat.

The last programme, from 2019 [10], identified older people as the most sensitive group. Several other risk factors during a heatwave were also identified within four main groups: personal, local, environmental risk factors, and those concerning existing health problems. Some examples of those risk factors which define vulnerability to a heatwave from the programme perspective are shown in Figure 10.

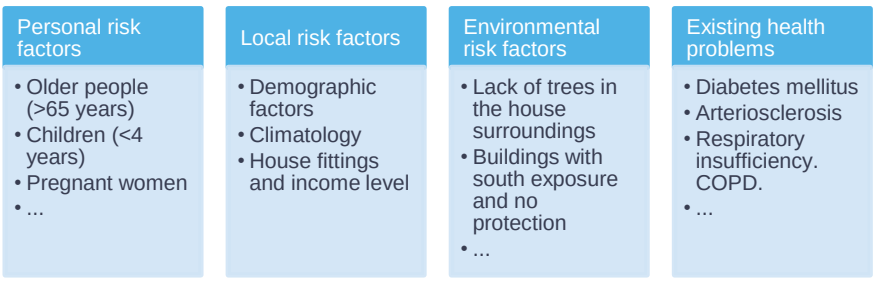


Figure 10. Main risk factors during a heatwave (excerpt) [10].

Several vulnerability maps have been developed and/or related analysis undertaken in Valencia. There are too many and, in some cases, they are also too extensive, to be added as annexes to this document. However, an overview is provided below, and the full references are freely available to download. Additional documents are provided by the city's Statistical Office [11] and Social Welfare Department [12], among others.

The main vulnerability mapping and analysis was released in 2018 based on data from 2016 [13], and is intended to be updated every three years. It includes not only a comprehensive report, but also the statistical data on which it is based, available as a spreadsheet file. Vulnerability was analysed and mapped based on several indicators, which are grouped on

three main topics, each one of them made up of several sub-sections: access to public facilities (including health, transport, education, population at risk and others), demographics (including population density, population increase, dependent population, population from outside the EU, population aged 65 or over living alone, population aged 80 or over and population under 18) and socio-economics (including educational level, cars, housing and economic status). This analysis was performed at census section level. A Global Vulnerability Index was also defined in order to summarise in a single Index the results from the sectoral indicators considered for each topic and sub-section. Figure 11 summarises the results of the Global Vulnerability Index aggregated at district level, and indicates the number and percentage of census sections and people living within them, which were identified as "Vulnerable"[1] or "Potentially vulnerable"[2].

			Vulnerable			Potentially Vulnerable		
District	Population	# of census sections	# of census sections	Population	% Population	# of census sections	Population	% Population
València	**787.266**	**599**	**60**	**71.137**	**9,0**	**60**	**71.530**	**9,1**
1. Ciutat Vella	26.472	25	0	-	-	0	-	-
2. l'Eixample	42.180	42	0	-	-	0	-	-
3. Extramurs	48.208	39	0	-	-	0	-	-
4. Campanar	37.084	27	3	3.919	10,6	1	877	2,4
5. la Saïdia	46.718	36	3	3.340	7,1	4	4.447	9,5
6. el Pla del Real	30.124	25	1	902	3,0	0	-	-
7. l'Olivereta	48.105	36	7	8.543	17,8	4	4.560	9,5
8. Patraix	57.356	41	0	-	-	2	1.758	3,1
9. Jesús	51.943	38	3	4.143	8,0	5	5.939	11,4
10. Quatre Carreres	73.067	51	2	2.767	3,8	7	8.612	11,8
11. Poblats Marítims	57.710	46	14	15.324	26,6	8	9.376	16,2
12. Camins al Grau	64.536	43	1	1.163	1,8	9	10.605	16,4
13. Algirós	37.210	28	1	1.284	3,5	1	910	2,4
14. Benimaclet	28.868	22	0	-	-	0	-	-
15. Rascanya	52.210	39	9	10.269	19,7	10	12.440	23,8
16. Benicalap	44.931	31	10	12.465	27,7	4	6.285	14,0
17. Pobles del Nord	6.478	5	2	1.545	23,8	1	1.419	21,9
18. Pobles de l'Oest	13.969	10	2	3.162	22,6	2	2.139	15,3
19. Pobles del Sud	20.097	15	2	2.311	11,5	2	2.163	10,8

Figure 11. Global Vulnerability Index. Modified from [13].

The location of every district in Valencia city is shown in Figure 12. Of particular relevance to this current report are the districts where the ARCH focus sites are situated, which will be introduced later in Chapter 6. These districts are District no 19 "Pobles del Sud" (where the

[1] A census section (and therefore, the population living within) was considered "Vulnerable" if its Global Vulnerability Index was equal to or less than the 10th percentile.

[2] A census section (and therefore, the population living within) was considered "Potentially Vulnerable" if its Global Vulnerability Index lay within the 10th to 20th percentile range.

Albufera estuary is located) as well as. Districts no. 17 “Pobles del Nord”, 4 “Campanar”, 10 “Quatre Carreres”, 19 “Pobles del Sud”, 15 “Rascanya”, 14 “Benimaclet” and 13 “Algirós” (where parts of the Huerta are located). See Figure 12 below for the full extent of the Huerta.

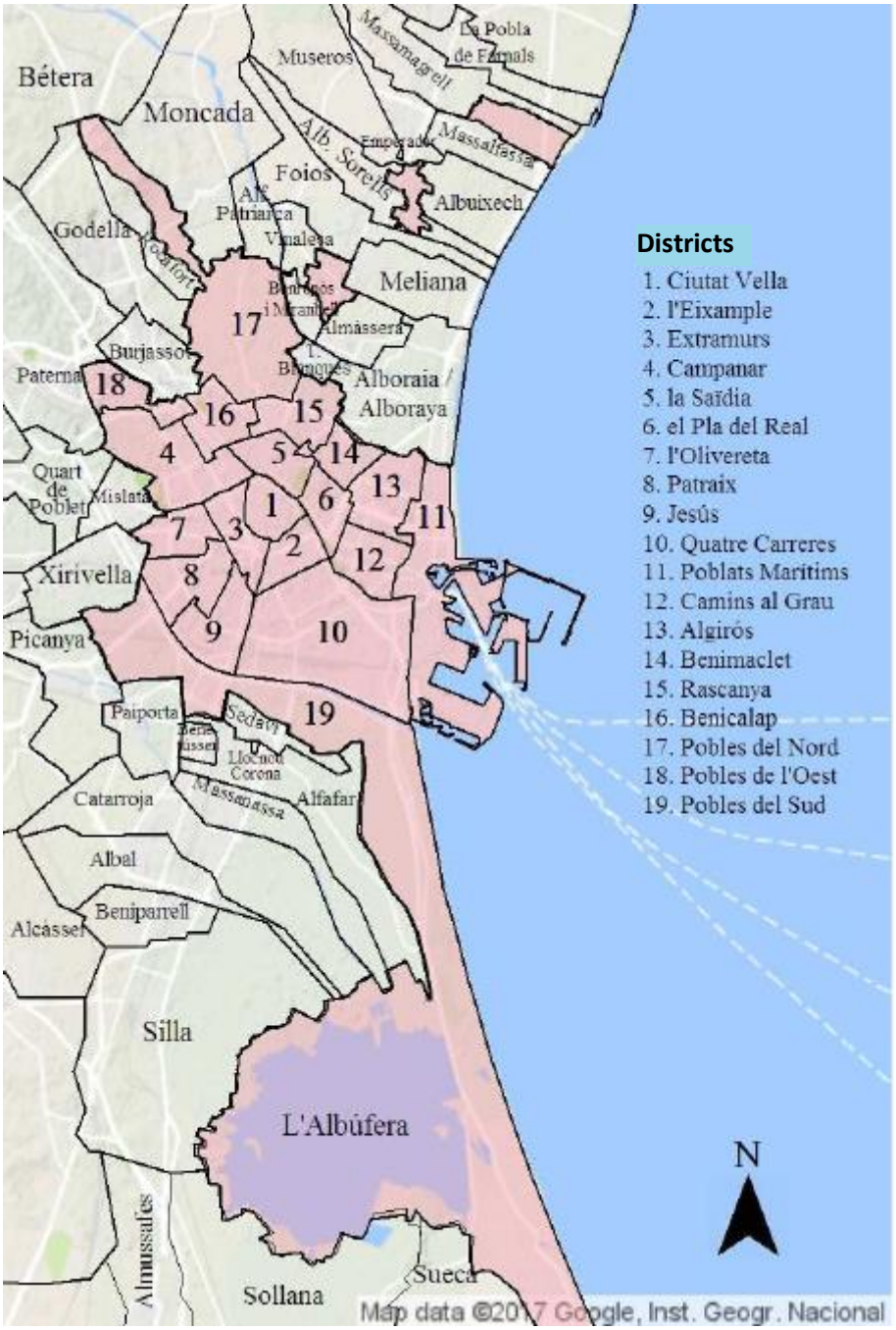


Figure 12. Valencia districts. Modified from [2].

Figure 13. Valencia green areas. Modified from [2].

Detailed analyses are also made available every year for some of the city neighbourhoods or districts [14], including some of the areas mentioned above, such as the Pobles del Sud [15] and Pobles del Nord [16] districts. A 2017 report prepared by the municipality [17] also spatially analysed vulnerability in the city, in the context of the recent economic crisis. In that case, the analysis was based on the social services structure of the city, and vulnerability indicators were disaggregated for each of the eleven municipal social services departments (each of whom provides services to certain neighbourhoods). For instance, Figure 14 shows the rate of households in risk of poverty and/or social exclusion per municipal social services department, according to the AROPE index previously described.

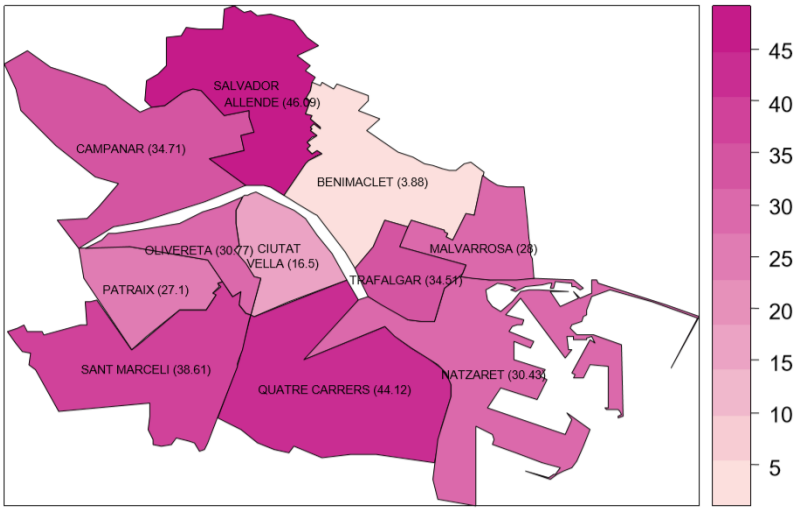


Figure 14. Arope Index (2017) per Valencia municipal social services department [17].

1.3. Economic features

Gross Value Added per capita in Valencia city in 2017 was 24,090.69 € [2]. Average economic growth rate was 2.3-2.4% (2019). See Figure 15 for recent trends at regional level.

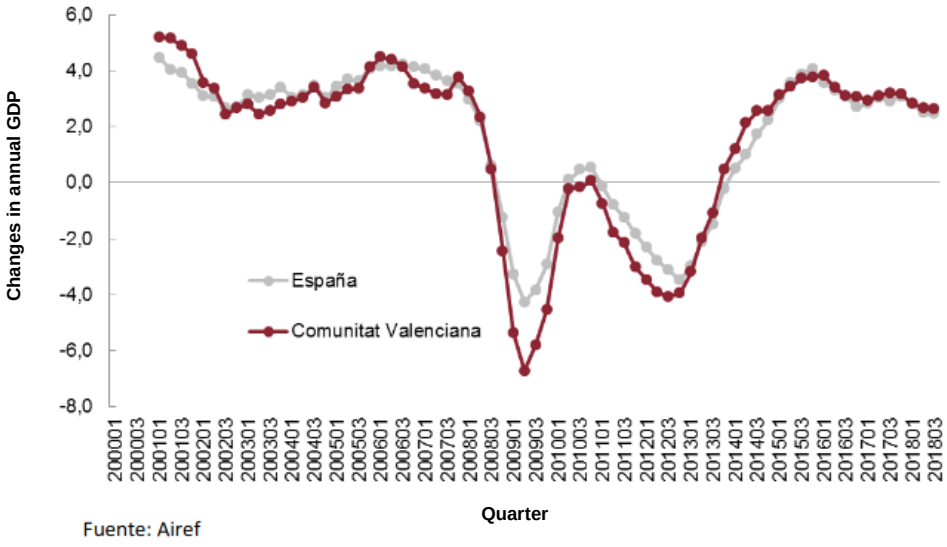


Figure 15. Evolution of the annual GDP (Gross Domestic Product) growth rate by quarter. Source: Comunidad Valenciana (regional government) [18].

The most important economic sector in Valencia city is “Trade and Services”, according to available data shown in Figure 16 [3], based on data from the economic activities tax. The next sector in terms of importance would be “Professional”, followed by “Construction”, “Industrial”, “Artistic” and, finally, “Livestock”.

	Total	Livestock	Industrial	Construction	Trade and Services	Professional	Artistic
2019	128,562	39	4,330	8,586	85,857	28,828	922
%	100.0	0.0	3.4	6.7	66.8	22.4	0.7

Figure 16. Economic activities by economic activities tax (2019) [3].

The city of Valencia is fundamentally a service area whose influence reaches far beyond the limits of its municipal district. The population currently employed in the services sector accounts for 83% of the total, with a large proportion of final demand activities (i.e. goods or services for consumption, public or private investment, or for export), retail and wholesale trade, specialised services for companies and professional activities.

Nevertheless, the city also maintains an important industrial base, with an employed population of 11%, made up of small and medium-sized companies, among which the paper and graphic arts, wood and furniture, metal products, and the footwear and clothing sectors stand out.

The city's dynamism as an economic centre and reference point for many economic activities is reflected in the strength of key institutions for economic development such as Feria Valencia, the Autonomous Port, the Stock Exchange, the Conference Centre and its universities.

Valencia also has cultural institutions that are increasingly important in its development: the Palau de les Arts, the IVAM, the Palau de la Música or the City of Arts and Sciences bring undeniable added value to the city and its metropolitan environment as a cultural and leisure centre.

Agricultural activities are of relatively minor importance in terms of employment (see Figure 17), however agricultural land accounts for a relatively large share of land use: total of 3,348 hectares, about one fifth of the total area of the municipality, mostly made up of horticultural crops. Agriculture is also important for the city in terms of cultural heritage, due for instance to the existence of the "Tribunal de las Aguas de la Vega de Valencia" ("Water Court of the Plain of Valencia"), considered the oldest European existing justice institution, which was recognised as Intangible Cultural Heritage by UNESCO in 2009 [19]. The "Paella", a rice dish, is the most traditional and typical dish in Valencia, with great cultural importance. Traditionally, it is made from rice grown in the Albufera Natural Park. It is also traditional to eat it on the weekends, often in one of the many restaurants in the Huerta surrounding Valencia or the Albufera. Agro-tourism activities are also increasingly important, with new companies offering several tours and other agro-food tourism activities in the Huerta [20]. Ornithological tourism is also developing, and the Albufera Natural Park, including its agricultural zones, is one of the best areas around Valencia for birdwatching [21]. Therefore, the influence of the agriculture sector on the services sector in the city of Valencia must also be acknowledged and appreciated.

	Annual average	1st quarter	2nd quarter	3rd quarter	4th quarter
Total	**276K**	**268,1**	**276.3K**	**278.6K**	**280.9K**
Agriculture	2.2K	1.8K	1.8K	1.9K	3.2K
Industry	33.8K	31.1K	33.6K	37.6K	32.9K
Building industry	11.1K	11.2K	12.6K	10.9K	9.6K
Services	228.9K	224.0K	228.3K	228.2K	235.2K

Figure 17. Number of gainfully employees by economic sector (2018) [3].

The average unemployment rate in Valencia city during 2018 was 14.5% (based on [3]), slightly lower than the national average during the same period (15.25%) [22]. The monthly evolution of the unemployment rate during that year is shown in Figure 18. The highest unemployment was recorded in January, while the lowest rate corresponds to June data.

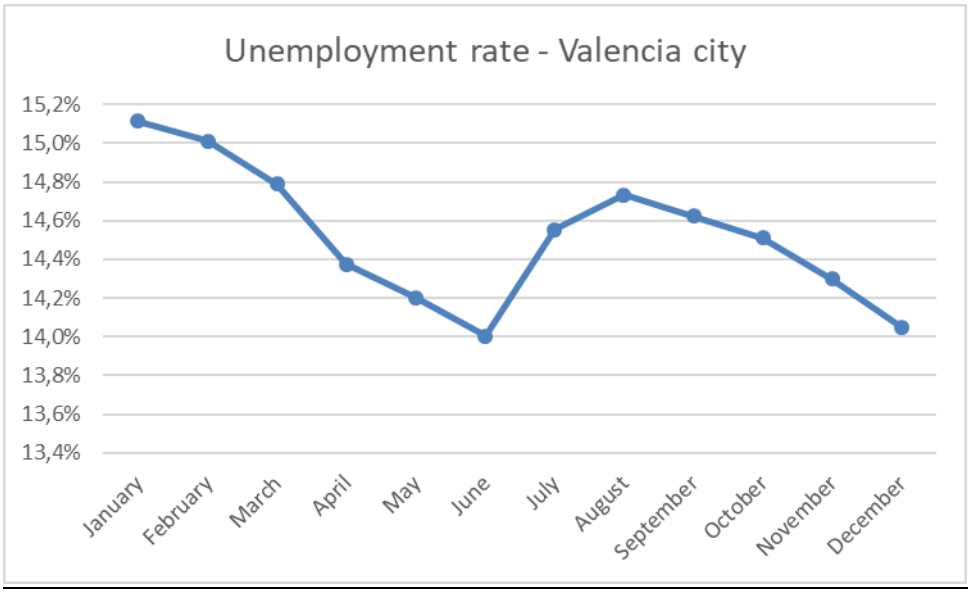


Figure 18. Unemployment rate. 2018. Based on data from [3].

The youth unemployment rate in Valencia city was 20.8% in the fourth quarter of 2018 (slightly higher for young women at 22.0%, compared to 20.0% for young men) [23].

1.4. Around the focus sites: the Huerta and the Albufera

1.4.1. Overview

While the Huerta is originally an agricultural landscape (mainly dominated by arable and woody crops), the Albufera Natural Park combines agricultural areas (mainly rice paddies) with large

areas with natural character, such as the Albufera lagoon, or the “Devesa del Saler” forest and other highly valuable ecosystems located in the sandbar between the lagoon and the sea. Some Huerta areas in the southern part of the municipality are also located within the Albufera Natural Park boundaries, and were classified in a particular category (“Espacios de Valor Natural”, Areas of Natural Value) within the Huerta Land Use Plan [1]. The overlapping area between both sites is shown in Figure 19.

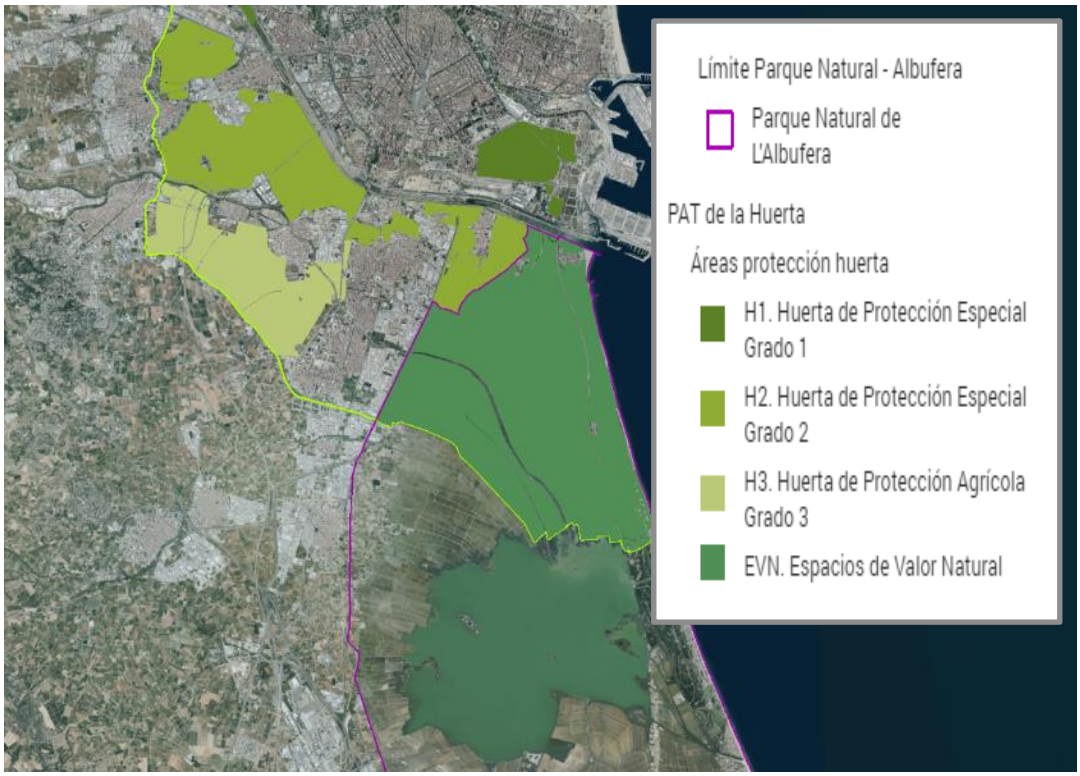


Figure 19. Areas of Natural Value (“EVN. Espacios de Valor Natural”), in the overlapping area within both Huerta (“Áreas protección huerta”)(outlined in green) and Albufera (“Límite Parque Natural-Albufera”)(outlined in purple) protected sites [24].

1.4.2. Employment

The districts adjacent to the Huerta and Albufera have been identified in previous sections (see part 5.2.3 above). These are peripheral districts of the city of Valencia with a socio-economic rank lower than the average of the city. These neighbourhoods occupy land that was previously farmland, meaning many older people are still engaged in agricultural employment and activities, while young people are more disconnected [25]. Initiatives are emerging that try to reverse this loss of connection with traditional agricultural livelihoods, such as farmers and local markets, or direct sales from producers to neighbours. As seen in Figure 12 and Figure 13, the “Pobles del Sud” district includes some Huerta areas, as well as the Albufera Natural Park sections that belong to the Valencia municipality, including the own Lagoon.

1.4.3. Vulnerable groups

There are vulnerable groups living within the vicinity of the Huerta and Albufera areas, as described in previous sections and references (see Figure 11 and subsequent comments for

some estimates of the number of vulnerable and potentially vulnerable people living in the districts adjacent to Huerta and Albufera). More detail on the prevalence per district of the main causes of vulnerability and potential vulnerability previously identified (access to public facilities, demographics and socio-economics) can be found in [13].

As will be mentioned in Chapter 6, both the Huerta and the Albufera are large and complex, and therefore smaller pilot areas could be established within them for the project purposes. In that case, additional, more detailed information regarding vulnerable groups in such areas could be extracted from the already identified sources or additional ones. For instance, it has already been mentioned that the "Pobles del Sud" district includes areas within both the Huerta and the Albufera. In addition to the previously identified sources of information, detailed vulnerability data could also be found if needed in the "Pobles del Sud" district analysis [26], which includes a thorough review on vulnerability, energy poverty or poverty, among other issues. Some of this information is extracted from the previously mentioned references. As an example of the available information, Figure 20 shows the total and relative vulnerable population in each of the population nuclei in the Pobles del Sud district.

Pobles del Sud	Population (2016)	Total Vulnerable Population (2016)	% Vulnerable Population (2016)
PINEDO	2.607	0	0,00%
EL SALER	1.704	0	0,00%
EL PALMAR	769	0	0,00%
EL PERELLONET	1.430	0	0,00%
EL FORN D'ALCEDO	1.215	1.207	99,30%
EL CASTELLAR-EL OLIVERAL	6.881	703	10,20%
LA TORRE	4.643	2.473	53,30%
FAITANAR	979	979	100,00%
Total CMSS	20.228	5.362	26,51%

Figure 20. Vulnerability per population nucleus in the "Pobles del Sud" district. Modified from [26].

Following is a detail of additional available spatial information regarding the Benicalap district, one of the Huerta neighbouring districts previously mentioned. Its vulnerable and potentially vulnerable census sections are described and mapped in [13], as seen in Figure 21.

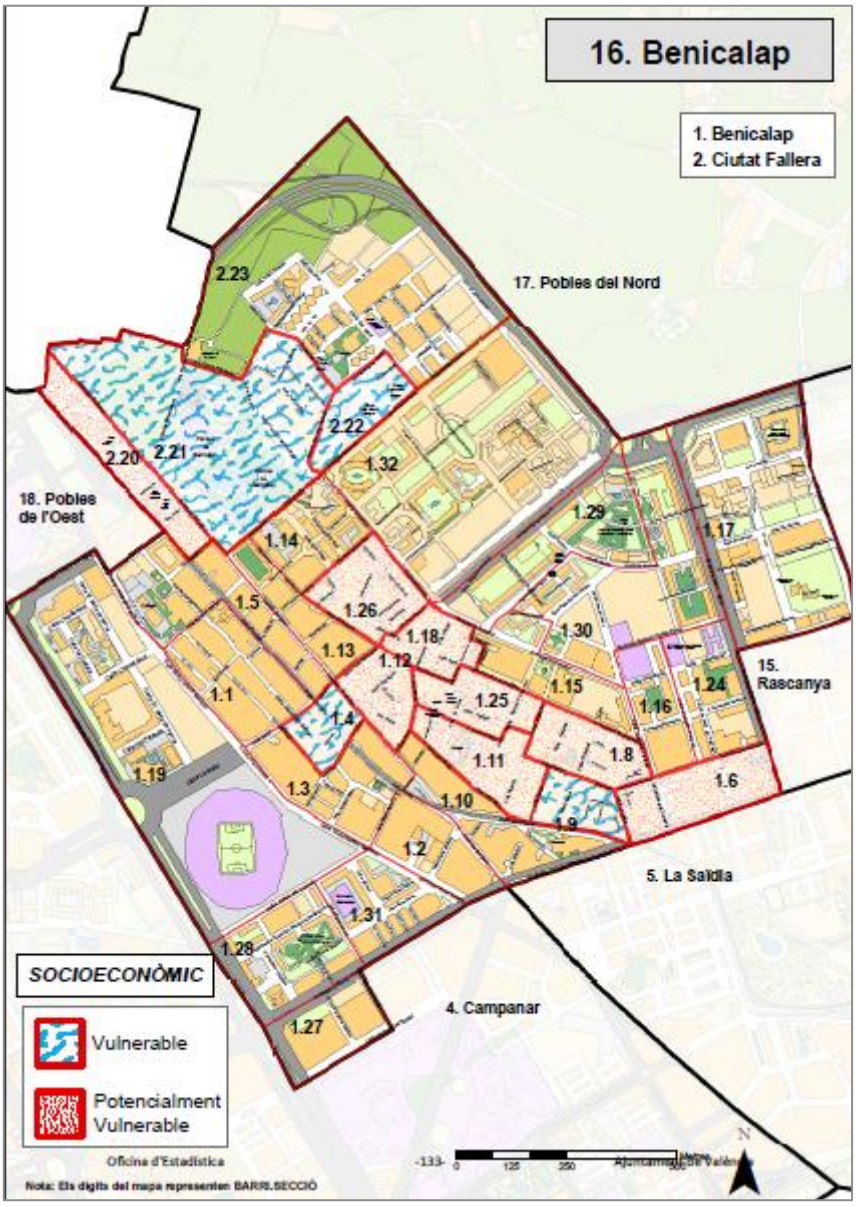


Figure 21. Socio-economic vulnerability mapping – Benicalap (*Huerta areas shown in green, in the census section coded 2.23*) [13].

Additional data, for instance regarding the aging index or the dependence index, are also available at neighbourhood level in [17]. See Figure 22 and Figure 23 for some examples of the information available in relation to Benicalap and other nearby neighbourhoods which are also close to the northern part of the Huerta, and which are all dependent on the Campanar Social Services Department.

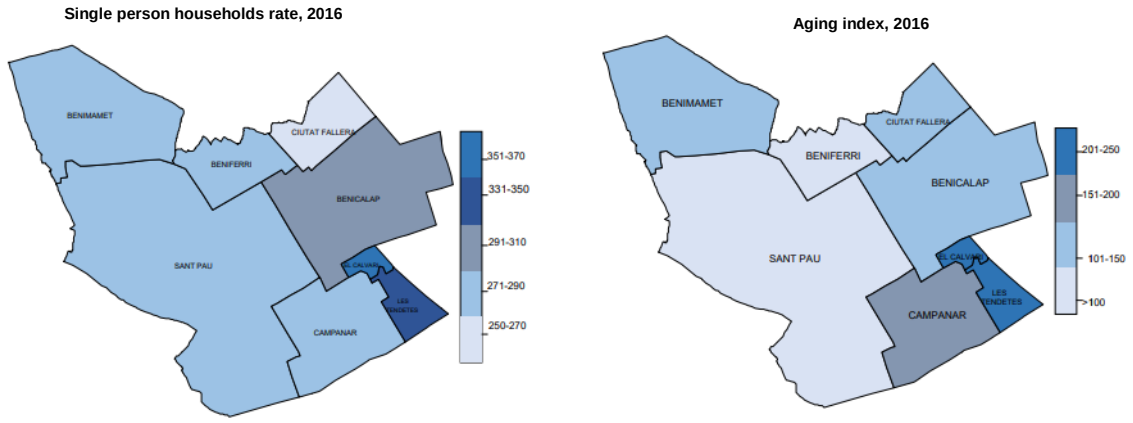


Figure 22. Single person households rate (left) and aging index (right) at neighbourhood level. 2016 data from the Campanar Social Services Department. Modified from [17].

	Female rate*	Male rate**	Aging Index	Dependency ratio	Single person households rate
Campanar	115,9	86,3	183,3	55,0	285,5
les Tendetes	113,5	88,1	228,4	53,2	339,6
el Calvari	108,0	92,6	216,4	58,8	363,2
Sant Pau	104,9	95,4	53,2	54,6	273,5
Benicalap	106,3	94,1	102,7	50,9	296,0
Ciutat Fallera	102,1	97,9	122,3	50,9	259,1
Benimàmet	105,3	95,0	106,4	52,0	284,3
Beniferri	101,5	98,6	60,4	38,8	271,7
Total CMSS	107,2	93,3	108,1	52,5	293,5
Ciudad de València	109,0	91,5	136,2	53,4	324,7

Figure 23. Neighbourhood level data from the Campanar Social Services Department [17] (*Female rate is defined as the number of females per 100 males at 1 January of year t; **Male rate is defined as the number of males per 100 females at 1 January of year t).

1.5. Overview of existing local framework for disaster risk reduction, climate adaptation and cultural heritage management

The boxes ticked below provides a preliminary overview of the local policy framework in regard to disaster risk reduction, climate adaptation and cultural heritage management (specifically, which information has already been mapped), which will be expanded on in Chapters 3, 4 and 5.

☐ *Emergency response procedures and responsibilities in the city*

☒ *Existing adaptation measures, strategies and key legislation in the city*

☐ *Existing cultural heritage protection measures, strategies and key legislation in the city*

☐ *Existing databases on climate risk information for the city*

☐ *Decision-making structures in the city regarding adaptation*

☐ *Decision-making structures in the city regarding cultural heritage protection*

☒ *Inventory of heritage assets and their condition*

2. Target cultural heritage landscapes identified for ARCH

The information below concerns the Huerta and Albufera at a general level. In discussion with stakeholders, the focus may still be refined in future to focus on selected districts, zones or ecosystems, due to the complexity and size of both cultural heritage landscapes.

2.1. La Huerta de València

2.1.1. Overview

The “Huerta” has been defined by Meeus as one of 30 main European landscapes, consisting of “Irrigated*, fertile valleys on Mediterranean coast*”, characterised by the presence of intensive horticulture and permanent crops such as fruit trees [27]. The “Huerta de València” is one of the last six landscapes of such type remaining in Europe (see Figure 24).

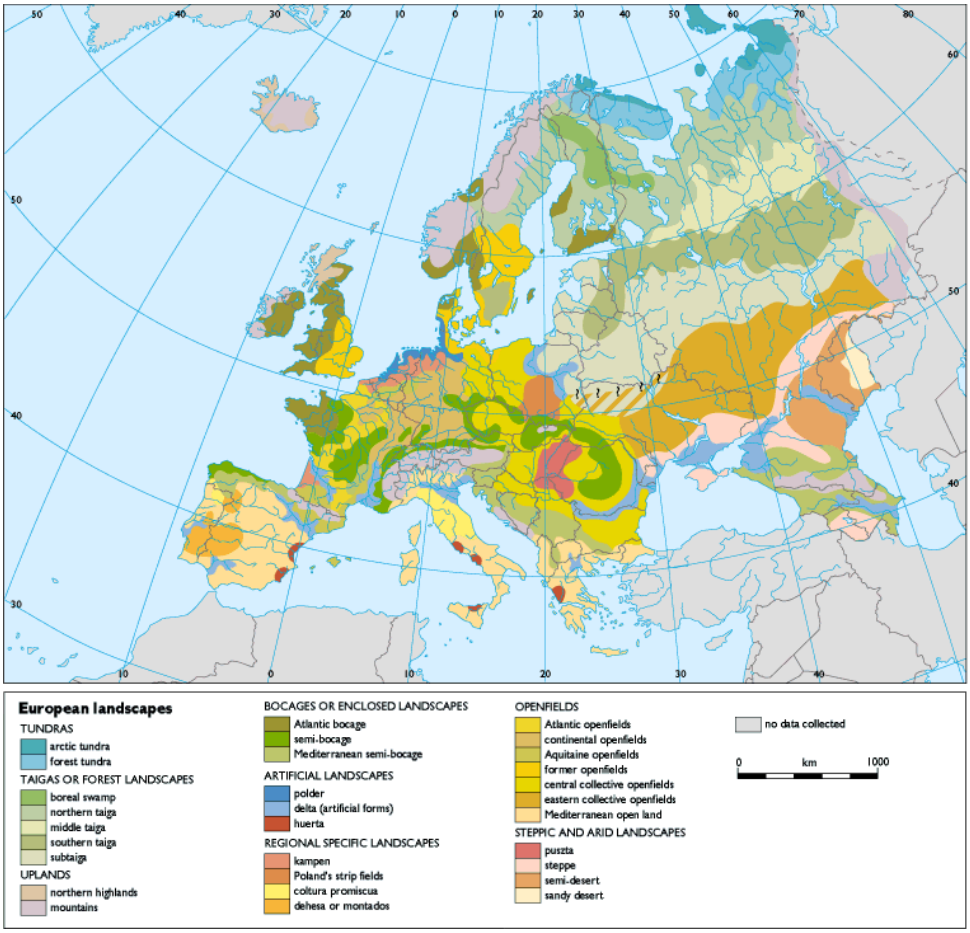


Figure 24. European landscapes [27].

The term “Huerta” is a specific, definable and recognisable historical concept that corresponds to an irrigation model created in medieval times. In this way, the Huerta de València is the territory delimited by the maximum perimeters of the irrigation ditches of medieval Islamic origin that captured the water in the district of València. That is, the seven hydraulic systems that

have formed part of the Water Court (“Tribunal de las Aguas”) for centuries, plus the Royal Acequia of Moncada.

The planning, establishment and development of the space of the Huerta was marked by three fundamental spatial elements:

- The network of irrigation ditches (“acequias”).
- The location of settlements: protected rural areas and goods.
- The road network.

The Huerta area is extremely large, well beyond the municipal boundaries of València city. The part of the Huerta within the “detailed” planning area alone (in dark green in Figure 25) has been estimated at nearly 11,393 ha [1] spans a total of 40 municipalities, of which València is only one, alone with: Albuixech, Aldaia, Alfafar, Alfara del Patriarca, Almàssera, Benetússer, Bonrepòs i Mirambell, Burjassot, Catarroja, Emperador, Foios, Godella, Lugar Nuevo de la Corona, Manises, Massalfassar, Massamagrell, Massanassa, Meliana, Mislata, Moncada, Museros, Paiporta, Paterna, Picanya, La Pobla de Farnals, Puçol, El Puig, Quart de Poblet, Rafelbunyol, Rocafort, Sedaví, Tavernes Blanques, Torrent, Vinalesa and Xirivella. The “extended planning area” (also shown in Figure 25 in lighter green), considered in the same land use plan, covers the whole of “L’Horta” county, including, for historical reasons, four additional municipalities (Albal, Alcàsser, Beniparrell and Picassent), where the Huerta can in fact no longer be found, at least according to the criteria considered in regional regulations [1] [28].

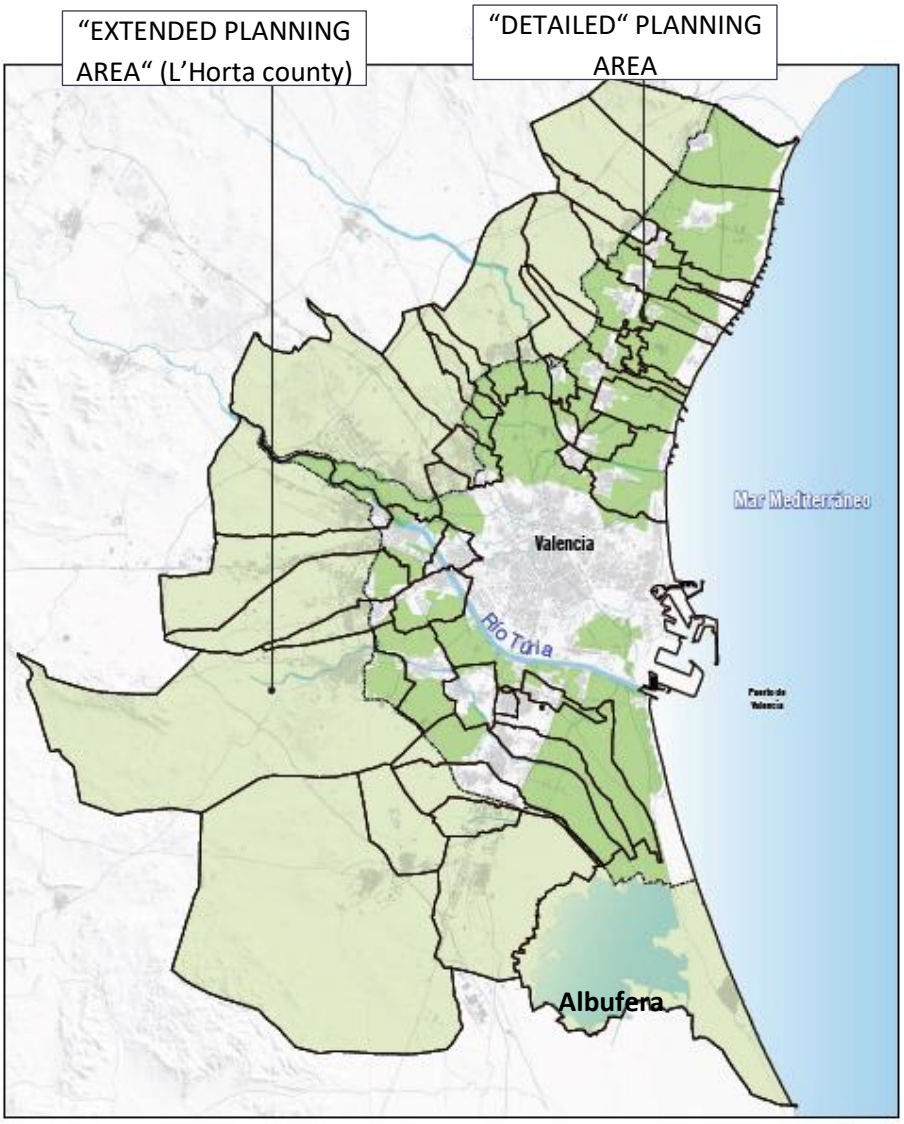


Figure 25. Planning Areas. Huerta de València Regional Plan (municipal boundaries shown in black). Modified from [1].

The Huerta de València is considered "*historic, cultural, natural and agricultural heritage of the Valencian people*" [1]. Relevant international cultural heritage designations are listed in section 3.1. Its social and public functions are recognised by regional law (Article 4, Law 5/2018 [28]: "*The agricultural activity and the natural, cultural and landscape heritage of the Huerta de València fulfils a relevant* social *function, since it favours the development of the agricultural sector, food sovereignty, human welfare, sustainable development and climate change mitigation*". However, other functions, such as its potential role regarding the adaptation of the city of València to climate change, have not yet been fully assessed.

In November 2019, the historical irrigation system and its "Horta" have been recognised on the register of Globally Important Agricultural Heritage Systems (GIAHS), managed by the UN Food and Agriculture Organization (FAO). According to the FAO's Yoshihide Endo who coordinates the GIAHS programme:

> *"The Horta of Valencia is invaluable. Half of the crops grown here are at risk of disappearing in the region. It provides for both farmers and fishers. Its citrus fruits have a Geographical Indication (GI) label due to their high quality and variety. The site is also home to a wide range of birds, fish and plants, many classified as rare, endemic or endangered,"*[3]

2.1.2. Stakeholders

The map of actors involved in managing, planning for and working within the Huerta is very diverse, but of particular importance is the role of the newly-created **Consell de l'Horta** (kick-off in February 2020) thanks to the recently-established Law of the Huerta in 2018. The Council's objective [28] is:

> *"to guarantee the survival and promote the revitalisation of agricultural activities in the Huerta, promoting an agriculture that is more respectful of the environment as well as the possibility of allowing complementary uses and activities compatible with agricultural activities, as well as encouraging citizen participation in the taking of decisions that affect the Huerta, food sovereignty, the reconnection between the countryside and the city, and promoting a local agri-food system"*
>
> *(art. 39 of the Law of the Huerta de València).*

At the time of writing, the Council is made up of members from the Agriculture Department (regional government), the Provincial Government of Valencia and the Municipality of València. The rest of the municipalities that form part of the Huerta area will join later.

There are also other public actors involved in the management of the Huerta. The current structure of the municipal government [29] includes the following areas relevant to the ARCH project:

- "Urban Ecology, Climate Emergency and Energy Transition",
- "Education, Culture and Sports" (which holds, among others, local competencies on cultural heritage and resources) and
- "Innovative Development of Economic Sectors and Employment" (which holds, among others, local competencies on agriculture, sustainable food and Huerta).

Three departments of the regional government are also relevant:

[3] for further information: http://www.fao.org/news/story/en/item/1252906/icode/

- “Agriculture, Rural Development, Climate Emergency and Ecological Transition”,
- “Territorial Policy, Public Works and Mobility” and
- “Education, Culture and Sport”.

The private sector is very important to the Huerta, especially farmers cultivating agricultural land there, such as the SME Terra I Xufa. Other relevant private companies include agritourism company Horta Viva and startup Green Urban Data which develops software to promote the use of remote sensing and other open data for climate change adaptation..

In terms of civil society, social movements have had a long tradition of protecting and supporting the territory in the Huerta, such as Per L'Horta, CERAI and the Assut Foundation. Universities and agricultural research centres are also present in the territory. In the figure below you can see a map of actors according to influence and interest, undertaken by the authors (for more detail on the stakeholder mapping exercise, see forthcoming ARCH report *D3.2 Local partnership and work plan*).

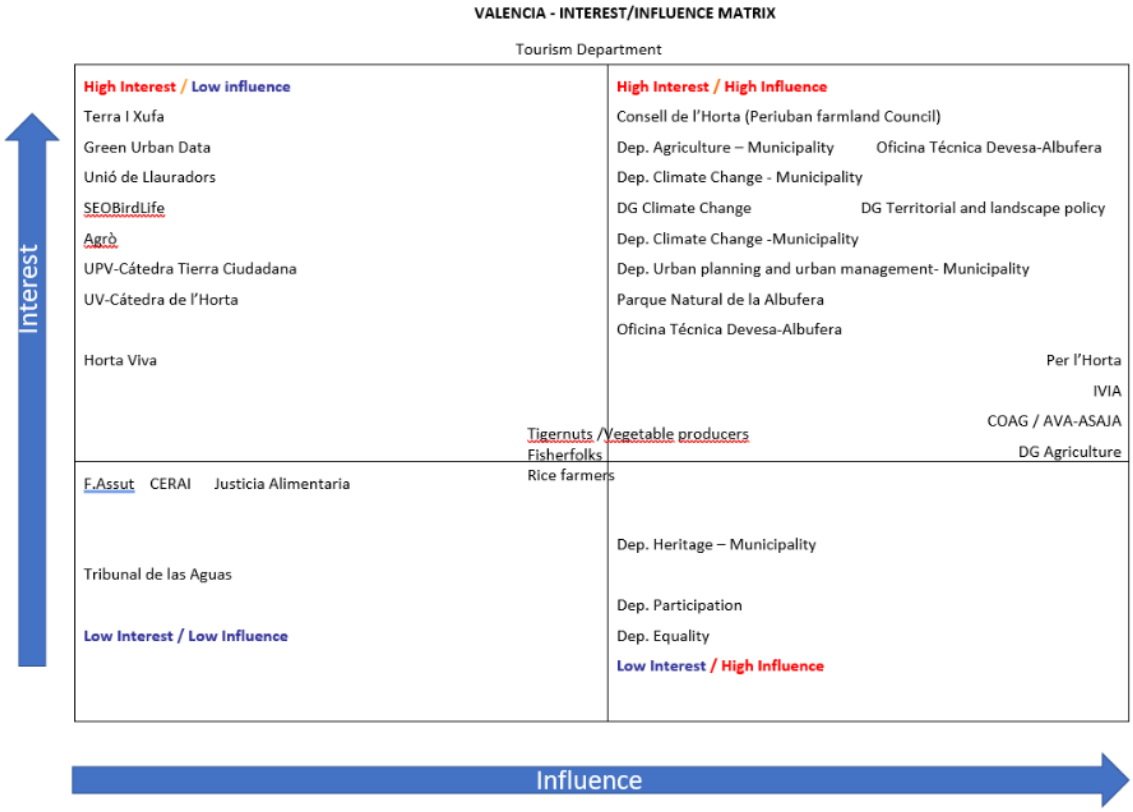


Figure 26. Stakeholder mapping, current as of February 2020. For latest version and more information, refer to *Local partnership and work plan for Valencia* (D3.2).

2.1.3. Hazards affecting the site

The following section briefly introduces the hazards potentially affecting the Huerta, which have been classified and named based on the hazard classification system from UNDRR’s Quick Risk Estimation (QRE) Tool [30]. More detail on hazards is provided in Chapter 10. No relevant **geophysical** hazards were identified. Flood risk is the main **hydrological** hazard for the

Huerta, although wave action could be considered as well in some very specific locations close to the coastline. Within the **meteorological** group of hazards, convective storms and extreme temperature are considered the main risks. Drought is the only relevant **climatological** hazard identified and could become highly significant considering the key influence of irrigation in the agricultural character of the Huerta landscape. Insect infestation is the only **biological** hazard identified according to the QRE Tool, since the tool's definition of "Disease" seems to focus on human diseases. However, as with pests, diseases affecting crops could also change in incidence and prevalence in the Huerta due to climatic changes.

The City developed a *Sustainable Energy and Climate Action Plan (SECAP)* in 2019, [31] including a vulnerability analysis (VA) [32] based on previous climate projections [33], both published in 2015. These VAs also provided the basis for Valencia's *Climate Adaptation Plan 2050* [34] published in 2017[4]. However, they are not spatially explicit, since they are solely based on data from one weather station, which moreover is located in the Valencia airport (outside the Valencia municipal boundaries, and more than 13 km from the coastline). Climate projections were calculated for the RCP4.5 and RCP8.5 scenarios in relation to several descriptive variables of future temperature and rainfall patterns. It should be noted that they are based on statistical downscaling methods, and not on the more advanced regional climate models such as EURO-CORDEX [35] and other derived and gridded data which are currently available. Therefore, assumptions made in the past VAs are of limited use, since they are mainly qualitative and based on data on which faces certain limitations.

The VA [32] was structured around five priority sectors (selected based on strategic and historical importance: water ("Agua"), biodiversity ("Biodiversidad"), coastal zones ("Zonas costeras"), health ("Salud"), and transport and land use planning ("Transporte y ordenación urbana"). Although the sectors agriculture and energy were not addressed in this first study, they were included in a further expansion of the report [36], and also in the analysis that forms part of *Climate Adaptation Plan 2050* [34]. Graphs below show how the level of vulnerability (ranging from "Despreciable" or negligible to "Muy alta" or very high) of each of the sectors in the first VA [32] is expected to evolve in the future (from 2014 up to 2100) in relation to the following expected changes due to climate change: temperature rise (Figure 27), decreasing precipitation (Figure 28), heavy rains (Figure 29), other extreme events (heatwaves and droughts) (Figure 30) and sea level rise (Figure 31). Heavy rains are considered in the analysis as the less dangerous impact driver, as the maximum vulnerability identified to their impacts is just low ("Baja"). Impacts due to sea level rise were also not considered especially worrying, since only coastal areas were considered to have a high vulnerability to it ("Alta"), and the rest of the sectors were considered, at most, to have a low vulnerability. The VA considered indeed that health was not vulnerable to sea level rise at all. The health and water sectors were assessed as highly vulnerable to heatwaves and droughts after 2040, while the rest of the sectors only scored medium ("Media") vulnerability to such extreme events, at most. Higher

[4] It is worth noting that the C*limate Adaptation Plan 2050* also includes results from an updated VA that also addressed the energy and agriculture sectors (see also Figures 32 and 33 below). This updated version, dated March 2016, is apparently not referenced or linked in any of the key documents consulted by the authors, but can be found online: https://www.valencia.es/ayuntamiento/Energias.nsf/0/57AABB553B187CC8C1257F8700396AD6/$FILE/An%C3%A1lisis_vulnerabilidad.pdf?OpenElement&lang=1

levels of vulnerability were linked to temperature rise and decreasing precipitation. In the case of temperature rise, water, biodiversity, coastal areas and health were considered highly vulnerable to temperature rise by 2070, at latest. Water, biodiversity and health were also assessed as highly vulnerable to decreasing precipitation from 2070, or in some cases earlier. No sector was considered to show a very high vulnerability to any of the climate change impact drivers analysed, for any of the time horizons considered.

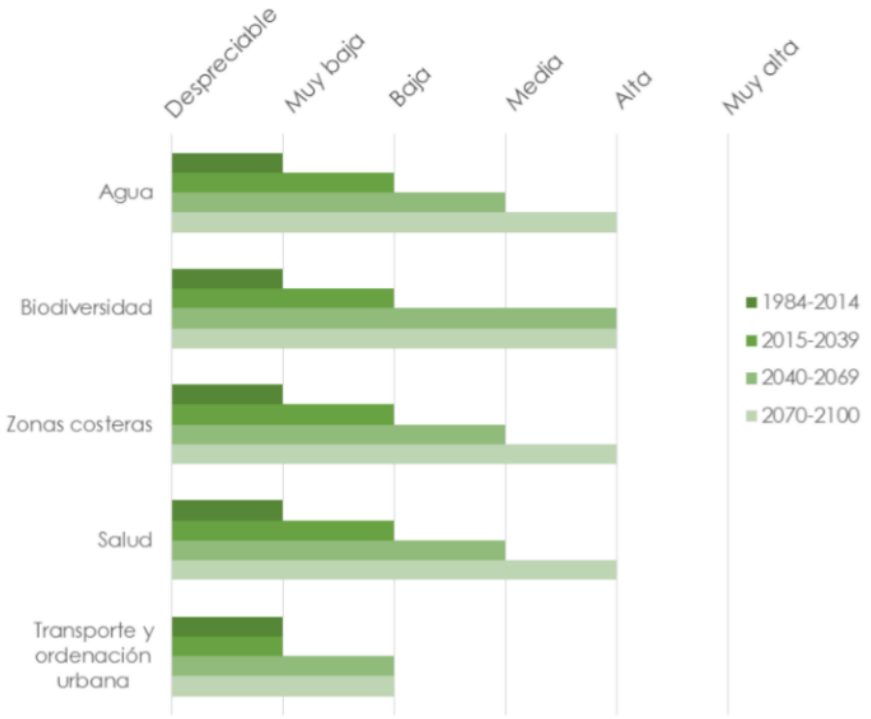


Figure 27. Levels of vulnerability to temperature rise [32].

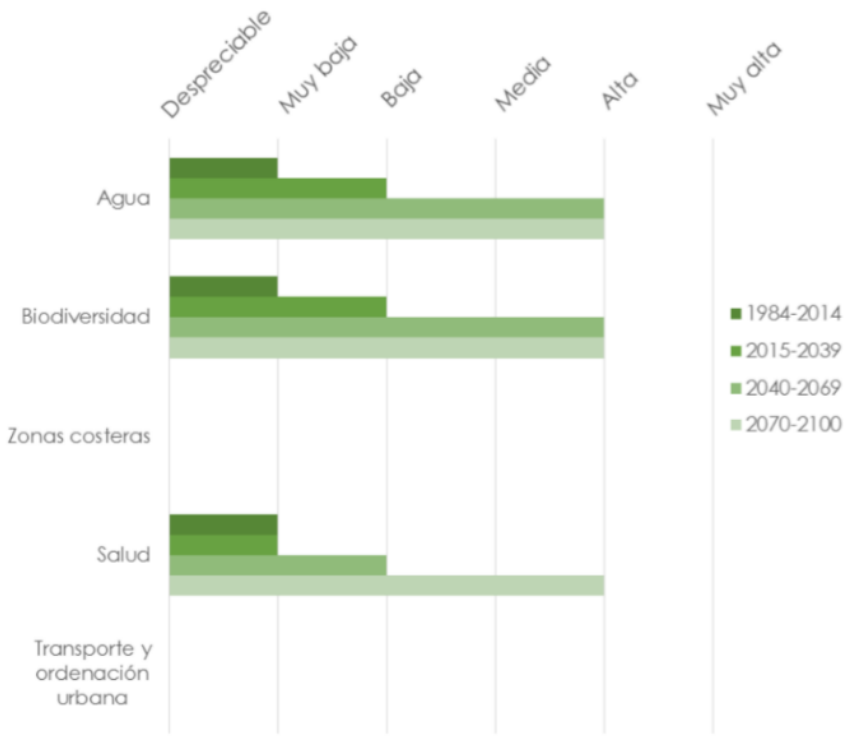


Figure 28. Levels of vulnerability to decreasing precipitation [32].

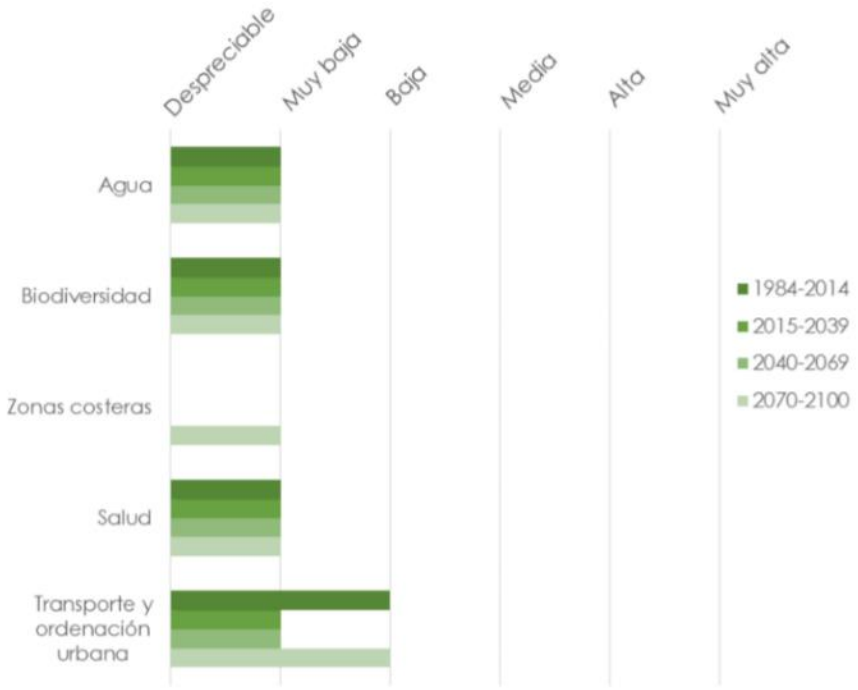


Figure 29. Levels of vulnerability to heavy rains [32].

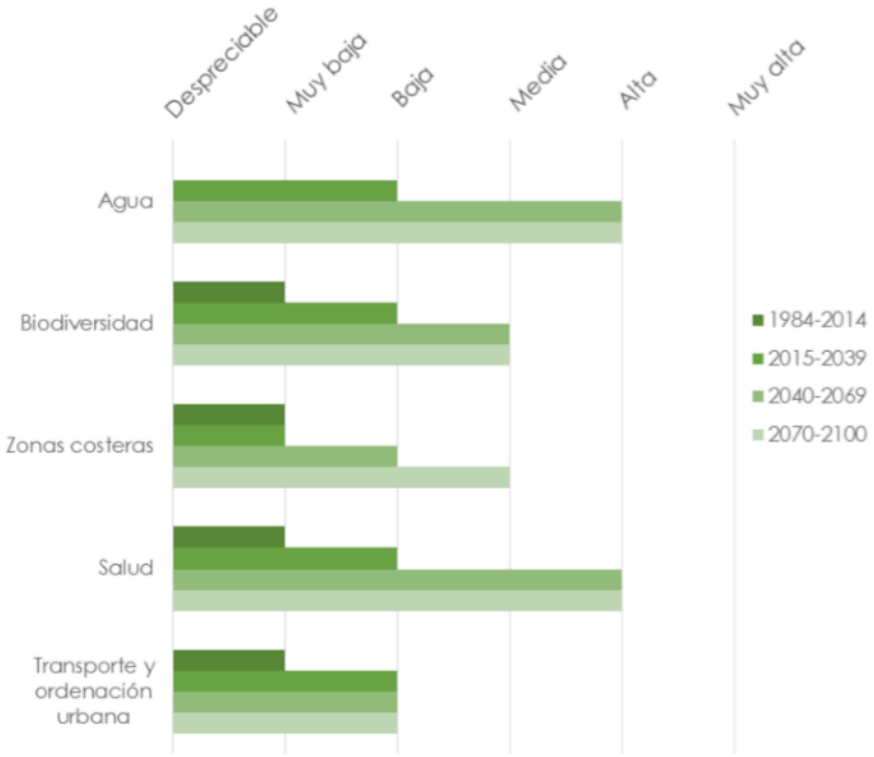


Figure 30. Levels of vulnerability to other extreme events (heatwaves and droughts) [32].

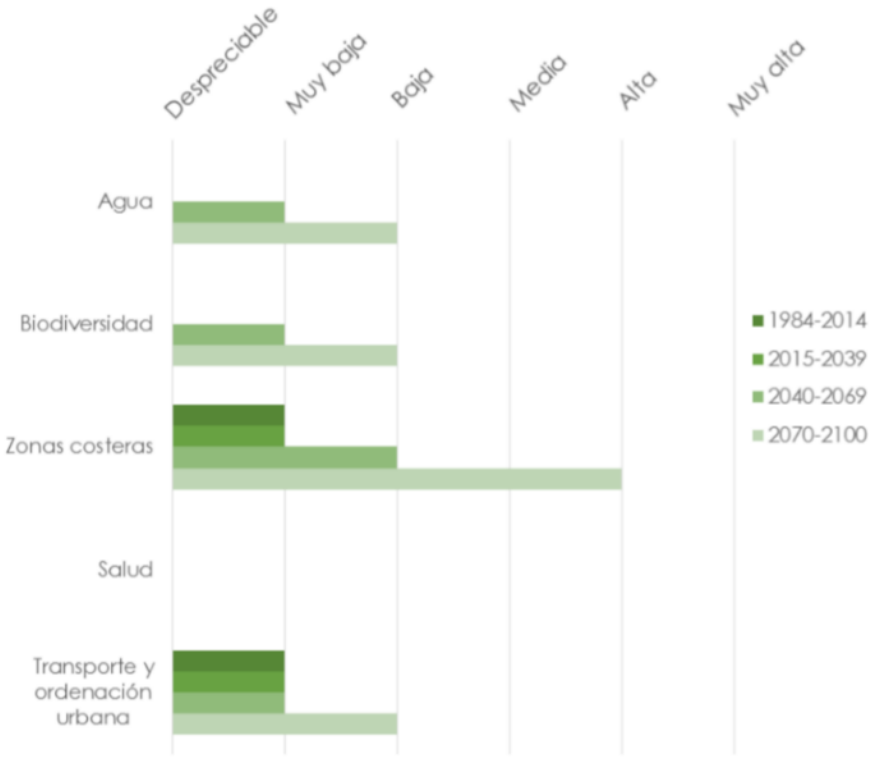


Figure 31. Levels of vulnerability to sea level rise [32].

Climate change hazards in the agriculture (Figure 32) and energy (Figure 33) sectors were presented in a slightly different way in the subsequent expansion of the VA [36]. The impacts likelihood ("Probabilidad") was assessed from unlikely ("Improbable") to highly likely ("Muy Probable"). Consequence from such impacts was ranked, from minimal ("Mínima") to catastrophic ("Catastrófica"). Drivers of impacts are then shown in the table according to their likelihood and consequence, for four different timeframes (T=average temperature, P= average annual rainfall, LT= heavy rainfall, REE= other extreme events, NM=sea level rise, (0=1984-2014, 1=2015-39, 2=2040-69, 3=2070-2100)).

1. PROBABILIDAD \ 2. CONSECUENCIA	Despreciable	Mínima	Menor	Significativa	Importante	Crítica	Catastrófica
	Improbable	NM0; NM1	LLT3	LLT2			
	Muy poco Probable		REE0		LLT1		
	Poco Probable		NM2	T0; P0	LLT0		
	Probable			T1; REE1	P1		
	Bastante probable			NM3	T2; REE2; REE3	P2; T3	
	Muy Probable					P3	

Figure 32. Risks of climate impacts in the agricultural sector, with magnitude of risk ranging from minimal to catastrophic, and probability ranging from unlikely to high likely [32].

1. PROBABILIDAD \ 2. CONSECUENCIA	Despreciable	Mínima	Menor	Significativa	Importante	Crítica	Catastrófica
	Improbable	NM0; NM1; LLT3			REE0		
	Muy poco Probable		LLT1; LLT2				
	Poco Probable	T0; P0	NM2	LLT0	V0		
	Probable		T1; P1			REE1; V1; V2	
	Bastante probable		T2	P2; T3; NM3		REE2; REE3	V3
	Muy Probable				P3		

Figure 33. Risks of climate impacts in the energy sector, with magnitude of risk ranging from minimal to catastrophic, and probability ranging from unlikely to high likely [32].

Climate change impacts and economic sectors in Valencia were also ranked in relation to four time horizons in [32], according to the levels of vulnerability above, although the difficulty in comparing "different impacts, affecting very different stakeholders" was explicitly recognised.

Figure 34 classifies, in decreasing order of importance, the five aforementioned groups of expected changes in relation to the level of risk associated with the sectors considered in the document. Furthermore, Figure 35 classifies seven economic sectors, in decreasing order too, in relation to their assessed level of vulnerability to the climate impacts considered.

	1984-2014	2015-2039	2040-2069	2070-2100
1	Torrential rain	Heat waves and drought	Heat waves and drought	Heat waves and drought
2	Increasing temperatures	Increasing temperatures	Increasing temperatures	Increasing temperatures
3	Decreasing precipitation	Decreasing precipitation	Decreasing precipitation	Decreasing precipitation
4	Heat waves and drought	Torrential rain	Rising sea level	Rising sea level
5	Rising sea level	Rising sea level	Torrential rain	Torrential rain

Figure 34. Impact classification according to their level of risk associated. Modified from [32].

	1984-2014	2015-2039	2040-2069	2070-2100
1	Agriculture	Biodiversity	Water	Water
2	Biodiversity	Agriculture	Biodiversity	Biodiversity
3	Energy	Water	Health	Health
4	Transport and urban planning	Health	Agriculture	Coast
5	Health	Energy	Coast	Agriculture
6	Water	Transport and urban planning	Energy	Energy
7	Coast	Coast	Transport and urban planning	Transport and urban planning

Figure 35. Sector classification according to their level of vulnerability. Modified from [32].

The VA does not analyse in detail the expected impacts of climate change in the Huerta areas of the municipality. The text only contains very brief generic information in relation to the expected impacts on agriculture of the considered changes in climate conditions. Agriculture was addressed in more detail in the subsequent expansion of the VA [31], but still no details are given in relation to issues such as which crops or which areas would be likely more affected, beyond a reference to sea level rise as a threat to some agricultural areas. There is no reference either to the potential role of the existence of Huerta areas surrounding the city in relation to the expected impacts on the urban environment, i.e. as contributing to coping capacity.

2.1.4. Measures proposed to address hazards and build resilience

Some measures to address these forecast climate impacts have already been proposed, but not implemented yet, for instance in the Valencia's *SECAP* [31]. The Annex to the *SECAP* includes many adaptation actions related to the Huerta (planned for implementation between 2019 and 2030), some of them are especially relevant for the aims of the ARCH project. For instance, Measure A.5.2.1 (Figure 36) is particularly interesting in that it explicitly links cultural heritage and adaptation, aiming to disseminate the values of the Huerta and Albufera, and comprising both the Huerta and Albufera areas together. Figure 37 shows a measure aimed at increasing public engagement in relation to the preservation of the Huerta as an adaptation measure for the city itself. Increasing resilience of urban and natural ecosystems is considered an interesting co-benefit which could be obtained. Figure 38. Measure A.4.1.4 Extension of reserved and protected areas for agricultural use which aims at increasing the protection of land for agricultural use in the city, even if it is already considered as available for development. Additionally, Figure 39. Measure A.4.2.2 Acknowledgement of the containment function of the rural territory which aims at identifying, assessing, and even monetising the Huerta's role as an element of green infrastructure, capable of absorbing rainfall (thereby mitigating flood impacts) and attenuating heatwaves. Finally, Measure A.11.2.1 (Figure 40) is focused on the recovery and protection of existing peri-urban Huerta areas, mentioning as a co-benefit the increased infiltration rate for rainfall.

<table>
<tr><th colspan="2">TRANSMISIÓN DE LOS VALORES DE LA HUERTA Y EL ENTRONO DEL PARQUE DE LA ALBUFERA COMO ELEMENTO DE AUTENTICIDAD</th></tr>
<tr><td colspan="2">Agentes implicados: Ayuntamiento de València</td></tr>
<tr><td>Adaptación</td><td>Prioridad a medio plazo</td></tr>
<tr><td colspan="2"><u>Descripción de la acción:</u>
Desarrollo de una cultura ligada al territorio. Perfeccionamiento de la oferta actual y difusión para dar a conocer los itinerarios e iniciativas existentes.
Código Plan de Adaptación: A.5.2.1

<u>Ayudas:</u> Para la realización de esta medida, en el momento de redacción del presente Plan, se podría contar con las siguientes ayudas:
• Generalitat.
• Programa LIFE.
<u>Periodo de actuación:</u> 2022-2025
<u>Indicadores:</u>
• Desarrollo de soportes de comunicación e información.</td></tr>
<tr><td>Beneficios asociados</td><td>Preservación del entorno natural.
Valoración de la imagen de la huerta y del territorio.</td></tr>
</table>

Figure 36. Measure A.5.2.1: Transmission of the values of the Huerta and the surroundings of the Albufera Natural Park as an element of authenticity [31].

FOMENTAR LA IMPLICACIÓN DE LA CIUDADANÍA EN LA PRESERVACIÓN DE LA HUERTA COMO ESTRUCTURA ADAPTATIVA FRENTE AL CAMBIO CLIMÁTICO	
Agentes implicados: Ayuntamiento de València y Generalitat	
Adaptación	Prioridad a corto plazo
Descripción de la acción: Fomentar la implicación de la ciudadanía en la preservación de la huerta como estructura adaptativa frente al cambio climático. Código Plan de Adaptación: **A.3.1.7** **Ayudas:** Para la realización de esta medida, en el momento de redacción del presente Plan, se podría contar con las siguientes ayudas: • Programa LIFE. • Convocatorias de la Fundación Biodiversidad. **Periodo de actuación:** 2017-2021 **Indicadores:** • Iniciativas participativas en torno a problemáticas como la huerta, los recursos energéticos, etc. • Participantes a las iniciativas participativas en torno a problemáticas como la huerta, los recursos energéticos, etc. • Iniciativas de huertos urbanos compartidos.	
Beneficios asociados	Contribuir al incremento de la resiliencia de los ecosistemas urbanos y naturales.

Figure 37. Measure A.3.1.7 To promote the involvement of citizens in the preservation of the Huerta as an adaptive structure in the face of climate change [31].

AMPLIACIÓN DE ZONAS RESERVADAS Y PROTEGIDAS PARA EL USO AGRARIO	
Agentes implicados: Ayuntamiento de València, Consejo agrario, alcaldes pedáneos y Asociación Per l'Horta	
Adaptación	Prioridad a medio plazo
Descripción de la acción: Ampliación de zonas reservadas y protegidas para el uso agrario en el PGOU y revertir la calificación de suelo urbanizable a no urbanizable de determinados terrenos usados como agrícolas o abandonados. Código Plan de Adaptación: **A.4.1.4** **Ayudas:** Para la realización de esta medida, en el momento de redacción del presente Plan, se podría contar con las siguientes ayudas: • FEADER. • Generalitat **Periodo de actuación:** 2022-2025 **Indicadores:** • Zonas calificadas para uso agrícola.	
Beneficios asociados	Preservación de nidos de biodiversidad. Dinamización del sector e incremento de los ingresos generados a nivel local.

Figure 38. Measure A.4.1.4 Extension of reserved and protected areas for agricultural use [31].

RECONOCIMIENTO DE LA FUNCIÓN DE CONTENCIÓN DEL TERRITORIO RURAL	
Agentes implicados: Ayuntamiento de València, Consejo agrario, alcaldes pedáneos y Asociación Per l'Horta	
Adaptación	Prioridad a medio plazo
Descripción de la acción: Reconocimiento de la función de contención del territorio rural – espacios de huerta- su alto índice de permeabilidad y de recarga freática. Reconocimiento del papel de la huerta urbana como elemento mitigador del efecto de ola de calor. Monetización de los servicios ambientales ofrecidos por la huerta y valoración de la oportunidad de la creación de un pago. Revalorizar el trabajo del agricultor. Código Plan de Adaptación: **A.4.2.2** **Ayudas:** Para la realización de esta medida, en el momento de redacción del presente Plan, se podría contar con las siguientes ayudas: • FEADER. • Programa LIFE. • Horizon 2020. **Periodo de actuación:** 2022-2025 **Indicadores:** • Monetización de los servicios de la huerta.	
Beneficios asociados	Valoración de la imagen de la huerta y del territorio.

Figure 39. Measure A.4.2.2 Acknowledgement of the containment function of the rural territory [31].

RECUPERACIÓN Y PROTECCIÓN DE LA HUERTA PERIURBANA EXISTENTE	
Agentes implicados: Ayuntamiento de València, Red de Distribución de Agua del Municipio.	
Adaptación	Prioridad medio plazo
Descripción de la acción: Recuperación y protección de la huerta periurbana existente. Código Plan de Adaptación: **A.11.2.1** **Ayudas:** Para la realización de esta medida, en el momento de redacción del presente Plan, se podría contar con las siguientes ayudas: • LIFE Programme • IDAE • Proyectos Clima • Marguerite **Periodo de actuación:** 2022-2025 **Indicadores:** • Huerta periurbana existente recuperada y protegida.	
Beneficios asociados	Permeabilización del suelo urbano, aumentando así la infiltración de las aguas lluvia al subsuelo.

Figure 40. Measure A.11.2.1 Recovery and protection of existing periurban Huerta [31].

The *Regional Climate Change and Energy Strategy* [37] also includes measures related to agriculture, most of which could be applied in the Huerta. Similar to the *SECAP*, the Strategy doesn't have an associated budget, and therefore depends on other funding sources in order to develop the proposed actions within the proposed 2020–2030 timeframe.

Moreover, some other projects based on European funding have started working in the adaptation of the Huerta (or neighbouring areas) to climate change, with the participation of Las Naves[5] or the Valencia city among other partners. For instance, the AELCLIC ("Adaptation of European Landscapes to Climate Change") project (co-funded by EIT Climate-KIC) worked during 2019 in the Huerta area between Valencia and Alboraya in order to create a local network of stakeholders able to co-define the contents of a potential Landscape Adaptation Plan to Climate Change (LACAP). The results and materials used in the Huerta pilot [38] and also those produced after the cross-cutting analysis of the works developed in 15 representative landscapes distributed across Europe [39] are freely available. Another project "Green Cities for Climate and Water Resilience, Sustainable Economic Growth, Healthy Citizens and Environments" (GrowGreen) [40], funded by Horizon 2020, is currently developing and monitoring a range of nature-based solutions (NBS) demonstrative actions in the Benicalap district, next to the Huerta, and in some cases focused on the transition zones between Huerta and city. Finally, Valencia has just started working in TOMORROW [41], another Horizon 2020 funded project, which aims at "empowering local authorities to lead the transition towards low-carbon, resilient and more liveable cities".

2.1.5. Support needed to build resilience

Based on the existing knowledge available to the City of Valencia with respect to hazards facing the Huerta (as described above), its associated gaps and shortcomings, as well as information gathered from various departments and stakeholders (among them the Department of Agriculture, Consell de l'Horta, Department of the Environment, Las Naves and the Climate and Energy Foundation), three priority objectives can be identified with respect to building cultural heritage resilience:

- To acknowledge and explore how the Huerta helps to mitigate the effects of climate change in the urban environment of València.
- To understand and demonstrate in detail the impacts of possible climate change scenarios on the Huerta.
- To design detailed resilience strategies in order to cope with these identified impacts.

As described previously, these objectives seek to fill an existing knowledge gap, given that the vulnerability level of the Huerta to climate change, and its role in the city's overall ability to adapt to climate impacts, have not been assessed in detail in the existing plans and strategies.

Specific support needs still need to be better identified after discussion with stakeholders, in order to clarify the need for addressing specific impacts or focusing on selected Huerta zones.

[5] Las Naves is the social and urban innovation centre for the city of Valencia, promoting urban innovation with a clear commitment to the people. Its objective is to improve directly or indirectly the quality of life of the residents of the city. Las Naves manages and develops projects and innovative solutions with the active participation of all major stakeholders from the local innovation environment across four so-called "propellers": public sector, private sector, academia and civil society. Las Naves' projects revolve around five main areas: Mobility, Energy and Water, Agri-food, Health and Healthy City, and Creative and Cultural Industries [98].

2.2. La Albufera de València

2.2.1. Overview

The Albufera de València (hereafter the Albufera) is a site of 21,120 ha in size, designated as a Wetland of International Importance under the Ramsar agreement. It is also designated as a Natural Park, under the regional protected area regime, and as a Natural 2000 site, under the European Habitats and Birds Directives. The following description of the site is provided by the Ramsar convention [42]:

> *Albufera de Valencia. 05/12/89; Comunidad Valenciana; 21,000 ha; 39°20'N 000°21'W. Special Protection Area EC Directive; Natural Park. A large coastal lagoon fed by streams, rivers and irrigation channels, fringed by areas of rice cultivation. The site is separated from the sea by an urbanized dune peninsula. Vegetation is dominated by aquatic, halophytic, and dune communities. The site's fauna is notable for its species diversity. Regional endemics include fish and crustaceans. The area supports a rich assemblage of breeding waterbirds, and large numbers of various species of waterbirds, especially ducks, winter at the site. Human activities include rice cultivation, fishing, and hunting. Ramsar site no. 454. Most recent RIS information: 1999.*

A map of the Natural Park is shown in Figure 41 [43]. The most important areas owned by the city of Valencia are the coastal lagoon, some of the rice cultivation areas, and most of the sand bar (locally known as “Devesa”), including emblematic locations such as the population nuclei of El Saler and El Palmar. The remaining areas of the Natural Park belong to neighbouring municipalities such as Silla, Catarroja or Sueca.

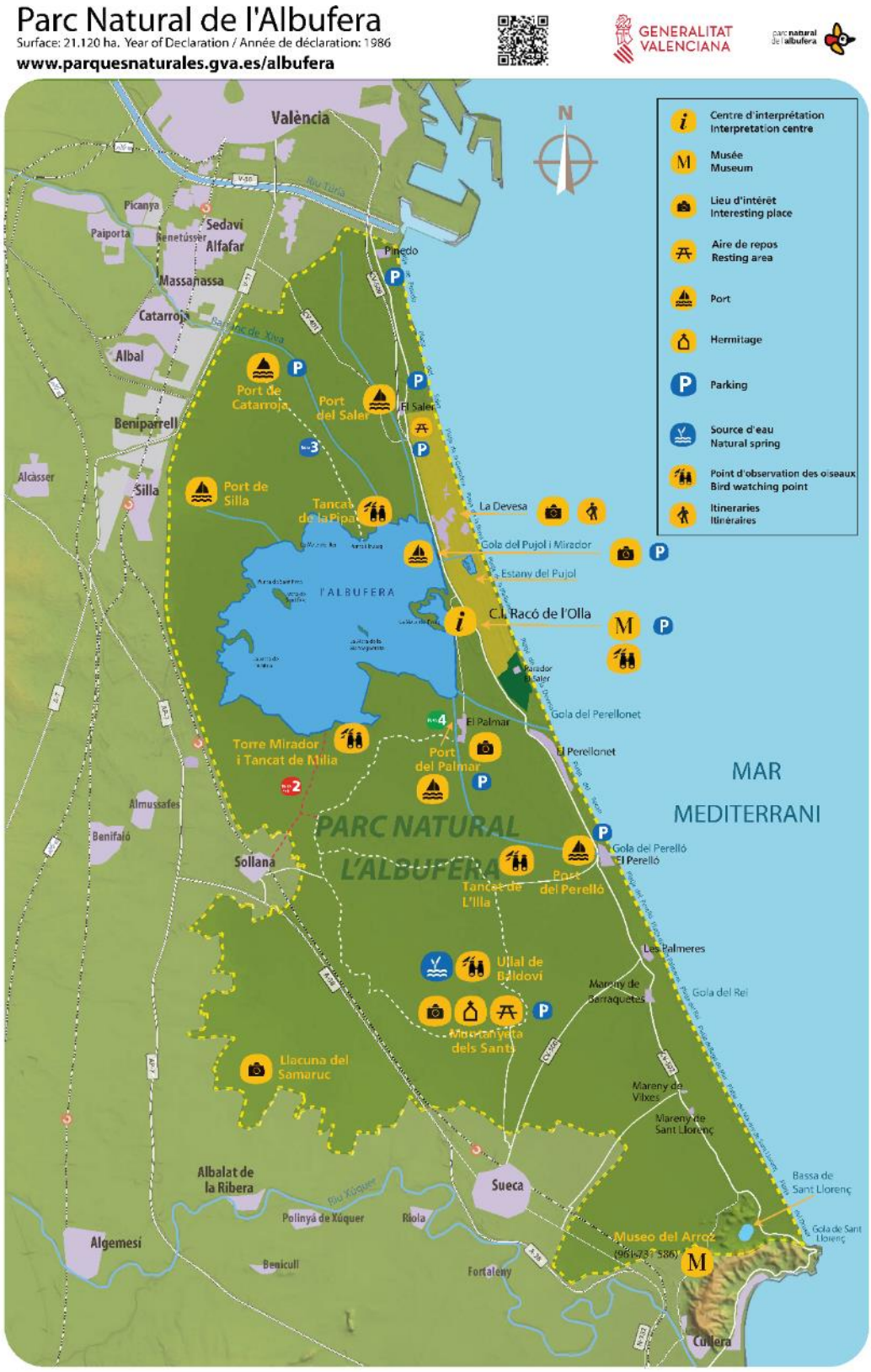


Figure 41. Albufera Natural Park Map [43].

2.2.2. Stakeholders

The Albufera management scheme is highly complex. Although the lagoon belongs to the city of Valencia, its water level (and, by extension, the water management regime of the surrounding rice paddies) is managed by rice farmers. These farmers control the body ("Junta de desagüe") which manages the gates in the "golas" (channels between the lagoon and the sea). The city of Valencia is involved in the regular maintenance of the golas, beaches, irrigation channels and other areas of the wetland, and for many years has supported the ecological restoration of the dune systems (which was funded via successive LIFE projects such as LIFE00 NAT/E/007339 [44] and LIFE04 NAT/ES/000044 [45]). These ecosystems, located in the sandbar ("Devesa"), were partly destroyed during early stages of an intended residential development of the area that started in the 1960s, and was finally stopped due to the strong public opposition[6]. Many of these maintenance and restoration actions are managed by the city's *in situ* technical office ("Oficina Técnica Devesa-Albufera").

The regional government is also involved in managing the Albufera, since it is responsible for most of the competences related to the area's protected status. A comprehensive legal regime exists [46]. The principal decision-making body for most of the protected area management matters is the management board ("Junta Rectora") of the Natural Park, where many stakeholders are present (from several departments of the regional government, to a representative of the lateen sailing sports federation – see the complete list in [47]). Their technical office in the Park is very active too, and undertakes many different actions throughout the year, including environmental and wildlife monitoring, which are summarised in annual management reports [48].The forest management branch of the regional government is also involved in the management of the area, since the forest in the Devesa is registered as public woodland, and therefore subject to a complementary specific management regime.

National authorities are also involved in the management and maintenance of the Albufera. For example, the Jucar Basin Management Agency (CHJ),which depends on the Spanish government, is in charge of establishing how much water (a critical element of the ecosystem) is assigned to the Albufera by means of hydrological planning. The CHJ is also responsible for a monitoring and control network which collects data on hydro-morphological, physical-chemical and biological parameters, some of them continuously monitored through different sensors located in the lagoon and surroundings [49].

The Albufera inhabitants are also key stakeholders to be considered. There are residents not only in the population nuclei which are part of the Valencia municipality, such as El Saler, El Palmar or El Perellonet, but also in scattered buildings which were built in the Devesa area before the 1960s urban development of the area was stalled. Other important stakeholders in the Albufera are boat operators people engaged in commercial fishing, hunters, the restaurant sector and tourism operators, including birding specialist guides. Civil society organisations such as A.E.Agró and SEO-Birdlife have been involved in the area for many years, and are for instance together in charge of the management of an artificial wetland for water treatment (Tancat de la Pipa). The Fundació Assut is another organisation very active in the area. Finally, the València area of the Albufera also includes a research centre focused on aquatic fauna

[6] More details can be found in [44] and [45]

(Centre d'Investigació Piscícola d'El Palmar) and a wildlife recovery centre (Centro de recuperación de Fauna del Saler).

2.2.3. Hazards affecting the site

General information from the 2015 VA of the city of Valencia has been already cited in section 2.1.3, along with its limitations. There has been no vulnerability mapping undertaken for the Albufera itself in the VA, nor a detailed analysis of potential impacts on its ecosystems due to climate change. However, there is a brief list of existing and potential impacts in the wetland, such as those associated with water temperature rise, decrease in rainfall, heavy rains and sea level rise [32]. Analysing in detail potential impacts such as future water quality changes in the Albufera and consequences for its natural and cultural heritage requires complex modelling at catchment scale, which has been out of the scope of previous studies.

The Albufera lagoon has been suffering from eutrophication for decades, due to excessive nitrogen and phosphorus inputs from fertilisation of the rice paddies and associated untreated, polluted waters discharged into the channels leading to the lagoon. The forecast temperature rise and changes in rainfall and water availability (and demand) according to the climate change scenarios projected at regional level are expected to aggravate these water quality problems, exacerbating the ecological deterioration of the lake [32]. Moreover, the lagoon and its surroundings are already showing salinisation processes, which will increase as the sea level continues to rise, causing additional changes in the lagoon ecosystem and rice cultivation. Salinity is a key factor in shallow lakes such as the Albufera, since it is one of the main water quality parameters that determines changes in the composition of plankton, which in turn strongly influences the eutrophication level of the lagoon and therefore its whole ecological status. Due to its proximity to the sea, and the low altitude of the sandbar that separates the lagoon from the sea, sea level rise could potentially lead not only to the total change of the lake ecosystem composition due to extreme salinisation, but even to its complete disappearance under the sea. The same can be said regarding the dune and forest areas of the Devesa sand bar, which additionally will suffer an increase in already high wildfire risk, as the climate becomes hotter and drier. Other potential challenges include an increase in the presence of invasive species, or the damage caused by increasingly frequent convective storms, affecting almost every ecosystem in the area, from the beaches to the forest and golas.

2.2.4. Measures proposed to address hazards and build resilience

The management regime of the Albufera Natural Park does not explicitly take into account climate change yet. However, some special measures aimed at improving the ecological status of the lagoon have been agreed by the local, regional and national administrations, and will be integrated by the Jucar basin management agency in the current review of the basin hydrological plan which, by law, needs to take climate change into account regarding the allocation of water resources[7].

[7] The new plan would be intended to cover the period 2021-2027, however at the time of writing the intended date of completion was unknown, and a related public consultation had been placed on hold due to the state of

Other measures have been proposed, but not implemented yet, for instance in the Valencia's *SECAP* [31]. The adaptation measures detailed in the Annex to the *SECAP* include one combined measure for both the Huerta and the Albufera, already mentioned (Figure 36. Measure A.5.2.1: Transmission of the values of the Huerta and the surroundings of the Albufera Natural Park as an element of authenticity). Other proposed measures related to the Albufera are shown in Figure 42 (Increasing the participation in the "Junta de Desagüe") and Figure 43 (dune conservation actions). Other measures, such as those shown in Figure 44 and Figure 45, do not mention explicitly the Albufera, but could be easily applied to it.

REGULACIÓN PARA MAYOR PARTICIPACIÓN EN LA JUNTA DE DESAGÜE DE LA ALBUFERA DE VALENCIA	
Agentes implicados: Ayuntamiento de València, Gobierno de Valencia	
Adaptación	Prioridad medio plazo
Descripción de la acción: Regulación que implique mayor participación en la Junta de desagüe de la Albufera de Valencia y para el abordaje de la problemática de la gestión del agua de forma integral (ciclos de inundación y vaciado) en el parque natural ya que tiene un impacto muy grande sobre el ecosistema del mismo y de la franja marítima. Código Plan de Adaptación: **A.12.1.3** **Ayudas:** Para la realización de esta medida, en el momento de redacción del presente Plan, se podría contar con las siguientes ayudas: • European Agricultural Fund for Rural Development (EAFRD) • European Maritime and Fisheries Fund (EMFF) • LIFE Programme • Cross-border cooperation • Natural Capital Financing • Facility (NCFF) **Periodo de actuación:** 2022-2025 **Indicadores:** • Junta de desagüe de la Albufera de Valencia creada.	
Beneficios asociados	Protección de las especies residentes en el municipio y conservación de las especies autóctonas.

Figure 42. Measure A.12.1.3 Regulation for greater participation in the Albufera de Valencia drainage board [31].

emergency arising from the COVID-19 pandemic. See more information here https://www.chj.es/es-es/medioambiente/planificacionhidrologica/Paginas/PHC-2021-2027-Indice.aspx

ACOMETER LABORES DE CONSERVACIÓN DE LA LÍNEA DE DUNAS	
Agentes implicados: Ayuntamiento de València, Gobierno de Valencia	
Adaptación	Prioridad corto plazo
Descripción de la acción: Acometer labores de conservación de la línea de dunas. Código Plan de Adaptación: **A.12.1.4** **Ayudas:** Para la realización de esta medida, en el momento de redacción del presente Plan, se podría contar con las siguientes ayudas: - European Agricultural Fund for Rural Development (EAFRD) - European Maritime and Fisheries Fund (EMFF) - LIFE Programme - Cross-border cooperation - Natural Capital Financing - Facility (NCFF) **Periodo de actuación:** 2017-2021 **Indicadores:** - Biodiversidad en el municipio conservada.	
Beneficios asociados	Protección de las especies residentes en el municipio y conservación de las especies autóctonas.

Figure 43. Measure A.12.1.4 Undertake conservation work on the dune line [31].

DESARROLLAR ACUERDOS INTERINSTITUCIONALES PARA GESTIONAR EL RIESGO CLIMÁTICO DE MANERA EFICIENTE	
Agentes implicados: Ayuntamiento de València, Estado, Generalitat	
Adaptación	Prioridad a corto plazo
Descripción de la acción: Crear o reforzar los mecanismos de coordinación / cooperación entre otras administraciones y el Ayuntamiento de Valencia de forma transversal a todos los sectores: - entre el Estado y el Ayuntamiento (ej. Costa: competencia de Estado). - entre la Generalitat y el Ayuntamiento. - a nivel de área metropolitana. Identificar donde fallan los mecanismos de coordinación actuales; crear mecanismos de retroalimentación entre organizaciones para informar de las necesidades a los que dispongan de las competencias; crear convenios de cooperación para llevar a cabo iniciativas interterritoriales. Código Plan de Adaptación: **A.9.1.1** **Ayudas:** Para la realización de esta medida, en el momento de redacción del presente Plan, no se han encontrado ayudas disponibles. **Periodo de actuación:** 2017-2021 **Indicadores:** - Grado de comunicación y coordinación entre el Ayuntamiento y otras administraciones. - Acuerdos institucionales sobre cambio climático de forma eficiente gestionados.	
Beneficios asociados	Mayor comunicación entre las instituciones, siendo mejores y más eficientes las medidas tomadas ante riesgos climáticos.

Figure 44. Measure A.9.1.1 Develop inter-institutional agreements to manage climate risk efficiently [31].

TRANSPOSICIÓN PLAN DE ACCIÓN TERRITORIAL DE LA INFRAESTRUCTURA VERDE DEL LITORAL EN LA PGOU Y OTRAS NORMATIVAS MUNICIPALES	
Agentes implicados: Promotores privados de vivienda; constructores; ingenierías y urbanistas; ciudadanía; Administraciones públicas estatales y regionales; Servicios municipales.	
Adaptación	Prioridad medio plazo
Descripción de la acción: Transposición Plan de Acción Territorial de la Infraestructura Verde del Litoral (Pativel) en el PGOU y otras normativas municipales del PATIVEL, del PATRICOVA y de todas las planificaciones sectoriales sostenibles que contribuyen a incrementar la resiliencia del territorio ante el cambio climático. Código Plan de Adaptación: **A.8.1.2** **Ayudas:** Para la realización de esta medida, en el momento de redacción del presente Plan, se podría contar con las siguientes ayudas: • European Agricultural Fund for Rural Development (EAFRD) • Community-led Local Development (CLLD) • Integrated Territorial Investments ITI • LIFE Programme • Urban innovation actions • CIVITAS activity Fund Sustainable mobility • Cross border cooperation • Transnational cooperation • INTERRG EUROPE • URBACT III • Proyectos Clima **Periodo de actuación:** 2022-2025 **Indicadores:** • Número de medidas de adaptación al cambio climático en el PGOU. • Introducir la adaptación en la planificación y ejecución urbanística municipal.	
Beneficios asociados	Crear ciudades resilientes al cambio climático que permitan reducir sus impactos y desarrollar sus capacidades adaptativas.

Figure 45. Measure A.8.1.2 Transposition of the territorial action plan for coastal green infrastructure into the general urban development plan (land-use planning) and other municipal regulations [31].

The *Regional Climate Change Strategy* [37] mentioned earlier also includes many measures which could be applicable in the Albufera. For instance, Measure 61 deals with adaptation measures of crops in wetlands, while Measure 77 aims at maximising wetlands' capacity to act as buffer zones regarding storms or coastal erosion. Both measures are quoted below. Acronyms contained within square brackets refer to the regional department or departments responsible for the measure implementation ("MN" refers to the competent department for the natural environment, and "AG" refers to the competent department in the domain of agriculture and stockbreeding).

***Measure 61. Adapting crops in wetlands**. Linked actions:*

[MN] [AG] To promote farming compatible with wetlands conservation; to establish progressive measures to dispose rice straw residues, in order to reduce carbon dioxide emissions from straw burning.

[MN] [AG] To promote crops more compatible with maintaining flooded areas, increasing the flow absorption capacity in flood season.

[MN] [AG] Limiting the use of fertilizers in certain crops in order to promote their role reducing the amount of organic matter reaching the wetlands.

[MN] [AG] To promote farming practices that prevent organic matter to be stored in the soil in a non-stabilised form, such as the adjustment of mowing height.

[MN] [AG] Research on more cost-effective and sustainable channels and ditches maintenance systems. Conservation and restoration of the irrigation networks considered of historical interest and traditional in order to recover the crops on water-meadows along rivers and streams, as well as on their slopes, to recover previous microclimatic conditions, to increase air moisture as a way to promote cloud formation and improve precipitation patterns.

Measure 77. To maximise the wetlands capacity to buffer against storm impacts (floods and coastal erosion). *Linked actions:*

[MN] Preservation of coastal sandbars or shingle banks linked to wetlands.

[MN] Preservation of river mouths (designated wetlands[8]).

[MN] Monitoring of salinization processes. Installation of a network of piezometers in wetlands.

[MN] Maintenance of adequate water levels to prevent seawater intrusion.

[MN] Impact assessment of the increased salinity in natural ecosystems.

Some existing projects that could be considered in order to avoid redundancies and exploit potential synergies are the already-mentioned TOMORROW project, the "PIMA Adapta Costas" (aimed at improving the resilience of the Spanish coast regarding climate change impacts [50]) or some other European funded projects such as the Interreg Delta Lady [51]. In a further step the scope of those projects, which could complement or support key actions that the ARCH project could develop in the Albufera area, will be clarified.

To date, and subject to the above-mentioned uncertainties, no specific climate change adaptation measures in the Albufera have been identified as implemented or currently under implementation to address these climate challenges[9], beyond the mentioned dune restoration project developed over the past decades, or the analysis and incorporation of the Albufera water requirements as part of updated hydrological planning at basin scale.

2.2.5. Support needed to build resilience

The previous paragraphs show some potential lines of action that could be developed by the ARCH project in Valencia. The lack of associated budget for either the Regional Strategy or the Valencia Action Plan is one of the main reasons why the ARCH project is so important,

[8] Reference to the Valencian Wetlands Catalogue [99] (in the Valencia Region, wetlands have been given special conservation status, including a specific category of protected areas).

[9] It should be noted that some relevant actions, e.g. measures from the *Regional Climate Change Strategy* [37] mentioned above, have been proposed but not yet applied to the Albufera. Further consultation with stakeholders is needed to determine whether these actions are planned for implementation, and if so, in what time frame.

since it could act as a powerful lever to develop some of those actions, which are mainly dependent on external funding.

Some of the identified potential actions show synergies with some of the measures that could be implemented in the Huerta area. At the same time, some measures proposed in the previous section in relation to the Huerta area could also be extended to and benefit the Albufera area, for instance in relation to the identified knowledge gaps in relation to the vulnerability of the Albufera to climate change, and the role it can play within the city's adaptation to climate change strategy.

In particular, assessing how is the Albufera helping the city to cope with the changing climate, or how will it do it in the future, seems particularly relevant. Modelling climate change impacts on agriculture, aquatic and forest ecosystems would also be needed in order to be able to design resilience strategies in order to cope with these identified impacts. At the same time, this should also be considered as a prerequisite for maximizing those potential environmental services provided by the Albufera and Huerta regarding climate change adaptation in the city.

Again, discussion with stakeholders is still needed in order to prioritize specific support needs or focusing on addressing specific impacts or selected Albufera zones or ecosystems.

3. Governance framework for cultural heritage management

This section considers the governance framework for cultural heritage relevant to Valencia's identified sites, by illustrating existing policies, strategies and programmes for the management, protection and use of cultural heritage at the different governance levels. It also reflects on the extent to which existing local commitments and action plans take into account the key international governance instruments created by UNESCO.

3.1. International

UNESCO[10] and European Cultural conventions[11] started in 1952 and 1954, respectively to address cultural recommendations and agreements. Since then, they have worked towards the protection of World Cultural and Natural Heritage. In 2009, the irrigators' tribunal of the plain of Valencia (linked to the Huerta) was inscribed on the UNESCO representative list of the intangible cultural heritage of humanity[12], following the Convention for the Safeguarding of the Intangible Cultural Heritage, which entered into force in 2006[13]. Furthermore, in 2002, the Food and Agriculture Organization of the United Nations launched a programme[14] to support the conservation of Globally Important Agricultural Heritage Systems (GIAHS). Recently, in 2019, the Huerta was added to the GIAHS list.

On the other hand, at European level the protection of European cultural heritage (both natural and architectural), in rural and island regions is covered by a resolution adopted in 2006 by the European Parliament[15].

3.2. National

Guided by international frameworks, Spain has deployed several regulations[16] that set the basis for the management of cultural heritage (using the title 'historical heritage'). According to law 16/1985, of 25 June, Spanish Historical Heritage includes buildings and movable objects

[10] https://whc.unesco.org/

[11] https://www.coe.int/en/web/culture-and-heritage/european-cultural-convention

[12] https://ich.unesco.org/en/RL/irrigators-tribunals-of-the-spanish-mediterranean-coast-the-council-of-wise-men-of-the-plain-of-murcia-and-the-water-tribunal-of-the-plain-of-valencia-00171

[13] https://ich.unesco.org/en/convention

[14] http://www.fao.org/giahs/background/a-global-partnership/en/

[15] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52006IP0355

[16] Law 16/1985, of 25 June, on Spanish Historical Heritage; Law 10/2015 of 26 May on the Safeguarding of Intangible Cultural Heritage; Law 1/2017 of 18 April on the restitution of cultural property unlawfully removed from the territory of Spain or another Member State of the European Union, transposing Directive 2014/60/EU of the European Parliament and of the Council of 15 May 2014 into Spanish law; Royal Decree 111/1986, of 10 January, partially implementing Law 16/1985, of 25 June, on Spanish Historical Heritage ; Royal Decree 1680/1991, of 15 November, implementing the ninth additional provision of Law 16/1985, of 25 June, on Spanish Historical Heritage, on State guarantees for works of cultural interest; Law 16/1985 on Historical Heritage; Royal Decree 111/1986 on the partial implementation of the Law

of artistic, historical, palaeontological, archaeological, ethnographic, scientific or technical interest. It also includes documentary and bibliographic heritage, archaeological sites and areas, as well as natural sites, gardens and parks, which have artistic, historical or anthropological value.

3.2.1. Management of historical heritage

Historical heritage is managed by the Ministry of Culture and Sports while natural heritage is managed by the Ministry of Ecological transition. There are two sub-directorates in charge of the protection and conservation of Spanish cultural heritage, dependent on the Directorate General of Fine Arts and Cultural Heritage.

General Sub-directorate for the Protection of Historical Heritage: responsible for the legal protection of cultural heritage. This entity is responsible for relations with other states and international organisations, such as UNESCO, in the field of cultural heritage, in the following cases, except for the European Heritage Days, which are coordinated by the Cultural Heritage Institute of Spain. In addition, this Sub-directorate coordinates the following bodies:

- Spanish Historical Heritage Council: Coordinating body between the State Administration and the Autonomous Communities[17] whose purpose is to facilitate communication and exchange of action programmes and information relating to Spanish Cultural Heritage.
- Board for the Qualification, Valuation and Export of Spanish Historical Heritage Goods: Collegiate consultative body attached to the General Directorate of Fine Arts and Cultural Goods and Archives and Libraries responsible for reviewing applications for export, import and acquisition of goods.

General Sub-directorate of the Spanish Cultural Heritage Institute: main functions are the elaboration and execution of plans for the conservation and restoration of Spanish cultural heritage; the study of updated methods and techniques for its restoration and conservation; the archiving, technical treatment and diffusion of the relevant documentation; interventions and works carried out in each specific case; the diffusion and exchange with international bodies; the training of technicians who attend to the aims of the Institute, and the proposal of agreements for the conservation of heritage with other public administrations and public or private entities.

3.2.2. Management of natural heritage

A legally-binding *Strategic Plan for Natural Heritage and Biodiversity*[18] , published in 2011, establishes goals, objectives and actions to promote the conservation, sustainable use and

[17] An Autonomous Community is a Spanish administrative territorial entity. The Spanish constitutional system establishes a system of recognition of territorial autonomy that grants States legal and administrative functions similar in many aspects to that of a federal state. Territorially the system of decentralisation is organized with 17 Autonomous Communities, Comunidad Valenciana being one of them; and two cities with statute of autonomy - Ceuta and Melilla-.

[18] https://www.miteco.gob.es/es/biodiversidad/temas/conservacion-de-la-biodiversidad/valoracion-y-aspectos-economicos-de-la-biodiversidad/cb_vae_plan_estrategico_patrimonio_nat_bio.aspx

restoration of natural heritage and biodiversity for the period 2011-2017. Its application will be extended until another strategic plan is adopted to replace it.

This national Strategic Plan incorporates the commitments made by Spain at international and EU level in the field of biodiversity, in particular those derived from the United Nations Convention on Biological Diversity's *Strategic Plan for Biodiversity 2011-2020* (approved by the Contracting Parties in October 2010) and the *EU Biodiversity Strategy to 2020* (adopted in May 2011 by the European Commission and endorsed by the Council of Environment Ministers in June 2011).

The Spanish Inventory of Natural Heritage and Biodiversity[19] is one of the instruments to store knowledge and plan to care for natural heritage and biodiversity, together with the *State Strategic Plan for Natural Heritage and Biodiversity* and the *Natural Resource Management Plans,* in accordance with Law 42/2007, of 13 December, on Natural Heritage and Biodiversity. Within this inventory the Albufera is included under “Other Natural Protected Areas”.

3.3. Regional

At the regional level, Law 4/1998 on Valencian Cultural Heritage aims at the protection, conservation, dissemination, promotion, research and enhancement of Valencian cultural heritage [52].

There is also a general inventory of Valencia's cultural heritage. This is divided into goods of cultural interest, goods of local relevance, movable goods of heritage relevance and intangible goods of local relevance. Within this classification, goods related to the Huerta are considered, such as farmhouses (“alquerías”) and “barracas”, typical constructions of the Huerta (see Figure 46 and Figure 47). Also inventoried as Valencian cultural heritage are some traditional irrigation channels and their related infrastructure (Figure 48), and even traditional paths connecting Valencia with neighbouring municipalities through the Huerta (Figure 49).

[19] https://www.boe.es/buscar/doc.php?id=BOE-A-2011-8228

Figure 46. „Alquería de Pallés“ (Huerta farmhouse, Valencia Municipality). Element included within the general inventory of Valencia's cultural heritage [1].

Figure 47. „Barracas de Panach“ (Huerta farmhouses, Valencia Municipality). Element included within the general inventory of Valencia's cultural heritage [1].

Figure 48. „Llengües del braç de dalt-del mig“ (Part of the Huerta irrigation network, Valencia Municipality). Element included within the general inventory of Valencia's cultural heritage [1].

Figure 49. „Camí Vell de Picassent“ (Old path from Valencia to neighbouring Huerta municipalities). Element included within the general inventory of Valencia's cultural heritage [1].

There are also additional relevant protected heritage elements that are located within Valencia’s Huerta areas, but are not directly related to farming. The most prominent examples are those related to religious symbols, places of worship or other religious sites, such as the old “Sant Miquel dels Reis” monastery (Figure 50).

Figure 50. „Monasteri de Sant Miquel dels Reis“ (Monastery within the Valencia municipality Huerta). Element included within the general inventory of Valencia's cultural heritage [1] [53].

The Water Tribunal, a key element of the Huerta which has already been mentioned based on its inclusion on the UNESCO representative list of the intangible cultural heritage of humanity (locally known as “Tribunal de las Aguas de la Vega de Valencia” or simply “Tribunal de las Aguas”) is also included within the regional inventory of Valencia’s cultural heritage as an intangible element in the domain of traditional knowledge [54] (Figure 51).

Figure 51. „Tribunal de las Aguas de la Vega de Valencia“ (which meets weekly in the Apostles Gate of Valencia Cathedral). Element included within the general inventory of Valencia's cultural heritage [54].

There are also regionally protected heritage elements in the Albufera area of the Valencia municipality. Besides those pertaining to some of the previously described categories, related to farming or religious worship, some elements are unique to the Albufera conditions. For instance, the gates in the “Gola de Pujol” (one of the channels between the Albufera Lagoon and the sea, crossing the Devesa forest area – see Figure 52), the dock and boatyard facility in the El Palmar population nuclei, as well as some drainage pump stations essential to complex water management in the rice paddies.

Figure 52. „Comportes de la Gola de Pujol“ (gates in the „Gola de Pujol“ channel). Element included within the general inventory of Valencia's cultural heritage [55].

Regarding intangible heritage, two of the traditional activities pursued in the Albufera (traditional fishing and lateen sailing) are also protected at a regional level (they were designated together as a single element, including traditional knowledge and activities related to both areas) [56].

Figure 53. „Actividades tradicionales de la Albufera de Valencia“ (traditional activities from the Albufera de Valencia). Element included within the general inventory of Valencia's cultural heritage [56].

The Regional Plan for the Huerta [1] also includes an inventory of protected cultural items (Document 5 of the Plan) where the main cultural resources in the whole Huerta area (not only in the Valencia municipality, but also in neighbouring municipalities) are catalogued and mapped. Some of these items are located in the Albufera agricultural areas which are included within the scope of this Regional Plan. Several levels of protection are also defined in the Plan, with their corresponding norms.

Lastly, there is a regional inventory of heritage and notable trees protected by law which was recently updated [57]. As shown in Figure 54, the inventory comprises several trees or groups of trees (which are shown as a single element) within the Huerta and Albufera sites, which are subject to the provisions of the regional tree heritage law [58].

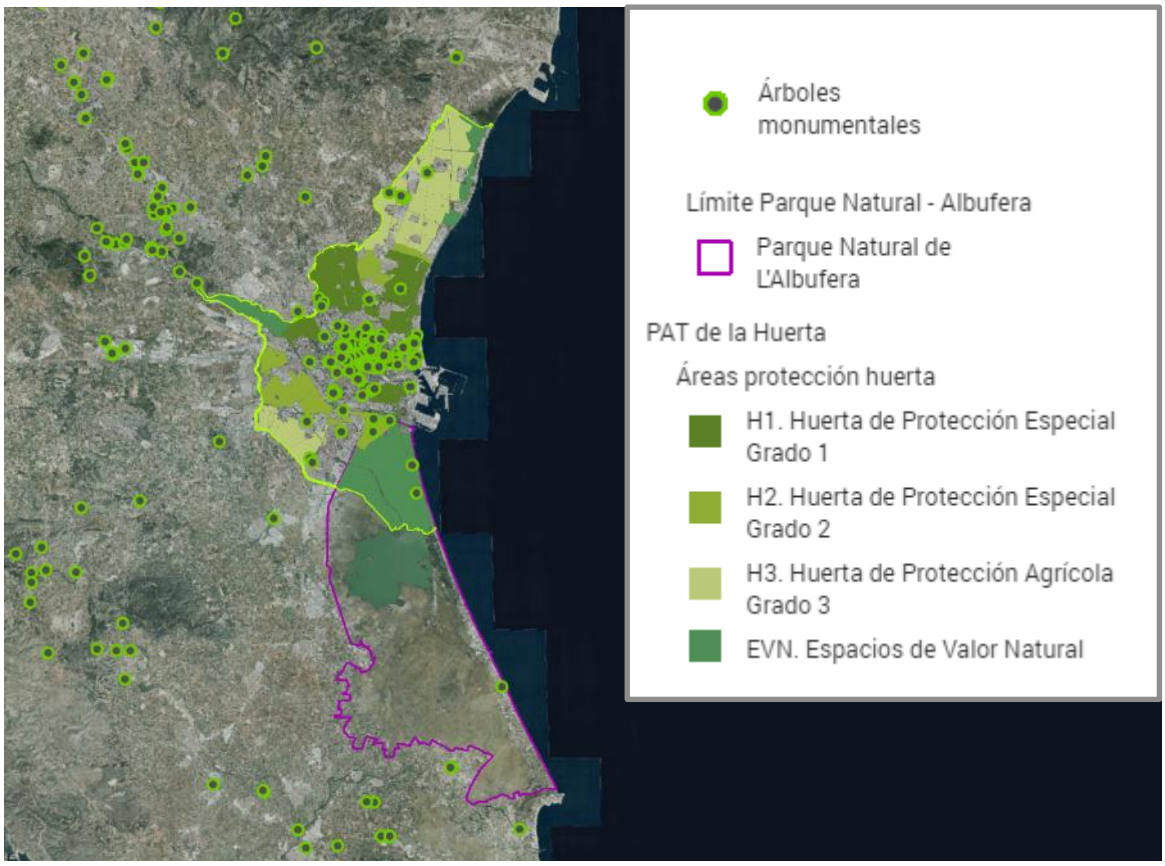


Figure 54. Heritage and notable trees ("Árboles monumentales") included in the regional inventory within and surrounding Huerta ("Áreas protección huerta") and Albufera ("Límite Parque Natural-Albufera") protected areas [24].

3.4. Local

Within the Department of Education, Culture and Sports, there is a delegation of heritage and cultural resources that includes the Historical and Artistic Heritage Service. At the same time, the Resource Management area of the City Council has a delegation of municipal heritage that is mainly responsible for legal heritage management.

In the area of Urban Ecology, Climate Emergency and Energy Transition, there is a section dedicated to trees of heritage significance, within the Delegation of Sustainable Gardening and Renaturalisation of the City.

The last revision of the Valencia masterplan included a Catalogue of Protected Goods and Areas. It was organised in two parts, depending on the rural or non-rural character of each element. The rural section of the Catalogue [59] is highly relevant, since it includes lists, maps and norms relative to the most important items catalogued in both the Huerta and Albufera areas of Valencia, such as irrigation channels, historic roads, typical rural huts ("Barracas") or the "Golas", channels connecting the Albufera Lagoon and the sea.

Local and regional catalogues and inventories are, to some extent, redundant, since heritage protection at regional level usually implies some level of protection at local level, and vice versa.

3.5. Gaps and needs

Considering to what extent the local policies are actually able to take into account recommendation coming from the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage, it is relevant to refer to the Overall Results Framework[20]. This tool was prepared to measure the impact of the 2003 Convention at various levels of governance through clearly identified objectives, indicators and benchmarks, as well as by means of a results-oriented monitoring system, under the following thematic areas:

I. Institutional and human capacities
II. Transmission and education
III. Inventorying and research
IV. Policies as well as legal and administrative measures
V. Role of intangible cultural heritage and its safeguarding in society
VI. Awareness raising
VII. Engagement of communities, groups and individuals as well as other stakeholders

Although there is a full set of regulations and other legal administrative measures setting a comprehensive governance framework for heritage protection, as has been described, recent events such as the demolition of the “Forn de la Barraca” (a historical building in the Huerta area of the neighbouring municipality of Alboraya), despite strong public opposition, show that this governance framework is far from being ideal. Significant further effort could also be placed in making both formal and non-formal education strengthen the transmission of (and promote respect for) Intangible Cultural Heritage (ICH).

At the time the report was written, it is also difficult to elaborate on to what extent inventories reflect the diversity of ICH and contribute to safeguarding, as well as how much research findings and documentation are accessible and are utilized to strengthen policymaking and improve safeguarding. The next National Periodic report of the Convention for the Safeguarding of the Intangible Cultural Heritage (due date: 15/12/2021), will perhaps provide more information in this regard, since this report will include a section on the current state of the “Water Tribunal of the plain of Valencia” element inscribed in the UNESCO Representative List of the Intangible Cultural Heritage of Humanity[21].

More closely associated with the objectives of the ARCH project, it should be noted that no specific mention to climate change has been found in the heritage protection governance framework review [60]. Therefore, no current mechanisms have been identified in order to proactively assess and mitigate potential impacts of climate-related hazards on historic areas.

[20] See https://whc.unesco.org/en/hul/

[21] https://ich.unesco.org/en/RL/irrigators-tribunals-of-the-spanish-mediterranean-coast-the-council-of-wise-men-of-the-plain-of-murcia-and-the-water-tribunal-of-the-plain-of-valencia-00171

4. Governance framework for disaster risk reduction

This section looks at the governance framework for Disaster Risk Reduction (DRR) relevant to Valencia's identified sites. After a first overview of the international context, it moves forward considering existing policies, strategies and action plans at national, regional and local level. It also reflects on the extent to which existing local commitments in particular are able to take into account and align to key international instrument for guiding disaster risk reduction, the Sendai Framework.

4.1. International

In 1994, a UN World Conference on Disaster Risk Reduction (DRR) was convened to discuss how to tackle the growing natural disasters. The focus was on developing effective measures around preparation, response and mitigation of disasters.

In 2000, the United Nations International Strategy for Disaster Reduction (UNISDR) was launched and five years later the **Hyogo Framework for Action**[22] launched, the main UN-wide policy on the subject of DRR existing at the time of its conception (2005-2015). Later on, in 2015, the **Sendai Framework**[23] for action 2015-2030 was adopted which is based on four priorities: (1) Understanding disaster risk, (2) Strengthening disaster risk governance to manage disaster risk, (3) Investing in disaster risk reduction for resilience, (4) Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and construction.

At EU level, a framework for EU cooperation on disaster prevention across all types of natural and man-made hazards was agreed in 2009[24]. Risk assessment together with risk analysis are the pillars of this prevention framework which are fundamental for a successful disaster management strategy. Two years later, the EU undertook to identify the risks Europe may face in the future based on national risk assessments[25]. This overview focuses primarily on risks that may have cross-border impacts and/or those larger scale impacts that may be experienced by more than one Member State.

[22] https://www.unisdr.org/files/1037_hyogoframeworkforactionenglish.pdf
[23] https://www.unisdr.org/we/coordinate/sendai-framework
[24] https://eur-lex.europa.eu/legal-content/es/ALL/?uri=CELEX:52014SC0134
[25] https://ec.europa.eu/echo/files/about/COMM_PDF_SEC_2010_1626_F_staff_working_document_en.pdf

4.2. Spanish Emergencies and Risk Management of Cultural Heritage.

4.2.1. National Plan for Emergencies and Risk Management in Cultural Heritage (NPERMCH)

In 2015 the Spanish government approved a *National Plan for Emergencies and Risk Management in Cultural Heritage* (NPERMCH)[26]. This plan promotes the conservation of cultural heritage by the implementation of preventive measures and actions in order to correct the deterioration of heritage over time. In this sense, the NPERMCH, like other national plans, is a multidisciplinary tool designed to be managed at different levels with the participation of different administrations (state, autonomous and local) and other public and private entities, for the promotion of knowledge, the programming of preventive actions, the training of technicians and the dissemination of knowledge about cultural heritage.

4.2.1.1. Objectives of the NPERMCH

The NPERMCH responds to the risk of damage as a result of a catastrophe, whether natural or anthropogenic. Disasters of anthropogenic origin are often related to negligence or carelessness (failures in surveillance or security systems that cause fires, floods, etc., lack of maintenance of buildings, etc.) and in other cases intentional (deliberately-lit fires, theft and illicit traffic, vandalism, politically or religiously motivated attacks and armed conflicts).

The overall objective of the NPERMCH is to define and implement preventive and palliative actions necessary for the protection of cultural property, against the action of phenomena of natural origin or other causes of anthropogenic origin likely to cause immediate damage.

In line with this, the NPERMCH has three fundamental goals: (i) to design measures or procedures for the prevention and protection of cultural heritage in the event of a catastrophe; (ii) to establish for these cases an action methodology to minimise the damage that could occur and to design action instruments and (iii) to coordinate the different institutions that intervene in emergency situations that affect the safety of people and property.

To this end, it is necessary to establish mechanisms for collaboration and participation at the state, regional and local levels, of the institutions responsible for civil protection and those responsible for safeguarding cultural heritage, as well as to manage the necessary resources, guaranteeing the rescue and protection of cultural property. The NPERMCH is a key instrument for executing 1) the Preliminary Phase and 2) the Damage Assessment and Emergency Intervention Phase of the National Coordination and Support Plan for the Protection of Cultural Property[27] and is considered fundamental for its operational efficiency.

In addition to the broad objective and goals outlined above, the specific objectives of the NPERMCH are as follows:

[26] https://sede.educacion.gob.es/publiventa/plan-nacional-de-emergencias-y-gestion-de-riesgos-en-patrimonio-cultural/patrimonio-historico-artistico/20705C

[27] Note that a link to this plan could not be located at the time of writing.

- Identify phenomena or hazards of natural origin that can seriously affect cultural property, as well as the probability of occurrence based on geographical, climatological, geological and biological parameters, etc.
- Identify hazards of anthropogenic origin -whether intentional, fortuitous or deriving from negligence- that can seriously affect cultural property and the probability of occurrence based on sociological, political, economic, etc. parameters.
- Identify and geographically locate the cultural property that may be affected by the various risks.
- Design measures to prevent and protect cultural property from the various risks to which it may be exposed.
- Establish coordination mechanisms between the different administrations.
- Design a damage assessment methodology in accordance with the provisions of the Coordination and Support Plan for the Protection of Cultural Property.
- Establish a criterion for prioritising actions.
- Plan resources and protocols for urgent action for the safeguarding and rescue of cultural property in the event of an emergency.
- To exchange knowledge and experiences between the different institutions that intervene in an emergency.
- To make society aware of the importance of safeguarding cultural assets, involving all citizens.

4.2.2. NPERMCH Guidelines for Autonomous Communities

In order to deal with the damage caused by catastrophic episodes, it is recommended that Autonomous Communities (among them Valencia) create their own cultural heritage emergency management units which, in collaboration with Civil Protection and cultural institutions, would then draw up prevention and action programs to safeguard cultural heritage.

These units, to be formed by technicians from different public administrations, would be in charge of urgent attention in emergency situations that could affect the integrity of cultural property and/or the people involved in rescue and recovery tasks; the design and application of preventive measures to avoid or minimise the consequences of disasters; the definition of lines of action, research and documentation programmes, as well as the training and dissemination programmes contained in this plan. Specifically, a unit would be required to undertake:

- Elaboration of the Map of Cultural Heritage Risks in its regional scope.
- Definition of the immediate measures to be implemented or recommended, in coordination with the other responsible agents involved.
- Elaboration of emergency intervention proposals.

- Elaboration, where appropriate, of Master Plans for the orderly recovery of the cultural heritage affected by the catastrophe and the monitoring of each of the interventions.

At the time of writing, it was unclear how the work undertaken by Valencia's emergency management unit was to be funded. This is to be explored in consultation with local stakeholders.

4.3. Regional

There is not a unique competent body at regional level regarding DRR. On the contrary, competences are shared among different departments according to the type of risk.

For instance, the Agriculture, Rural Development, Climate Emergency and Ecological Transition Department is responsible for wildfire prevention at the regional level [61]. In this regard, a complex regulatory and planning framework exists, under which the Albufera Natural Park, for instance, is subject to a specific Forest Fire Prevention Plan according to its protected area status [62]. At the same time, the whole municipality of Valencia (including its part of the Albufera National Park) is also under the framework of the Lliria forest management zone, which includes other municipalities as well, and also has its own specific Forest Fire Prevention Plan [63]. Other regional forest fire prevention plans and measures also apply [64]. There is also an online dashboard (see screenshot in Figure 55) regarding wildfire information at regional level [65], which serves as an information hub for every stakeholder involved in fire prevention and analysis.

Figure 55. Integrated Wildfire Management System (screenshot) [65].

The Mediterranean Center for Environmental Studies (CEAM), which is a foundation dependent on the Regional Department of Agriculture, Rural Development, Climate Emergency and Ecological Transition, has also a webpage named "CEAMET" [66] which is used to disseminate public information, forecasts and warnings in relation to several

environmental risks. For instance, CEAMET is used in the framework of the Extreme Temperatures Warning System (in partnership with the Regional Health Department), UV Radiation Warning System, and Troposphoric Ozone Warning System (see Figure 56).

Figure 56. Entry point to the CEAMET Warning Systems (screenshot) [66].

In addition to the former examples of complex governance at the regional level, a regional flood risk management plan (PATRICOVA) was developed by the regional department competent on land use planning [67].

There is also a different body in charge of the regional emergency telephone number “1·1·2 Comunitat Valenciana” [68], which depends on the Justice, Interior and Public Administration Department. It not only attends emergency calls, but also, among many other competences, functions as an access point to most of the real-time information regarding risks monitored at the regional level, such as wildfire or weather risks (see Figure 57). It also provides guidelines to citizens on best practices regarding protection from different hazards, such as flood risk, wildfire risk or seismic risk [69].

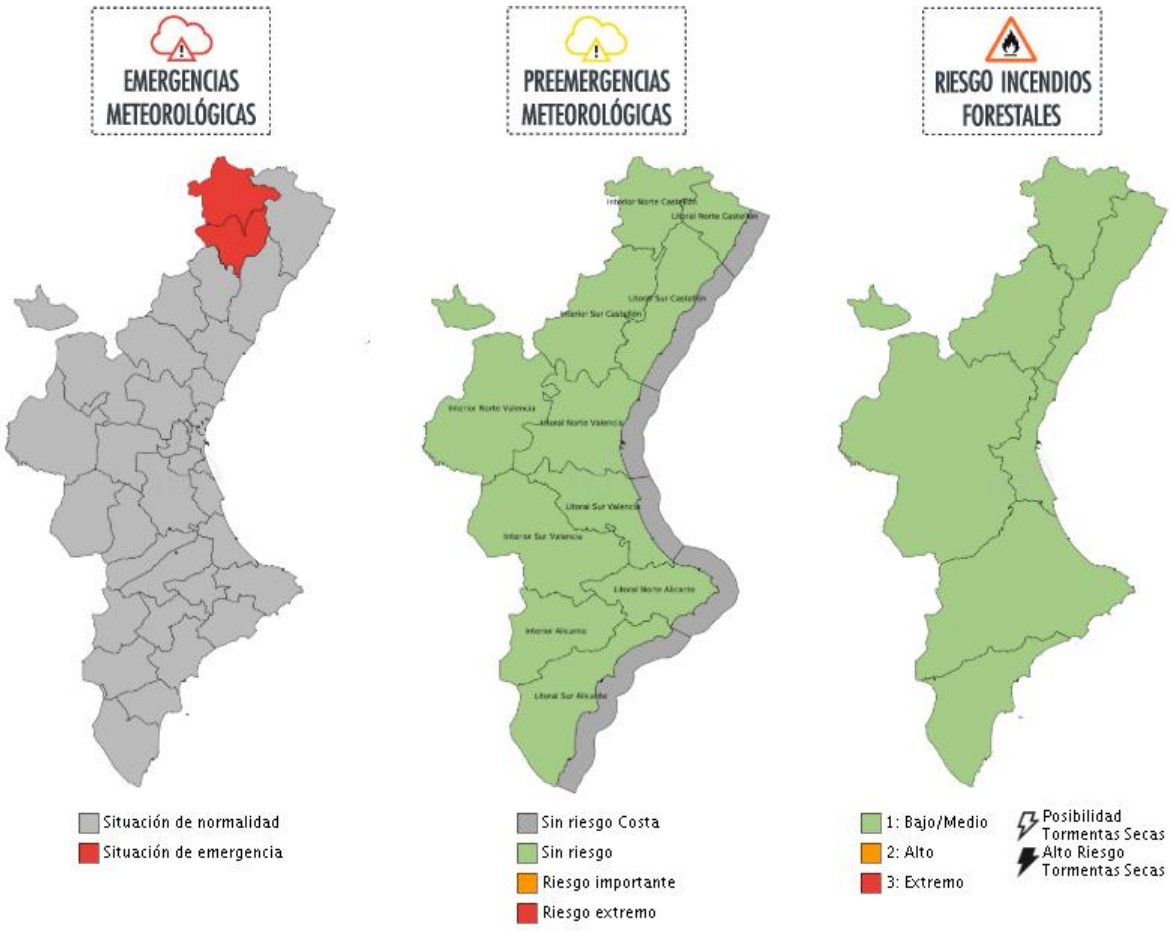


Figure 57. 1·1·2 Comunitat Valenciana Meteorological Risks Warnings (screenshot) [68].

4.4. Local

The city's Health Service is responsible for issuing health alerts regarding risks such as those caused by UV radiation and extreme temperatures [70].

The Air Quality city agency is in charge of the activation/deactivation of the local air pollution protocol in cases of high levels of PM10 or nitrogen dioxide [71], based on the data recorded by the regional air quality measurement network.

The city also has a Citizens' Protection Area [72], which includes the City Fire and Civil Protection Departments. The City Fire Department is not only in charge of firefighting, but also of fire prevention, and has a special fire station located next to the Albufera forest area ("Devesa del Saler"). There are also currently in force a specific operating procedure regarding wildfires in the Devesa del Saler [73] and a city ordinance in relation to fire protection [74]. It should also be noted that, according to regional regulations, every Valencian municipality where forested land is found needs to prepare a Local Fire Prevention Plan [75]. In the case of the municipality of Valencia, such a Plan has yet to be developed, for reasons that were unknown at the time of writing.

The city is also able to order the closure of the city parks and gardens, including cemeteries, in case of weather-related hazards, as set out in the corresponding Parks and Gardens City Ordinance [76].

Surveillance, rescue, life-saving and safety in the city beaches are also under the responsibility of the Beaches Service of the city [77], as established in the City Ordinance related to Beaches and Neighbouring Zones Use [78]. The city is therefore responsible, among other competences, for enforcing bathing prohibitions, in the presence of any health hazard detected by the Regional Department with competence in the Environmental area, or even shutting down the bathing areas if needed by any identified risk.

4.5. Gaps and needs

No explicit mention of heritage protection among the local governance framework for DRR has been found during this first stage of research, suggesting there is an opportunity here to establish links between these two areas of management. However, further information is needed in order to confirm this, as mentioned in the following section.

Taking into consideration how well DRR at the local level currently aligns to the strategies proposed in the Sendai Framework, it is useful to look at the Framework's four main priorities and the associated desired actions[28]:

Priority 1: Understanding disaster risk.
Priority 2: Strengthening disaster risk governance to manage disaster risk.

In the case of the Valencia municipality, it seems there is no mention of a single, unified pre-disaster risk assessment or a strong mechanism in place that could foster coordination across institutions at local level. Consistent efforts are instead made at national (NPERMCH) and regional level (Integrated Wildfire Management System), or even at a local level, but individually by each of the organisms or authorities which have responsibilities over specific risks. Both could be definitely relevant for the city scale, especially with reference to Valencia's targeted areas of la Huerta and the Albufera whose jurisdictional borders are not confined within the municipality.

Priority 3: Investing in disaster risk reduction for resilience.

Especially in relation to the management of city beaches and, increasingly, nature-based solutions for climate change adaptation, Valencia is taking a first step towards strengthening the sustainable use and management of ecosystems and implementing integrated environmental and natural resource management approaches that incorporate disaster risk reduction.

Priority 4: Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction.

[28] See: https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030

Some effort is already invested in developing and maintaining a people-centred approach and operating early warning systems, as well as disaster risk and emergency communication mechanisms. It is unclear whether the latter are developed through a participatory process or tailored to the needs of users, including social and cultural requirements, in particular gender. More precise insights would be needed to assess if the city is promoting the application of simple and low-cost early warning equipment and facilities, and to broaden release channels for natural disaster early warning information.

5. Governance framework for climate change adaptation

This section looks at the governance framework for climate change adaptation of relevance to the City of Valencia and its targeted sites. It elaborates on the relevant policies, strategies, visions and action plans for climate change adaptation in Valencia at the different governance levels. It concludes with a reflection on the extent to which local governance of climate change adaptation takes into consideration key international governance instrument the 2015 Paris Agreement.

5.1. International adaptation framework

In 1972, during the first Earth Summit in Stockholm (United Nations Conference on Human Environment - Stockholm, 1972), international agencies and governments from around the world got together to help defining ways to stimulate sustainable development at the global level; climate change was already at the center. Given the magnitude of the problem, in 1988 the Intergovernmental Panel for Climate Change was established.

Twenty years after the first Earth Summit, the UN Framework Convention on Climate Change (UNFCCC) was adopted in New York and is currently made up of 196 signatory states that meet annually; among the main agreements and commitments of the Convention we can find the Kyoto Protocol (1997) and the Paris Agreement (2015). The first entailed a commitment to reduce greenhouse gas emissions, having the second to reinforce these commitments in order to keep the temperature rise global average below 2ºC compared to pre-industrial levels.

At the European level, the European Adaptation Strategy to Climate Change is effective since 2013 and described below.

5.1.1. EU Climate Change Adaptation Strategy (2013)

The overall objective of the strategy is to contribute to a Europe more resilient to climate change and variability. This translates into improved preparedness and responsiveness to the impact of climate change at local, regional, national and European levels, with particular emphasis on better coordination and a common approach. The strategy has three priorities, divided into eight actions, which are shown in Figure 58. The documents on which the strategy is based are the SWD (Staff Working Documents) 2013: numbers 133-139. These documents cover the following themes: Adaptation in coastal and marine areas; Impacts on human, animal and plant health; Adaptation of infrastructures; Climate change, environmental degradation and migration; Technical guidelines for Cohesion Policy programmes and investments;

Principles and recommendations for rural development programmes; and Guidelines for the development of adaptation strategies.

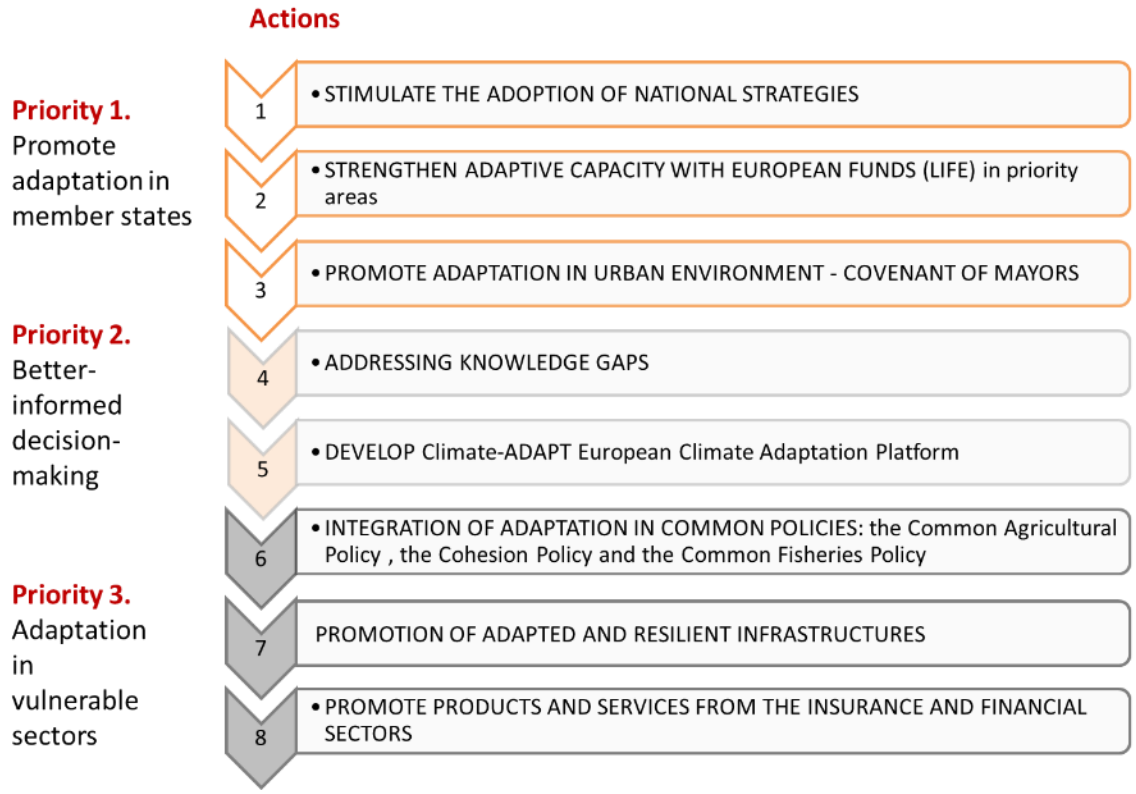


Figure 58. Priorities and key actions to contribute to a more climate-resilient Europe.

The Commission recognises the importance of cities for successful adaptation by translating this into the European Climate Change Strategy (Action 3). Based on the model of the Covenant of Mayors, the Commission supports mitigation and adaptation in cities, notably by launching a voluntary commitment to adopt local mitigation and adaptation strategies and awareness-raising activities.

5.2. Spanish adaptation framework

5.2.1. Key National Documents and Policies on Adaptation

5.2.1.1. Spanish Strategy for Climate Change and Clean Energy (EECCEL). Horizon 2007-2012-2020

This document is the first climate change strategy including adaptation in its content. However, the strategy is largely mitigation-oriented in order to comply with the Kyoto Protocol, though it also mentions adaptation briefly. The main adaptation related objective is the development and implementation of the PNACC (described below). The EECCEL also includes objectives in this area of awareness, sensitisation and research on climate change and clean energy.

5.2.1.2. National Plan for Adaptation to Climate Change (PNACC) and Third Work Programme (TPT) (2006, 2014)

The main objective of this Plan is the integration of adaptation to climate change into the planning and management of different socio-economic sectors and Spanish systems. The specific objectives are the generation of regional climate scenarios, the promotion of impact assessments, vulnerability and adaptation options in all sectors and ecological systems contemplated in the Plan, the progressive promotion of integrated cross-sector assessments in different geographical areas, as well as the dissemination and communication of the main results obtained. It also establishes the need to strengthen R&D&I as well as periodic monitoring and evaluation reports of the PNACC and its component projects. Despite the interdependence of several sectors among them, the Plan is divided into 16 sectors for its development: Biodiversity, Water Resources, Forests, Agricultural Sector, Coastal Zones, Hunting and Inland Fishing, Mountain Areas, Soil, Fishing and Marine Ecosystems, Transport, Human Health, Industry and Energy, Tourism, Finance - Insurance, Urbanism, Construction. In the first work program, 3 of these sectors or systems were identified as priorities: Water Resources, Coastal Zones and Biodiversity.

The third work programme of the PNACC continues to develop the objectives of the PNACC and to maintain the structure of the second programme with 4 axes and two pillars:

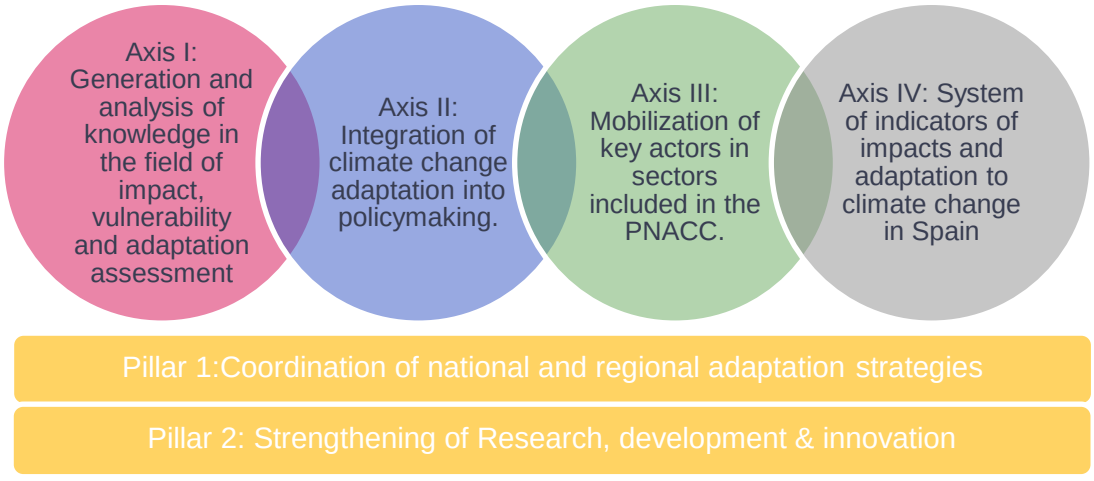


Figure 56. Structure of the Spanish PNACC.

The fourth PNACC monitoring report summarizes the progress made between 2015-2018 corresponding to the third work programme. In this period, in the area of knowledge generation, new sectoral assessments have been developed that affect strategic areas such as biodiversity, water, soil - desertification, agriculture, aquaculture, tourism, health, energy, marine environment and coastal areas.

The creation of the PIMA ADAPTA instrument, which is fed by income from auctions of emission allowances, has allowed for a substantial expansion of support economic to projects in the area of adaptation. In this context Valencia was supported to restore the native riverbank vegetation and the elimination of common cane (*Arundo donax*) in the Turia Natural Park. On the other hand, the LIFE SHARA project is enabling the strengthening of the components relating to the management knowledge, training and governance, all strategic areas in the case of adaptation. Among the inspiring experiences of adaptation to climate change disseminated within the framework of LIFE SHARA an example from Valencia was highlighted: Changing the city from food policies.

5.2.1.3. Strategy for adaptation to climate change on the Spanish coast (2016)

This strategy is based on and shares objectives with the Coastal Act (Act 22/1988), later amended by Act 21/2013.

The general objectives of the Strategy:

- Increase the resilience of the Spanish coast to climate change and climate variability.
- Integrate adaptation to climate change into the planning and management of the Spanish coast.

The strategy consists of three parts: i) current diagnosis of the coast, ii) specific objectives, general guidelines and proposed measures, iii) implementation and monitoring and iv) annex of the plans and programmes linked by sectors and autonomous communities. The strategy lists 26 adaptive measures to favour the resilience of the Spanish coast. Aligned with this strategy an action to repair the protection layer of the Marjal dels Moros in Valencia was deployed.

Furthermore, in the context of the coast context, the Ministry of Agriculture and Fisheries, Food and Environment presents a comprehensive study that proposes definitive solutions to the erosion of the southern coast of Valencia[29].

5.2.2. Recent developments

The Spanish Government has recently declared a state of climate emergency [79]. The declaration included the commitment to pass a number of measures within the following 100 days, such as, among others, a national Climate Change and Energy Transition Law. These measures had not yet been approved at the time of writing, and were placed on hold due to the state of emergency arising from the COVID-19 pandemic. The National Adaptation Plan will also be reviewed, including a new monitoring system. Therefore, the next months will be

[29] https://www.miteco.gob.es/es/costas/temas/proteccion-costa/estrategias-proteccion-costa/valencia/estrategia-proteccion-valencia.aspx

key in setting the new framework in which adaptation to climate change will take place in Spain.[30]

5.3. Regional

The main responsibilities in climate change at a regional level are assigned to the General Directorate of Climate Change, which is dependent on the Autonomous Secretariat for Climate Emergency and Ecological Transition of the Regional Department of Agriculture, Rural Development, Climate Emergency and Ecological Transition.

The Regional Government has also declared a state of climate emergency [80]. Among other measures in current development, a regional Climate Change Law is also being prepared. However, the procedure for preparation and adoption of such a regulation was also placed on hold at the time of writing due to the state of emergency arising from the COVID-19 pandemic.

The Regional Government has also adopted the Regional Climate Change Strategy update [37], which has already been extensively cited in previous sections. The main objectives of the Regional Strategy in relation to Climate Change Adaptation are:

- To identify vulnerabilities
- Risk detection
- To increase resilience in the economic fabric and the Valencian society
- To adopt preventive measures to minimise the potential damages that climate change might produce on people and the environment.

The strategy includes a comprehensive list of measures and actions in relation to mitigation, adaptation, and also with a combined approach integrating mitigation and adaptation. Several work lines are established, and within each of them general measures are set, and later disaggregated into actions. For each action, the regional department or body in charge is identified.

There are also several bodies through which public engagement and participation in climate change are promoted and conducted. Some of them are currently under review, such as the Climate Change Experts Valencian Committee, but others are still active, such as the Advisory and Participatory Environmental Board ("CAPMA") [81] in which the main social and professional groups are present.

5.4. Local

The city of Valencia is aware of the potential impact that climate change presents for the different sectors at the local level. The municipal government structure [29] includes an Area

[30] At the time this report was initially prepared and delivered (30.04.2020), the second, and currently adopted, National Plan for Adaptation to Climate Change (PNACC, 2021-2030) was still under development.

of Urban Ecology, Climate Emergency and Energy Transition. Within this area, especially relevant to the ARCH project are the Departments of Climate Emergency and Energy Transition, as well as the Department of Protected Areas Conservation and Devesa-Albufera. There is also a Department of Agriculture, Sustainable Food and Huerta, within the Innovative Development of Economic Sector and Labour Area.

There is also a Municipal Climate and Energy Foundation ("València Clima i Energia"), which depends on the Department of Climate Energy and Energy Transition [82]. Its main areas of work are climate change information and training, as well as the transformation of the city in terms of resilience and ability to face the present and future challenges from global warming.The previously cited *SECAP* of Valencia [31], prepared in accordance with the requirements of the EU Covenant of Mayors for Climate & Energy initiative [83] is the most updated document outlining local commitments in relation to climate change. The adaptation measures proposed are detailed, prioritised and allocated time schedules in the Annex to the Plan.

Some considerations can be done with regards to the policy and regulatory framework at local level: in the SECAP we can see how, starting from the *Análisis de Riesgos y Vulnerabilidades* (which includes a vulnerability assessment for the agriculture, water, biodiversity, coast, energy, health, transport and urban planning sectors), the strategic objectives of the "Plan of Adaptation to Climate Change of València 2050" (prepared by the City Council in January 2017) will then be realised through 14 goals, aiming to: raise awareness; increase community resilience in the face of climatic events and its consequences; protect the "Huerta" ecosystem, while highlighting the benefits it brings; improve intra- and inter-institutional coordination.

The Paris Agreement (see Part 5.1 above) sets out a framework of fundamental international significance for climate action at all levels of government, and hence warrants some reflection in terms of its relevance at local level. It primarily targets climate mitigation, and directly addresses nation states, with a focus on nationally-determined contributions to emissions. Article 7 of the agreement, however, deals explicitly with climate adaptation and how parties recognise that it represents indeed a global challenge that needs to be faced at all governance levels, including the local dimension. Some of the key aspects of particular relevance for the city of Valencia, to which the local commitments (outlined in the previous part of this section) align, are set out as follows:

Adaptation (Art. 7)

Each Party shall, as appropriate, engage in adaptation planning processes and the implementation of actions, including the development or enhancement of relevant plans, policies and/or contributions, which may include:

(a) The implementation of adaptation actions, undertakings and/or efforts;

(b) The process to formulate and implement adaptation plans;

(c) The assessment of climate change impacts and vulnerability, with a view to formulating nationally determined prioritized actions, taking into account vulnerable people, places and ecosystems

The above fields of action can be understood as a framework in which all nations that are party to the Paris Agreement are expected to take action. In that sense, they are of limited use as an implementation guide for local governments, however it can be assumed that such national governments are working to establish national policy frameworks for action that will in turn demand regional and local levels of government to implement complementary strategies.

This current report was prepared at a time that the new Spanish adaptation plan (PNACC, 2021-2030) was still under development, hence regard for the detail of this new forthcoming strategy, based on the lessons learned from the first national plan, will be of importance to local ongoing work to update vulnerability assessments, monitoring models and adaptation actions – in order to ensure that local objectives and strategies both serve and are supported by national guidelines.

5.5. Gaps and needs

As mentioned previously, the current policy and regulatory framework at national and regional level is under revision. Therefore, future developments in the next few months should be considered in the next steps of the project. Further, given that governance is complex, due to the involvement of many bodies and other stakeholders, a round of meetings with the main authorities involved will be developed in order to verify and complete the information presented herein.

6. 6. Expected impacts of climate change-related and natural hazards

The purpose of this section is to report and review the preliminary collection of relevant information about hazards, exposed elements, as well as impacts provided by ARCH city partners in collaboration with their local research partners, in order to offer an initial overview on the risks that might affect the selected historic areas and their communities. It should be noted that the content in this section is not exhaustive, but rather should be understood as a departure point to serve as a basis for future work.

This section is structured as follows: a description of the methodology is provided, followed by a Risk Profile Table, outlining hazards, exposed elements, impacts, and corresponding resilience-building measures already planned or implemented to date. Next follows a review, interpretation, and validation of the information provided in the Risk Profile Table. Finally, an outlook is provided concerning further risk analysis work in the context of the ARCH project.

6.1. Methodology

In order to elicit relevant information for risk analyses from city partners, ENEA, Fraunhofer, ICLEI, and Tecnalia developed a Risk Profile Table template (see Part 6.2 below) based on the central risk components identified in the 5th Assessment Report of the Intergovernmental Panel on Climate Change [84]: hazards, exposed elements, impacts (physical, societal, functional, economic, and intangible), as well as corresponding resilience-building measures already planned or implemented to date. This template was filled out by city partners and provides a starting point from which to conduct more detailed risk analyses. Furthermore, it allows to provide a useful starting point for the data, models, methods, and tools to be developed during the project

The information provided in the Risk Profile Table was reviewed and harmonised by ENEA in order to provide a comparable description across all city cases and ensure relevance to (and validity for) similar on-going[31] and/or future initiatives and projects in the field of disaster risk reduction, climate change adaptation, and cultural heritage preservation.

The following standards, reference material, and tools were identified as most suitable for this exercise:

- The City Climate Hazard Taxonomy [84] for classification of hazards[32];

[31] E.g. United Nations Office for Disaster Risk Reduction: Words into Action guidelines: National disaster risk assessment. UNDRR, 2017. Online: https://www.undrr.org/publication/words-action-guidelines-national-disaster-risk-assessment

[32] It should be noted that hazards were identified and named in the Risk Profile Table based on [30] rather than [84].

- The UNDRR QRE Tool [30] and ISO standard 37120 Sustainable cities and communities — Indicators for city services and quality of life[33] for the classification of exposed elements and impacts; and
- The ICOMOS CCHWG[34] classification and INSPIRE[35] directive for the classification of heritage assets.

Based on the harmonised information, initial proposals for risk analysis focus actions (e.g. which methods and tools to apply for which part/issue of a historic area) were formulated by ENEA. The initial proposals will be further defined during the co-creation process and in exchange with the relevant local stakeholders.

[33] https://www.iso.org/standard/68498.html

[34] https://adobeindd.com/view/publications/a9a551e3-3b23-4127-99fd-a7a80d91a29e/g18m/publication-web-resources/pdf/CCHWG_final_print.pdf

[35] INSPIRE, Infrastructure for Spatial Information in EuropeD2.8.III.2 Data Specification on Buildings – Technical Guidelines (5.3.1.1.4. Classification of buildings, pages 43-45).

6.2. Risk profile table

Heritage site (historic area)	**Hazard**[36]	**Exposed element** [37]	**Impacts**					**Corresponding resilience-building measure**	**Notes/Evidence**
			Physical	**Societal**	**Functional**	**Economic**	**Intangible**	**Description** (please indicate specific S or general G)	
Huerta	Flood (*) (riverine flooding, coastal flooding and flash floods) and Convective Storms (**) *(Unless indicated otherwise, the information in subsequent columns applies to both hazards)*	Buildings. Natural environment Tangible heritage (irrigation infrastructure, agricultural machinery and equipment). Intangible cultural heritage (agricultural traditional skills and customs). People (urban area and at the site). Road, railroad and other infrastructure networks.	Damage to buildings, roads and other infrastructure and equipment. Loss of agricultural soil due to erosion (* and **) or salinization(*). Loss of irrigation water due to damage to storage or distribution infrastructures (* and **) and salinization (*).	Injury and mortality. Loss of access to key services such as food provision and access to critical infrastructures.	Disruption of transport services and water supply. Disruption of ecosystem services (food production, etc).	Agricultural losses due to damages to crops, cropland, infrastructures or machinery, among other. Loss of tourism revenue due to service disruption.	Damage or loss of cultural heritage (buildings, infrastructures, etc).	Flood mapping, zoning, and monitoring (S). (*) Flood defence works (S).(*) Early warning systems (S). Water supply diversification and infrastructure improvements (S). Coastal defences (S). Various measures within the Valencian Climate Change and Energy 2030 Strategy (S). Various measures within the Valencia Sustainable Energy and Climate Action Plan (S). Green Infrastructure Management (G).	[1], [24], [31], [37], [67], [25], [85], [86], [87], [88], [89],

[36] Note: the UN Office for Disaster Risk Reduction (UNDRR)'s Resilience Scorecard defines 'hazard' as 'a process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation'. Of these, the ARCH project is addressing natural and climatic hazards.

[37] Note: the UN Office for Disaster Risk Reduction's Resilience Scorecard defines 'exposure' as 'the situation of people, infrastructure, housing, production capacities and other tangible human assets located in hazard-prone areas'.

Heritage site (historic area)	**Hazard**[36]	**Exposed element** [37]	**Impacts**					**Corresponding resilience-building measure**	**Notes/Evidence**
			Physical	**Societal**	**Functional**	**Economic**	**Intangible**	**Description** (please indicate specific S or general G)	
Huerta	Extreme temperature (*) and Drought (**) *(Unless indicated otherwise, the information in subsequent columns applies to both hazards)*	Natural environment, crops and croplands. Intangible cultural heritage (agricultural traditional skills and customs). People (urban area and at the site).	Damage to crops, soils and the natural environment. Increased evapotranspiration (*).	Illness or death (*). Loss of access to key services such as food provision. Increased competition for water.	Decrease of the ecosystem services (less food production if disruption to water supply, or very extreme heat events, or due to new or increase of existing pests and diseases).	Decrease of agricultural productivity leading to loss of revenue. Loss of tourism revenue due to service disruption (*).	Damage or loss of cultural heritage (such as agricultural traditional customs).	Extreme temperatures and heat waves program (S) (*). Various measures within the Valencian Climate Change and Energy 2030 Strategy (S). Various measures within the Valencia Sustainable Energy and Climate Action Plan (S). Various measures within the River Basin Management Plan (S)(**)	[31], [37], [25], [1], [87], [89], [86], [85], [24], [90], [88], [91]
Huerta	Insect infestation	Natural environment, crops and croplands. Tangible cultural heritage (channels) Intangible cultural heritage (agricultural traditional skills and customs). People (urban area and at the site).	Damage to crops, and the natural environment.	Illness or death. Loss of access to key services such as food provision.	Decrease of the ecosystem service (less food production if new or increase of existing pests).	Decrease of agricultural productivity leading to loss of revenue. Loss of tourism revenue due to service disruption.	Damage or loss of cultural heritage (such as agricultural traditional customs).	Regional Action Plan on Vector-Borne Diseases (S). Asian Tiger Mosquito Prevention and Control Campaign (S). Various measures within the Valencian Climate Change and Energy 2030 Strategy (S). Various measures within the Valencia Sustainable Energy and Climate Action Plan (S).	[31], [37], [25], [1], [89], [86], [85], [24], [92], [93]

Heritage site (historic area)	**Hazard**[36]	**Exposed element** [37]	**Impacts**					**Corresponding resilience-building measure**	**Notes/Evidence**
			Physical	**Societal**	**Functional**	**Economic**	**Intangible**	**Description** (please indicate specific S or general G)	
Albufera	Flood (*) (riverine flooding, coastal flooding and flash floods) and Convective Storms (**) *(Unless indicated otherwise, the information in subsequent columns applies to both hazards)*	Buildings. Natural environment. Tangible cultural heritage (irrigation infrastructure, agricultural machinery and equipment). Intangible cultural heritage (agricultural and fishing traditional skills and customs). People (urban area and at the site). Road and other infrastructure networks. Boats and jetties. “Golas” (sea-lagoon channels) and associated infrastructure. “Motas” (traditional elevated paths and field margins for water management).	Damage to buildings, boats and jetties. Impacts on roads, channels and other infrastructure. Loss of soil due to erosion or salinization. Loss of irrigation water due to damage to storage or distribution infrastructures and salinization. Loss or damage to highly valuable ecosystems. Damage to “golas”, “motas” and associated infrastructure.	Injury and mortality. Loss of access to key services such as food provision. Loss of jobs and associated impacts in local people.	Damage to coastal, forest and lagoon ecosystems. Loss of crops and fish stocks. Disruption of transport and tourist services. Disruption to electricity and water supply.	Agricultural losses due to damages to crops, cropland, infrastructures or machinery, among other. Loss of tourism revenue due to service disruption. Fishing losses.	Damage or loss of cultural heritage (traditional leisure activities in the forest lagoon areas, buildings, infrastructures, jetties, traditional fishing equipment and practices, etc).	Flood mapping, zoning, and monitoring (S) (*). Flood defence works (S) (*). Early warning systems (S). Water supply diversification and infrastructure improvements (S). Coastal defences (S). Various measures within the Valencian Climate Change and Energy 2030 Strategy (S). Various measures within the Valencia Sustainable Energy and Climate Action Plan (S). Green Infrastructure Management (G). Forest Management (G) (**). Protected Area Management (G).	[67], [37], [31], [1], [25], [85], [86], [87], [88], [89], [46], [24], [94]

Heritage site (historic area)	**Hazard**[36]	**Exposed element** [37]	**Impacts**					**Corresponding resilience-building measure**	**Notes/Evidence**
			Physical	**Societal**	**Functional**	**Economic**	**Intangible**	**Description** (please indicate specific S or general G)	
Albufera	Wave action	Beaches. “Golas” (sea-lagoon channels) and associated infrastructure. Lagoon shores and banks. People. Road and other infrastructure networks. Boats and jetties. Fishing equipment.	Loss of highly valuable ecosystems. Damage to “golas”, and associated infrastructure. Damage to buildings, boats and jetties. Impacts on roads, channels, fishing equipment and other infrastructure.	Injury and mortality. Loss of access to key services due to increased coastal erosion.	Damage to coastal and lagoon ecosystems. Loss of fishing equipment. Disruption of fishing and tourist services.	Loss of tourism revenue due to service disruption and damage to beaches, jetties and other areas. Fishing losses.	Damage or loss of cultural heritage (traditional leisure activities in the beach and lagoon areas, buildings, infrastructures, jetties, traditional fishing equipment and practices, etc).	Coastal defences (S). Various measures within the Valencian Climate Change and Energy 2030 Strategy (S). Various measures within the Valencia Sustainable Energy and Climate Action Plan (S). Green Infrastructure Management (G). Protected Area Management (G).	[37], [31], [1], [25], [85], [86], [87], [88], [89], [46], [24]
Albufera	Extreme temperature (*) and Drought (**) *(Unless indicated otherwise, the information in subsequent columns applies to both hazards)*	Natural environment, crops and croplands. Intangible cultural heritage (agricultural and fishing traditional skills and customs). People (urban area and at the site).	Damage to crops, soils and the natural environment. Increased evapotranspiration. Increased wildfire risk.	Illness or death. Loss of access to key services such as food provision. Increased competition for water.	Increased eutrophication of lagoon water and damages to forest areas, leading to a worse ecological state. Decrease of the ecosystem services (such as less food production, or due to new or increase of existing pests and diseases).	Agricultural losses due to damages to crops and cropland. Loss of tourism revenue due to service disruption. Fishing losses.	Damage or loss of cultural heritage (traditional leisure activities in the forest and lagoon areas, fishing practices, etc).	Extreme temperatures and heat waves program (S) (*). Various measures within the Valencian Climate Change and Energy 2030 Strategy (S). Various measures within the Valencia Sustainable Energy and Climate Action Plan (S). Forest Management (G). Protected Area Management (G). Green Infrastructure Management (G). Various measures within the River Basin Management Plan (S) (**).	[37], [31], [1], [25], [85], [86], [87], [88], [89], [46], [24], [90], [94], [91]

Heritage site (historic area)	**Hazard**[36]	**Exposed element** [37]	**Impacts**					**Corresponding resilience-building measure**	**Notes/Evidence**
			Physical	**Societal**	**Functional**	**Economic**	**Intangible**	**Description** (please indicate specific S or general G)	
Albufera	Wildfire	Natural environment, crops and croplands. Intangible cultural heritage (agricultural and fishing traditional skills and customs). People (urban area and at the site). Buildings. Roads and other infrastructure. Wildlife	Damage to crops, soils, the natural environment and human-made structures.	Illness or death, direct or indirect (e.g. due to air quality problems). Loss of access to key services such as the place of residence or food provision.	Damage or total destruction of the ecosystem, leading to a decrease of the ecosystem services. Disruption in transport and other services. Loss of housing.	Agricultural losses due to damages to crops and cropland. Loss of tourism revenue due to service disruption. Fishing losses. Impacts on buildings and other human-made structures.	Damage or loss of cultural heritage (traditional leisure activities in the forest, beach and lagoon areas, fishing practices, etc).	Albufera Natural Park Fire Prevention Plan (S). Forest Management (G). Protected Area Management (G). Green Infrastructure Management (G).	[37], [31], [1], [25], [85], [86], [87], [88], [89], [46], [24], [94]
Albufera	Insect infestation	Natural environment, crops and croplands. Tangible heritage (channels). Intangible heritage (agricultural traditional skills and customs). People (urban area and at the site).	Damage to crops, and the natural environment.	Illness or death. Loss of access to key services such as food provision.	Decrease of the ecosystem services (less food production if new or increase of existing pests).	Decrease of agricultural productivity leading to loss of revenue. Loss of tourism revenue due to service disruption. Fishing losses.	Damage or loss of cultural heritage (traditional leisure activities in the forest, beach and lagoon areas, fishing practices, etc).	Regional Action Plan on Vector-Borne Diseases (S). Asian Tiger Mosquito Prevention and Control Campaign (S). Various measures within the Valencian Climate Change and Energy 2030 Strategy (S). Various measures within the Valencia Sustainable Energy and Climate Action Plan (S). Forest Management (G). Protected Area Management (G). Green Infrastructure Management (G).	[37], [31], [1], [25], [85], [86], [87], [88], [89], [46], [24], [92], [93], [94]

Note: Hazards identified and named based on [30] .Due to the size of both areas (Huerta and Albufera) and their complex land use, regulatory and governance frameworks, the previous table should not be considered as complete or comprehensive, but rather the first stage of an exploratory process to be further refined during the project development.

6.3. Preliminary classification of hazards, exposed elements, and impacts

The purpose of this section is to review, interpret, validate, and harmonise the information provided in the Risk Profile Table as a sound basis for the project to address Valencia's risks for the two historic areas that will be examined, i.e. Huerta and Albufera. This preliminary analysis covers:

a) hazards,

b) elements exposed to those hazards, and

c) impacts that the identified hazards might cause on the exposed elements.

A related purpose is to identify possible data gaps, and proposals for focus project actions in the context of the city case.

6.3.1. Hazards

The Valencia city authors of previous sections show an awareness of the hazards that are affecting the two selected sites, as also highlighted by the preliminary resilience assessment presented later in part 7. Seven different hazard types have been identified in the Risk Profile Table. Five of them – *Convective Storms*, *Drought*, *Extreme temperature*, *Flood* and *Insect Infestation* – are hazards affecting both areas, whereas *wave action* and *wildfire* only affect Albufera. For the purpose of this discussion, these hazards have been classified in Table 1 below according to the hazard categories belonging to the *C40 City Climate Hazard Taxonomy*[38]*.* which are broken down into main hazard types, and hazard sub-types[39].

The hazard categories identified in the Risk Profile Table for both Huerta and Albufera are: ***Meteorological, Climatological, Hydrogeological, and Biological.*** Although not specifically reported in the Risk Profile Table (because it was based on the QRE tool and associated terminology), the hazards ***extreme precipitation and sea-level rise*** can be extrapolated from identification of convective storms, coastal flooding and wave action, while ***pollution*** was identified elsewhere in this report (see part 2.2.3). Therefore, human-induced hazards have also been included in the hazard classification. Table 1 below lists all hazard categories and (sub-)types identified for Huerta and Albufera.

[38] https://www.c40.org/researches/city-climate-hazard-taxonomy

[39] It should be noted that C40's taxonomy has some limitations in that the hazards classified as "Meteorological, climatological and hydrological" are themselves the result of meteorological events. Conflating meteorological and climatic hazards is problematic as the two types have different time scales. At the time of writing, discussion on hazard classification is ongoing and a single system has not yet been agreed upon.

Hazard Group	Hazard Main Type	City Climate Hazard Type (sub type indicated in brackets where applicable)
Meteorological	Precipitation	Rain storm
	Wind	Severe wind; Cyclone
	Lightning	Electrical storm (Lightning/thunderstorm)
	Extreme temperature - Cold	Extreme winter conditions (Ice, hail); Cold wave (Cold snap, frost); Extreme cold weather (Cold days)
	Extreme temperature - Hot	Heat wave; Extreme hot weather (Hot days)
Climatological	Water scarcity	Drought (Lack of precipitation and seasonal melt (snow, glacial))
	Wild fire	Forest fire; Land fire (Bush fire, grass fire, pasture fire, scrub fire)
Hydrological	Flood	Flash/surface flood; River flood; Coastal flood
	Wave action	Storm surge
	Chemical change	Salt water intrusion
Biological	Insects and microorganisms	Water-borne disease; Vector-borne disease; Air-borne disease; Insect infestation

Table 1. Hazard categories and types identified for both Huerta and Albufera. Bold characters indicate hazard types relevant for Albufera only.

6.3.2. Exposed Elements

The elements exposed to the aforementioned hazards, identified within the Risk Profile Table for Huerta and Albufera have been reorganised in Table 2 below, according to the following categories:

- Natural Environment
- Built Environment: critical Infrastructures and Buildings;

- Cultural heritage;
- Services (essential or basics and productive);
- Human and social aspects.

Here, the cultural heritage category subsumes all exposed elements that are in themselves heritage, i.e. exposed elements declared as heritage are only categorised as such and not as any of the other categories (e.g. traditional fishing equipment is not categorised under services while non-traditional fishing equipment is).

Exposed Element Categories	Exposed Element Types
Natural Environment	Ecosystems
	Wildlife
Built Environment	Buildings
	Road, railroad and other critical infrastructures
	Storage and irrigation water infrastructures, channels
Cultural Heritage	Tangible and Intangible elements (see Table 3)
Services, essential and productive	Cropland
	Agricultural machinery and equipment
	Fishing Equipment
	Boats and Jetties
Human and Social Aspects	External people (e.g. tourists,)
	Local people

Table 2. Exposed elements identified for both Huerta and Albufera; in bold the ones that are peculiar to Albufera only.

Table 3 reports in further detail the exposed elements categorised as cultural heritage. Here, reference has been made to the six categories identified by the ICOMOS Climate Change and Cultural Heritage Working Group, CCHWG (2019). For Huerta and Albufera, four out of the six CCHWG categories are of particular relevance, i.e.: **Movable heritage, Building and Structures, Cultural Landscapes and Intangible Heritage**. These cultural heritage categories have been broken down further into cultural heritage types (i.e. Archaeological heritage and Associated and Traditional Communities) to provide a more detailed picture.

Exposed Cultural Heritage Categories	Exposed Cultural Heritage Types
Moveable heritage	Traditional agricultural equipment **Traditional fishing equipment**
Archaeological resources	Archaeological finds
	Archaeological materials
	Archaeological sites
	Archaeological monuments
Buildings and structures	Buildings
	"Golas"
	"Motas"
	Hydrographic, irrigation and drainage network
Cultural landscapes	Combined works of nature and humankind
Associated and traditional communities	
Intangible heritage	Knowledge and skills to produce traditional crafts: Agricultural traditional skills **Traditional fishing practices**
	Social practices: **traditional leisure activities in lagoon, beaches and forest areas**
	Cultural heritage value
	Performing arts
	Festive events
	Rituals, Agricultural traditional customs
	Oral traditions
	Knowledge and practices concerning nature and universe

**Golas, sea-lagoon channels and associated infrastructure. ***Motas traditional elevated paths and field margins for water management*

Table 3. Categories and sub-categories of the cultural heritage exposed elements identified for both Huerta and Albufera; underlined characters identify elements peculiar to Huerta and bold characters the ones peculiar to Albufera only. In Italics elements that may be relevant for future analysis, although not included in the Risk Profile Table.

6.3.3. Impacts

The identification of impacts in the Risk Profile Table for Valencia is exhaustive and well supported by the evidence and information collated in this baseline report. Table 4 below briefly reports the different impacts identified for the five categories of impacts, included in the Risk Profile Table for the different exposed elements categorised as per Table 3.

		Impacts				
Exposed Elements		*Physical*	*Functional*	*Societal*	*Economic*	*Intangible*
Natural Environment	Ecosystem	Increase in existing pests /diseases. Decease in fishes. Costal Erosion. Physical damage to lagoon, shores, banks & beaches. Evapotranspiration & eutrophication of lagoon water	Decrease in ecosystem services (including food provision)		Agricultural sector: direct economic losses and loss of revenue	Loss of agricultural traditional skills and customs
	Wildlife		Decrease in ecosystem services	Loss of access to key services	Fishing, hunting and tourism sector: direct economic losses and loss of revenue	Loss of cultural heritage values
Built Environment	Buildings	Physical Damage			Direct Economic loss due to physical damage	
	Storage & irrigation infrastructures, channels	Physical Damage	Loss/ disruption of service	Loss of access to key services		

		Impacts				
Exposed Elements		*Physical*	*Functional*	*Societal*	*Economic*	*Intangible*
	Road, railroad and other critical infrastructures	Physical Damage	Loss/ Disruption of service	Loss of access to key services		
Cultural Heritage	Tangible and Intangible elements	Physical Damage	Loss/ Disruption of service	Loss of access to culture	Direct Economic loss due to physical damage	Loss of cultural heritage values
Services, essential and productive	Cropland	Loss of crops	Loss/ Disruption of service	Loss of access to food provision	Agricultural sector: Direct economic loss & LoR*	Loss of agricultural traditional skills and customs
	Agricultural machinery & equipment	Direct Physical Loss	Loss/ Disruption of service	Loss of access to food provision	Agricultural sector: Direct economic loss & LoR*	Loss of agricultural traditional skills and customs
	Boats & Jetties		Loss/ Disruption of service		Tourism Sector: direct economic loss & LoR	Traditional leisure activities in lagoon areas
	Fishing Equipment		Loss/ Disruption of service	Loss of access to key services	Fishing: direct economic losses and loss of revenue	Traditional fishing equipment/ practices
Human and Social Aspects	External			Loss of Tourism	LoR from tourism	
	Local	Illness, injury and mortality		Loss of Jobs	Impact on Local Economy	

Table 4. Physical, Functional, Societal, Economic and Intangible impacts identified for the different exposed elements in the two selected sites; bold characters highlight the impacts peculiar to Albufera only.

The identified hazards (Table 1) are reported to affect all or some of the identified exposed elements (Table 2 and Table 3), potentially causing (with slight differences) the impacts identified in Table 4.

Risk analyses, implemented with different methods and levels of complexity (depending on the available data, knowledge, time, and personnel) will be needed to quantify the likelihood, level and extent of the expected impacts, as briefly indicated in the following section.

6.4. Outlook and implications for further risk analyses within ARCH

The Risk Profile Table identified several exposed elements for the two sites and different potential hazards that can cause cascading and interdependent impacts. As part of the ARCH project it will not be possible to analyse all identified issues with the same level of detail. While for some of them a simplified approach will likely be sufficient, for selected ones, detailed analyses will be conducted, e.g. supported by data collected through field sensors and measurements. A prioritisation for where to concentrate the attention might be based on the combination of multiple criteria, as an example:

- exposed cultural heritage at higher risk,
- potential for cascading effects,
- high social and cultural value of cultural heritage,
- weaker resilience essentials. See discussion in chapter 7.
- Local municipal and regional stakeholder´s prioritisation based on standing strategies and plans as will be reported in the forthcoming deliverable D3.2 (Local partnership and work plan).

In further detail, the prioritisation could be conducted as follows:

- Identification of the cultural heritage at higher risk via a detailed risk analysis aimed at providing insights into the interactions of the identified hazards with the exposed elements and with all dimensions of their vulnerabilities (physical, environmental, social, economic and cultural), including the likelihood (more or less probable) of the hazards and the level (more or less severe) of the expected impacts on each exposed element. Workshops or structured interviews with the local stakeholders might be conducted for filling out qualitative risk matrices, similar to the one represented in Figure 57 below.

		CONSEQUENCE				
		Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
LIKELIHOOD	Almost Certain 5	low	medium	high	extreme	extreme
	Likely 4	low	medium	high	extreme	extreme
	Possible 3	low	medium	high	high	extreme
	Unlikely 2	low	medium	medium	high	extreme
	Rare 1	low	low	medium	medium	high

Figure 57. Example of qualitative risk matrix identifying the Risk severity (with qualitative terminology from low to extreme and associated couloirs, as a function of hazard likelihood and severity of impacts/consequences (from insignificant to Catastrophic) from ISO31000 [40].

- Identify cascading and interrelated impacts, e.g. by using an adapted impact chain methodology (see e.g. [96] or [97] defined as part of the RESIN project).
- Assess the social and cultural value of cultural heritage with local stakeholders and communities by identifying non-quantifiable values of their tangible and intangible cultural heritage elements (Figure 58) using an online questionnaire or app (for further details, also see Section 6 of Camerino's baseline report).
- Identify weaker resilience essentials, using the ARCH Resilience Assessment Framework currently in development in work package 7.

40 Standards Australia (2009). AS/NZS ISO 31000:2009 Risk Management – Principles and guidelines

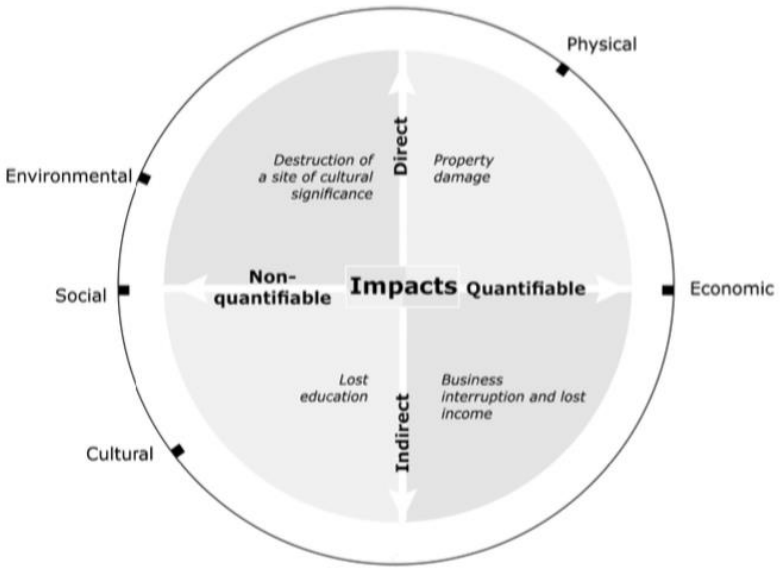


Figure 58. Direct and indirect impacts of disasters according to [98].

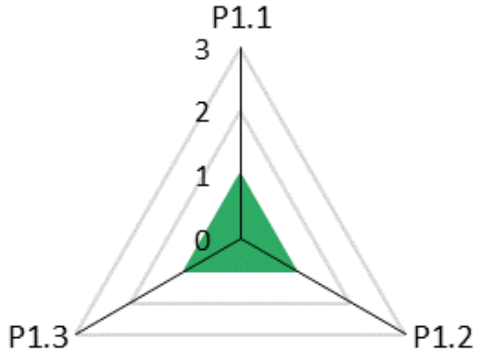
To support the above-mentioned steps the ARCH DSS could be employed as a participatory WebGIS tool to support stakeholder engagement using visualisations and geospatial information on hazards and impacts that Valencia might have already available.

7. Preliminary resilience assessment

The following resilience assessment was developed using the preliminary version of the UNDRR Disaster Resilience Scorecard for Cities [99]. The preliminary assessment was conducted within the framework of a webinar between Las Naves, Tecnalia, and Fraunhofer on January 13, 2020. As the original Scorecard is aimed at city-level, not all questions were immediately applicable on the level of historic areas or single heritage assets. Wherever possible, answers were provided for the historic areas under examination (e.g. with regard to hazard scenarios). For all other questions, answers were provided on city-level (e.g. with regard to city masterplans). The results give a first indication of the overall resilience of the city with some – but not exclusive – focus on the historic areas examined by ARCH. In addition, the application of the Scorecard will be used as input for the development of the ARCH Resilience Assessment Framework specifically focused on historic areas. Lastly, the preliminary resilience assessment results presented in the baseline reports should not be employed to develop resilience action plans, as not all necessary stakeholder groups were involved in the assessment process.

It should also be noted that due to the scope of the Scorecard and the particularities of Valencia historic areas in relation to the rest of the city cases, the resilience of Huerta and Albufera might not be fully reflected on the assessment.

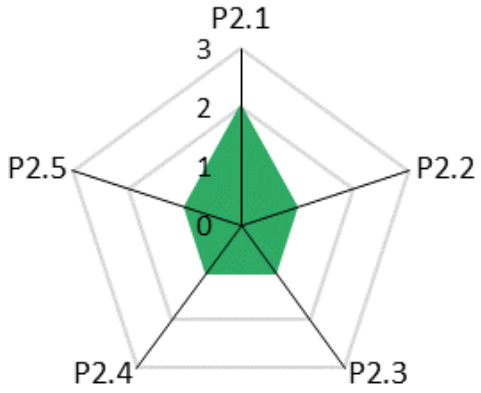
7.1. Essential 01: Organise for resilience



P1.1	Does the City master plan (or relevant strategy/plan) adopt the Sendai Framework?	1
P1.2	Is there a multi-agency/sectoral mechanism with appropriate authority and resources to address disaster risk reduction?	1
P1.3	Is resilience properly integrated with other key city functions / portfolios?	1

Regarding Essential 01 València achieves a resilience score of 3/9. The city has no overall city master plan compliant with the Sendai Framework, but instead has several sectoral plans that partially comply with the Framework (score of 1 for P1.1). Among these plans are the *SECAP*, the PATRICOVA action plan for flood risk prevention, and the municipal ordinance for the use of beaches and adjacent areas. Organisation and coordination for disaster risk reduction could be improved; the different city teams connected to DRR have authority, however inter-agency support for DRR is lacking (score of 1 for P1.2). Lastly, resilience is only integrated in key city functions on an ad hoc basis, however an action plan for climate change adaptation is currently being drafted which may improve the situation (score of 1 for P1.3).

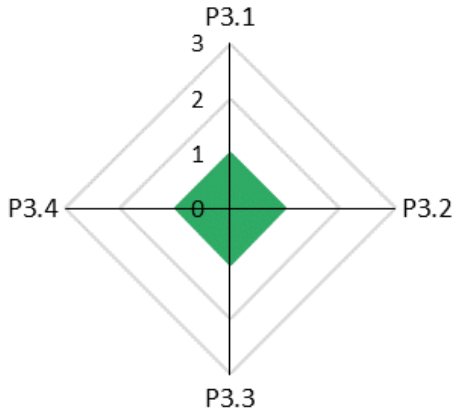
7.2. Essential 02: Identify, understand and use current and future risk scenarios



P2.1	Does the city have knowledge of the key hazards that the city faces, and their likelihood of occurrence?	2
P2.2	Is there a shared understanding of risks between the city and various utility providers and other regional and national agencies that have a role in managing infrastructure such as power, water, roads and trains, of the points of stress on the system and city scale risks?	1
P2.3	Are their agreed scenarios setting out city-wide exposure and vulnerability from each hazard, or groups of hazards (see above)?	1
P2.4	Is there a collective understanding of potentially cascading failures between different city and infrastructure systems, under different scenarios?	1
P2.5	Do clear hazard maps and data on risk exist? Are these regularly updated?	1

For Essential 02, València achieves a resilience score of 6/15. The city understands the main hazards affecting it, but currently has no defined process for updating this information (score 2 for P2.1). Individual system risks – at least for water management and flooding – are known, but not systematically shared among relevant stakeholder groups in order to understand cascading effects (score of 1 for P2.2). Disaster scenario information is only available for some hazards, with an aim to provide more information on these as part of the climate change adaptation action plan (score of 1 for P2.3). As a result, from P2.2 and P2.3, the understanding of cascading effects is limited (score of 1 for P2.4). Lastly, hazard maps currently only exist for heat waves and flooding in the urban environment (score of 1 for P2.5).

7.3. Essential 03: Strengthen financial capacity for resilience

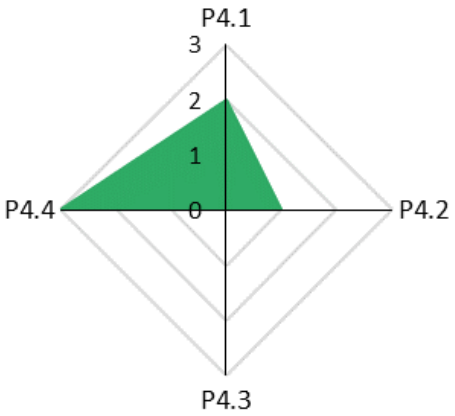


P3.1	The city / lead agencies understand all sources of funding, and the “resilience dividends”, are well connected, understand all available routes to attract external funding and are actively pursuing funds for major resilience investments.	1
P3.2	Does the city have in place a specific ‘ring fenced’ (protected) budget, the necessary resources and contingency fund arrangements for local disaster risk reduction (mitigation, prevention, response and recovery)?	1
P3.3	What level of insurance cover exists in the city, across all sectors – business and community?	1
P3.4	What incentives exist for different sectors and segments of business and society to support resilience building?	1

Regarding Essential 03 València achieves a resilience score of 4/12, which leaves significant room for improvement. Currently, there is only limited knowledge about available funding approaches for resilience measures (score of 1 for P3.1) and no coordinated, dedicated budget for local disaster risk reduction exists. However, there are regional/national emergency funds available (score of 1 for P3.2). In addition, the level of insurance coverage varies significantly

across sectors (score of 1 for P3.3), and only a limited number of incentives to promote resilience building exists (score of 1 for P3.4).

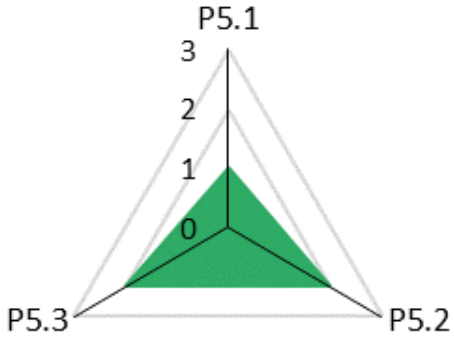
7.4. Essential 04: Pursue resilient urban development



P4.1	Is the city appropriately zoned considering, for example, the impact from key risk scenarios on economic activity, agricultural production, and population centres?	2
P4.2	Are approaches promoted through the design and development of new urban development to promote resilience?	1
P4.3	Do building codes or standards exist, and do they address specific known hazards and risks for the city? Are these standards regularly updated?	0
P4.4	Are zoning rules, building codes and standards widely applied, properly enforced and verified?	3

Regarding Essential 04 València achieves a resilience score of 6/12. There exist zoning plans for the whole city as well as the Huerta that incorporate hazard and risk mapping, but no systematic process for updating these plans (score of 2 for P4.1). Resilience approaches for new urban developments are not promoted in a consistent way, although a number of strategic documents related to this topic exist (score of 1 for P4.2). While building codes and standards exist, these do not address specific hazards or risks the city faces[41] (score of 0 for P4.3). However, existing building codes are compulsory and enforced by the city (score of 3 for P4.4).

7.5. Essential 05: Safeguard natural buffers to enhance the protective functions offered by natural ecosystems



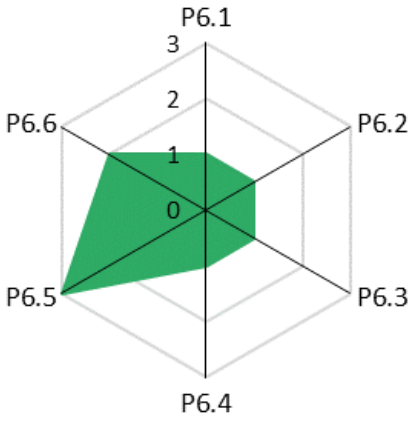
P5.1	Beyond just an awareness of the natural assets, does the city understand the functions (or services) that this natural capital provides for the city?	1
P5.2	Is green and blue infrastructure being promoted on major urban development and infrastructure projects through policy?	2
P5.3	Is the city aware of ecosystem services being provided to the city from natural capital beyond its administrative borders? Are agreements in place with neighbouring administrations to support the protection and management of these assets?	2

For Essential 05 València achieves a resilience score of 5/9. The city and key stakeholders are becoming more aware of the functions provided by their key natural assets, especially the

[41] Present building codes and standards (e.g. EN ISO 15927-1-6 or EN ISO 52000-1) consider historic/present climate and not future climate in their calculations. Furthermore, building codes and standards are out of the scope of local governments, having little margin of manoeuvre

Huerta, but this awareness is still incomplete (score of 1 for P5.1). At the same time, green and blue infrastructure is promoted heavily and several studies and strategies in this area exist. However, guiding material for practitioners could still be improved (score of 2 for P5.2). Related to P5.1, the city is becoming more aware of the functions provided by natural capital beyond the city administrative borders, with the new Huerta law aiming to create a common forum with neighbouring municipalities (score of 2 for P5.3).

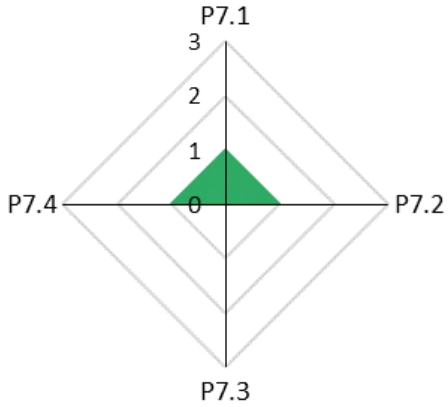
7.6. Essential 06: Strengthen institutional capacity for resilience



P6.1	Does the city have clear access to all the skills and experience it believes it would need to respond to reduce risks and respond to identified disaster scenarios?	1
P6.2	Does a co-ordinated public relations and education campaign exist, with structured messaging and channels to ensure hazard, risk and disaster information (that can be understood and used) are properly disseminated to the public?	1
P6.3	Extent to which data on the city's resilience context is shared with other organizations involved with the city's resilience.	1
P6.4	Are there training courses covering risk and resilience issues offered to all sectors of the city including government, business, NGOs and community?	1
P6.5	Are training materials available in the majority of languages in common use in the city?	3
P6.6	Is the city proactively seeking to exchange knowledge and learn from other cities facing similar challenges?	2

Regarding Essential 06 València achieves a resilience score of 9/18. While the city can access most of the skills and resources necessary to respond to identified disaster scenarios, gaps still exist (score of 1 for P6.1). Some programmes and channels exist for disseminating hazard, risk, and disaster information, but at most 25% of the population is reached, leaving significant room for improvement (score of 1 for P6.2). In addition, only a limited number of available data layers are shared within the city / other organisations, and the data shared is usually raw and requires interpretation (score of 1 for P6.3). Only a limited number of training courses for government employees, business owners, NGOs, and community members covering risk and resilience issues exist (score of 1 for P6.4). However, the existing training material is usually available in all languages commonly used in the city, namely Valencian and Castilian Spanish (score of 3 for P6.5). Lastly, the city understands the importance of knowledge sharing and seeks networking opportunities to exchange on lessons learned (score of 2 for P6.6).

7.7. Essential 07: Understand and strengthen societal capacity for resilience

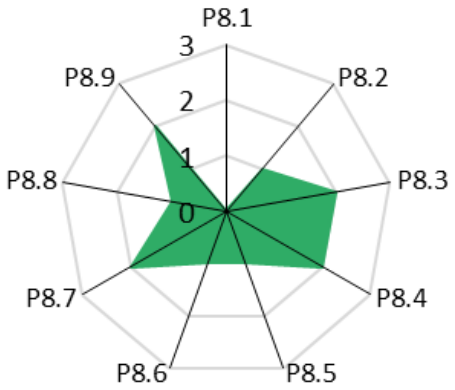


P7.1	Are “grassroots” or community organizations participating in risk reduction and post-event response for each neighbourhood in the city?	1
P7.2	Are there regular training programmes provided to the most vulnerable populations in the city?	1
P7.3	What proportion of businesses have a documented business continuity plan that has been reviewed within the last 18 months?	0
P7.4	How effective is the city at citizen engagement and communications in relation to DRR?	1

For Essential 07 València achieves a resilience score of 3/12. While grassroots organisations help with awareness raising for disaster risk reduction, their involvement in risk reduction and post-event response could be intensified (score of 1 in P7.1). Similarly, only some channels for citizen engagement related to disaster risk reduction exist (score of 1 for P7.4). In addition, while a mapping of vulnerable population groups exists, they do not receive any specific disaster training (score of 1 for P7.2). Lastly, no information about the proportion of businesses with a documented and regularly reviewed business continuity plan is available (score of 0 for P7.3).

7.8. Essential 08: Increase infrastructure resilience

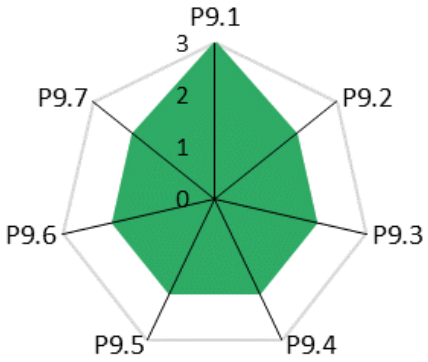
Regarding Essential 08 València achieves a resilience score of 12/27. There are no plans or forums to tackle critical infrastructure resilience (score of 0 for P8.1), and only a limited number of protective infrastructure exist (score of 1 for P8.2), such as shelters in the case of flash flooding or heavy rain. Because the information on potential disaster scenarios is limited, the city expects some loss of service for the water and energy systems under the “most severe” scenario (score of 2 for P8.3 and P8.4) and some loss of service for the transport and communication systems under the “most probable” scenario (score of 1 for P8.5 and P8.6). More than 90% of major injuries can be treated within 24 hours under the “most severe” scenario (score of 2 for P8.7). In addition, up to 10% of teaching facilities are likely at risk under the “most probable” scenario (score of 1 for P8.8). Lastly, equipment levels of first responders are estimated to be adequate for the “most severe” scenario, although this might require relying on mutual aid arrangements (score of 2 for P8.9).



P8.1	Is critical infrastructure resilience a city priority, does the city own and implement a critical infrastructure plan or strategy?	0
P8.2	Is existing protective infrastructure well-designed and well-built based on risk information?	1
P8.3	Would a significant loss of service for these two essential services be expected for a significant proportion of the city under the agreed disaster scenarios?	2
P8.4	Would a significant loss of service be expected for a significant proportion of the city in the 'worst case' scenario event? In the event of failure would energy infrastructure corridors remain safe (i.e. free from risk of leaks, electrocution hazards etc.)?	2
P8.5	Would a significant loss of service be expected for a significant proportion of the city in the 'worst case' scenario event? In the event of failure would transport infrastructure corridors remain safe (i.e. free from risk of flood, shocks etc) and passable?	1
P8.6	Would a significant loss of service be expected for a significant proportion of the city in the 'worst case' scenario event?	1
P8.7	Would there be sufficient acute healthcare capabilities to deal with expected major injuries in 'worst case' scenario?	2
P8.8	% of education structures at risk of damage from "most probable" and "most severe" scenarios	1
P8.9	Will there be sufficient first responder equipment, with military or civilian back up as required?	2

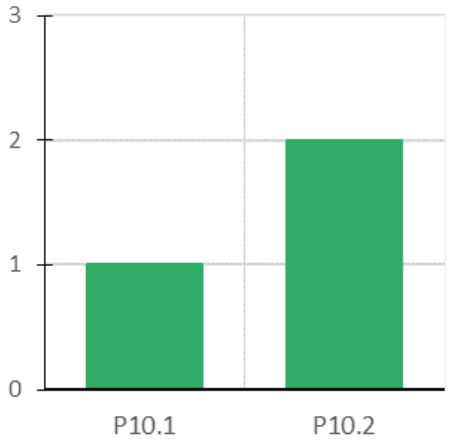
7.9. Essential 09: Ensure effective disaster response

For Essential 09 València achieves a resilience score of 15/21. The city estimates that it will reach more than 90% of its population with its early warning systems (score of 3 for P9.1) and has a comprehensive disaster management plan. However, this plan contains gaps (score of 2 for P9.2). The local disaster risk management authority has enough staff to cover all neighbourhoods within 24 to 48 hours in case of a surge event scenario (score of 2 for P9.3) and equipment/supply needs are defined and linked to disaster scenarios (score of 2 for P9.4). Similarly, emergency food and basic relief items should be sufficient under the "most severe" scenario (score of 2 for P9.5). There also exists a local emergency operations centre with hardened / redundant communications that should withstand the "most severe" scenario. However, only the most essential agencies for disaster risk management participate in crisis management (score of 2 for P9.6). Lastly, the city conducts annual drills involving both the public and professionals in a limited number of test scenarios (score of 2 for P9.7).



P9.1	Does the city have a plan or standard operating procedure to act on early warnings and forecasts? What proportion of the population is reachable by early warning system?	3
P9.2	Is there a disaster management / preparedness / emergency response plan outlining city mitigation, preparedness and response to local emergencies?	2
P9.3	Does the responsible disaster management authority have sufficient staffing capacity to support first responder duties in surge event scenario?	2
P9.4	Are equipment and supply needs, as well as the availability of equipment, clearly defined?	2
P9.5	Would the city be able to continue to feed and shelter its population post-event?	2
P9.6	Is there an emergency operations centre, with participation from all agencies, automating standard operating procedures specifically designed to deal with “most probable” and “most severe” scenarios?	2
P9.7	Do practices and drills involve both the public and professionals?	2

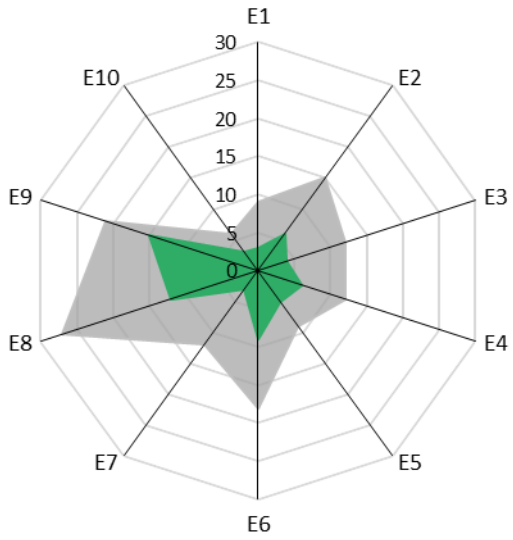
7.10. Essential 10: Expedite recovery and build back better



P10.1	Is there a strategy or process in place for post-event recovery and reconstruction, including economic reboot, societal aspects etc.?	1
P10.2	Do post-event assessment processes incorporate failure analyses and the ability to capture lessons learned that then feed into design and delivery of rebuilding projects?	2

For Essential 10, València achieves a resilience score of 3/6. Some post-recovery plans exist, but these are not comprehensive and are not understood by relevant stakeholders (score of 1 for P10.1). In terms of lessons learnt, there are clear processes in place to capture lessons from previous failures for coping post-event, but the mechanism to transfer these lessons to the design and delivery of future rebuilding projects needs improvement (score of 2 for P10.2).

7.11. Overall resilience of València



Overall, València achieves a resilience score of 66/141 with significant room for improvement in most Essentials. The exception to this is Essential 09, due to the large reach of València's early warning system, its comprehensive disaster risk management plan, good coverage in terms of emergency staff and food supply, and the existence of a local emergency operations centre.

The city achieves its lowest score in Essential 07, because grassroots movements are not sufficiently involved in disaster risk management processes, vulnerable population groups do not receive tailored training for disasters, no information about the coverage of business continuity plans is available, and only a limited number of channels exists for citizen engagement.

8. Conclusion

The protection of both the Huerta and Albufera, as cultural heritage landscapes and ARCH focus sites, is of high importance for the local economy, culture and biodiversity in Valencia. From the perspective of cultural heritage, risk management and adaptation to climate change, it seems that the junction between them has not yet been sufficiently explored in Valencia, neither in general terms, nor in regard to the ARCH focus sites. According to this first analysis, at local level, it seems that climate change is not yet proactively considered in existing approaches to managing and protecting cultural heritage. Conversely, DRR also seems to be not focused on heritage protection yet. This has yet to be confirmed by means of several meetings with relevant stakeholders, for instance in order to verify the degree in which the Guidelines for the Autonomous Communities from the NPERMCH are being implemented. No reference has been found in relation to the works that should be developed under these guidelines, such as the elaboration of the Map of Cultural Heritage Risks in the Comunitat Valenciana and subsequent steps (such as the definition of measures or emergency intervention proposals). If those lines of action, research and documentation are indeed not being developed, this should be considered a major gap in the governance framework for heritage management and protection. In addition, it is of note that the NPERMCH does not explicitly consider natural heritage, which is at the core of the recognised heritage values shared by the Huerta and Albufera cultural peri-urban landscapes.

From the climate adaptation perspective, heritage protection is considered in the Regional Strategy and local *SECAP,* precisely in relation to the mentioned measures and actions involving the Huerta and Albufera. However, as mentioned previously, the lack of budget allocation to such measures and actions restricts their application, unless external funding can be secured or new budget lines made available, for instance after the passing of the new key pieces of legislation currently being drafted, such as the future national and regional Climate Change Laws. These regulations had been placed on hold at the time of writing due to the state of emergency arising from the COVID-19 pandemic.

The key strategies that will determine the alignment of the ARCH project´s outcomes with Valencia´s vision and policies are those developed by the municipal and regional departments of agriculture and climate change, and can be found in key documents such as the city's *SECAP* and the regional *Climate Change Strategy 2020-2030*. However, some gaps have been identified in relation to the basic scientific knowledge which should be available prior to developing any resilience strategy for Huerta and Albufera, such as a more detailed vulnerability analysis, or impact modelling on agriculture, aquatic and forest ecosystems, in order to be able to better assess the several meteorological, climatological, hydrological, biological and human-induced hazards identified. Due to the complexity and size of both geographical areas, further discussion with stakeholders is also needed in order to prioritize specific support needs which might be addressed via the ARCH project.

For this and other reasons, during the ARCH project´s timeline an improved coordination of the stakeholders from Huerta and Albufera is envisioned. It is expected that improved coordination and cooperation among stakeholders, together with the knowledge that will be shared with Valencia city staff as part of the project, would improve Valencia´s social, physical and economic resilience against climate hazards. It is also anticipated that collecting and

promoting evidence of the extent to which the Huerta and Albufera are able to mitigate the effects of climate change within the city may serve to highlight their importance and as such to further protect these and other natural (heritage) sites.

In addition, given that Valencia City already promotes a management discourse that recognises the role of green and blue infrastructure in responding to the current context of climate emergency, there is an opportunity here for the ARCH project to align with this agenda and support its realisation through decision support tools focused on the Huerta and Albufera.

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10. Annex

10.1. Key documents governing cultural heritage management (see Chapter 3)

Name of document	Type of document	Level	Binding / non-binding	Author(s)	Year of publication	Summary of content	Timeline for future evaluation/update	Link (if available)
Convention for the Safeguarding of the Intangible Cultural Heritage	Convention	International	Non-binding	United Nations Educational, Scientific and Cultural Organization (UNESCO)	2003	The Convention established (Article 16) a Representative List of Intangible Cultural Heritage of Humanity.	No relevant timelines for the Convention itself have been identified. The created list of intangible heritage elements is annually updated.	Convention: https://ich.unesco.org/en/convention List of Intangible Cultural Heritage https://ich.unesco.org/en/00011?type=00002#tabs
Report of the 39th Session of the Conference of FAO	Report	International	Non-binding	Food and Agriculture Organization of the United Nations (FAO)	2015	The Conference endorsed the Globally Important Agricultural Heritage Systems (GIAHS) initiative as FAO Corporate programme.	No relevant timeline for the GIAHS initiative itself has been identified. Proposals to join the initiative are evaluated several times a year by the programme Scientific Advisory Group.	http://www.fao.org/3/a-mo153e.pdf

Name of document	Type of document	Level	Binding / non-binding	Author(s)	Year of publication	Summary of content	Timeline for future evaluation/update	Link (if available)
European Framework for Action on Cultural Heritage	Commission staff working document	International	Non-binding	European Commission	2018	Framework of continued action for Europe's cultural heritage based on a holistic, mainstreaming and integrated approach, multi-stakeholder cooperation. Five areas of action: inclusiveness, sustainability, resiliency, innovation and reinforcement of global partnerships.	Implementation of the Framework will be monitored by the Cultural Heritage Forum, an informal Commission expert group meeting at least annually since 2019.	https://ec.europa.eu/culture/content/european-framework-action-cultural-heritage_en

Name of document	Type of document	Level	Binding / non-binding	Author(s)	Year of publication	Summary of content	Timeline for future evaluation/update	Link (if available)
European Landscape Convention	Agreement	International	Binding	Council of Europe	2000	Promotes the protection, management and planning of the landscapes and organizes international co-operation on landscape issues. Aware that the landscape contributes to the formation of local cultures and that it is a basic component of the European natural and cultural heritage, contributing to human well-being and consolidation of the European identity.		https://www.coe.int/en/web/conventions/full-list/-/conventions/treaty/143

Name of document	Type of document	Level	Binding / non-binding	Author(s)	Year of publication	Summary of content	Timeline for future evaluation/update	Link (if available)
Convention Concerning the Protection of the World Cultural and Natural Heritage	Agreement	International	Binding	UNESCO	1972	Provides a permanent framework – legal, administrative and financial – for international cooperation in safeguarding humankind´s cultural and natural heritage and introduces the specific notion of a "world heritage" whose importance transcends all political and geographic boundaries.		https://whc.unesco.org/en/conventiontext/
European Convention on the Protection of the Archaeological Heritage (Revised)	Agreement	International	Binding	Council of Europe	1995	This revised Convention updates the provisions of a previous Convention adopted by the Council of Europe in 1969. The new text makes the conservation and enhancement of the archaeological heritage one of the goals of urban and regional planning policies.		https://www.coe.int/en/web/conventions/full-list/-/conventions/treaty/143

Name of document	Type of document	Level	Binding / non-binding	Author(s)	Year of publication	Summary of content	Timeline for future evaluation/update	Link (if available)
Law 16/1985 on Historical Heritage	Law	National	Binding	Head of State	1985	Protection, increase and transmission to future generations of Spanish Historical Heritage.		https://www.boe.es/eli/es/l/1985/06/25/16/con
Law 42/2007 on Natural Heritage and Biodiversity	Law	National	Binding	Head of State	2007	Basic legal framework of Spanish biodiversity and natural heritage conservation, sustainable use, improvement and restoration. National transposing legislation of several specific international regulations and recommendations.	The timeline of the first implementation plan of the Law (Plan Estratégico del Patrimonio Natural y la Biodiversidad) was 2011-2017. However, the second implementation plan has not yet been approved.	https://www.boe.es/buscar/act.php?id=BOE-A-2007-21490&p=20180721&tn=0
Law 4/1998, of 11 June, on Valencian Cultural Heritage	Law	Regional	Binding	Presidency of the Regional Government	1998. Several amendments and revisions since then.	Basic legal framework at regional level for public and private action in relation to the protection, conservation, dissemination, promotion, research and enhancement of the Valencian cultural heritage.		http://www.dogv.gva.es/es/disposicio-consolidada?signatura=1137/1998&idioma=es&L=1&url_lista=

Name of document	Type of document	Level	Binding / non-binding	Author(s)	Year of publication	Summary of content	Timeline for future evaluation/update	Link (if available)
General inventory of Valencia's cultural heritage	Inventory	Regional	Binding	Regional Department of Education, Culture and Sport	1998	List of cultural interest goods, goods of local relevance, movable goods of heritage relevance and intangible goods of local relevance.	Continuous updating	http://www.ceice.gva.es/es/web/patrimonio-cultural-y-museos/inventario-general
Law 5/2018 of the "Huerta" of Valencia	Law	Regional	Binding	Presidency of the Regional Government	2018	Basic regulatory framework of the "Huerta", including aspects such as land use, agricultural activity management and funding, improvement of living and working conditions of the people engaged in cultural activities and the preservation of the "Huerta".	Several time limits established in the law regarding the application of different provisions. Two years deadline for the own regional government in order to pass the necessary provisions to ensure the effective execution of the law.	http://www.dogv.gva.es/es/disposicio-consolidada?signatura=002588/2018&url_lista=

Name of document	Type of document	Level	Binding / non-binding	Author(s)	Year of publication	Summary of content	Timeline for future evaluation/update	Link (if available)
Regional Plan for the "Huerta" of Valencia	Plan	Regional	Binding	Regional Department of Housing, Public Works and Organisation of the Territory	2018	Land use plan in the "Huerta" of Valencia, including: report, maps, protection catalogue, norms, and landscape analysis.	Indefinite duration meanwhile not reviewed. To be updated at least every 4 years.	http://politicaterritorial.gva.es/es/web/planificacion-territorial-e-infraestructura-verde/pat-horta-de-valencia
Valencian Government Decree 71/1993, concerning the Albufera Natural Park legal regime	Regulation	Regional	Binding	Regional Department of the Environment	1993. Several amendments and revisions since then.	Natural Park designation and establishment of its basic legal framework.		http://www.dogv.gva.es/es/disposicio-consolidada?signatura=1546/1993&idioma=es&L=1&url_lista=

Name of document	Type of document	Level	Binding / non-binding	Author(s)	Year of publication	Summary of content	Timeline for future evaluation/update	Link (if available)
Valencian Government Decree 164/2016 designating Albufera traditional activities as intangible cultural heritage	Regulation	Regional	Binding	Regional Department of Education, Research, Culture and Sport	2016	Designation of artisan fishing and lateen sailing as intangible cultural heritage and establishment of arrangements for its protection and safeguarding.		http://www.dogv.gva.es/es/disposicio?sig=008555/2016&&L=1
Master Plan for the Use and Management of the Albufera Natural Park	Plan	Regional	Binding	Regional Department of Land and Housing	2004	Albufera Natural Park detailed use and management norms, including zoning.	Latest review process started in February 2020.	http://www.dogv.gva.es/es/disposicio?sig=5268/2004&&L=1
Regional tree heritage law	Law	Regional	Binding	Presidency of the Regional Government	2006	Establishment of a regulatory framework aiming at the conservation, dissemination, promotion, research and growth of the regional tree heritage of the Valencian Region.	An advisory committee is established, and should meet at least once per year.	http://www.dogv.gva.es/es/disposicio-consolidada?signatura=2845/2006&idioma=es&L=1&url_lista=

Name of document	Type of document	Level	Binding / non-binding	Author(s)	Year of publication	Summary of content	Timeline for future evaluation/update	Link (if available)
Regional inventory of heritage and notable trees	Inventory	Regional	Binding	Regional Department of Agriculture, Rural Development, Climate Emergency and Ecological Transition	2012. Several amendments and revisions since then.	List of trees and groups of trees protected because of age, size or local relevance reasons.	Continuous updating	http://www.agroambient.gva.es/documents/20551003/163052224/Cat%C3%A0leg+d%27Arbres+Monumentals+i+Singulars+de+la+Comunitat+Valenciana/dc68cb0f-1b57-4a81-bc5d-b4415e328cc2
Catalogue of Protected Goods and Areas	Part of the city Masterplan simplified review	Local	Binding	Valencia City Council	2012	Protected goods and areas catalogue, required by existing land management laws (including: reports, maps, protection catalogues, norms, and summary sheets).		https://www.valencia.es/ayuntamiento/urbanismo.nsf/vDocumentosTituloAux/59554911F786991DC125798F003A1AB1?OpenDocument&bdOrigen=ayuntamiento%2Furbanismo.nsf&idapoyo=693E082FE52C3836C125798F0039D4DB&lang=1

Name of document	Type of document	Level	Binding / non-binding	Author(s)	Year of publication	Summary of content	Timeline for future evaluation/update	Link (if available)
Local ordinance regarding the Albufera Lagoon boat register	Regulation	Local	Binding	Valencia City Council	2002	Navigation regulation in the Albufera Lagoon, which is only allowed to traditional boats, including the establishment of a local register and the related administrative procedures.		https://sede.valencia.es/sede/descarga/doc/DOCUMENT_1_ORD0014_C

10.2. Table 2: Governance framework governing disaster risk reduction (see Chapter 4)

Name of document	Type of document	Level	Binding / non-binding	Author(s)	Year of publication	Summary of content	Timeline for future evaluation/update)	Link (if available)
Sendai Framework	Agreement	International	Non-binding	United Nations Office for Disaster Risk Reduction (UNDRR)	2015	Establishment of a global framework for action to prevent new and reduce existing disaster risks, based on 7 targets, 4 priorities for action with supporting rationale and 13 guiding principles.	Valid until 2030. UNDRR is in charge of follow-up and review of the Sendai Framework by preparing periodic reviews on progress, among other actions.	http://www.unisdr.org/we/inform/publications/43291

Name of document	Type of document	Level	Binding / non-binding	Author(s)	Year of publication	Summary of content	Timeline for future evaluation/update)	Link (if available)
Decision No. 1313/2013/EU	Policy / strategy	International	Binding	The European Parliament and The Council of The European Union	2013	Defines the various mechanisms that should promote solidarity and should support, complement, and facilitate coordination of Member States' actions in the field of civil protection with a view to improving the effectiveness of systems for preventing, preparing for and responding to disasters. Prevention is of key importance for protection against disasters and requires further action.		https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:347:0924:0947:EN:PDF
Decision 420/2019/EU	Policy / strategy	International	Binding	The European Parliament and The Council of The European Union	2019	Amendments to Decision No 1313/2013/EU on a Union Civil Protection Mechanism.		https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019D0420&from=EN

Name of document	Type of document	Level	Binding / non-binding	Author(s)	Year of publication	Summary of content	Timeline for future evaluation/update)	Link (if available)
Directive 2007/60/EU	Guideline	International	Binding	The European Parliament and The Council of The European Union	2007	The purpose of this Directive is to establish a framework for the assessment and management of flood risks, aiming at the reduction of the adverse consequences for human health, the environment, cultural heritage and economic activity associated with floods in the Community. It should be read together with Act no. 7/2010 Coll. on flood protection,		https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32007L0060

Name of document	Type of document	Level	Binding / non-binding	Author(s)	Year of publication	Summary of content	Timeline for future evaluation/update)	Link (if available)
National Plan for Emergencies and Risk Management in Cultural Heritage (NPERMCH)	Plan	National	Non-binding	Department of Education, Culture and Sport	2015	Definition and implementation of preventive and remedial actions for cultural heritage protection against hazards, including risk identification, and programs and lines of action.	Valid for a period of 10 years. Objectives should be revised in 2020. A monitoring committee was established, and yearly monitoring reports should be published.	http://www.culturaydeporte.gob.es/planes-nacionales/planes-nacionales/emergencias-y-gestion-riesgos.html https://sede.educacion.gob.es/publiventa/descarga.action?f_codigo_agc=15107C
Albufera Natural Park Forest Fire Prevention Plan	Plan	Regional	Non-binding	Regional Department of Land and Housing	2006	Guiding document in relation to forest fire prevention in the Albufera Natural Park. Includes the analysis and diagnostic of current conditions, action plans for fire prevention and control, an economic and financial report, and specific cartography.	The economic and financial report was based on a 10-year timeframe since its approval/publication.	http://www.agroambient.gva.es/es/web/prevencion-de-incendios/planes-de-prevencion-de-incendios-forestales-de-la-red-de-espacios-naturales-protegidos/-/asset_publisher/J8VsgHcswUqD/content/albufera

Name of document	Type of document	Level	Binding / non-binding	Author(s)	Year of publication	Summary of content	Timeline for future evaluation/update)	Link (if available)
Lliria forest managament zone Forest Fire Prevention Plan	Plan	Regional	Non-binding	Regional Department of Government and Housing	2015	Guiding document in relation to forest fire prevention in the Lliria forest management zone. Includes the analysis and diagnostic of historical and current conditions, action plans for fire prevention and control, technical standards and instructions, an economic and financial report, and specific cartography.	2030	http://www.agroambient.gva.es/es/web/prevencion-de-incendios/planes-de-prevencion-de-incendios-forestales-de-demarcacion/-/asset_publisher/G7Yr70d2P4Cc/content/lliria?redirect=http%3A%2F%2Fwww.agroambient.gva.es%2Fes%2Fweb%2Fprevencion-de-incendios%2Fplan

Name of document	Type of document	Level	Binding / non-binding	Author(s)	Year of publication	Summary of content	Timeline for future evaluation/update)	Link (if available)
Regional flood risk management plan (PATRICOVA)	Plan	Regional	Partially binding	Regional Department of Territorial Policy, Public Works and Mobility	2015	Sectoral plan for flood risk reduction including, among other, specific regulations, an action Plan, a list of high flood risk municipalities, cartography and an Implementation Guide.	Monitoring and implementation reports every two years. Future update once it is considered adequate according to the monitoring process.	http://politicaterritorial.gva.es/es/web/planificacion-territorial-e-infraestructura-verde/patricova-plan-de-accion-territorial-de-caracter-sectorial-sobre-prevencion-del-riesgo-de-inundacion-en-la-comunitat-valenciana
Specific operating procedure regarding wildfires in the Devesa del Saler	Guideline	Local	Binding	Valencia City Council	2017	Definition of the resources and work plan involved in reaction to emergencies due to wildfires in the Devesa del Saler area of the Albufera.		http://www.valencia.es/ayuntamiento/bomberos.nsf/0/6DBD12EB83938BD7C125827A003B276F/$FILE/PROCOP%201.11%20INCENDIOS%20FORESTALES%20EN%20LA%20DEVESA%20DEL%20SALER.pdf?OpenElement&lang=1

Name of document	Type of document	Level	Binding / non-binding	Author(s)	Year of publication	Summary of content	Timeline for future evaluation/update)	Link (if available)
Valencia city ordinance in relation to fire protection	Regulation	Local	Binding	Valencia City Council	2007	General and detailed standards in relation to fire protection, regime of sanctions.		https://sede.valencia.es/sede/descarga/doc/DOCUMENT_1_ORD0013_C

10.3. Table 3: Governance framework for climate adaptation (See Chapter 5)

Note: Strategies, policies, action plans etc. relevant for climate adaptation may also be found in plans developed for other purposes, e.g. master plans, environmental plans, and health plans.

Name of document	Type of document	Level	Binding / non-binding	Author(s)	Year of publication	Summary of content	Timeline for future evaluation/update)	Link (if available)
Paris Agreement	Agreement	International	Binding	UNFCC	2015-2016	The Paris Agreement builds upon the Convention and for the first time brings all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects, with enhanced support to assist developing countries to do so. As such, it charts a new course in the global climate effort.		https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

Name of document	Type of document	Level	Binding / non-binding	Author(s)	Year of publication	Summary of content	Timeline for future evaluation/update)	Link (if available)
United Nations Framework Convention on Climate Change	Agreement	international	binding	The United Nations	1992	The ultimate objective of the Convention is to stabilize greenhouse gas concentrations at a level that would prevent dangerous anthropogenic (human induced) interference with the climate system. It states that such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened, and to enable economic development to proceed in a sustainable manner		https://unfccc.int/process-and-meetings/the-convention/what-is-the-united-nations-framework-convention-on-climate-change

Name of document	Type of document	Level	Binding / non-binding	Author(s)	Year of publication	Summary of content	Timeline for future evaluation/update)	Link (if available)
EU Climate Change Adaptation Strategy	Strategy	International (Europe)	Non-binding	European Commission	2013	Framework and mechanisms for improving the EU's preparedness for current and future climate impacts.	Last evaluated in 2018 (see report below). Update likely 2021.	https://ec.europa.eu/clima/policies/adaptation/what_en#tab-0-1
Evaluation of the EU strategy on adaptation to climate change	Report	International (Europe)	Non-binding	European Commission	2018	This report examines the process and the results of the evaluation of the strategy COM/2018/738, including the lessons learned from its implementation.		https://ec.europa.eu/clima/policies/adaptation/what_en#tab-0-1

Name of document	Type of document	Level	Binding / non-binding	Author(s)	Year of publication	Summary of content	Timeline for future evaluation/update)	Link (if available)
National Climate Change and Energy Transition Law	Law	National	Binding	Department of Ecological Transition and Demographic Challenge	To be passed in 2020.	Basic national regulatory framework for climate change mitigation and adaptation.	Currently under final stages of drafting, prior to parliamentary procedure.	https://www.miteco.gob.es/es/prensa/ultimas-noticias/la-ley-de-cambio-clim%C3%A1tico-y-transici%C3%B3n-energ%C3%A9tica-entra-en-la-recta-final-de-su-tramitaci%C3%B3n-administrativa/tcm:30-506983
National Plan for Adaptation to Climate Change (PNACC)	Plan	National	Non-binding	Department of the Environment and Rural and Marine Affairs	2006	Reference framework for the coordination of public administrations in the development of activities regarding impact and vulnerability assessments and climate change adaptation in Spain.	Second PNACC to be adopted in 2020, including major updates.	https://www.miteco.gob.es/es/cambio-climatico/temas/impactos-vulnerabilidad-y-adaptacion/plan-nacional-adaptacion-cambio-climatico/

Name of document	Type of document	Level	Binding / non-binding	Author(s)	Year of publication	Summary of content	Timeline for future evaluation/update)	Link (if available)
Third PNACC Work Programme (TPT)	Work Programmes	National	Non-binding	Department of the Environment and Rural and Marine Affairs	2014	In December 2013 the Third Work Programme was approved, which seeks to address climate change adaptation in a comprehensive manner.	The development of the PNACC is monitored through the elaboration of the Progress Reports, published in 2008, 2011, 2014 and 2018.	https://www.miteco.gob.es/es/cambio-climatico/temas/impactos-vulnerabilidad-y-adaptacion/3PT-PNACC-enero-2014_tcm30-70397.pdf
Strategy for adaptation to climate change on the Spanish coast	Strategy	National	Non-binding	Department of Agriculture, Fisheries, Food and the Environment.	2016	Adaptation strategy including a current diagnosis of the coast, setting of specific objectives, general guidelines and proposed measures, as well as an implementation and monitoring plan.	The development of adaptation actions until 2050 is proposed.	https://www.miteco.gob.es/es/costas/temas/proteccion-costa/estrategiaadaptacionccaprobada_tcm30-420088.pdf

Name of document	Type of document	Level	Binding / non-binding	Author(s)	Year of publication	Summary of content	Timeline for future evaluation/update)	Link (if available)
Valencian Climate Change Strategy 2020-2030	Strategy	Regional	Non-binding	Regional Department of Agriculture, Rural Development, Climate Emergency and Ecological Transition	2019	Regional mitigation and adaptation strategy, including a list of potential measures and actions as well as a monitoring system.	2030. Monitoring system established, based on several indicators to be tracked via a new software application.	http://www.agroambient.gva.es/es/web/cambio-climatico/2020-2030

Name of document	Type of document	Level	Binding / non-binding	Author(s)	Year of publication	Summary of content	Timeline for future evaluation/update)	Link (if available)
Territorial Plan for Green Infrastructure in the Coastline (PATIVEL)	Plan	Regional	Partially binding	Regional Department of Territorial Policy, Public Works and Mobility	2018	Coastline land use plan, based on several criteria such as climate change adaptation, including: Information and explanatory report, planning maps, landscape assessment, regulations, economic report, strategic environmental and territorial reports, beach inventory and its regulations, proposal of coastline regional path, protections catalogue.	Indefinite duration meanwhile not reviewed. To be updated at least every 20 years or earlier, according to a list of specified criteria.	http://politicaterritorial.gva.es/es/web/planificacion-territorial-e-infraestructura-verde/plan-de-accion-territorial-de-la-infraestructura-verde-del-litoral
Valencia Region Forest Plan (PATFOR)	Plan	Regional	Partially binding	Regional Department of Infrastructures, Land and the Environment	2013	Forest regional plan, including, among other, an analysis of the Valencian forest ecosystems climate change adaptation potential and a proposal of potential adaptation guidelines.	Indefinite duration. To be reviewed at least every 15 years.	http://www.dogv.gva.es/es/disposicio?sig=004345/2013&&L=1 http://www.agroambient.gva.es/es/web/medio-natural/patfor

Name of document	Type of document	Level	Binding / non-binding	Author(s)	Year of publication	Summary of content	Timeline for future evaluation/update)	Link (if available)
Valencia Sustainable Energy and Climate Action Plan (SECAP)	Plan	Local	Non-binding	Valencia City Council	2019	Developed within the framework of the Covenant of Mayors initiative, the SECAP includes, *inter alia*, an action plan including mitigation and adaptation actions.	2030	https://www.covenantofmayors.eu/about/covenant-community/signatories/overview.html?scity_id=11935
Climate Change Adaptation Plan Valencia 2050	Plan	Local	Non-binding	Valencia City Council	2017	The Valencia Adaptation Plan has been structured around 4 strategic objectives (adapting people, promoting a sustainable green economy, responsible management, and designing an attractive and efficient city) that will be implemented through 14 goals.		https://www.valencia.es/ayuntamiento/energias.nsf/0/8B7F4BFFA988C100C12581AF003BE403/$FILE/PACCV_20170127.pdf?OpenElement&lang=1