



Spatial Development Strategy of the Republic of Croatia

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Spatial Development Strategy of the Republic of Croatia



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Strategy development process and methodology

On 25th November 2013, the Ministry of Construction and Physical Planning issued the Decision on the Development of the Spatial Development Strategy of the Republic of Croatia¹ pursuant to Article 64, para. 4 of the Physical Planning and Building Act and in accordance with the Proposed Plan of Activities from the Territorial Monitoring Report of the Republic of Croatia 2008 – 2012.² The Spatial Development Strategy of the Republic of Croatia is a fundamental national document guiding the spatial development. It defines long-term objectives of spatial development, strategic focuses of development of activities and starting points for coordination of their development measures based on the spatial development goals as defined by the Physical Planning and Building Act and in accordance with the overall economic, social and cultural development, as well as other fundamental national development and strategic documents. The competent body for preparing the Strategy in cooperation with the spatial development stakeholders is the Croatian Institute for Spatial Development.³

¹ OG 143/13

² OG 61/13

³ CISD, established towards the end of 2013 as an institution responsible for performing physical planning activities for the state-commenced operation on 1st January 2014, and Spatial Planning Institute (SPI) within the MCPP ceased activities.

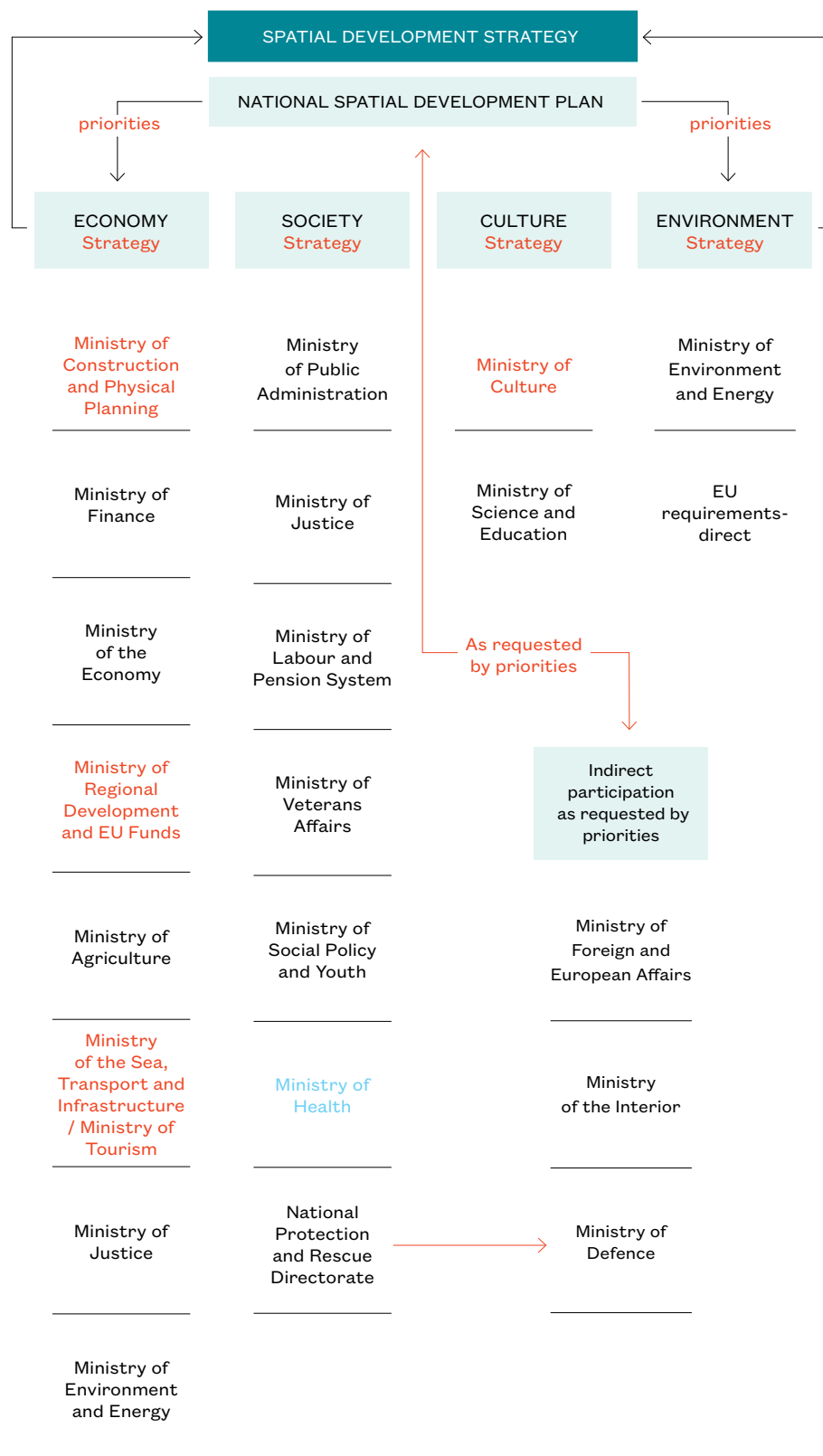
The 1997 Physical Planning Strategy of the Republic of Croatia and the Physical Planning Programme of the Republic of Croatia adopted in 1999 directed the spatial development and the development of the physical planning system in Croatia for almost two decades. Whether the problem was overly ambitious ideas or non-existence of instruments for their implementation within the physical planning system, some planning elements of the 1997 Strategy and the 1999 Programme remained unrealized. This does not diminish the major benefits of both documents: guiding the development of a war-torn country, particularly related to connecting the territory by building a network of fast roads; clear orientation towards sustainable development and rational land use, preservation of natu-

ral, cultural and landscape values and environmental protection; design of a physical planning system with clearly defined factors, levels of planning and guidelines for spatial development, as a result of which the territory of Croatia has been covered by the current generation of spatial plans; considering the need for the development of a physical planning information system and monitoring the state of space.

Some of the key reasons for the development of the new Strategy are the phenomena and processes observed through monitoring the state of space, a series of sectoral strategies and other development documents, with an indirect or direct impact on space, which were adopted after the 1997 Strategy, as well as a

FIGURE 0.1.
**THE SPATIAL
 DEVELOPMENT
 STRATEGY IN
 RELATION TO
 OTHER STRATEGIC
 DOCUMENTS**

- strategies directly impacting the space
- strategies without direct impact on space



changed context – the Republic of Croatia has grown from a young state that is just developing its physical planning system to a EU member state, with all the rights and obligations pertaining to this status. The EU *acquis communautaire*, which guides the development of specific spatial systems, as well as considering the policy whose implementation ensures and allocates significant funds that can be used for spatial development, are therefore important starting points for the development of the Strategy.⁴

Special attention has been paid to the analysis of sectoral development documents (strategies, programmes, plans) whose implementation has an indirect or direct impact on space. A large number of such documents testify to the development of a strategic and developmental approach within different scopes of authority and indicates that the spatial development of the Republic of Croatia does not start from scratch, but from the existing physical planning system developed over time with mostly delimited authorities of stakeholders in spatial development. The analysis performed identified more than thirty spatial development related documents on the national level. Significant differences in methodology as compared to the 1997 Strategy are a result of its legal context and stipulated contents. The 1997 Strategy contained the territorial monitoring report, and the Territorial Monitoring Report of the Republic of Croatia 2008 – 2012⁵ is a stand-alone document. This Report created the preconditions for the development of the new Strategy.

On the other hand, the 2013 Physical Planning Act, by stipulating the obligation to draw up the State Plan for Spatial Development, operationalizes the spatial planning component of the Strategy using the spatial plan at the state level, and the 1997 Strategy was followed by the 1999 Programme with measures for coordinating the development of spatial systems.

In this regard, it is important to stress the significance of the Strategy as the guiding document operationalized through the spatial planning system on three levels: national, regional and local. Such a system allows for adaptability to the requirements of development of the society as a whole and unpredictable external influences recognized at the international/global level.

Following the methodological model used in development of similar documents, the principle of integration, evaluation and alignment of sectoral requirements and partnerships, upon adoption of the Decision on the development of the Strategy, requests have been submitted to competent ministries, state bodies, county institutes for physical planning, agencies and other public administration bodies for delivery of relevant data. At the same time, the analysis and evaluation of individual spatial systems and key processes has commenced, as well as the procedure of strategic environmental assessment, in accordance with special regulations.

Given the fact that within the framework of the process of development of Amendments to the 1997 Strategy, adopted in 2013⁶, a detailed analysis and evaluation of the state of transport and energy system was conducted, and the adopted amendments referred to these sectors, for the purpose of development of the new Strategy, six expert bases were prepared:

- Analysis of spatial plans of counties⁷
- Landscape – factor of the Spatial Development Strategy⁸
- Regional development, system of settlements, urban and rural development and spatial transformation⁹
- Integrated Coastal Zone Management¹⁰
- Demographic scenarios and migrations¹¹
- Development of economic activities in space¹²

Expert discussions have been conducted concerning the topics of expert bases with the representatives of physical planning institutes of counties and the City of Zagreb, and then with the representatives of state administration bodies and the scientific community.¹³

Based on defined core values of the space of Croatia, the spatial development management system and the observed state of space and trends¹⁴, the expert team of the Croatian Institute for Spatial Development started developing the concept of the Strategy by overlaying strata of spatial data, conducting a SWOT analysis workshop, defining the general mission (vision) of spatial development by 2030 and starting points, and by drafting priorities, guidelines and implementation frameworks.

⁴ This primarily refers to territorial cohesion achieved by encouraging regional development and minimizing regional disparities, that is, balancing development indicators of EU member states, within themselves and at the EU level. Documents of particular importance for the development of the Strategy are: 1999 ESDP, Guiding principles for sustainable spatial development of the European continent, adopted at the 12th CEMAT meeting in 2000, 2000 Lisbon Declaration (revised in 2005), TA 2020 adopted at the CEMAT meeting in 2011

⁵ The second Territorial Monitoring Report at the national level (the first was prepared in 2003), but only discussed in the Croatian Parliament.

⁶ OG 76/13

⁷ Prepared by: Urbanistica d.o.o., Zagreb, team leader Jasminka Pilar- Katavić

⁸ Prepared by: Faculty of Architecture of the University of Zagreb, team leader prof. Mladen Obad Šćitaroci, PhD

⁹ Prepared by: Institute for Tourism, Zagreb, team leader Jasenka Kranjčević, PhD

¹⁰ Prepared by: Urbos d.o.o., Split, team leader Zoran Radman, PhD

¹¹ Prepared by: Faculty of Economics and Business of the University of Zagreb, team leader Ass. Prof. Ivan Čipin, PhD

12 Prepared by:
Institute for Development and International Relations, Zagreb, team leader Ana-Maria Boromisa, PhD

13 Expert discussions were held on 16th and 17th June 2014 in the great hall of the Faculty of Architecture of the University of Zagreb.

14 The state and trends were defined on the basis of the Territorial Monitoring Report of the Republic of Croatia 2008 – 2012, expert bases, delivered relevant data and analysis of other (sectoral) development documents impacting on spatial processes.

15 13th November 2014

16 Irena Đokić PhD, Helena Knific Schaps, Jasenka Kranjčević PhD, Prof. Anka Mišetić PhD, Prof. Dane Pejnović, PhD. Nenad Starc, PhD, Prof. Krunoslav Šmit PhD

17 Consultations with the concerned public on the Draft of the Spatial Development Strategy of the Republic of Croatia were held from 15th June to 14th July 2015. Public consultations on the Draft of the Strategy were held in Split, Rijeka, Zagreb and Osijek.

The selected results of the analysis of the state and trends and the concept of the Strategy were presented to the public as part of the expert meeting *Physical Planning System, from Strategy to a New Generation Spatial Plan*, organized by the Ministry of Construction and Physical Planning and the Croatian Institute for Spatial Development.¹⁵

After the presentation of the concept of the Strategy, another round of consultations with representatives of individual sectors was held. The elaboration of the concept of the Strategy was continued in cooperation with the Advisory Body consisting of renowned experts.¹⁶

As a continuation of the process of development of the Strategy, consultations with the public on the draft of the Strategy¹⁷ have been held, as well as a public debate on the Strategic Study on the Environmental Impact of the Strategy, based on the previous work of the Strategic Assessment Committee.¹⁸ Opinions collected during the public consultations were the groundwork for another revision of proposed guidelines and development of the Final Draft of the Spatial Development Strategy of the Republic of Croatia. All ministries delivered their opinions before the Draft of the Strategy was submitted to the Government of the Republic of Croatia for consideration.

The Spatial Development Strategy of the Republic of Croatia was adopted by the Croatian Parliament on 13th October 2017. It was published in the Official Gazette of the Republic of Croatia 106/2017 on 31st October 2017.

18 The Strategic Study on the Environmental Impact of the Spatial Development Strategy of the Republic of Croatia together with the Draft of the Spatial Development Strategy was a subject of public debate from 15th June 2015 to 14th July 2015. The public presentation on the Strategic Study and the Draft of the Strategy was held on 1st July 2015 in Zagreb.



1. Core values

The sea, coast and islands, waters, air space, mineral resources and other natural resources, as well as land, forests, flora and fauna, other components of the natural environment, real property and items of particular cultural, historical, economic and ecological significance, which are defined by law to be of interest to the Republic of Croatia shall enjoy its special protection.
— The Constitution of the Republic of Croatia

The core values of the future development of the system of spatial and physical planning and protection in the Republic of Croatia are:

- the values of space resulting from the diversity of the spatial basis and identity defined on the basis of natural, cultural, landscape and social values and the culture of construction, physical planning and design of space
- the scopes of former models of planning and implementation of spatial development: the tradition of urban and spatial planning observed in the Croatian space and the system of physical planning based on the guidelines of the Physical Planning Strategy of the Republic of Croatia from 1997 (1997 Strategy)
- the international context, primarily that accepted by the Republic of Croatia in the pre-accession period along with the status of 28th EU Member State.¹

Recognition, preservation, promotion and sustainable use of values of Croatian space, particularly those on which its identity is based, are supported through the spatial development concept and achievement of priorities and guidelines of spatial development, as well as through the development and implementation of all plans, programmes and projects related to the implementation of this Strategy and affecting the Croatian space.

Graphical presentations in this document serve exclusively for the purposes of this document and in no way presume the defining or demarcation of international borders.

¹ 1st July 2013

1.1. Spatial basis

The basis of spatial development of the Republic of Croatia are its geographic position and natural and geographical characteristics. Croatia is situated in south-east Europe at the contact point between the Pannonian, Dinaric and Mediterranean region combining cultural and geographical influences of Central Europe, the Mediterranean and the Balkans. The main part of its territory is occupied by the Pannonian and Pannonian-Peripannonian region, that is, central and eastern Croatia, and the Adriatic-Mediterranean region, that is, northern and southern coastal area. These two are connected by the central Dinaric mountainous region. The Croatian state territory extends in the form of an arch between Danube in the east and north-western coast of Istria in the west, the Mura River in the north and Prevlaka in the south.

1,244

islands, islets, cliffs and reefs make the Croatian coastline one of the most indented in Europe

1.1.1. Geographic diversity

The natural and geographical elements that make the spatial basis of Croatia are landforms, climate and ecological and hydrological characteristics. Diverse landforms, including plains, hills, and mountainous areas are formed on a base of complex geological composition and structure.

The dominant landform are plains, up to 200 m a.s.l., which represent more than half of surface area. A quarter of the territory is made up of hilly terrains, from 200 to 500 m. There are around 20% of mountainous areas from 500 to 1000 m, and those above 1000 m represent only around 4 % of total area. The highest summits are Dinara (Sinjal), 1,831 m, Sveti Jure, 1,762 m, on Biokovo, and Vaganski vrh, 1,757 m, on South Velebit.

The plains dominate the Pannonian and Pannonian - Peripannonian region, particularly in its eastern part, and mountainous areas dominate the central and mountainous Croatia. The specific feature of Croatia is its indented coastline and high percentage of karst landforms. With its 1,244 islands, islets, cliffs and reefs,

the Croatian coastline is one of the most indented in Europe. The largest islands are Cres (405.7 km²), Krk (405.2 km²) and Brač (395.4 km²). Karst landforms make up more than half of surface area of state territory, which is reflected in its numerous spatial specifics, from geomorphological and hydrological to landscape features.

Weather and climate are the result of several interdependent factors: location in the middle latitude zone, in the Mediterranean by the warm Adriatic Sea, near the Atlantic Ocean and large continental areas, Afrika in the south and Eurasia in the north-east, openness of the continental part towards the north and the modifying impact of landforms with relatively high mountainous barriers along the coastline and the inland Pannonian basin.

1.1.2. Natural resources

Air

Air protection in the Republic of Croatia is regulated by special regulations,² and includes monitoring and reporting on air quality, prevention and reduction of air pollution, defining limit values and moni-

² Environmental Protection Act (OG 80/13, 153/13, 78/15), Air Protection Act (OG 130/11, 47/14) and regulations for the implementation of these acts



FIGURE 1.1.

TOPOGRAPHY

- 0—50 m a.s.l.
- 50—100 m a.s.l.
- 100—300 m a.s.l.
- 300—500 m a.s.l.
- 500—1000 m a.s.l.
- 1000—1500 m a.s.l.
- > 1500 m a.s.l.

Sources: Topography generated from EarthExplorer ASTER Global DEM (USGS/METI/NASA)
Built areas and water courses: GIS base EuroGeographics (EuroGlobalMap EGM 7.0)

Croatia is situated between the Pannonian, Dinaric and Mediterranean region

³ CAEN (Croatian Agency for the Environment and Nature)

⁴ Numerical data: Croatian Hydrographic Institute, Split

toring of emissions of pollutants, reducing the damage to the ozone layer and reduction of the impact of and adaptation to climate change. Based on the data measured at measuring stations of the national network for permanent air quality monitoring and local networks for air quality monitoring in counties and cities which include special purpose measuring stations, and regarding pollutants whose concentrations exceeded limit and allowed values, it can be concluded that the air is mostly clean or slightly polluted – first category, while in certain urban and industrial areas the air is moderately or excessively polluted – second category.³

Sea

The sea, as a significant natural and geographical feature, is an essential factor of the country's overall development. The Adriatic is a warm sea and is the arm of the Mediterranean Sea most deeply cut in the European mainland. The Croatian part

of the Adriatic coast is 1,880 km long and occupies the largest part of its eastern coast. The total length of the coastline with islands is significantly larger and amounts to 6,278 km, and the border of the territorial sea of the Republic of Croatia is 948 km long.⁴ According to the UN Convention on the Law of the Sea, Croatia as a coastal state on the Adriatic exercises its sovereignty over internal sea waters and the territorial sea and the pertaining sovereign rights and jurisdiction over the maritime zone of the Ecological and Fisheries Protection Zone and the continental shelf.

Inland

The surface area of the land territory is 56,594 km², or 64.3% of the total state territory.

Soil

Due to different features of climate and terrain, Croatia is characterized by great diversity of pedological cover.

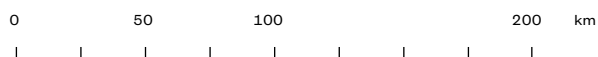
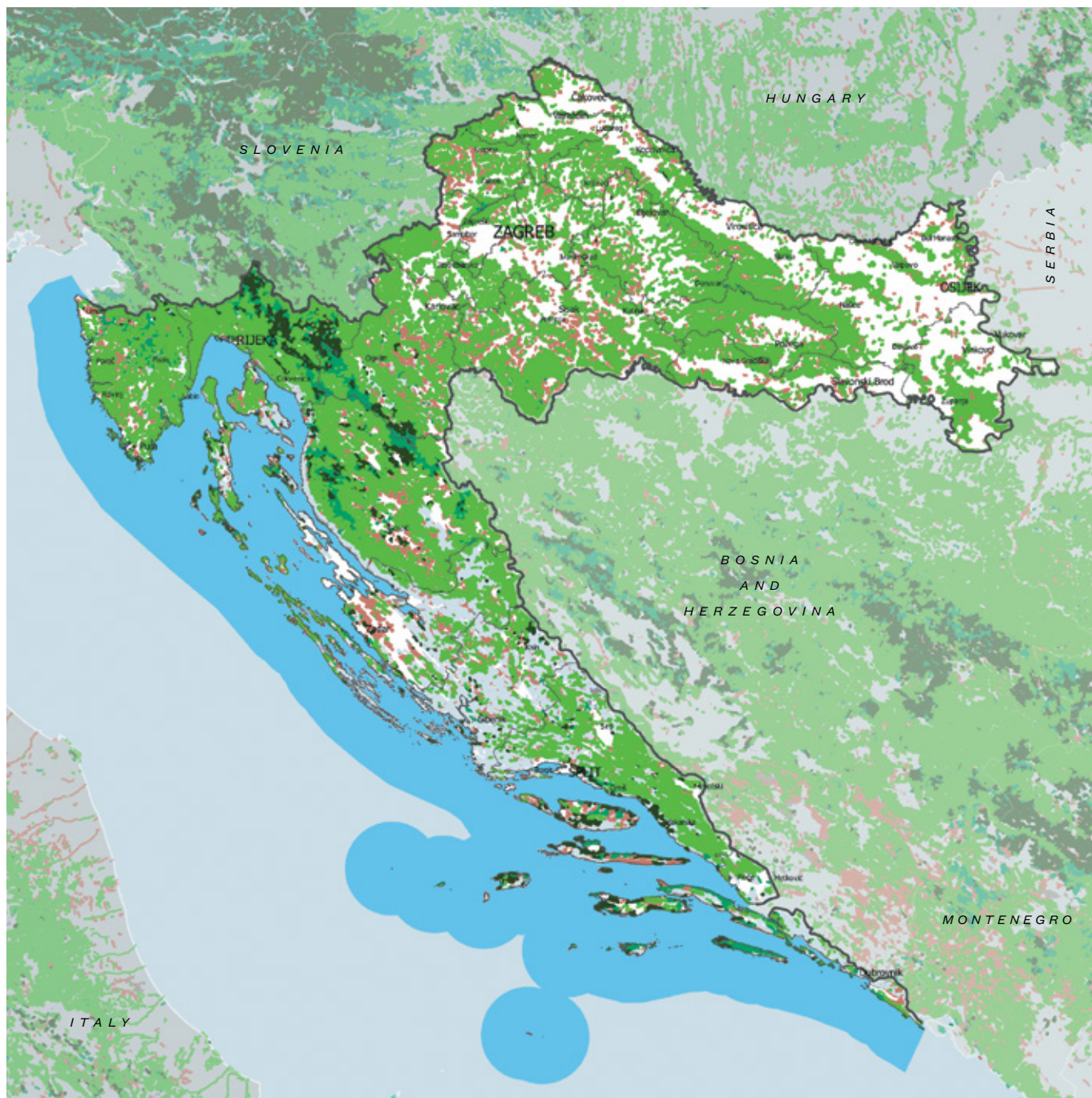
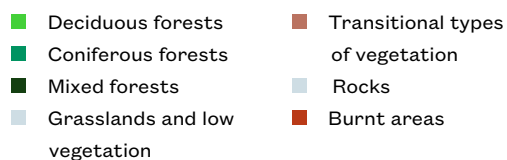


FIGURE 1.2.
**LAND
USE: FORESTS
AND OTHER
AREAS**



Source: Information system EEA
(Corine Land Cover)



FIGURE 1.3.
**LAND USE:
AGRICULTURE**

- | | |
|---|--|
| ■ Agricultural areas — non irrigated | ■ Orchards |
| ■ Agricultural areas — irrigated | ■ Olive — groves |
| ■ Vineyards | ■ Pastures |
| | ■ Complex patterns of agricultural areas |
| | ■ Areas with a significant share of natural vegetation |

Source: Information system EEA (Corine Land Cover)

FIGURE 1.4.

DATA ON EXPLOITATION RESERVES OF NON - ENERGY MINERALS



Source: ME, Mining Sector, 2013, Annual balance sheet of reserves of mineral raw materials in the Republic of Croatia

⁵ Except for geothermal water, which is considered a partially renewable source.

⁶ Interest of the Republic of Croatia is defined by the Croatian Constitution and the applicable Mining Act (OG 56/13, 14/14). It also regulates the ownership of the Republic of Croatia over mineral raw materials.

⁷ The currently valid strategy is that from 2008

⁸ Croatian Geological Institute

This is manifested in different genetic soil types and soil capabilities. High-quality soils are found in eastern Croatia: chernozem, humogley and eutric brown soils. Along Sava, Drava and Danube, young river alluvial soils of different fertility prevail, while in the central and western part of the region between Sava and Drava, pseudogleic soil is the most common. Mountainous areas have poorer, dystic (acidic) brown soils, brown soils on limestone and dolomites, and limestone-dolomite black soil. In the coastal area, lithosol, karst interspersed with terra rossa and brown soils on limestone and dolomite prevail. In this area, Istria boasts the most fertile land: deep terra rossa and brown soils on flysch, followed by Ravni kotari and larger islands. Anthropogenic soils, modified by human activity, cover around 3 – 5% of the Croatian territory.

Forests and forest land

Forests and forest land extend over 26,887 km², that is, cover around 47.5% of land territory of the Republic of Croatia. The share of natural forests in the total forest area is 95%, and forestation accounts for around 5%, including plantations. Deciduous forests account for 79%, evergreen forests 16%, and degraded forests 5%.

Agricultural areas

Agricultural areas account for around 47.6% of land territory of the Republic of Croatia. A large share of agricultural are-

as is not used for growing crops, which is a great potential for a significant increase in agricultural production, both for food and non-food purposes.

Mineral raw materials

Mineral raw materials are non-renewable⁵ natural resources of interest to the Republic of Croatia and are in its ownership.⁶ Formally they are under special state protection, that is, they can be explored and economically exploited exclusively under the conditions and in the manner stipulated by law. In accordance with the law, exploration of mineral raw materials implies works and tests to determine their existence, quality, quantity and potential conditions of exploitation, and exploitation means extraction of deposits and refining. The basic document defining the management of mineral raw minerals and planning mining economic activity at the state level is the Strategy of Management of Mineral Raw Materials.⁷ A map of mineral raw materials is being prepared at the national level,⁸ and some counties have conducted mining and geological studies of potential exploration areas for mineral raw materials, as well as areas of registered and existing reserves of mineral raw materials as the basis for planning demand and supply of mineral raw materials in its documents.

Non-energy minerals

Non-energy raw materials having a special

		1997	1998	1999	2000	2008	2009	2010	2011	2012	2013	2014	2015
geothermal water in l/s	reserves												
	recovered	405	0	410	420	312	297	398	390	418	386	252	0
Condensate in 1,000 m ³	reserves	4,099	4,474	4,183	3,468	2,555	2,368	2,020	2,354	2,235	2,100	1,435	1,237
	recovered	393	265	326	328	214	187	180	169	147	137	122	111
oil in 1,000 m ³	reserves	11,666	10,183	9,002	8,008	8,917	8,454	8,460	9,199	9,295	11,370	11,162	10,695
	recovered	1,310	1,252	1,098	1,003	653	619	563	528	511	499	518	619
natural gas in 1,000,000 m ³	reserves	33,925	35,030	33,595	29,204	36,436	34,500	31,163	23,959	24,315	21,368	17,933	14,929
	recovered	1,868	2,137	1,665	1,888	2,847	2,819	2,833	2,571	2,086	1,963	1,824	1,850
coal in 1,000 t	reserves	39,779	2,917	2,917	0	5,062	4,601	5,062	5,062	5,062	0	0	0
	uncovered	48	0	0	0	0	0	0	0	0	0	0	0

economic importance in Croatia are:

- architectural-building stone
- technical-building stone
- building sand and gravel.

Technical-building stone is primarily found in the Dinarides – from Istria to the southernmost parts of Dalmatia. Architectural-building stone is limited to tectonically less disturbed rocks, and the deposits of building sand and gravel are mostly found in areas along water courses.

According to the results of more recent explorations, in 2012, larger quantities of exploitation reserves of most non-energy minerals were discovered as compared to 1997 data (Figure 1.4.).⁹

In this period, a decrease in exploitability of registered exploitation reserves by more than 50% was recorded¹⁰ which opens room for increase of economic activities for exploitation, i.e., processing of specific raw materials. The most significant positive differences of established exploitation reserves refer to: architectural-building stone, bauxite, gypsum, building sand and gravel, carbonate raw material for ind. processing, quartz sand, siliceous raw materials for industrial processing, raw materials for cement production, technical and building stone and mercury.¹¹

It should be noted that these mineral raw materials are often accompanied by occurrence of rare minerals (rare-earth el-

ements) with growing global demand and value on a daily basis.

Energy minerals

Sufficient quantity of energy and secure energy supply are the basis of economic growth and social standard of a country. An increase in energy consumption leads to an increasing demand for energy minerals, their exploitation and processing.

Energy needs in Croatia are met mostly by using energy minerals – coal, oil, natural gas and radioactive mineral raw materials. In Croatia, there are registered reserves of coal, oil, natural gas and geothermal waters, but no registered reserves of radioactive mineral raw materials. In 2015, the share of natural gas in of primary energy production amounted to 27%, crude oil 12.5%, and the share of thermal energy is almost negligible, around 0.2%.¹²

The exploitation reserves of all energy minerals decreased in the period from 1997 to 2012, whereby the exploitation of natural gas increased, exploitation of geothermal water stagnated, and the exploitation of condensates and oil decreased. In the Republic of Croatia, coal has not been exploited since 1994.

TABLE 1.1.
**BALANCE SHEET
OF RESERVES AND
ANNUAL QUANTITY
OF EXPLOITATION OF
ENERGY MINERALS**

Source: ME, Balance sheet of reserves of energy minerals, 2017

⁹ Figure 1.4. is based on the data of the ME – Mining Sector (2013). Annual balance sheet of the state of reserves of mineral raw materials of the Republic of Croatia

¹⁰ IDIR, 2014, expert basis, Appendix 5, Table 7

¹¹ IDIR, 2014, expert basis, Appendix 5, table 3

¹² ME, *Annual Energy Overview – Energy in Croatia 2015*

¹³ According to the act regulating issues related to waters and water resources; in force: Waters Act (OG 153/09, 63/11, 130/11, 56/13, 14/14)

¹⁴ Source: River Basin Management Plan 2016 – 2021 (OG 66/16)

Groundwater

The total quantity of renewable water sources is 35,200 m³ per capita. Almost 90% of total quantity of water supplied to cities and settlements is abstracted from an underground source, which stresses the importance of protection of groundwater resources. The largest reserves are found in valleys of the rivers Drava and Sava and in the deep karst of the mountainous Croatia and Dalmatinska zagora. The Pannonian region is dominated by alluvial aquifers of intergranular porosity generated within large sedimentation basins of the rivers Drava and Sava, are rich in water and represent the main water supply resource of the northern part of Croatia. Due to their specificity, the areas of karst aquifers have very complex groundwater courses, which often involve multiple springs and sinks at various horizons within the same catchment area. These are extremely high-quality waters, largely without chemical and bacterial contamination. Renewable reserves of groundwater are not equally distributed within the Danube river basin. Due to complex hydrogeological relations on the territory of Croatia and insufficient and unequal exploration of aquifers, determining the reserves of groundwater is partly based on estimates. Due to different natural quality of water in specific areas, current level of use, natural vulnerability of the area, pressures on these areas and priorities in protection of individual areas, the strategic reserves of groundwater are divided into four types depending on the quality and conditions of their protection.

One important strategic issue is the protection of surface and ground resources of drinking water on islands and coastal areas from all forms of pollution and salination.

By determining and protecting strategic reserves of groundwater, the needs of public water supply on the entire territory of Croatia will be ensured in the long run. For this reason, their protection and use are of highest national interest. By including these areas in spatial plans and defining their protection, preconditions for adequate use of these areas will be ensured, both in terms of all water management activities and all other activities that can threaten the preservation of this highly important resource.

Rivers

Land waters drain towards the Black and Adriatic Sea. In this regard, the territory of the Republic of Croatia is divided into two river basins:¹³ the Danube river basin and Adriatic basin. The border between the basins on the territory of Republic of Croatia passes through a natural hydrographic and hydrogeological watershed between the Adriatic and Black Sea basins.

The surface area of the Danube river basin is 35,117 km², or 65% of the Croatian land territory.¹⁴ The rivers of the Danube river basin are larger and calmer, and a large number of them are border or cross-border waters and have cross-state significance. The largest rivers are: Sava, which is for the most part of its course, around 60% of a total of 945 km, located in Croatia, as well as Drava and Danube. Kupa is the longest river whose entire course is located on the territory of Croatia.

The surface area of the Adriatic basin is 35,303 km², or around 40% of the total territory of the Republic of Croatia. The Adriatic basin is located on karst terrain, and around third of its surface area includes closed karst sinks without above ground drainage towards the sea. The largest sinking rivers are found in Lika. The rivers near the coast are shorter, with smaller catchment areas and larger falls, possessing 60% of total potential of water power in the country. Near the coast, the largest rivers are Mirna and Raša in Istria and Zrmanja, Krka and Cetina in Dalmatia. The largest tributary of the Adriatic Sea on its eastern shore is Neretva, but only 20 km of its lower course is located on the territory of Croatia. A part of waters of the Adriatic basin are significant border or cross-border waters.

Lakes

Lakes in Croatia are relatively small. A small number of natural lakes are larger than 0.5 km². The largest natural lakes are found in the coastal part of the country. The largest are the Vrana Lake in Dalmatia (30.2 km²), Prokljan Lake in the lower course of Krka (11.5 km²) and Vrana Lake on the island of Cres (5.8 km²). The said lakes are natural phenomena because their surface is above sea level, and their bottom below sea level (cryptodepression). Specific phenomenon in terms of origin, appearance and significance is the biodynamic system of Plitvice Lakes, consisting of 16 lakes of total area of 1.9 km². The largest artificial lake is Peruća Lake on the Cetina River (13 km²).

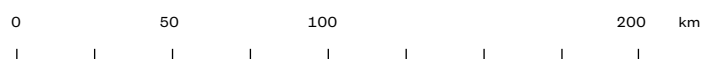


FIGURE 1.5.
**STRATEGIC
RESERVES OF
GROUNDWATER**

- Reserves of groundwater type I
- Reserves of groundwater type II

- Reserves of groundwater type III
- Reserves of groundwater type IV
- rivers

Source: Croatian Waters, 2009, Water Management Strategy, water courses: GIS base Euro-Geographics (EuroGlobalMap EGM 7.0)

1.2. Identity

Material evidence of Croatian identity is sufficient to understand the necessity of not only their preservation and protection, but also their role as a driver in the development of modern architectural expression. That is why it is necessary to establish the basic approach and developments in all variants of existing accomplishments so that the creative drive of new developments can reach the values of identity. Cultural heritage is not a dead past, but a living basis for building the future. The values of heritage must be preserved, and modern opportunities and ambitions only enrich the given moment by achievements of the readable identity which becomes a continuous path of development. Confronting the past and the modern, the global and the regional is not a conflict, but opens the door for new possibilities. In order to achieve this, basic postulates that determine the approach to architecture, its creative level and necessity of judging excellence must be defined. In a process that enables building, they must be present in all their components.

—academic Boris Magaš

1.2.1. Social identity

Spatial development is inseparable from the social context and is strongly connected to social identities and values of the Croatian society. The relation between society and space, as well as the overall spatial development, is realized within a specific cultural framework and the associated lifestyle.

Social identity defines the community, that is, its common characteristics, and specifics that differentiate it from others. In studies of social identity, its most important constitutive elements are language, tradition, religion, culture, territory, ethnic group/nation and family/gender.¹⁵

Everyday behaviour, on the individual and collective level, revolves around es-

tablished social identities and associated social values. Accepted values mutually interact within a network of values extending on several levels: from personal, local, regional, national, global, but also some specific ones such as for example values characteristic of the so-called transition countries such as Croatia. Therefore, the basis of this Strategy are generally accepted values of modern Croatian society which were affirmed from the Constitution of the Republic of Croatia¹⁶ to individual normative documents. These are fairness, equality, social inclusion, individuality, participation, responsibility, social cohesion, sustainable development, health, cooperation, diversity, security.

In international context, Croatia belongs to the countries of Western Europe and countries dominated by secular and rational values and values of self-expression

¹⁵ Cifrić, I.; Nikodem, K. 2006

¹⁶ Constitution of the Republic of Croatia (OG 56/90, 135/97, 8/98, 113/00, 124/00, 28/01, 41/01, 55/01, 76/10, 85/10, 5/14)



FIGURE 1.6
**PROTECTED
NATURAL AREAS OF
STATE IMPORTANCE**

- National parks
- Nature parks
- Special reserves
- Strict reserves

Source: Nature Protection Information System of the State Institute for Nature Protection

associated with postmaterialist values and transition from modern industrial to post-modern – post-industrial era: quality of life, internal harmony, environmental protection, support of differences, active political participation and freedom of individual¹⁷

Cultural and historical, traditional specifics of Croatian society as a whole, but also the specifics of regional and local social development, are the wealth of cultural and social identities. Therefore, the Strategy recognizes the diversity of social identities in the Republic of Croatia as a special value and fundamental principle and takes care to preserve and integrate them.

1.2.2. Natural and cultural heritage

Protected natural areas

Protected areas, due to their beauty, rich-

ness and diversity, are the fundamental value for protection of nature, and are managed for the purposes of long-term preservation of nature and accompanying ecosystem services. In Croatia, there are 417¹⁸ protected areas classified into nine categories.¹⁹

Protected areas of state importance are:

- 8 national parks (Plitvice Lakes, Kornati, Brijuni, Mljet, Krka, Northern Velebit, Paklenica and Risnjak) of total surface area of 917 km²
- 11 nature parks (Biokovo, Kopački rit, Lonjsko polje, Medvednica, Papuk, Telašćica, Velebit, Vrana Lake, Učka, Žumberak – Samoborsko gorje and Lastovo islands) of total area of 3,976 km²
- 2 strict reserves (Hajdučki and Rožanski kukovi and Biješe and Samarske stijene)
- 77 special reserves.

¹⁷ According to dominant value orientations defined by the *European Values Study (EVS)* and *World Values Survey (WVS)* from 1996 and 1999

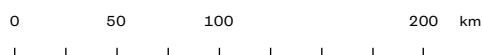
¹⁸ MEE, Register of Protected Areas, 7th July 2015

¹⁹ Nature Protection Act (OG 80/13)

FIGURE 1.7.
**NATURA 2000
AND EUROPEAN
BIOREGIONS**

- Areas of preservation significant for species and habitat types – (pSCI)
- Areas of preservation significant for birds (Special Protection Areas–SPA)
- Areas of potential cross-border cooperation in the area of protection of nature
- Borders of great European biogeographical regions

Sources:
Nature Protection Information System of the State Institute for Nature Protection Information system EEA



8 national parks

11 nature parks

National parks Plitvice Lakes and Krka are characterized by karst hydrography and morphology as well as by waterfalls and lakes. Kornati, Brijuni and Mljet are island national parks characterized by a rich undersea world. Risnjak, Paklenica and Northern Velebit are typically mountainous areas with diverse vegetation and landforms.

Other protected areas classified into five categories are: two regional parks, 85 nature monuments, 85 significant landscapes, 28 forest parks and 122 park architecture monuments.

The total surface area of all protected areas is 7,499 km², or 8.6% of total state territory. The Plitvice Lakes National Park is included on the UNESCO World Heritage List. Velebit Nature Park, with national parks Paklenica and Northern Velebit on its territory, is included on the List of Biosphere Reserves within the UNESCO

scientific programme– Man and Biosphere – MAB, as well as the cross-border biosphere reserve Mura – Drava – Danube between the Republic of Croatia and the Republic of Hungary, which encompasses the Regional Park Mura – Drava and Nature Park Kopački rit. Nature parks Kopački rit, Lonjsko polje, Vrana Lake, Ornithological Reserve Crna Mlaka Fishponds and the area of Neretva River Delta are included on the List of Wetlands of International Importance of the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar). Due to its abundance of bird species, Kopački rit, Lonjsko polje and Vrana Lake are included on the List of Important Bird Areas of Europe (IBAs).

Ecological network within the physical planning system - Natura 2000

The ecological network of the Republic of Croatia is a part of the EU ecological

network of preserved areas Natura 2000, consisting of Special Protection Areas (SPAs) and proposed Sites of Community Importance (pSCI). Out of a total of 780 areas, there are 742 areas important for species and habitat types and 38 areas important for birds.

Natura 2000 covers 36.7% of land and 16.4% maritime territory of the state, or 25,960 km² or 29.6% of total area.²⁰ The Republic of Croatia is among the EU Member States with the highest percentage of territory included in Natura 2000.

The fundamental principle of an integral approach to spatial and physical planning is the protection of nature and environment as a continuous component present in all segments. Natura 2000 network is one of the basic starting points for spatial planning.

Cultural heritage

The Republic of Croatia has a rich and diverse cultural heritage present on the entire territory, which is extremely important due to its connection with the European and Mediterranean tradition. The cultural heritage is an integral and inseparable part of the human environment and one of the fundamental spatial values and as such is of special interest to the Republic of Croatia.

FIGURE 1.8.

INTERNATIONALLY PROTECTED NATURAL HERITAGE AREAS



Source: Online portal of SINP

Research, analysis and evaluation of cultural heritage is a continuous responsibility of the Ministry of Culture, Directorate for the Protection of Cultural Heritage, in cooperation with 19 competent conservation departments and the City Institute for the Conservation of Cultural and Natural Heritage in Zagreb pursuant to the Act on the Protection and Conservation of Cultural Property.²¹ According to this Act, cultural property is divided into material immovable and movable property and non-material cultural property. Immovable cultural property are individual buildings and complexes of buildings, archaeological sites, cultural and historical units and cultural landscape.

Cultural properties are inscribed into the Register of Cultural Property of the Republic of Croatia, a public document consisting of three lists: List of protected cultural property, List of cultural property of national importance and List of preventively protected property (for a period of three or six years for archaeological heritage).

There is a total of 6,699²² immovable cultural properties registered in the Register of Cultural Property of the Republic of Croatia, out of which 6099 are permanently protected cultural property, and 600 are preventively protected properties. There are 578 cultural and historical areas permanently and preventively protected, the majority of which are urban (196) and rural areas (169), mostly settlements or parts of settlements, especially in coastal areas. These areas, as well as those outside settlements are rich in land and underwater archaeological sites and zones, which currently amount to 1140, many of which are explored and presented.

The extraordinary value of cultural heritage on the territory of Croatia has been confirmed by the inscription of seven cultural properties on the UNESCO World Heritage List:

- Historical Complex of Split with the Palace of Diocletian (1979)
- Old City of Dubrovnik (1979)
- Episcopal Complex of Euphrasian Basilica in the Historic Centre of Poreč (1997)
- Historic city of Trogir (1997)
- The Cathedral of St. James in Šibenik (2000)
- Star Grad Plain on Hvar (2008)
- Stećci – Medieval tombstones

Plitvice Lakes National Park is on the UNESCO World Heritage List

²⁰ SINP, 18th August 2014, without dotted localities

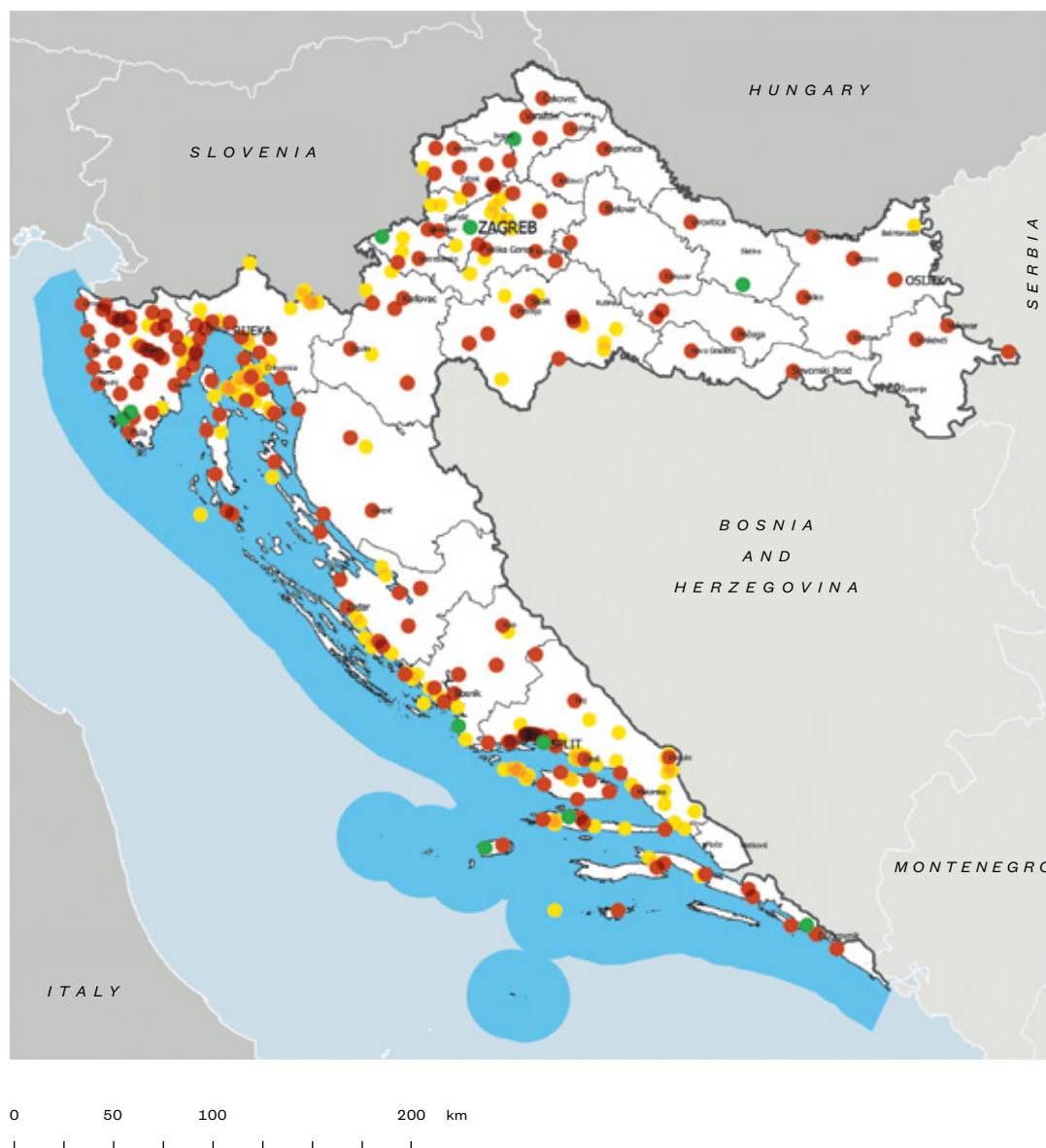
²¹ According to the law and regulations regulating the system of protection of cultural property; the Act on the Protection and Conservation of Cultural Property is in force (OG 69/99, 151/03, 157/03, 87/09, 88/10, 61/11, 25/12, 136/12, 157/13, 152/14, 98/15)

²² The said numerical data on Cultural Property in the text are taken from the Register of Cultural Property of the Republic of Croatia on 30th December 2016

FIGURE 1.9.
**PROTECTED
URBAN AND RURAL
UNITS, PROTECTED
CULTURAL
LANDSCAPES**

- Protected urban cultural and historical units
- Protected rural units
- Cultural landscape

Source:
Register of Protected Cultural Property, Ministry of Culture



Graveyards (2016), while further 17 cultural properties are on the UNESCO Tentative List.

Due to their exceptional aesthetic and cultural and historical values, the Register of Cultural Property of the Republic of Croatia includes 12 cultural landscapes, and the registration of the Cultural landscape Žumberak - Samoborsko gorje - Plešivičko prigorje is currently underway: Agricultural landscape – west slope of the street Donji Brezniščak, Zagreb

- Cultural island landscape Dakse, Dubrovnik
- Architectural and landscape complex of the fortification system Paravia - Barbariga, Vodnjan
- Cultural landscape Stari Grad Plain, Stari Grad, island of Hvar
- Cultural and historical landscape Jankovac, Slatinski Drenovac
- Cultivated landscape in the area

of Castle Bela I and Bela II, Bela

- Cultivated landscape Bucavac, Primošten
- Cultural landscape of Palagruža Islands, Komiža
- Cultural landscape of Brijuni Islands, Fažana
- Cultural landscape of Marjan Peninsula, Split
- Cultural landscape of Stipanska islet near Maslinica on the island of Šolta, Maslinica
- Associative landscape of Goli otok, Rab.

In addition to rich cultural heritage, especially architectural, which is the fundamental starting point for planning, management and design of sustainable spatial development, it is necessary to point out non-material cultural heritage as an important element in the economic and social development of an area. Today, on the territory of Croatia, there are 154

non-material cultural properties recognized and valued, with a large number of individuals and associations, institutions, as well as local and regional self-government units involved in their conservation, which also represents a potential for development.

1.2.3. Culture of building, physical planning and spatial design

Will we drown in the global field of consumerism or preserve personality, which contributes to viability and continuation of the character of the space in which we live? This is actually a question of self-respect and preservation of own dignity.

— Davor Salopek

Built environment is the most historically present expression of identity and culture of a nation. Interventions based on national architectural heritage have the potential to stimulate development and progress with positive effects for the positioning of Croatia in the European context.

The presence of man on the territory of Croatia dates back to the prehistorical era, which is proven by Palaeolithic findings in natural shelters, caves and semi-caves in all parts of the country: Hušnjakovo near Krapina, Vindija near Donja Voća, Šandalja in Istria, Vetrnica near Zagreb, etc. The first traces of construction in the form of dugouts, wood dwellings, settlements in the continental area, where there are no natural shelters, for example Vučedol, date back to Neolithic. In the coastal area, at the same time, people erect dry stone dwellings near Medulin, Nin, Bribir, Kosinj, on Brač and elsewhere. Organized life on the territory of Croatia can be figured out due to archaeological and architectural evidence of the urban character of settlements and towns from the Middle Ages to modern history, as found in Cavtat, Dubrovnik, Vis, Stari Grad on Hvar, Trogir, Zadar, Pula, Poreč, Zagreb, Varaždin, Osijek, Vinkovci, Sisak. Traces of ancient Greek settlements have been found in the deepest layers of Pharos, Tragurium, Salona, Epidaurum, Korkyra, Issa, and Roman settlements in Narona, Iadera, Aenona, Pola, Parentium and others. Special units are the city centres of Split (Diocletian Palace), Trogir and Dubrovnik.

The contribution of Croats to the European building culture begins in the pre-Romanesque period by adapting antique and early Christian buildings for liturgic needs and continues through the construction of central-plan churches, with mixed influences of Byzantine and northern Italian building experiences in coastal areas (St. Donatus in Zadar, cathedrals in Trogir, Zadar, on Rab, etc.) and Central and Northern Europe (churches in Čazma, Topusko, Gora, the Zagreb Cathedral and others). There are numerous examples of pre-Romanesque and early Romanesque church architecture from 7th to 12th ct. on the territory of Croatia, particularly on the coast, islands and nearby hinterland. These are central-plan churches with a circular, often multi-layered, base or ground plan in the shape of an isosceles cross whose central space is covered by a dome (Church of St Nicholas near Nin -trefoil, Church of St. Trinity in Split and St. Mary in Trogir - sexfoil, Holy Cross in Nin- cross-shaped ground plan) or longitudinal churches with more or less segmented volume (for example, church of St. George in Radun near Kaštel Stari). This architectural heritage is characterized by early Croatian wicker ornaments. From 15th to 17th ct., fortified noblemen's palaces, fortress cities, for example Karlovac, defence systems and fortresses such as Zagreb's Kaptol, Dubrovnik Walls, Osijek's Tvrdća, walls around Zadar, Ston, fortresses near Sisak, Slavonski Brod, Senj, Modruš and fortified towns in Istria are built. In the Republic of Ragusa, in 16th ct. a Renaissance culture of countryside life developed - around Dubrovnik and on nearby islands numerous villas were built. At the beginning of 17th ct., architecture was given Baroque elements: palaces and churches in Zagreb, Varaždin, Samobor, Čakovec, Belec. Near the end of the century, new cities are renovated and planned, the natural landscape is modified through setting up large estates, castles and organized villages are built. In 19th ct., Croatian cities get new urban facilities - public parks, swimming pools, theatres and museums, administrative buildings and public libraries, which introduces new values into the organization of urban space. Twentieth century and modernist architecture affirm Croatia's affiliation with the architectural culture of Europe.

Characteristic construction materials - in Adriatic region, unwrought and wrought stone, in continental region, brick and coloured plaster - defined also

the various construction and design processes. Coastal settlements are characterized by a specific architectural design of stone structures of clear stylistic historical expressions, with the presence of dry stone in all variants of landscape values. The Slavonian plains are characterized by the courtyard, derived from the elementary function of the relations between the residential house and accompanying buildings, and Istria and Hrvatsko zagorje, although of similar hilly landscape, give a completely different architectural and urban interpretation. The heritage of more modest settings also undoubtedly includes folk and marginal building in all regions: Posavina, continental, mountainous, coastal Croatia, as well as the man-shaped landscape such as dry stone walls and gromače.

The undersea world of the Croatian Adriatic and the underwater areas inland are only partially explored. Ancient sites are recognized and protected as evidence of economic, war and other paths of people and goods in these areas, amphoras and other ceramic items, sunken ships from various historical periods and bridges. Croatia and the world public are occasionally surprised by an accidental major finding such as Apoxyomenos found in the waters of the island of Lošinj.

These are all evidences of the culture of building and building spirit as a permanent feature of the national identity. As a materialized historical factor, it must achieve the continuity of its existence in modernity as well.

Architectural Policies of the Republic of Croatia 2012 – 2020, Apolitika, National guidelines for excellence and culture of building were adopted by the Croatian Government²³ in 2012. Public interest was then expressed for the quality of all built and natural environment, directed towards achievement of three basic goals: culture of building as a precondition for quality of built environment, quality of built environment as a precondition for a good life of every individual and quality architecture as a stimulus for national development and progress.

Apolitika considers the achievement of objectives through ten mutually interrelated thematic areas:

- social awareness
- public interventions in space
- building heritage

- spatial development and planning
- building and designing space
- housing
- architectural and urban planning tenders for the best solution
- education
- space and architecture as drivers of economic development
- legislative framework.

1.2.4. Landscape

Croatia as a whole is a cultural landscape – access to use of individual segments of space can be graded according to agreed criteria, but no part of it can be modified without prior evaluation; Croatia is a park of Europe – on the territory of Croatia there are testimonies of all layers of European civilization and culture from prehistory to modern day; Croatia is a geographical model of European landscapes – high mountains and Pannonian plains, Adriatic coast and river catchments areas, karst and wetlands, forests and agricultural lands, and a special European treasure are more than a thousand of its islands.²⁴

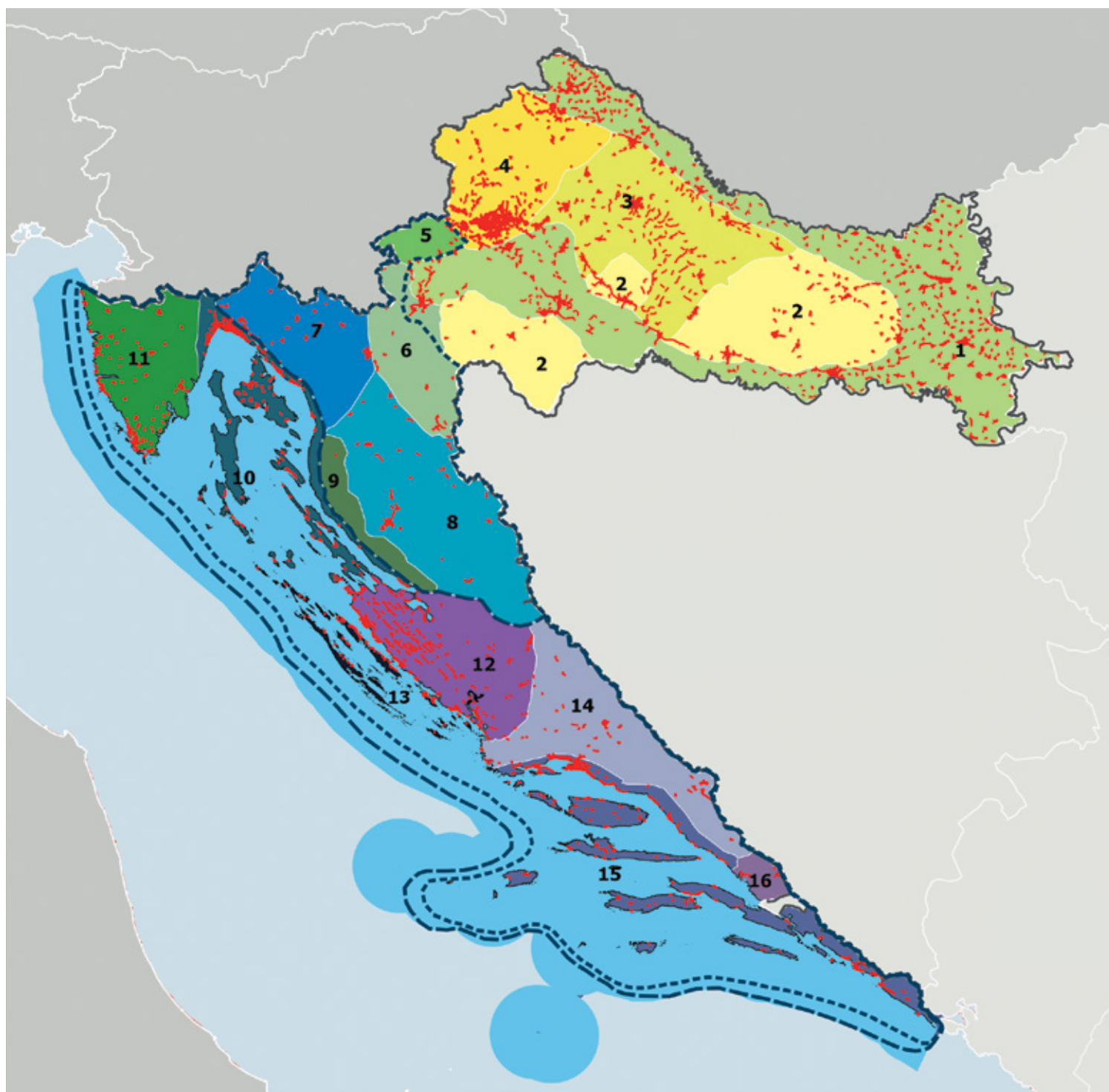
Landscape²⁵ means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors, essential component of people's surroundings, an expression of the diversity of their shared cultural and natural heritage, a foundation of their identity. The diversity of landscape is one of the greatest spatial values and an important component of the identity of the state. Landscape is the basic life, identity and economic resource of a state – its values (natural, cultural, ambience, social, visual and other) are limited and consumable.

On the territory of Croatia there are testimonies of all layers of European civilization and culture from prehistory to modern day. The anthology of architecturally articulated landscape includes Istrian small towns on hilltops, planned medieval and Renaissance towns such as Pag, Ston, Korčula, Dubrovnik and Karlovac, Pannonian settlements with courtyards created during the Baroque period, Baroque fortresses as a connection between urban structure and landscape, for example, Tvrđa in Osijek and Slavonski Brod, military architecture of 18th and 19th century etc.

²³ 29th November 2012, on 64th session

²⁴ Taken from the text *Cultural Landscapes - Programmatic Vision of Cultural Landscapes of Croatia*, which was prepared within the project of the Croatian Academy of Sciences and Arts *Protection of Property of National Interest*, which started in autumn 2013. The text on cultural landscapes is signed by a group of authors: Prof. Mladen Obad Šćitaroci, PhD, (coordinator), Željka Čorak, PhD Assoc. Prof. Bojana Bojanić, Obad Šćitaroci, PhD, Biserka Dumbović-Bilušić, PhD, Prof. Vladimir Goss, PhD, and academic Vladimir Marković.

²⁵ There are controversies about the use of the terms *krajobraz* and *krajolik* (trans.note: both meaning landscape). In the Strategy, the term *krajobraz* is used as a continuity of the existent spatial planning and legal terminology.



0 50 100 200 km

FIGURE 1.10.
**LANDSCAPE
REGIONALIZATION**

- | | | |
|----------------------------------|--------------------------------|--|
| 1. Plains of Northern Croatia | 7. Gorski kotar | 14. Dalmatinska zagora |
| 2. Pannonian mountains | 8. Lika | 15. Coastal area of Central and South Dalmatia |
| 3. Bilogora-Moslavina Area | 9. Top area of Velebit | 16. Lower Neretva |
| 4. North-Western Croatia | 10. Kvarner-Velebit area | |
| 5. Žumberak and Samoborsko gorje | 11. Istria | |
| 6. Kordun plateau | 12. Northern-Dalmatian plateau | |
| | 13. Zadar-Šibenik archipelago | |
| | | ■ Built area |
| | | — Adriatic area |
| | | --- Karst area |

Sources:

I. Bralić, 1995, *Krajobrazna regionalizacija Hrvatske s obzirom na prirodna obilježja* (Landscape regionalization of the Republic of Croatia according to natural features)

Built areas: Information system EEA (Corine Land Cover)

26 Act on Ratification of the European Landscape Convention (OG-IA 12/02, 11/04), European Landscape Convention, 2000, Florence

Landscape is the fundamental, life, identity and economic resource of a state

Landscape value also includes examples of the connection between land and construction; traditional wooden architecture of Turopolje, Posavina and Hrvatsko zagorje, stone construction of the Adriatic coastline and islands and dry stone construction.

Parks are valuable parts of landscape: Dubrovnik's Renaissance parks, Baroque and Romanticist Maksimir, parks of Baroque and Historicist castles of Hrvatsko zagorje and Slavonia, public city parks and promenades of Croatian cities and settlements as well as arboretums.

By signing the European Landscape Convention,²⁶ Croatia has accepted the obligation to recognize landscapes in law as an essential component of people's surroundings, an expression of the diversity of their shared cultural and natural heritage, and a foundation of their identity. It also assumed the obligation to recognize the character of landscape at the national, regional and local level and to establish instruments for its protection, management and planning. The Convention acknowledges the importance of all landscape, not just outstanding ones, in terms of their crucial influence on the quality of life. Landscape in the context of the European convention and modern global interpretations of the importance of landscape includes natural, rural, urban and peri-urban areas, including land, inland water and marine. The entire territory of Croatia is a landscape – both landscape and seascape – and must be perceived as a property of the greatest national interest.

Landscapes in the Republic of Croatia are protected by special laws, including the Environmental Protection Act, Nature Protection Act, Act on the Protection and Conservation of Cultural Property and the Physical Planning Act. The Environmental Protection Act recognizes the landscape as an essential component of people's surroundings which ensures the preservation of landscape diversity. The Nature Protection Act ensures the conservation of significant and characteristic features of landscape which, by virtue of their linear and continuous structure or function are essential for the migration, dispersal or genetic exchange of wild species. The Act on the Protection and Conservation of Cultural Property protects the landscape as an immovable cultural property – historically characteristic

structures that bear witness to man's presence in an area – from cities, villages and buildings with surroundings to parks. Elements of landscape are protected by spatial planning documentation – spatial plans of counties, cities and municipalities.

The concept of natural landscape encompasses areas of intact nature whose development is defined and regulated by natural laws exclusively, without interference of man.

Anthropogenic/cultural landscapes can be described as parts of Earth exposed to basic influences of nature and man, which significantly change its original appearance. This landscape is a result of human activity and design due to specific functional reasons.

The rural landscape, apart from activities related to the cultivation and land use and to the greatest extent the presence of agricultural land, is defined by the presence of settlements, which can be: former small towns and market towns, villages, hamlets, isolated farms, stantias, granges, occasional shepherd's huts, facilities for cattle and other buildings surrounded by agricultural land. Forms of settlement and estates, parcellation, fencing, position of isolated buildings and natural characteristics are important elements that form the patterns of rural landscape.

Cultivated landscapes mostly refer to agrarian/agricultural areas. Patterns of agrarian landscape have been created for centuries and are determined by ownership relations and adapted to the geomorphological features of the terrain. In addition, according to functional and morphological criteria and the use of space, we can distinguish between urban, rural, industrial, sacral, fortification and other institutional landscapes.

Urban landscape includes the areas of settlements and other built facilities. The urban landscape that refers to areas of urban settlements can also be described as the visual perception of special spatial values: aesthetic ones, such as views and panoramas; built and open structures. A special type of urban landscape is the historical urban landscape created by recognizing excellence in the historical urban area which is subject to change and development in the course of history.

1.3. Spatial development

Development of a growingly mobile, dynamic and indefinite society in a growingly defined space that is definitely available to us is a dramatic conflict that can by itself define the place, role, need, purpose, method and objectives of spatial planning. — Ante Marinović-Uzelac, 2011

1.3.1. Tradition of spatial and urban planning

Croatia has a strong tradition of planning of space and environment, whose formal beginnings date back to 19th century, when a series of regulative plans of Croatian cities and settlements were developed. However, planning of cities in Croatia has an even longer tradition, as shown by numerous examples of medieval towns with traces of Greek and Roman orthogonal planimetry, which are recognizable to a greater or lesser extent (Poreč, Rab, Zadar, Split), cities of a regular basis as part of a planned building endeavour (Zagreb's Gradec, Veliki and Mali Ston, Korčula) as well as planned fortified towns of the Renaissance and Baroque Periods.

With its geopolitical and cultural orientation as a Central European, Mediterranean and Danube region and Pannonian state, Croatia has preserved the heritage of prehistory, ancient Greece and Rome, Byzantine Empire, Carolingian and Ottoman Empire, and Republic of Venice, which influenced the coastal area and Austria-Hungary, which influenced the continental Croatia.

Valuable examples of plans of our historical cities are Dubrovnik – Old Town, Split with the Diocletian Palace, Zadar, Šibenik, Osijek – Roman Mursa, Tvrđa in Osijek, Ilok, Slavonski Brod with the fortress, Renaissance star of Karlovac, Bjelovar, Zagreb – Kaptol and later regulatory foundations of Upper and Lower Town, etc. Known documents from 13th ct. such as the Dubrovnik Statute from 1272 and

Vinodol Statute from 1288 contain, among other things, guidelines and instructions for physical planning, which stipulate the interrelations of individual buildings.

Dynamic processes of urbanization after the WW2 resulted in the need to establish the Urbanistic Institute of SR Croatia in 1947 in Zagreb, urban planning institutes in Split, Zagreb, Rijeka and Osijek, establishment of the Department for Urban and Spatial Planning at the Faculty of Architecture in Zagreb and founding of numerous institutes relevant for studying, monitoring and directing occurrences and processes in space.

Spatial planning of wider areas, regions and communities of municipalities has been developed since the 1960s. The first regional spatial plan has been prepared in 1958 for what was then the district of Krapina. In terms of methodology, the plan followed modern world trends in spatial planning, corridors and components of spatial development, influence zones, scenarios of expected spatial development, polycentricity of systems of settlements – focal points of development.

In the period from 1967 to 1972, in cooperation with the United Nations, Croatia developed a programme and plan of physical planning of the Adriatic area, that is, implemented the planning of space and environment of the Adriatic area: Northern, Central and Southern Adriatic – Regional Spatial Plan of the Southern Adriatic 1968 and Coordination Regional Spatial Plan of the Northern Adriatic, 1972, and its direct hinterland. Apart from the said methodology of re-

Croatia has a strong tradition in physical planning

gional plans, these plans addressed the issue of planning of the sea as the area of special value.

By 1974, spatial plans of larger regional units were developed (spatial plans of former municipalities and former communities of municipalities) and the first Planning Atlas of SR Croatia (the so-called Red Book, Zagreb, 1974), which was the background for the development of the Spatial Plan of SR Croatia adopted in 1974²⁷ (for the development period until 2000). At the end of 1970s, the methodology of preparation of spatial development plans was modified – for the first time these plans defined the building areas of settlements (spatial plans of municipalities Županja, Vinkovci), which was later included in laws and regulations. During 1980s, the new spatial plan of SR Croatia was being developed and adopted in 1989 – Spatial Plan of SR Croatia,²⁸ preceded by numerous studies, including the study Space and Man's Environment in the Long-Term Development of SR Croatia, within an extensive science and research project Scientific Basics of Long-Term Development of SR Croatia by 2000 (1984). This study promoted the concept of interactive approach to planning, with the ultimate goal of improving the quality of life. Use of spatial potentials and their protection were planned while taking into account spatial, social, cultural and economic factors.

Upon proclaiming independence and sovereignty, the Republic of Croatia directed its spatial development by preparing and adopting key physical planning documents at the state level, the 1997 Strategy and the 1999 Programme. Both documents were amended in 2013 to include new starting points and determinants of development of infrastructure systems. The 2007 Physical Planning and Building Act defines the Strategy as a spatial development document, and not only a physical planning document.

1.3.2. Physical planning system

Spatial planning in the Republic of Croatia is carried out in accordance with the laws and regulations and strategic documents at the national, regional and local level with the implementation of the principle of vertical and horizontal coordination and alignment.

The current physical planning system, which ensures requirements for the use, protection and management of space of the Republic of Croatia as a particularly valuable national property, is a result of long practice and tradition of spatial planning. The system is based on the territorial structure of the state defined in the Constitution and special laws²⁹ and the powers and authority of public administration bodies,³⁰ and is regulated in detail by the basic law in the area of physical planning,³¹ whereby its basic principles are aligned with the EU laws and regulations. The relation of the physical planning system to other areas is regulated by special laws.

The Croatian Parliament, Croatian Government and representative bodies of local and regional self-government units ensure the efficiency of physical planning by adopting spatial plans and other documents defined by the Physical Planning Act regulating the organization, use and purpose of space and requirements for use and protection thereof in accordance with the goals and principles of physical planning.³²

These documents are adopted on the state, regional and local levels and their technical accuracy, in accordance with the law, is ensured by state administration bodies, expert administration bodies, institutes and other legal entities registered for performing expert tasks of physical planning, and licensed architects who independently perform expert tasks of spatial planning.

For the purposes of systematic performance of expert tasks and improvement of development and physical planning system, a network of institutions has been established on the state and regional level, consisting of:

- Croatian Institute for Spatial Development
- 20 county institutes for physical planning
- Physical Planning Institute of the City of Zagreb.

Spatial Development Strategy of the Republic of Croatia

The meaning, contents and responsibility for the adoption of the Strategy are stipulated by law.³³

The Strategy is a basic state document for directing the development in space

²⁷ OG 21/74

²⁸ OG 12/89

²⁹ Constitution of the Republic of Croatia (OG 56/90, 135/97, 8/98, 113/00, 124/00, 28/01, 41/01, 55/01, 76/10, 85/10, 5/14), Act on the Local and Regional Self-Government (OG 33/01, 60/01, 129/05, 109/07, 125/08, 36/09, 36/09, 150/11, 144/12, 19/13, 137/15), Act on Territories of Counties, Towns and Municipalities in the Republic of Croatia (OG 86/06, 125/06, 16/07, 95/08, 46/10, 145/10, 37/13, 44/13, 45/13, 110/15)

³⁰ A public administration body, pursuant to Article 1 of the Administrative Procedure Act (OG 47/09), means: bodies of state administration and other state bodies, bodies of local and regional self-government units and legal entities with public authority.

³¹ Physical Planning Act (OG 153/13)

³² Physical Planning Act (OG 153/13)

³³ Physical Planning Act (OG 153/13), Articles 50 to 52

in accordance with the overall needs and possibilities arising out of basic state documents. The development of the Strategy is the responsibility of the ministry in charge of tasks of physical planning and is adopted by the Croatian Parliament.

The modern development of the Republic of Croatia and the nature of spatial relations are accompanied by processes of globalization regarding primarily economic, social and ecological issues, which raises the need for mutual cooperation of all development factors in the social, economic, technical, technological and ecological sphere, which is why monitoring of space, its planning and rational use is an inseparable part of the overall strategy of the country's development.

In this sense, the Strategy should reach a high degree of consensus on important goals of physical planning, on methods and instruments to achieve them on the state, regional and local level, along with the monitoring or establishment of co-relations with the European documents on the strategic and supranational level – particularly for defining the guidelines of physical planning for urban and rural system, coastal area and spatial corridors.

The Strategy defines the long-term objectives of spatial development of the Republic of Croatia, strategic orientations of development of activities in space and starting points for the coordination of their development measures in space, and it basically includes:

- starting points, basis and organization of spatial development with guidelines and priorities for achievement of spatial development goals
- development of spatial systems with guidelines for spatial development on the regional and local level
- measures for the protection of the environment in accordance with the Sustainable Development Strategy of the Republic of Croatia.

Spatial plans and strategic development documents in other economic and administrative areas and activities may not be contrary to the Strategy.

Spatial plans

The physical planning system is realized through the development and adoption of spatial plans, and their implementation on the basis of issued documents for implementation and/or special regulations. Spatial plans have the effect and legal

nature of by-laws, and their preparation, adoption procedure and implementation are additionally verified by issuing relevant opinions and consents, administrative procedures of issuing approvals for construction and administrative supervision in accordance with special laws. The participation of the public and all interested participants in the procedure of preparation and adoption of spatial plans is enabled through public debate.

Spatial plans are adopted on the state, regional and local level. It should be noted that the entire territory of the Republic of Croatia is covered by applicable spatial plans: spatial plans of counties, municipalities and cities.

The 2013 Physical Planning Act introduced into the physical planning system the State Plan of Spatial Development as an activity planned by the Strategy and urban physical planning documents of state and county significance.

Monitoring the state of space

The state of space and area of physical planning is monitored and analysed by drawing up and adopting the Territorial Monitoring Report at the state, regional and local level for a four-year period. Based on the analysis of implementation of spatial plans and other documents with impact on space and analysis and evaluation of the state and trends of spatial development, the reports give suggestions and basic recommendations for measures for improving future spatial development.

Physical Planning Information System

Preparation, adoption, implementation and supervision of spatial plans, permanent monitoring of the state of space and the area of physical planning and the preparation of the Territorial Monitoring Report shall be operatively based on the Physical Planning Information System (PPIS).

PPIS is established in order to achieve the following objectives by using modern technologies:

- continuous monitoring of trends in spatial development and regular reporting and monitoring the state of space, for the purposes of efficient monitoring of implementation of the Strategy and other spatial planning documents
- integration of spatial planning and other data important for physical

The Strategy defines the long-term objectives of spatial development of the Republic of Croatia

PPIS – following trends, integration of data, availability, transparency, public participation

planning (e.g. issued approvals for construction, construction inspection control, etc.) and spatial data of public administration bodies used in development of spatial plans

- exchange of spatial planning and other spatial data important for spatial planning between entities of physical planning
- simultaneous presentation of spatial planning and other available spatial data publicly and without restriction
- availability of spatial plans
- transparency of the procedure of development and adoption of spatial plans
- more efficient participation of the public in the procedure of development and adoption and monitoring the implementation of spatial plans
- simpler collection of clear information on possible interventions in space for all interested parties.

1.4. International context

On 1st July 2013, the Republic of Croatia became a full member of the EU, which opened up the possibility, as well as the obligation, of correlational application of regulations and alignment with the *acquis communautaire*. International cooperation is focused on the EU and the Council of Europe and on the implementation of other international agreements and conventions defining the obligations concerning protection of nature and preservation of biodiversity, protection of natural resources and the environment, damage prevention, climate change, mitigation of risks of disasters and waste management in cases of industrial incidents.

EU development policies

In the last 15 years, a large number of development documents have been adopted at the EU level, which are focused on designing and realization of the model of planning sustainable growth, based on a balanced social, cultural, economic and spatial and ecological development and intergenerational solidarity.³⁴ Development is globally focused on increasing the competitiveness of the EU and the entire territory of Europe on the international scene, that is, positioning of Europe in terms of its distinctiveness in accordance with the strategic goal of achieving social, economic and territorial cohesion. **Economic cohesion** means achieving a high level of development of as large an area as possible of a specific spatial unit for the purposes of strengthening its overall competitiveness in the regional and wider international context, but also achieving a certain level of economic integration into the entire system. **Social cohesion** encompasses a socially fair and balanced development for the benefit of as many social, territorial and other groups as possible, with a certain degree of solidarity and minimum social exclusion. **Territorial cohesion**, which is in the broader sense used as a synonym for European spatial planning, means a territorially balanced development of a specific spatial unit, inseparable from the processes of economic and social cohesion

and focused on achieving a certain level of territorial integration.

The overall idea of spatial development and planning is based on the respect for geographic, historical and culturological specifics, that is, tradition and identity, avoiding the pitfall of exclusively market-oriented planning based on the growing competition of attracting investment. The idea of territorial cohesion stresses the application of a spatial approach in all stages of decision-making on sectoral policies with the distinct need for cooperation on all levels of management.

In Europe 2020,³⁵ created in 2010, after facing the 2008 economic crisis, which warned about the structural weaknesses of the European economy and slow adjustment to new global conditions on the labour market, a strategic framework for smart, sustainable and inclusive development was defined. Five main objectives for measuring success were set: employment, research and development, climate change and energy, education and elimination of poverty.

EU spatial policies

The strategic development orientations of the EU are translated into the field of spatial development and spatial planning by defining objectives according to which

³⁴ One of the first such documents is the *Treaty of Lisbon, amending Treaty on the European Union and the Treaty establishing the European Community*, signed in 2007, which entered into force in 2009

³⁵ European Strategy for Smart, Sustainable and Inclusive Growth, European Commission 2010

environment-friendly economic growth is based on a solid and balanced spatial structure.

Unlike the regional and environmental policy, spatial planning at the EU level is not within the competence of the EU,³⁶ meaning it is still the responsibility of member states. Although at the EU level, there is no uniform policy and legislation for spatial planning, common spatial planning development objectives have been agreed upon by taking into account the space as a whole and individually at the level of regions with similar development problems and possibilities, whereby the spatial component of development transcends territorial and political borders. The basic principles of the concept of spatial planning and development of the EU have been elaborated in a series of documents and regulations of different legal force (regulations, directives, decisions, recommendations or opinions) and integrated into national spatial policies, whereby the obligation and model of implementation derive from the relevant levels of power.³⁷

Spatial planning has been set as one of the key instruments for establishing a long-term and sustainable framework for economic, social and territorial development, both within and between member states. Reflecting on spatial development in this context has been extended from the system and practice of spatial planning to management of spatial processes through numerous public institutions on different management and administrative levels. Special emphasis is put on the coordination between decision-making and establishing partnerships between numerous stakeholders at all levels – horizontal and vertical (in the sense of defining their competence, responsibility and authority and achieving a balance of interests). There is a growing significance of the so-called communication culture between all stakeholders, which is achieved by establishing various support mechanisms – from establishing the network bases of planning data (e.g. ESPON) and web tools (e.g. RFSC, TIA) to educating citizens for responsible participation in the democratic process of preparation, adoption and implementation of decisions.

By agreement between member states and the European Commission, an officially accepted, although not legally binding, document has been prepared, the European Spatial Development Perspective

(ESDP),³⁸ which is the programmatic and political framework for sectoral policies both on the EU level and on the level of individual member states and their regional and local authorities which have an impact on space. It directs spatial policies towards a balanced and sustainable development of the EU by achieving common goals:

- economic and social cohesion
- preservation and management of natural resources and cultural heritage
- balanced competitiveness of the European territory.

The political framework of the territorial component of the EU cohesion policy has been set in the Territorial Agenda EU 2020,³⁹ as a result of a belief that achieving the EU goals defined in Europe 2020, in view of different developmental possibilities of individual regions, is possible only if we take into account territorial dimension of the strategy. Directions of sustainable development depend on the specifics of individual areas, and for regions that fall behind, a mechanism of solidarity has been established.

Croatia and EU spatial policies

The principles of EU spatial policies have been recognized in laws and regulations of the Republic of Croatia in the area of spatial and physical planning even before EU accession. The set physical planning objectives have been aligned with the cohesion policy requirements in the Physical Planning Act⁴⁰, and refer primarily to: proportional spatial development in line with economic, social and environmental starting points; spatial sustainability in relation to the rational use and conservation of spatial capacities on land, sea and underwater for the purposes of efficient protection of space; connecting the Croatian territory with the European physical planning systems; nurturing and developing regional spatial characteristics; mutually aligned and complementary distribution of different human activities in space aimed at a functional and balanced development of community along with the protection of integral values of space; rational use and protection of natural property, preservation of nature, environmental protection and prevention from pollution risks; protection of cultural property and values; efficient and humane development of urban and rural settlements and a secure, healthy and socially functional life and work environment; integrity of valuable coastal

³⁶ All treaties and agreements, along with other EU legislature (regulations, recommendations, decisions, directives, etc.) represent the *acquis communautaire*, and the EU may define only policies within the scope of the *acquis*, that is, those within its competence.

³⁷ EU levels of authority: exclusive (those over which the EU has an exclusive right of decision-making and member states may no longer decide on these issues); divided (both the EU and member states have the right of legal regulation until the adoption of the EU legal standard) and complementary (they do not authorize the EU for legislative action, but only for support to activities of member states, particularly in the area of research and development).

³⁸ European Spatial Development Perspective – ESDP, Potsdam 1999

³⁹ TA 2020 was agreed at the informal meeting of ministers in charge of spatial planning and territorial development on 19th May 2011 in Gödöllő, Hungary.

⁴⁰ OG 153/13

ecosystems and quality of sea; supply, functional availability and use of services and buildings for the needs of different population groups, particularly children, old people and persons with limited movement abilities; creating a high value built environment while respecting the specifics of individual units and the natural and urban landscape and cultural heritage; spatial conditions for economic growth. It should be noted that in 1996 the Republic of Croatia ratified the Convention on Environmental Impact Assessment in a Transboundary Context adopted in Espoo (Finland) on 25th February 1991.

Coastal area and the sea

In a broader context, the shores of the Mediterranean have been an area of concentrated development for millennia, and the increased risk of destruction of sensitive coastal ecosystems and degradation of original landscapes transcends national borders.

In addition to national policy and legislature, there is a wide spectre of different EU policies that have an impact on the development of the coastal area, for example, the common policy on agriculture and fisheries, establishment of the Trans-European Transport Network (TEN-T), Natura 2000, policy on renewable energy sources, etc. The following documents have a special impact on the implementation in coastal and marine areas:

- Directive 2008/56/EC of the European Parliament and of the Council of 17th June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive) (OJ L 164, 25th June 2008) (MSFD)⁴¹
- Directive 2014/89/EU of the European Parliament and of the Council of 23rd July 2014 establishing a framework for maritime spatial planning (OJ L 257/135, 28th August 2014) (FMSP).⁴²

FMSP

One of the most important general goals of the FMSP is a more efficient management of maritime activities and efficient use of maritime resources in connection with integral management of the coastal area.

The scope of this Directive is the area of marine waters defined as: waters, seabed and subsoil on the seaward side of the baseline from which the extent of territorial waters is measured extending to the

outmost reach of the area where a Member State has or exercises jurisdictional rights, in accordance with the Unclos.⁴³ With regards to spatial planning, the Directive allows the adjustment of borders of coverage in the part of the sea covered by spatial plans.

As part of multilateral cooperation and in connection with assumed obligations, an important document for Croatia as a Mediterranean country is the **Mediterranean Strategy for Sustainable Development**⁴⁴ - a framework strategic development document for directing national sustainable development strategies. It combines the activities and policies of the EU and UN and is focused on initiating a dynamic partnership between Mediterranean countries. The Strategy is based on the Barcelona Convention⁴⁵ signed by 21 Mediterranean countries, and its main focus is the establishment of international instrument of protection and conservation of the Mediterranean. In time the protection was extended to the coastal area in interaction with the sea, and a series of protocols were adopted as legal instruments of the Barcelona Convention, which the states must include in their national regulations upon adoption and ratification.

One of these protocols is the **Integrated Coastal Zone Management Protocol** (ICZM),⁴⁶ the first international legal document introducing integral management of the coastal zone as an obligation, and which from a multidisciplinary perspective takes into account spatial planning, environmental protection and protection of nature, protection of cultural and architectural heritage and economic activity aimed at sustainable development, particularly in tourism, agriculture and fisheries. The ICZM in the territorial sense focuses on the continental part of coastal local self-government units and the territorial sea.

In the field of physical and spatial planning a series of obligations arising out of the ICZM has already been integrated into the existing legislative framework in the Republic of Croatia. For the purposes of preserving the identity of the coast of the Republic of Croatia and creating conditions for sustainable development of the coastal area, as early as 2004 the Regulation on protected coastal area, development and conservation has been adopted. This Regulation, and subsequently the Act, defines the protected area of special

⁴¹ Marine Strategy Framework Directive – MSFD, 2008

⁴² Framework for Maritime Spatial Planning – FMSP, 2014

⁴³ UN Convention on the Law of the Sea, 1982

⁴⁴ UNEP/MAP-EU, 2005

⁴⁵ *Convention for the Protection of the Mediterranean Sea Against Pollution*, Barcelona 1976; amended in 1995, name changed into *The Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean* (entered into force in 2004)

⁴⁶ Signed in 2008 in Madrid, ratified by the Act on Ratification of the ICZM (OG – IA 8/12 and 2/13), in force since 28th February 2013

FIGURE 1.11.
**CROATIA AND
EUROPEAN
MACROREGIONS**

- EU Strategy for the Danube region
- EU Strategy for the Adriatic-Ionian Region
- EU Strategy for the Danube region / EU Strategy for the Adriatic-Ionian Region

Sources:
EUSDR - www.danube-region.eu
EUSAIR - www.adriatic-ionician.eu



interest for the Republic of Croatia in the zone of land and islands 1000 m from the coastline and the maritime zone 300 m from the coastline (Protected Coastal Area-PCA). The law which is currently in force and regulates the issues of physical planning⁴⁷ extends the PCA on the area of coastal local self-government units (which correspond to the inland border of the coastal zone according to the ICZM) for which basic planning and protection measures have been defined. The PCA specifically defines the restricted area in the zone of land and islands 1000 m from the coastline and maritime zone 300 m from the coastline, with strict measures that include the restriction of economic activities and construction on the coast, conservation of basic natural and cultural features of landscape (particularly in unbuilt areas outside settlements), rationalization of construction areas of settlements, prevention of joining construction areas along the coastline and stricter building requirements.

Territorial cooperation

The European spatial development processes are largely affected by developmen-

tal differences among individual member states that slow down the achievement of the EU's common goals. In order to minimize the differences between different European regions, the funds of European Structural and Investments Funds (ESIF) in the Republic of Croatia for the financial period 2014 – 2020 are used for the implementation of various Programmes of European territorial cooperation, which encourage the exchange of experiences and joint projects on the local, regional and central state level with partners from neighbouring countries and other regions of the EU. The Act on establishing the institutional framework for the implementation of European Structural and Investment Funds in the Republic of Croatia 2014 - 2020⁴⁸ establishes the institutional framework for management and implementation of ESI funds.

Macroregional cooperation

Equal macroregional cooperation is the element of European policy grounded in the basic goals of the EU, that is, economic, social and territorial cooperation. The macroregional approach, based on the bottom up principle, can address the

⁴⁷ Physical Planning Act (OG 153/13)

⁴⁸ OG 92/14

joint developmental challenges facing individual geographic regions and is focused on cooperation between the EU member states and third countries. Initiatives and institutions⁴⁹ related to regional development are accompanied by the preparation of strategic documents that define the areas of cooperation and priorities and can be supported by European structural and investment funds. The implementation of macroregional strategies should be carried out according to the 3NOs principle,⁵⁰ that is, through the existing structures and institutions and without adopting new legal frameworks and instruments.

The Republic of Croatia is involved in the development of the **Strategy for the Danube Region**⁵¹ and the **Strategy for the Adriatic-Ionian Region**.⁵²

These strategies in many aspects overlap with recognized Croatian priority areas within the EU institutions such as economic growth, employment and investments, energy, digital union, strengthening the institutional environment, transport integration and intermodal connecting and conservation of biodiversity, landscape and quality of water, air and soil.

The Danube Strategy

The Danube Strategy encompasses the countries of the Danube river basin with the total population of over 110 million. The basic regional objectives or focuses of cooperation are directed towards mutual connection, conservation of the environment and strengthening the prosperity, institutional capacity and security. The following priorities have been recognized: strengthening the transport mobility and intermodality; stimulating the development of sustainable sources of energy; strengthening cultural cooperation, tourism and human contacts; conservation of water quality; risk management; conservation of biodiversity, landscape and quality of air and soil; increasing the level of knowledge with the help of research activities, education and information technologies; strengthening the competitiveness of entrepreneurship and development of economic clusters; training; strengthening institutional capacity and cooperation and cooperation regarding security issues and elimination of organized crime.

The Republic of Croatia has recognized the following main development priorities

of the Croatian Danube region within the framework of the Danube Strategy:

- connecting the Danube region with the Adriatic coast by strengthening intermodal transport
- strengthening economic competitiveness of the region based on natural resources (modernization of agriculture, diversified forms of tourism) and development of entrepreneurship
- environmental protection, primarily by preventing risks and increasing the share of renewable energy sources
- strengthening human resources.

International Commission for the Protection of the Danube River (ICPDR)

The ICDPR gathers 14 countries and the European Commission for the purposes of protection and preservation of the Danube River. The mission of the ICPDR is to promote and coordinate sustainable and fair water management, which includes the conservation, improvement and rational use of waters for the benefit of all countries of the Danube river basin.

Framework Agreement on the Sava River Basin

The Sava Commission is a joint body of the Republic of Croatia, Republic of Slovenia, Bosnia and Herzegovina and Republic of Serbia, seated in Zagreb and having the international legal capacity necessary for the implementation of the Framework Agreement on the Sava River Basin and achievement of mutually agreed goals:

- establishment of the international navigation regime on the Sava River and its tributaries
- establishment of sustainable water management
- undertaking measures for preventing or mitigating hazards, such as floods, ice risks, droughts and incidents that involve substances harmful for water, as well as reducing or eliminating its harmful effects.

The Adriatic-Ionian Strategy

The Adriatic-Ionian Strategy is the extension of the Adriatic-Ionian Initiative from 2000, and, in accordance with the Barcelona Convention, which regulates the broad multilateral cooperation in management of the coastal zone in the Mediterranean, promotes regional cooperation on the protection of the Adriatic region. This is the first macroregional strategy with a large share of non-EU countries (Albania, Bosnia and Herzegovina, Mon-

⁴⁹ South-East European Cooperation Process (SEECPP), Regional Cooperation Council (RCC), Central European Initiative (CEI), Adriatic-Ionian Initiative (All), Alps-Adriatic Working Community, Disaster Preparedness and Prevention Initiative for South Eastern Europe, Danube commission, Sava commission

⁵⁰ NO to new institutions, NO to new sources of funding, NO to new legislature

⁵¹ Danube Strategy (EUSDR), European Council, 2011

⁵² Adriatic-Ionian Strategy (EUSAIR), European Commission, 2014

The Republic of Croatia is involved in the development of the Strategy for the Danube Region and the Strategy for the Adriatic-Ionian Region

UN Programmes in the Republic of Croatia related to spatial development: UNDP and UNEP with the MAP

tenegro and Serbia) that cooperate with member states (Croatia, Greece, Italy and Slovenia), and encompasses a geographical region on the coasts of the Adriatic and Ionian Seas, with more than 70 million inhabitants. Macroregional cooperation opens up the possibility of realization of development potentials of this region, which currently shows significant inequality of development – from employment, GDP and infrastructure to degree of conservation of environment, with a marked vulnerability of the region to earthquakes and climate change (droughts, floods, erosions and forest fires). The Strategy promotes economic growth and development of the region by increasing its attractiveness, competitiveness and connectivity while protecting the marine and land environment and ecosystem.

The basic pillars of the Adriatic-Ionian Strategy:

- Blue Growth
- Connecting the Region
- Environmental Quality
- Sustainable Tourism

are a result of acknowledgment of main common problems of the countries of the Adriatic and Ionian region: overfishing, transport overload, lack of transport connections and seasonal character of tourism. The Adriatic-Ionian Strategy integrates the Maritime Strategy for the Adriatic and Ionian Seas,⁵³ focused on blue economy, healthier marine environment, safer maritime zone and responsible fisheries.

The Transnational Initiative Baltics – Adriatic – Black Sea

The goal of the initiative, as a new form of cooperation between the European countries on the North-South axis, is to identify and promote cooperation, both on the political level and in a series of sectors such as the economy, energy, transport, environmental protection, culture and identity and other common issues. In the context of spatial development, the transport and energy aspects of the initiative are of special significance, particularly in terms of strengthening the strategic position of Croatian ports. Due to similar historical and economic circumstances, future cooperation should be directed towards other common issues: development of small and larger towns, survival of rural areas, and mitigation of the depopulation processes.

Multilateral relations

The United Nations (UN)

At the UN Conference on Sustainable Development, held in 2012 in Rio de Janeiro, the framework for elimination of poverty and promotion of sustainable development from 2000⁵⁴ through balancing the economic, social and environmental component has been revised and extended. The future Sustainable Development Goals for the period after 2015 have been defined, whose priority areas refer to solving global issues such as poverty, inequality, health, food safety, education, gender equality, water, sustainable energy, decent work, inclusive and sustainable growth, sustainable consumption and production, biological diversity, degradation of land, sea and oceans and the issue of rights and building peaceful societies.

The UN programmes and offices in the Republic of Croatia closely related to spatial development and planning are the UN Development Programme (**UNDP**) and UN Environmental Programme (**UNEP**), that is, the Mediterranean Action Plan (**MAP**) founded in 1975 within the UNEP, UNISDR (UN Office for Disaster Risk Reduction).

The North Atlantic Treaty Organization (NATO)


The Republic of Croatia became the member of NATO on 1st April 2009, taking over specific international responsibilities and obligations that affect special purpose planning.

⁵³ European Commission, 2012

⁵⁴ Millennium Development Goals (MDG) by 2015, Millennium Declaration, UN political document for the 21st century, September 2000

2. Current state and trends





The analysis of the current state and trends as a starting point for determining the concept, priorities and strategic directions of spatial development is based on the Territorial Monitoring Report of the Republic of Croatia 2008 — 2012, thematic expert bases, recent sectoral documents, submitted data of public administration bodies and remarks and suggestions given in the course of public consultation.

2.1. Population basis

¹ University of Zagreb,
Faculty of Economics
and Business, 2014

The demographic status of Croatia in the last 15 years, as a continuation of earlier trends, is characterized by¹ the decrease in the total number of population, continuous natural population decline, that is, higher number of deaths compared to live births, increased ageing of population and an imbalance in the age structure of population, continuous increase of life expectancy at birth. In this period, only the net migration value was positive, but in 2009 it became negative.

2.1.1. Demographic dynamics

By comparing the basic demographic indicators with other EU countries, in the period 2008-2012, Croatia had a negative population growth, negative net migration value, and a decline in the total population, and belongs to a group of only five countries in the EU with a simultaneous population decline and negative net migration value in the said period. Consequently, even a moderate fertility rate increase cannot stop further population decline in Croatia over the coming decades.

According to the most recent 2011 Census of Population, Households and Dwellings (2011 Census), there were 4,284,889 people living on the territory of the Republic of Croatia. Compared to the 2001 Census, the number of inhabitants decreased by 152,571, or an index of 96,56.

The analysis by counties shows that only four out of a total of twenty-one counties experience population increase: Zadar County (index 104,92), Zagreb County (index 102,55), City of Zagreb (index 101,40) and Istria County (index 100,83). The largest population decline was recorded in Vukovar-Srijem County (index 87,67).

The number of inhabitants decreased in most of the counties as compared to 1998, with a marked negative population growth. From 1998 to the end of 2013, only seven counties experienced a pos-

itive sum of population growth and net migrations: all the counties along the Adriatic coast, except for Primorje-Gorski kotar County, and the City of Zagreb and Zagreb County. In the relative sense, the largest population increase, more than 10% of total population, was recorded in Zagreb and Zadar Counties. Overall depopulation, losing more than 10 % of population, most affected Lika-Senj, Sisak-Moslavina, Karlovac, Bjelovar-Bilogora and Virovitica-Podravina County. These are also economically most underdeveloped counties in which the population growth has been negative for many years.

The basic determinants of population dynamics are population growth, natural population change and migration, spatial mobility of population, as a result of natural and social spatial factors.

The analysis of natural population change on the territory of Croatia in 2015² shows a negative natural population growth (-16,702), in that there were 37,503 live births and 54,205 deaths. No county on the territory of Croatia had a positive population growth that year. The highest negative population growth was recorded in Osijek-Baranja County (-1,557), followed by Primorje-Gorski kotar (-1,440) and Sisak-Moslavina County (-1,348). The lowest negative population growth was recorded in Međimurje County (-26) and Dubrovnik-Neretva County (-62).

² CBS, Natural
Population Change in
the Republic of Croatia,
2015

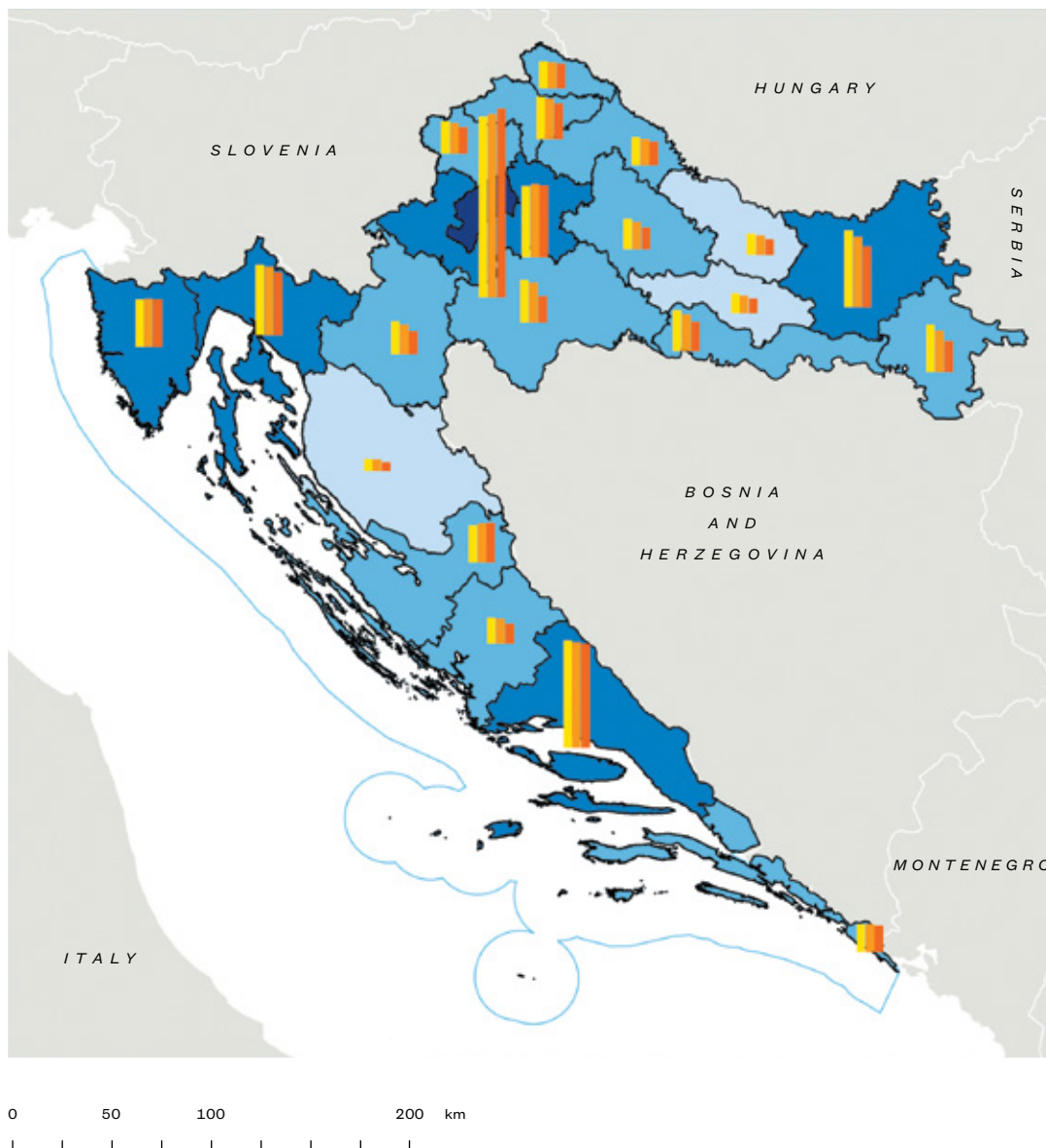


FIGURE 2.1.
**POPULATION
CHANGE 2001–2011
AND PROJECTIONS
TO 2030**

up to 100,000
 100,000—200,000
 200,000—500,000
 more than 500,000
 population 2001
 population 2011
 population 2030
 (projection)

Sources:
 CBS, Census 31st March 2001,
 Census 31st March 2011
 University of Zagreb, Faculty of
 Economics and Business, 2014,
 expert basis

Today, as in the past few decades, the birth rate in Croatia is so low that without immigration, the decline in the number of inhabitants is inevitable.

In many counties, migrations have a stronger effect on the number and structure of population than the difference between live births and deaths. From 1998 to 2013, the negative population growth in Croatia was almost compensated by the positive net migration value. In the observed period, ten counties and the City of Zagreb had a positive net migration value, headed by Zagreb County and Zadar County, where the positive net migrations accounted for almost 15% of the total population in 1998. At the same time, due to a negative net migration value, Vukovar-Srijem and Požega-Slavonia County lost about 5% of their population. The Zagreb, Istria and Šibenik-Knin Coun-

ties, despite a natural population decline, have not experienced a total population decline precisely because of migration.

The population growth zones in some Croatian counties are generally fuelled by migrations, which will become even more noticeable in the future, particularly if they experience an increase in the number of inhabitants.

The migration stock in Croatia regarded as the share of immigrated population in the county (from another county or from abroad) is moderate and amounts to 30.5%. An above-average share of immigrants has been recorded in the City of Zagreb (46.7%) and Zagreb County (40.8%), and the lowest share of immigrants in population have been recorded in the Međimurje County (12.9%), Krapina-Zagorje County (13.7%) and Varaždin County (14.8%).

Croatia belongs to a group of only five EU countries with simultaneous population decline and negative net migration value

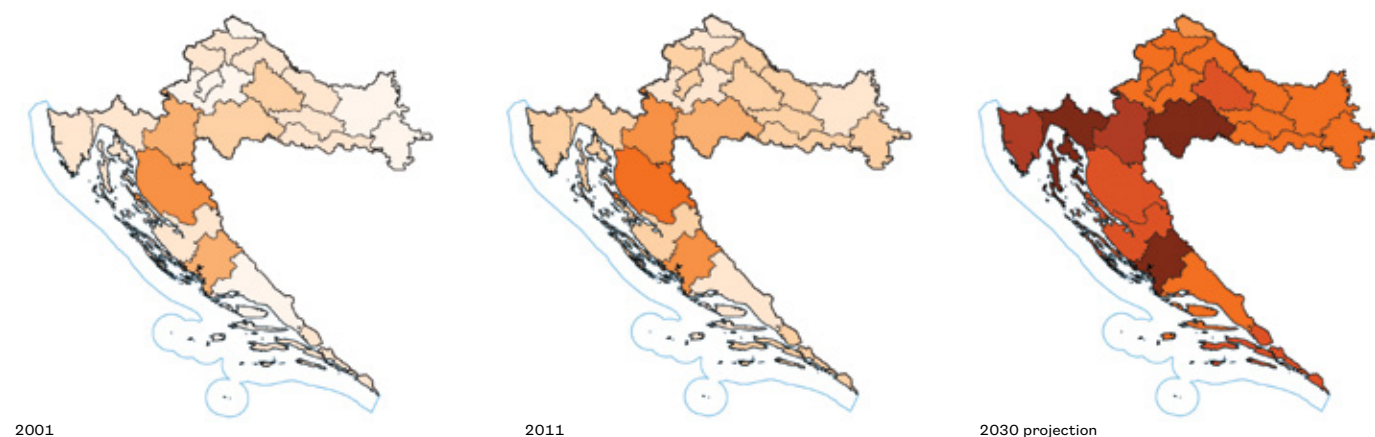
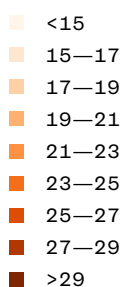


FIGURE 2.2.
**SHARE OF
POPULATION
AGED
ABOVE 65**



Sources:
CBS, Census 31st March 2001,
Census 31st March 2011
University of Zagreb, Faculty of
Economics and Business, 2014,
expert basis

2.1.2. Demographic structures

Population ageing

Demographic ageing of population has been present for years, with a tendency to increase. The number of youth is decreasing, and the number of old people is increasing and will further increase in the future.

The speed and tempo of ageing, as well as the extension of life span in Croatia is illustrated by the fact that from 2001 to 2014 the number of the oldest group of old people (80 and above) has almost doubled, from 98,802 to 189,923 inhabitants.

According to most demographic indicators of ageing, Croatian population is among 10 to 15 demographically oldest in the world. According to the 2011 Census, the territory of the Republic of Croatia is populated by old population, that is, population of advanced old age with the ageing index of 115.0%.

At the regional level, in three Croatian counties, the share of old people (65+) has already exceeded 20%: Lika-Senj, Karlovac and Šibenik-Knin Counties. The lowest share of old people in the total population is found in Međimurje, Zagreb and Split-Dalmatia Counties.

The lowest share of children under 15 years of age in the total population is found in Primorje-Gorski kotar, Istria and Karlovac Counties. The reason is a lower fertility rate, but also an above-average life expectancy in these counties. The highest share of children in the total population is found in Brod-Posavina and Vukovar-Srijem Counties, as a result of higher fertility rates and lower life expectancy.

The ageing index, the ratio of old people (65+) and young people (0- 14) is one of the best indicators of ageing because it is most sensitive to difference or changes in the age structure of a population. How fast the population is aging in Croatia is also evident from the fact that in the 2001 Census, most counties, 14 of them, had more young people than old people in the total population, and only a decade later, in 2011, only the Zagreb and Međimurje Counties had less old people than young people in the total population. On the other hand, 50 and more percent of old people than young people in the total population is found in the Primorje-Gorski kotar, Šibenik-Knin, Karlovac and especially Lika-Senj Counties, where it amounts to more than 80%.

Human resources

With around 20% of highly educated population aged 25 to 64 according to the 2011 Census, Croatia falls behind the EU average of around 27%. More than half of Croatian counties have less than 15% of population in that age group with tertiary level of education, and the lowest share is found in Virovitica-Podravina County (10.4%). At the same time, only four counties have a share of highly educated people above the national average: Primorje-Gorski kotar (24.2%), Dubrovnik-Neretva (23.8%) and Split – Dalmatia (22,5%) Counties and especially the City of Zagreb, which exceeds the EU average with 35 % of population.

With regards to the share of the employed in the total population, according to the 2011 Census, the counties in the north-west and west of Croatia have a higher share, particularly the City of Zagreb (47.8%), Istria (46%) and Zagreb (45,8%) Counties. On the other hand, in

20%
**population
with tertiary
education (EU
average: 27%)**

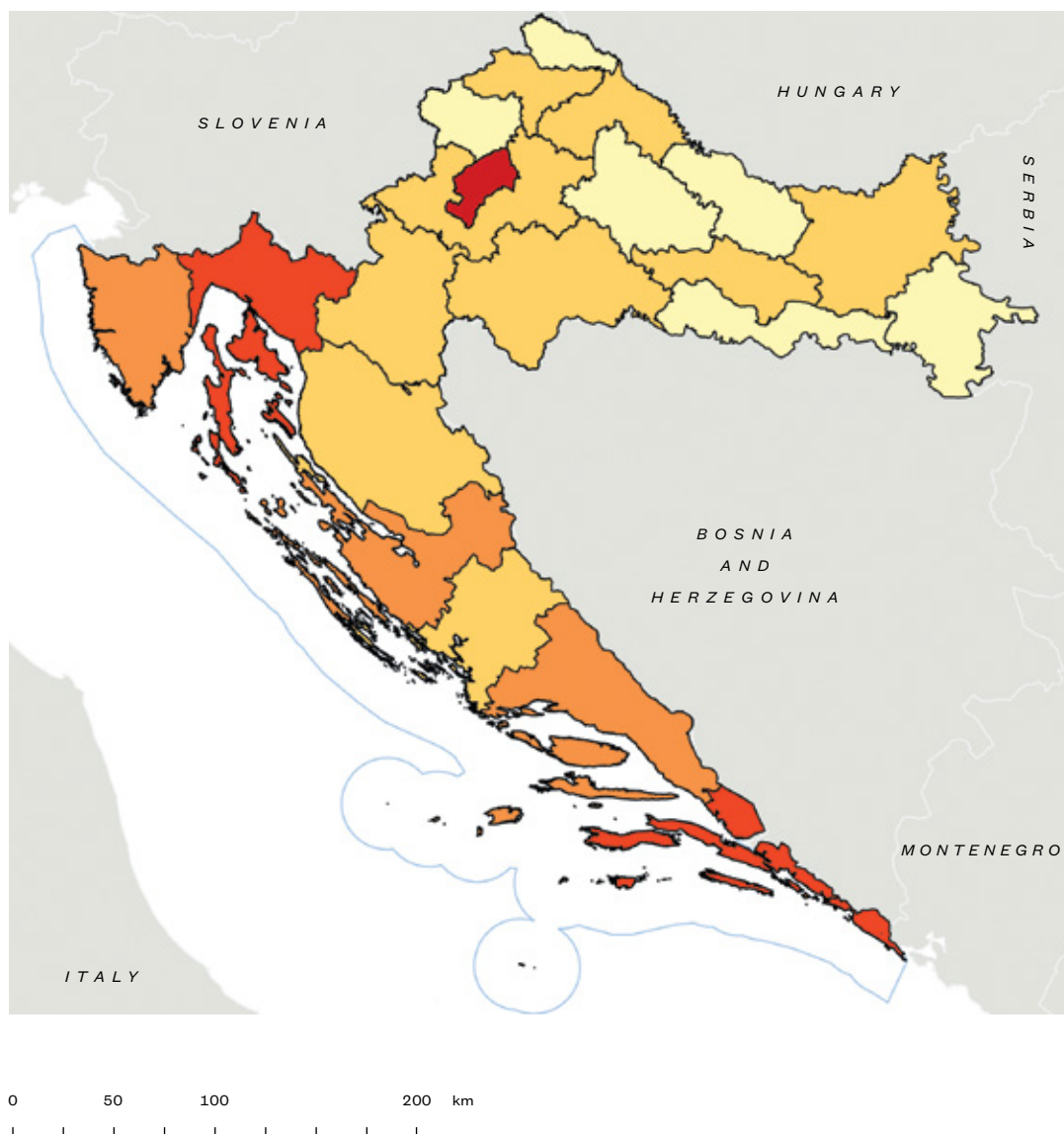


FIGURE 2.3.
**SHARE OF
POPULATION
AGED 25-65
WITH COMPLETED
TERTIARY
EDUCATION**

- > 28% (1)
- 23—28% (2)
- 18—23% (3)
- 13—18% (9)
- < 13% (6)

Source: CBS, Census 31st
March 2011

the Brod-Posavina and Vukovar-Srijem Counties, less than a third of the total population are employed.

2.1.3. Demographic projections

It is very likely that the population will fall to 4,000,000 by year 2030. The probability for this projection is very high, and the optimistic scenario is the stagnation at the population numbers from 2013. This would be feasible only in the event of a significant immigration – 350,000 more immigrants than emigrants in that period or less positive net migrations with significant fertility rate increase. Both variants are highly unlikely, and a decrease in the number of inhabitants is the most likely scenario.

Not all large age groups will experience a decline by 2030 – the increase by more than 200,000 inhabitants is expected for the old segment of the population (65+).

All older age groups will increase in number, some significantly, particularly the advanced old age group (80+). Children (0 – 14) and the working-age population (15-64) will decrease by around 125,000 and 425,000 inhabitants respectively. The highest decline by 2030 will be experienced by young age groups within the working-age population – in their twenties and thirties.

The highest absolute decline will be experienced by age groups 25 – 29, by more than 75,000 people. For the age group 30-34, even a highest decline is possible if negative economic trends continue and the young population emigrates abroad in large numbers; a population increase in these age groups is highly unlikely. The decline in the total population is highly probable in all counties except the City of Zagreb, which will experience a mild increase in total population, whereas stagnation or mild decline is expected in Zadar,

**The population
is expected to
decrease to less
than 4,000,000
by year 2030**

Split-Dalmatia, Istria and Zagreb Counties. The highest decline in the total population, more than 30%, could be recorded in the Sisak-Moslavina County, and more than 20% in Vukovar-Srijem and Karlovac Counties. There will be twice more old people (65+) than children (0 – 14) in Primorje-Gorski kotar (ageing index 269.8), Sisak-Moslavina (261.8), Karlovac (250.2), Istria (243.9), Šibenik-Knin (232.7) and Liika-Senj Counties (205.4).

2.2. Spatial organization

2.2.1. Administrative and territorial structure

Counties are regional self-government units, whereas municipalities and cities are local self-government units.³ The City of Zagreb, as the capital, is a separate and single territorial and administrative unit.⁴

The city is defined as a local self-government unit which is the seat of county bodies, that is, as a unit with more than 10,000 inhabitants, and represents an urban, historical, natural, economic and social unit. Apart from city districts, the city may include suburban settlements, which together represent a natural, economic and social units connected by daily migrations and need of inhabitants of local significance. Also, regardless of these conditions, a place may be proclaimed a city due to special historical, economic and geographical and transport reasons.⁵ A municipality is a unit of local self-government which is as a rule established for an area of several settlements representing a natural, economic and social unit and connected by common interests of the population. Forming of new local self-government units is possible by voluntary joining of several local self-government units.⁶

At the regional level, the territory of Croatia is administratively divided into 20 counties and the City of Zagreb, which has the status of a county, and at the local level, into the City of Zagreb, 127 cities and 428 municipalities.⁷

In the City of Zagreb, 20 cities which are county seats and the remaining 107 cities, there is a total of 2,232,934 or 52.11% of the population. Out of a total of 6,756 settlements, 2,670 (39.52%) of them are urban and suburban settlements. The largest surface area of the city territory of 967.02 km² is found in Gospić, and the smallest in Kastav, 11.44 km². The cities as local self-government units cover 38.39% of the land territory of Croatia, while administrative seats cover only 5.43% of land territory of Croatia. The surface areas of all urban settlements are smaller than 100 km², except for Zagreb, whose surface area is 305.94 km².⁸

Within the spatial planning system, the territorial structure of cities and municipalities compared to the size of statistical surface areas is not optimal. Due to the number of local self-government units in Croatia and the total number of spatial plans, it is clear that meeting stipulated requirements is a problem in terms of organization, staff and finances.

2.2.2. Social infrastructure

Social infrastructure belongs to a group of central functions of a settlement and represents its backbone. The development of social infrastructure, that is, its structure, distribution and dimensions must be in line with the development and distribution of population, and upgrade and improve the standard and quality of living. The central functions must follow the planned social and economic development but are first of all the precondition for a balanced spatial development.

Since most institutions of social activities are developed within settlements, their systematization, development and hierarchical structure are closely related to the level of consideration of the development of the system of central settlements.

Social activities, as activities of public interest, can be classified into several basic groups of central functions according to their main properties: administration, judiciary, pre-school, primary and secondary education, higher education, science and technology, and culture, healthcare, social welfare, sport, citizens' associations, political parties, religious communities and other organizations.

The system of central settlements, and their social infrastructure network, ensure the availability of services for the population, which directly affects the stability of population and homogeneity of an area, and is a prerequisite for its economic and spatial development.

Necessary functions for settlements at the lowest level of centrality are a local administration office, primary school, pri-

³ Act on Territories of Counties, Cities and Municipalities in the Republic of Croatia (OG 86/06, 125/06, 16/07, 95/08, 46/10, 145/10, 37/13, 44/13, 45/13, 110/15)

⁴ Act on the City of Zagreb (OG 62/01, 125/08, 36/09, 119/14)

⁵ Act on Local and Regional Self-government (OG 33/01, 60/01, 129/05, 109/07, 125/08, 36/09, 36/09, 150/11, 144/12, 19/13, 137/15)

⁶ Act on Territories of Counties, Cities and Municipalities in the Republic of Croatia (OG 86/06, 125/06, 16/07, 95/08, 46/10, 145/10, 37/13, 44/13, 45/13, 110/15)

⁷ Central Register of Spatial Units, November 2014

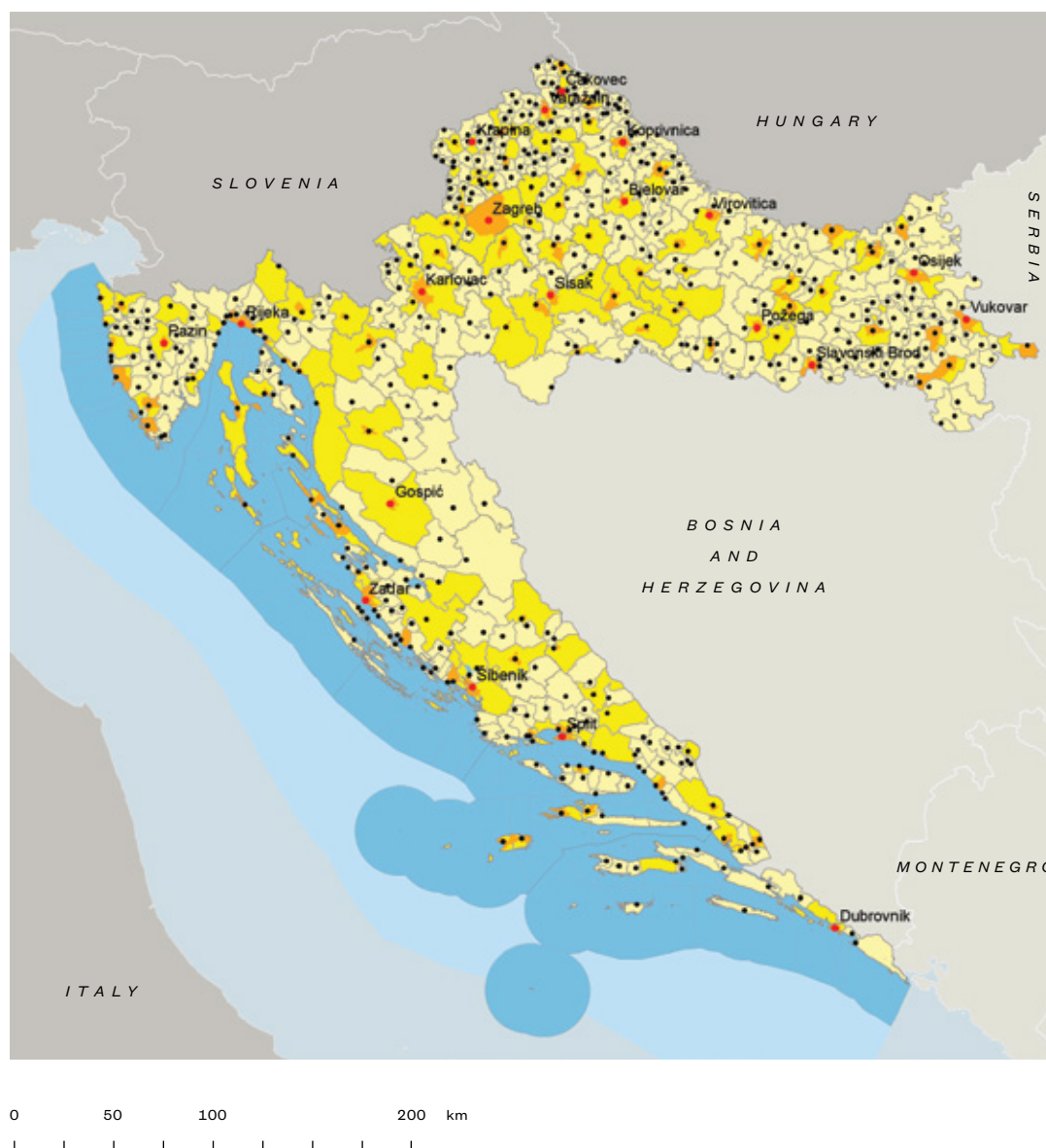
⁸ CBS, Census of Population, Households and Dwellings, 2011, TMR and Central Register of Spatial Units, November 2014

FIGURE 2.4.

ADMINISTRATIVE AND TERRITORIAL STRUCTURE

- County seat
- Municipality/urban centre
- Urban settlements
- City
- Municipality

Source: SGA, 2014, Central register of spatial units



⁹ M. Vresk: *Osnove urbane geografije (Urban Geography Basics)*, Zagreb, 1990

*mary health care outpatient clinic, post office and a store.*⁹

Systematic education of children and youth is carried out in the Republic of Croatia from pre-school age until the completion of secondary education. Pre-school programmes are obligatory for all children a year before starting primary school.

The plan of the network of kindergartens, where pre-school education is provided, is adopted for their areas by representative bodies of local and regional self-government units, which must ensure the implementation of the pre-school programme for children who do not attend kindergarten. The network of kindergartens must meet the requirements of availability and rational structure of kindergartens and programmes for pre-school children in accordance with their needs and abilities.

The network of school institutions, which includes all institutions that perform the

activity of education, is structured in such a way that it meets the specified needs of the labour market, identified through systematic monitoring and projections of demographic, economic and urbanistic development in the area, meets the requirements of availability and rational structure of admission areas, that is, school institutions and programmes of education and fulfils the conditions and criteria stipulated by national pedagogic standards. Availability means the possibility of regular education to every child obliged to attend primary education in a primary school, another authorized institution or school facility, with adequate distance from their place of residence and transport connectivity which does not affect the safety of pupils and the possibil-

City of Zagreb
127 cities
428 municipalities

	Local primary schools	Branch schools	Primary schools total	Post office	Pharmacy	Primary health care outpatient clinic	Dental care outpatient clinic	Bank office
No. of non-urban settlements	439 (890*)	1,219 (1,240*)	1,658 (2,130*)	807	344	655	398	147
Share in the total number of non-urban settlements (%)	6.7	18.7	25.4	12.4	5.3	10.1	6.1	2.3

TABLE 2.1.

**NUMBER AND SHARE OF RURAL AND URBAN
SETTLEMENTS WITH A PRIMARY SCHOOL,
POST OFFICE, PHARMACY, PRIMARY HEALTH**

**CARE AND DENTAL CARE OUTPATIENT CLINIC
AND A BANK**

Source: Institute for Tourism, 2014, expert basis, *Ministry of
Science, Education and Sport, 2015

ity of secondary education to a pupil by using daily transportation or accommodation in a students' home. Establishment of a network of institutions for vocational education particularly takes into account the economic viability and justifiability, existing economic capacity and economic development plans of an area, securing protection of national and local interests and projection of demographic trends in individual areas.¹⁰

In school year 2014/2015, programmes of pre-school education covered a total of 133,764 children in 1,590 units (1,413 kindergartens and 177 other legal entities, such as primary schools, playrooms and other institutions or associations). Compared to school year 2007/2008, when 113,615 children attended programmes of pre-school education in 1,288 units (1,168 kindergartens and 120 other legal entities), the number of pre-school institutions and children¹¹ included in pre-school programmes increased significantly.

Obligatory primary school education is carried out in school year 2014/2015 in 2,130 primary schools: 890 local and 1,240 branch schools or departments attended by 323,195 pupils, which is an increase in the number of schools, but a decrease in the number of pupils compared to school year 2006/2007, where 380,295 pupils attended 2,086 primary schools.

In the school year 2014/2015, there were 456 secondary school with 178,679 students and 58 students' homes with a total of 6,758 beneficiaries.¹²

The network of higher education institutions consists of 8 public universities, 2 private universities, 11 public vocational universities, 4 private vocational universities, 3 public colleges and 22 private colleges. The network extends on the territory of all counties, mostly in county seat. The founding of a larger number of public vocational universities provided the matrix of a polycentric development of higher education.¹³

The network of institutions for culture, information and sport includes libraries, theatres, cinemas, museums, music institutions, open universities, archives, television and radio stations, art organizations, associations of technical culture, network of sport facilities, etc.

The network of healthcare institutions is divided into primary, secondary and tertiary healthcare. Primary healthcare is organized in 49 health centres located in almost all counties, 156 institutions for medical care in all counties, 13 institutions for health care in 6 counties, 1 institution for palliative care and 7 institutions for occupational medicine in 5 counties.¹⁴ Secondary health care is organized in 20 general hospitals located in most of the counties, 24 special hospitals, 3 sanatoria and 372 polyclinics. Tertiary health care consists of five university hospital centres, 2 university hospitals and 5 clinics.¹⁵

As a result of depopulation, Croatia is experiencing a trend of closure of regional primary schools or departments, closing of primary health care outpatient clinics and post offices. Only slightly less than

¹⁰ Act on Education in Primary and Secondary School (OG 87/08, 86/09, 92/10, 105/10, 90/11, 5/12, 16/12, 86/12, 126/12, 94/13, 152/14, 7/17), Vocational Education Act (OG 30/09, 24/10, 22/13)

¹¹ Statistical release ISSN 1330-0350, Croatian Bureau of Statistics, Zagreb, 2015

¹² Statistical release ISSN 1330-0350, Croatian Bureau of Statistics, Zagreb, 2015

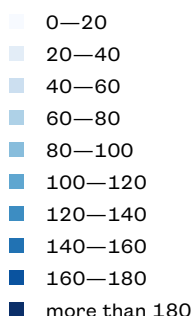
¹³ Network of Higher Education Institutions and Study Programmes in the Republic of Croatia, strategic document adopted by the Parliament on 28th October 2011

¹⁴ Data of 31st December 2011

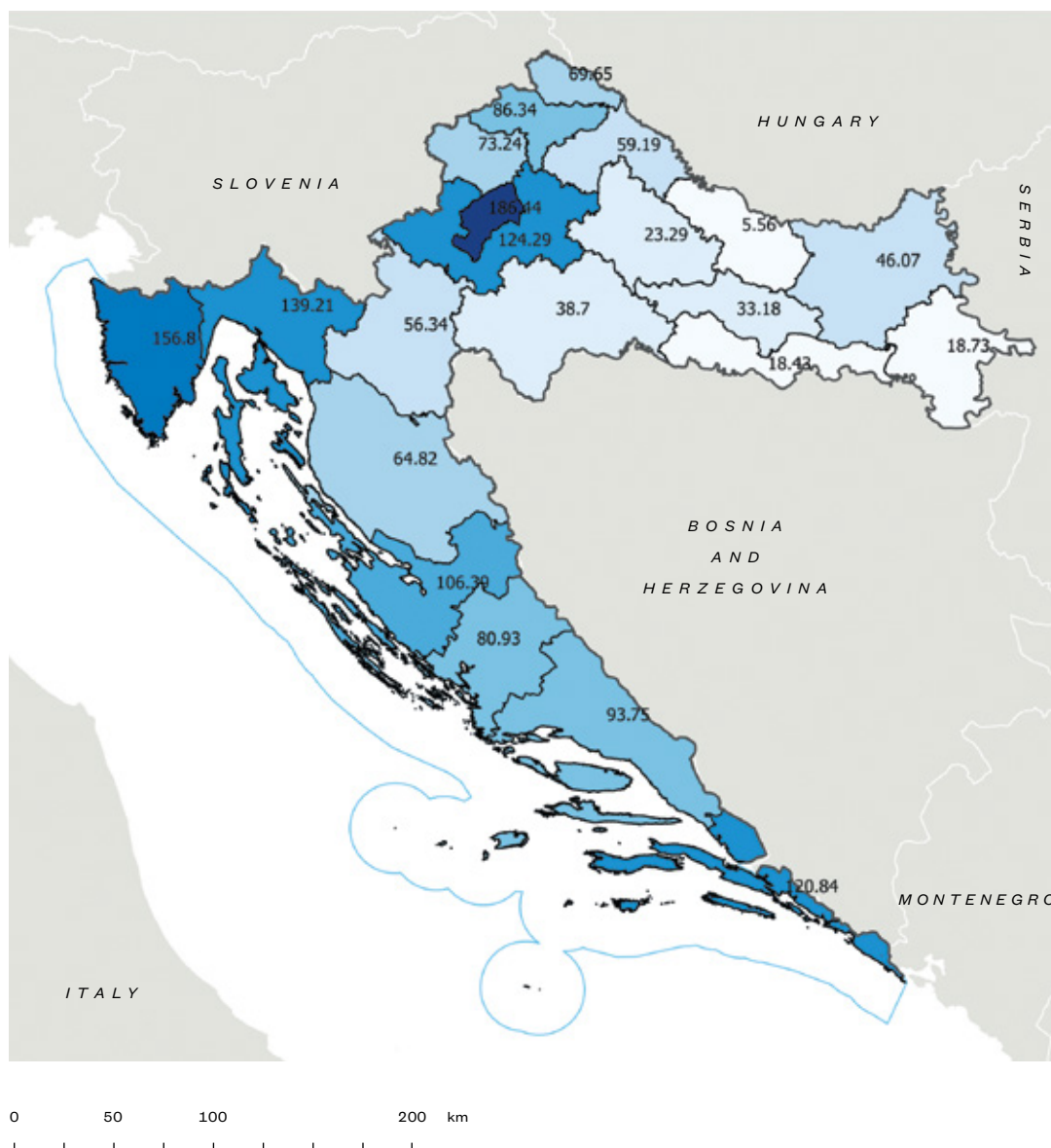
¹⁵ MH, December 2016

FIGURE 2.5.

COUNTY DEVELOPMENT INDEX



Source: MRDEUF, 2013, Values of the development index and indicators for the calculation of the development index at the local level



20% of settlements still have at least one of these functions: primary health care outpatient clinic, school or post. The remaining 70.9% of settlements have none of these functions.¹⁶

¹⁶ Institute for Tourism, 2014, expert basis

2.2.3. Regional disparities

Unequal regional development is the result of interaction of natural and geographical conditions and historical circumstances, and more recently, unfavourable demographic trends.

On the territory of the Republic of Croatia there are great regional disparities in terms of the structure of population, functional development and level of regional development according to the development index, competitiveness index, GDP, etc.

Croatia is regionally unequally urbanized. Coastal macroregions are above-average urbanized, particularly around Split and Rijeka. This is the result of migration from the hinterland and islands to cities, as well as a high population growth in the first and partially second generation of migrants. Migrations are, on one hand, motivated by relatively unfavourable natural conditions (lack of agricultural land and other resources), and on the other hand, by agrarian overpopulation of rural areas in the hinterland and on the islands, but also an attractiveness of the coast with cities, which is subject to littorization.

Macroregions in the continental part of Croatia have different characteristics and are less urbanized. Large agricultural areas in the city surroundings and possibilities of exploitation lead to longer and stronger continuation of agricultural



FIGURE 2.6.
**SYSTEM OF
SETTLEMENTS,
DEVELOPMENT AND
PROBLEM AREAS**

- Urban agglomerations of macroregional centres
- Stronger development areas with a well-developed urban system
- Areas affected by development challenges
- Capital
- Macroregional centre
- Regional centre
- Subregional centre
- Regional and local centre

Source: Institute for Tourism, 2014, expert basis

characteristics. The Zagreb microregion is the largest in Croatia. A broad economic base (well-developed production and service industries) stimulated emigration from rural areas and social restructuring of agricultural population, which contributed to the development of Zagreb and other continental cities such as Varaždin, Sisak, Karlovac. The Osijek microregion is traditionally an agricultural region.¹⁷

One of the indicators of regional development is the development index,¹⁸ according to which counties have been classified into four groups. The largest number of counties are in Group I with the lowest development index: Virovitica-Podravina, Brod-Posavina, Vukovar-Srijem, Bjelovar-Bilogora, Požega-Slavonia, Osijek-Baranja, Karlovac, Koprivnica-Križevci, Lika-Senj, Međimurje and Krapina-Zagorje Counties.¹⁹ In Group II are: Šibenik-Knin,

¹⁷ Institute for Tourism, 2014, expert basis

¹⁸ The development index is calculated on the basis of the following indicators: (1) unemployment rate, (2) income per capita, (3) budget income of local or regional self-government units per capita, (4) general population trends and (5) education rate. <http://www.mrrfeu.hr/default.aspx?id=405>, Act on Regional Development of the Republic of Croatia (OG 147/14)

¹⁹ MRDEUF, 27th December 2013

20 NUTS 2 level division of regions according to EUROSTAT

21 Institute for Tourism, 2014, expert basis

22 National Programme of Reconstruction and Development for determining the criteria and coverage at the level of spatial plans of counties and the Spatial Programme of Reconstruction and Development of Settlements for determining the measures and interventions in existing spatial plans of local self-government units (at the level of settlements)

23 Reconstruction Act (OG 24/96, 54/96, 87/96, 57/00, 38/09, 45/11, 51/13)
Programme for the Return and Accommodation of Displaced Persons, Refugees and Resettled Persons (OG 92/98)
National Programme of Development of Islands (passed in the Parliament on 28th February 1997)
Island Act (OG 34/99, 149/99, 32/02, 33/06)
Act on Mountainous Areas (OG 12/02, 32/02, 117/03, 42/05, 90/05, 80/08, 148/13, 147/14)
Act on Humanitarian Demining (OG 153/05, 63/07, 152/08)
National Programme of Mine Action 2009- 2019 (OG 120/09)
Act on Areas of Special State Concern (OG 86/08, 57/11, 51/13, 148/13, 76/14, 147/14, 18/15)
Law on Agriculture and Rural Development (OG 80/13, 41/14, 107/14, 30/15)
– not initiated by the 1997 Strategy / 1999 Programme

Varaždin and Split-Dalmatia Counties. Group III are Zadar, Dubrovnik-Neretva and Zagreb Counties. The best indicators of the development index are found in Primorje-Gorski kotar, Istria Counties, and the City of Zagreb, which are in Group IV.

The connection between spatial distribution and the development index shows that, except for Zagreb and Varaždin Counties and the City of Zagreb, developed counties can be found in the Adriatic region of Croatia.²⁰

Economic and demographic indicators point to the long-term most negative effects on space in Virovitica-Podravina, Požega-Slavonia and Brod-Posavina Counties and in parts of Sisak-Moslavina, Lika-Senj, Karlovac and Bjelovar-Bilogora Counties.²¹ Eastern Croatia (Slavonia, Baranja and West Srijem), as a region with the largest share of settlements affected by depopulation (84.9%), along with demographic decline of Osijek and its surrounding area and unfavourable economic trends, points to a marked regression of this part of Croatia. On the other hand, Zadar with its hinterland represents a larger continuous zone with positive changes, which indicates a growing significance of this city as a regional centre.

2.2.4. Areas with development specificities

With regards to limited development, the following problem areas have been identified: war-torn areas, areas near the state border, rural areas and villages, mountain rural areas, islands.

The basic characteristic of these areas is the ambivalence of their low development index and highly valuable, but underutilized potentials and resources. The main reasons for developmental difficulties are recognized in the interaction of negative demographic processes, underdevelopment of the network of settlements, social and transport infrastructure and the economy, as well as a peripheral position in relation to the main directions of development. Within the said areas, there are some differences: local self-government units covered by the Act on Mountainous Areas and local self-government units on islands have a relatively high development index.

Areas with development specificities are highly valuable from the aspect of pres-

ervation of biosphere, as shown by the fact that they contain a large part of preserved nature in Croatia.

The 1997 Strategy defined the need for adoption of strategic documents at the national level on the basis of which the basic elements of physical planning of areas with limited development would be defined in spatial plans on relevant levels.²² Such documents have not been developed, but spatial plans at the regional and local level have been adopted, which covered these issues and provided guidelines to solve them. The implementation of these plans depends on the possibilities for economic growth at the local and national level, and there is a possibility of using EU funds.

The 1999 Programme identified spatial and development priorities for these areas: improved use of built environment, creating conditions for launching economic activities and preservation of population. The proposed measures to achieve these goals refer to construction and/or reconstruction of infrastructural systems, activation of local resources, adequate distribution of functions of settlements, recovery of areas overburdened and threatened by development (tourist areas, illegal building, protected heritage, agricultural areas, forests, areas of exploitation of mineral raw materials, etc). The said priorities and measures are still ongoing.

These areas have been recognized as areas of special national interest and the Programme envisages the development of expert bases and adoption of special regulations on their planning within the framework of special measures for achieving development and rational use and protection of space. Based on the guidelines and goals defined by the Strategy and the Programme, a legislative framework for incentives has been set in order to achieve a more balanced development of all areas of the Republic of Croatia.²³ The category of areas of special state concern has been introduced, in three groups, out of which the first two refer to war-torn areas, and the third is defined according to economic, structural and demographic development criteria.

Efficient application of these regulations, that is, efficient allocation of public finances and implementation of incentives, has been hindered by a lack of uniform criteria and indicators for implementation and

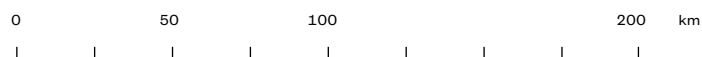
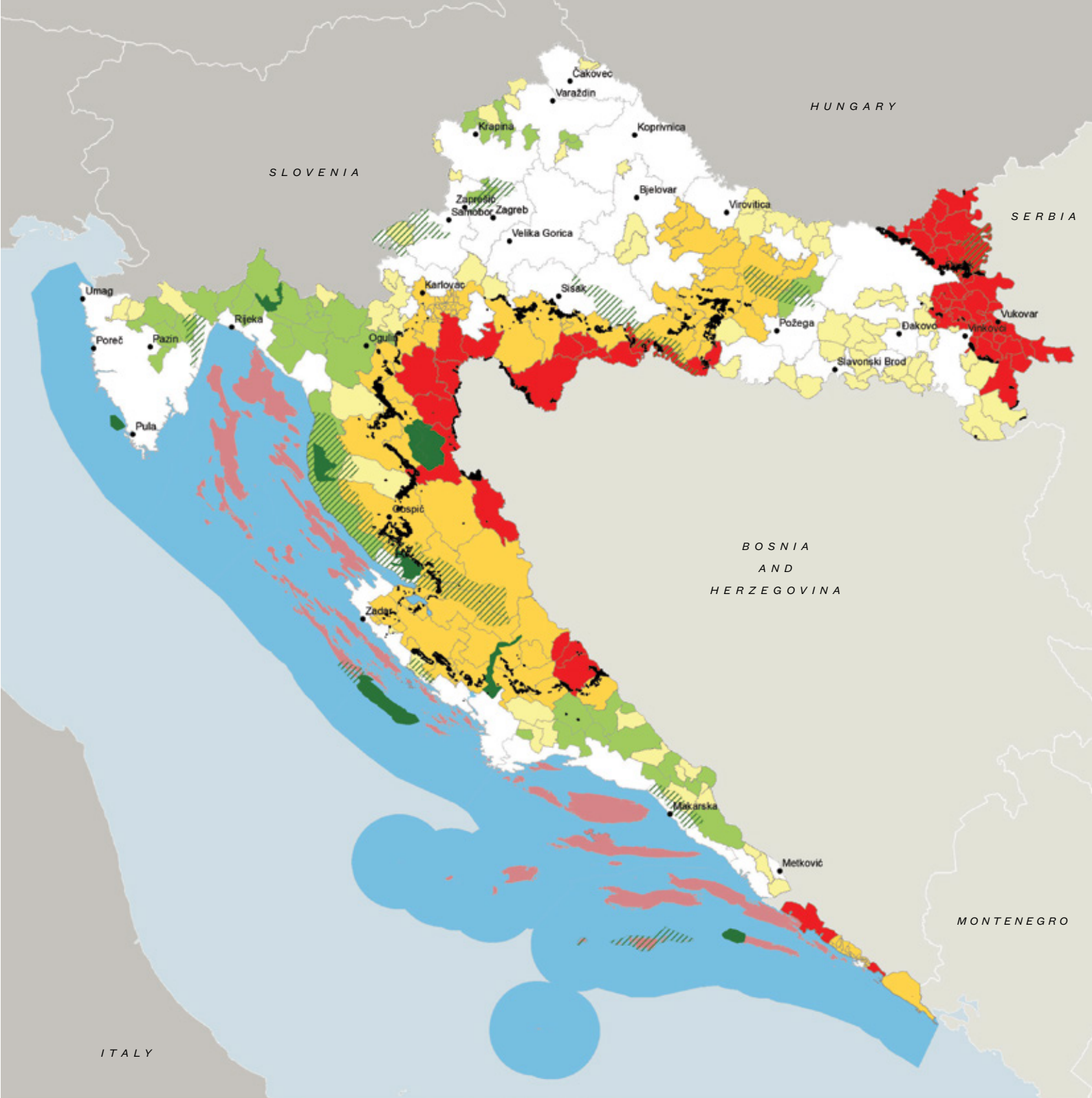


FIGURE 2.8.
**AREAS WITH
DEVELOPMENT
SPECIFICITIES**

- ASSC I
- ASSC II
- ASSC III
- Islands
- HMA areas
- Mine suspected areas
- National parks
- ▨ Nature park

Sources:

Nature Protection Information System of the State Institute for Nature Protection, Act on Mountainous Areas (OG 12/02, 32/02, 117/03, 42/05, 90/05, 80/08, 148/13, 147/14)
Act on Areas of Special State Concern (OG 86/08, 57/11, 51/13, 148/13, 76/14, 18/15)
CMAC, MIS portal

~1,352

**km of the border
will require
adaptation to the
Schengen regime**

monitoring, but also the economic crisis. When reflecting on ways to stimulate sustainable regional development by implementing the regional development policy, these areas have been recognized as poorly developed and/or areas with developmental specifics. The strategic goals for development of these areas have been focused on minimizing regional inequalities through special interventions from the state budget and withdrawal of dedicated funds from EU funds, with simultaneous strengthening of competitiveness of each regional unit.

The basis for efficient allocation of public funds and implementation of incentives is correlation with the development index of local/regional units (for poorly developed areas) and/or development of special territorial development programmes based on exceptional natural, geographic and other characteristics (for areas with development specificities).

Rural areas

Rural areas account for a large part of the territory of Croatia (around 60% according to the Programme), and many villages reflect the former high representation of agricultural population. Today we are faced with the image of abandoned areas and low representation of agricultural population in the total structure of population (around 20%), which is partly result of an incomplete recovery of the war-torn areas during the Homeland War.

In terms of typology, in the north-eastern and northern parts of the country, market oriented agricultural settlements prevail, in the western and south-western parts, settlements of agricultural intensification with low demographic dynamics prevail, and in the hinterland of Primorje and in the central parts along the border with Bosnia and Herzegovina, settlements of rural periphery prevail.²⁴

The Rural Development Strategy of the Republic of Croatia 2008 – 2013 uses the methodology of the Organization for Economic Cooperation and Development (OECD) based on the population density threshold of 150 inhabitants/km² at the local level, which does not examine the differentiation of urban and rural areas in spatial units smaller than local self-government, whereas the draft of the Rural Development Programme 2014-2020, for the purposes of implementation of rural development measures, regards as rural

or mixed areas all local self-government units which belong to predominantly rural or mixed counties (NUTS 3) by separate use of the OECD's methodology. Exceptions are Zagreb, Split, Rijeka and Osijek, where, apart from the agglomeration seats themselves, all settlements that belong to the same administrative unit are regarded as mixed or rural. According to this approach, around 75% of population lives in mixed and rural settlements, which insufficiently differentiates the actual rural area and its contents.

TA 2020 as the new EU spatial planning document aligned with the documents referring to urban development and territorial cohesion sets as its goals new forms of partnership and territorial management between rural and urban areas. Scenarios prepared within the framework of the ESPON programme related to the EU development vision by 2050 predict further rural-urban migrations and continuation of depopulation of rural areas, particularly in Eastern-European countries and remote (peripheral) regions of the EU.

Rural areas are characterized by negative demographic, economic and developmental trends. A large number of small settlements dispersed in a branched, but insufficiently structured and connected network is the cause of a poorer transport accessibility and insufficient infrastructure. These areas are characterized by insufficient capacity for creating top quality and sustainable workplaces, which is why they lag behind urban areas. Almost one fifth of the state territory (18%) is rural periphery with only 1.3% of population and numerous developmental limitations.

Areas along the state border

Areas along the state border are important for national security and defence. Cross-border cooperation of local self-government units in border areas also has an important role in the overall establishment of good-neighbourly relations. The arch-like shape of the territory is a result of the complex geopolitical position and interaction of various factors during historical and geographical development.

Because of this, the Republic of Croatia has a long land border of 2,370.5 km, out of which around 1,100 km are water courses, and more than half of the total length, around 1,352 km, will require adaptation to the Schengen regime, which

²⁴ Institute for
Tourism, 2014,
expert basis



FIGURE 2.7.
**AREAS ALONG THE
STATE BORDER**

- Permanent border crossings for international transport in road traffic
- LSGUs bordering countries
- LSGUs bordering non-EU countries
- Road network
- Motorway
- State road

Sources: SGA, 2014, Central Register of Spatial Units, Regulation on Border Crossings of the Republic of Croatia (OG 79/13), HC, 2014

involves stricter measures of surveillance of outside borders of the EU. The specific character of border regions, particularly those near the border, is affected by the fact that their development depends on stipulated measures for ensuring the inviolability of the state border, but also on circumstances and relations between the Republic of Croatia and neighbouring countries within the international legal regulation of the state border and border regimes. With regards to settlements in border regions, a special problem is the issue of twin cities, cities on rivers towards neighbouring countries and cross-border environmental impact. The border regions have been partly affected by war destruction, which is also the reason for depopulation.

Development measures of thematic national programmes are applied to parts of border regions, for example, for rural

areas, reconstruction of war-torn areas and development of islands and the programme of European territorial cooperation, that is, programme of cross-border cooperation.

Hill-mountainous rural areas

Mountainous areas²⁵ are defined as areas of interest and areas under special protection of the Republic of Croatia. Due to high altitudes, sloping and segmented terrain, working and living conditions are aggravated there. The status of mountainous areas is granted to 12 cities and 33 municipalities in geographical subregions: Gorski kotar, Lika, Banovina, Kordun, Dalmatinska zagora, north-eastern Istria and Hrvatsko zagorje. Incentives refer to demographic reconstruction, economic growth and sustainable development and creating preconditions for resolving social problems and improving the standard of living of the population.

²⁵ Act on Mountainous Areas (OG 12/02, 32/02, 117/03, 42/05, 90/05, 80/08, 148/13, 147/14)

In the context of conditions for development, the specific feature of these areas is a high displacement rate and a rarefied network of settlements with predominantly extremely small settlements with less than 100 inhabitants.

In these areas, significant natural resources are underutilized, primarily forests and pastures. They have combined characteristics of border regions, war-torn areas and rural areas.

War-torn areas

For war-torn areas, measures have been adopted for reconstruction of destroyed or damaged material property and creating conditions for the implementation of the programme of return of displaced persons, refugees and resettled persons. The process of reconstruction and revitalization of these areas, which includes the reconstruction of all segments of development – economic, demographic, housing, infrastructural, social and spatial development, protection of spatial values, reconstruction of cultural identity and recovery of endangered resources is not fully completed.

Mine suspected areas

Mine suspected areas are still a serious problem due to a series of economic, ecological and security issues of the local population and the overall development of the country. According to the estimates of the Croatian Demining Centre CROMAC,²⁶ mine suspected areas extend over 446,00 km² in 9 counties,²⁷ primarily in Lika-Senj, Sisak-Moslavina and Osijek-Baranja Counties. In addition, there is a high concentration of mines on the wider area of large towns which were part of the battlefield: Sisak, Benkovac, Osijek, Petrinja, Pakrac, Lipik and Vinkovci.

The mine suspected areas largely consist of forests (84.3%) and agricultural areas (15.4%).²⁸ Mine contamination hinders the use of forest property in manufacturing industries, as well as the implementation of forest protection measures (for example, fire protection). Also, a large area of arable land in eastern Croatia cannot be utilized for agricultural production, and in almost all counties there are no possibilities for a more efficient development of livestock farming due to a large area of mine contaminated meadows and pastures. In Dalmatia, the mine contaminated areas of macchia and karst are a direct obstacle to the implementation of fire

protection in highly endangered areas, but also for the development of tourism.

2.2.5. Coastal and sea areas

Coastal area is facing an increased concentration of population, consequences of unsystematic development of tourism and the growing need for exploitation of marine resources, and is exposed to the risk of natural disasters, particularly due to climate change and seismological conditions. Also, there is a marked conflict of interest between individual categories of beneficiaries and a lack of an integral developmental approach for this area. The ultimate effect of an increased pressure on space is devastation or permanent loss of valuable natural area and landscape, loss of economic land and marine resources, disturbance and change in biodiversity and ecosystem and pollution of the environment.

The condition of coastal and sea areas is proportional to the sustainability of its use and resistance to natural and anthropogenic impact. The development potential of this area derives mostly from natural values, which is an additional reason for cautious and reasonable use and protection of space. Economic development of the area is primarily related to tourism and recreation, agriculture involving local crops, maritime economic activities – fisheries, aquaculture, exploitation of sea salt and underwater energy and mining resources and coastal industry and ports. Natural vulnerability of these areas is conditioned by geomorphological characteristics of karst, vicinity of the sea and seismic activity. On the other hand, increased risks of anthropogenic impact are related to climate change, pollution of the environment and physical devastation of natural values and landscape.

Development of agriculture in the coastal area stagnated due to investments in industrialization after World War II, political decisions and abrupt development of tourism, which resulted in increased migration of population towards the coast and depopulation of rural areas as well as loss of valuable agricultural land through uncontrolled urbanization. The share of cultivated agricultural land in the Adriatic Croatia in the total cultivated land of the country is only 17%, but the significance and potential for its development lie in exclusive cultivation of

²⁶ State institution founded in 1998, systematically dealing with the issue of demining

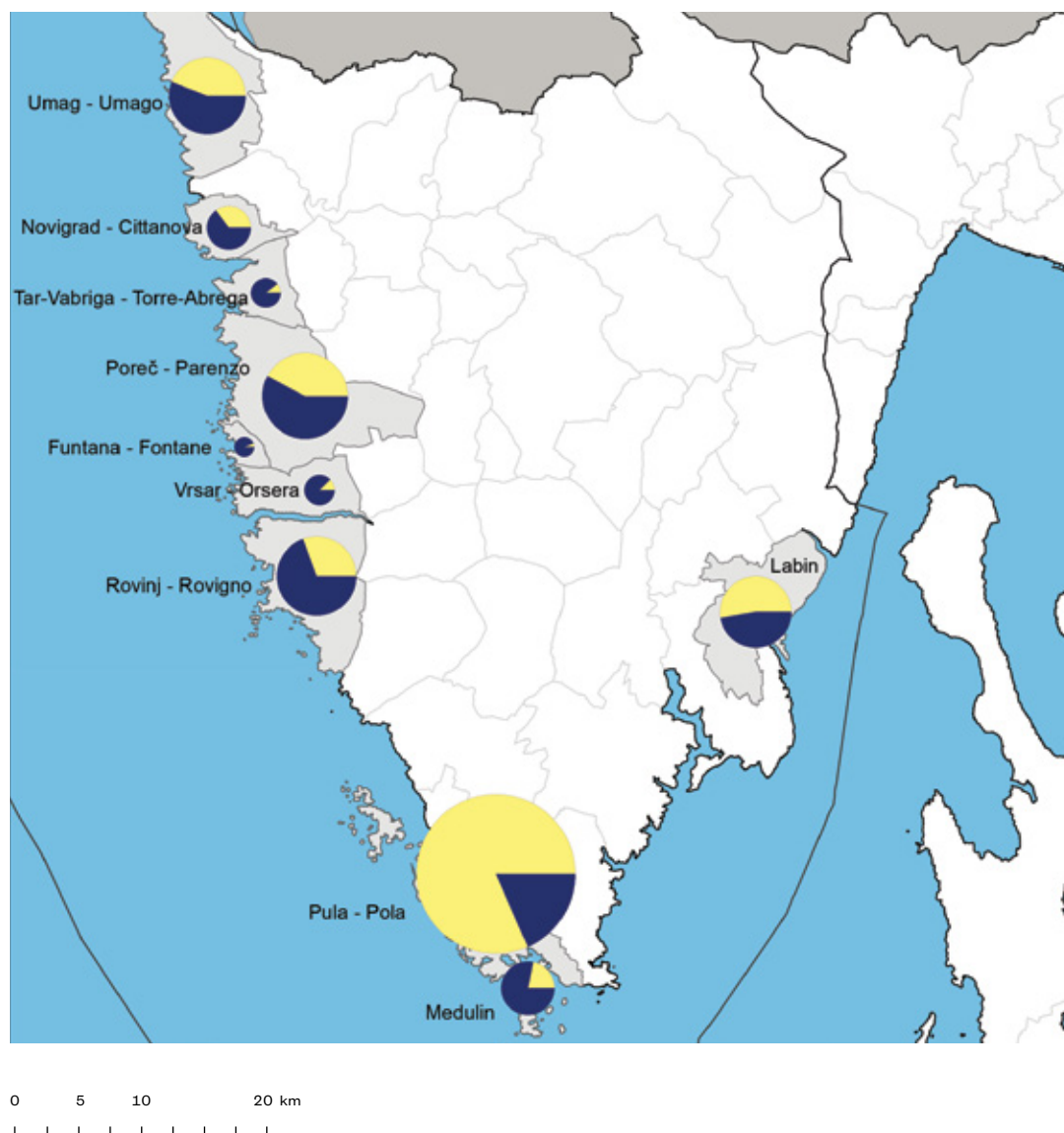
²⁷ Data of the CROMAC, MIS portal 2017

²⁸ Data of the CROMAC submitted for the purposes of preparation of the Strategy

FIGURE 2.9.
**NUMBER OF
AVERAGE DAILY
OVERNIGHT STAYS
OF TOURISTS IN
AUGUST COMPARED
TO THE NUMBER OF
INHABITANTS OF
LSGUs OF
ISTRIA COUNTY**

■ Number of
inhabitants
■ Average daily
overnight stays in
August

Source: CBS, 2012, Tourism –
cumulative data January-
December 2011



local crops (for example, entire production of olives, almonds, citruses and figs in Croatia is located in this area). Some of today's significant consequences of development pressures that affect the physical, biological, economic and social processes are:²⁹

- overbuilding in the coastal area and uncontrolled building along the coastal line
- inadequate and/or illegal building, particularly in the narrow coastal area
- inadequate infrastructure of settlements as well as tourist and recreation zones
- lack of urban and industrial wastewater treatment plants
- decline in seawater quality near cities, ports and tourist zones, including zones of nautical tourism
- usurping maritime domain areas and public coastal areas

- loss of integrity and quality of coastal landscape.

From the perspective of tourism, the largest pressure on space occurs during the main tourist season, particularly in July and August. The problems of extreme seasonal character of tourism are peak pressures on the entire infrastructure which increase the vulnerability of the area to anthropogenic impacts.

A special problem are vacation homes, particularly those connected to the structure and infrastructure of settlements. In addition to mostly inadequate spatial standards, dubious quality of building and design, the regime of use of these buildings leads to difficulties in the functioning of settlements and the local population. Building areas are usually extended by conversion of agricultural and/or forest land, and investors, with their plans for

²⁹ Urbos d.o.o., 2014, expert basis

FIGURE 2.10.
**NUMBER OF
 AVERAGE DAILY
 OVERNIGHT STAYS
 OF TOURISTS IN
 AUGUST COMPARED
 TO THE NUMBER
 OF INHABITANTS IN
 LSGUs OF THE SPLIT-
 DALMATIA COUNTY**

■ Number of
 inhabitants
 ■ Average daily
 overnight stays in
 August

Source: CBS, 2012, Tourism
 – cumulative data January-
 December 2011



building vacation homes, introduce into the local community new relations and development ambitions, as well as identification of public and private interests when planning and interpreting the needs and development goals. The double matrix with different number of users complicates the calculation of capacity and viability of the entire infrastructure, including public services. This also creates the illusion of a statistical increase in the number of inhabitants, providing a false image of demographic revitalization, particularly on islands.

Integrated approach to the development of the coastal area

Current situation in the coastal area is a result of, among other things, a long-standing sectoral approach to development, accompanied by a growing number of strategic documents at the sectoral and local or regional level, without efficient alignment

of interests and operational coordination. Within the system of physical planning, there were prior attempts to create an integral approach. During the period of intensive construction of hotels, workers' resorts, secondary housing buildings, roads along the coast and extension of coastal settlements, which started at the beginning of 1960s, a regional spatial plan – Programme for Long-Term Development and Plan for Physical Planning of the Adriatic Region of Croatia was developed in 1967, as the first spatial planning document that systematically analyses the state and development possibilities of the Adriatic region of Croatia. In that period, the development of projects and plans was started in cooperation with the UN institutions, planning institutions of the Republics of Montenegro, Bosnia and Herzegovina and Slovenia and foreign partner companies: North Adriatic and South Adriatic, with emphasis on the de-



0 50 100 200 km

FIGURE 2.11.
**COASTAL
AREA**

- Protected coastal area*
- Restricted area*
- Restricted area

- Border of Adriatic Croatia**
- Adriatic Croatia**
- Continental Croatia**

Source: *Physical Planning Act (OG 153/13)
**NUTS2 division of regions according to EUROSTAT

velopment of tourism, and Adriatic III, with emphasis on environmental protection. The central focus of these documents was the development of tourism, but also permanent preservation of natural and cultural values on which tourist offer is based and preservation of the narrowest coastal zone, whereby integral planning was defined as the basic expert position.

The integral approach to the development of the coastal area implies active re-integration of the wider hinterland for the purpose of creating a synergic effect of its development potential. In that sense, individual counties have different experiences. In the Istria County, for example, there is a long-standing synergy of development potentials of the inland and coastal areas of the peninsula (supply of coastal settlements with locally cultivated agricultural products and enriching the tourist offer with local gastronomic and wine products, transformation of stanzias dating back to the beginning of 20th c. into recognizable tourist destinations, cultural events in revitalized historical centres of urban and rural settlements, etc.).

On the other hand, in the Primorje-Gorski kotar County, the hinterland (particularly Gorski kotar) is insufficiently connected to the coastal area, especially due to the predominant influence of the City of Rijeka.

An integral development of the coastal area is also connected to defining development priorities within the framework of the EU cohesion policy at the level of NUTS 2 regional division, that is, development strategic directions of 7 coastal counties that make the statistical territorial units of the Adriatic Croatia.³⁰

Planning the sea area

The integral approach to spatial development of the coastal area also implies sustainable planning of the sea area and islands. The sea as a resource is extremely important for Croatia as a maritime country, both in terms of protection of nature and the environment and preservation of biological diversity and the ecosystem and in terms of a large number of diverse activities related to maritime transport, construction of transport and utility infrastructure, tourism and nautical tourism and maritime economic activities and exploitation of marine mineral resources. The pollution of the marine environment is one of the most significant ecological issues of today since every ex-

cessive and uncontrolled activity at sea and influence from the land, for example, discharges of unpurified wastewater, is reflected in disruptions of the ecosystem and damage to natural resources.

Some of the potentially most important effects of an unplanned development of the sea are:

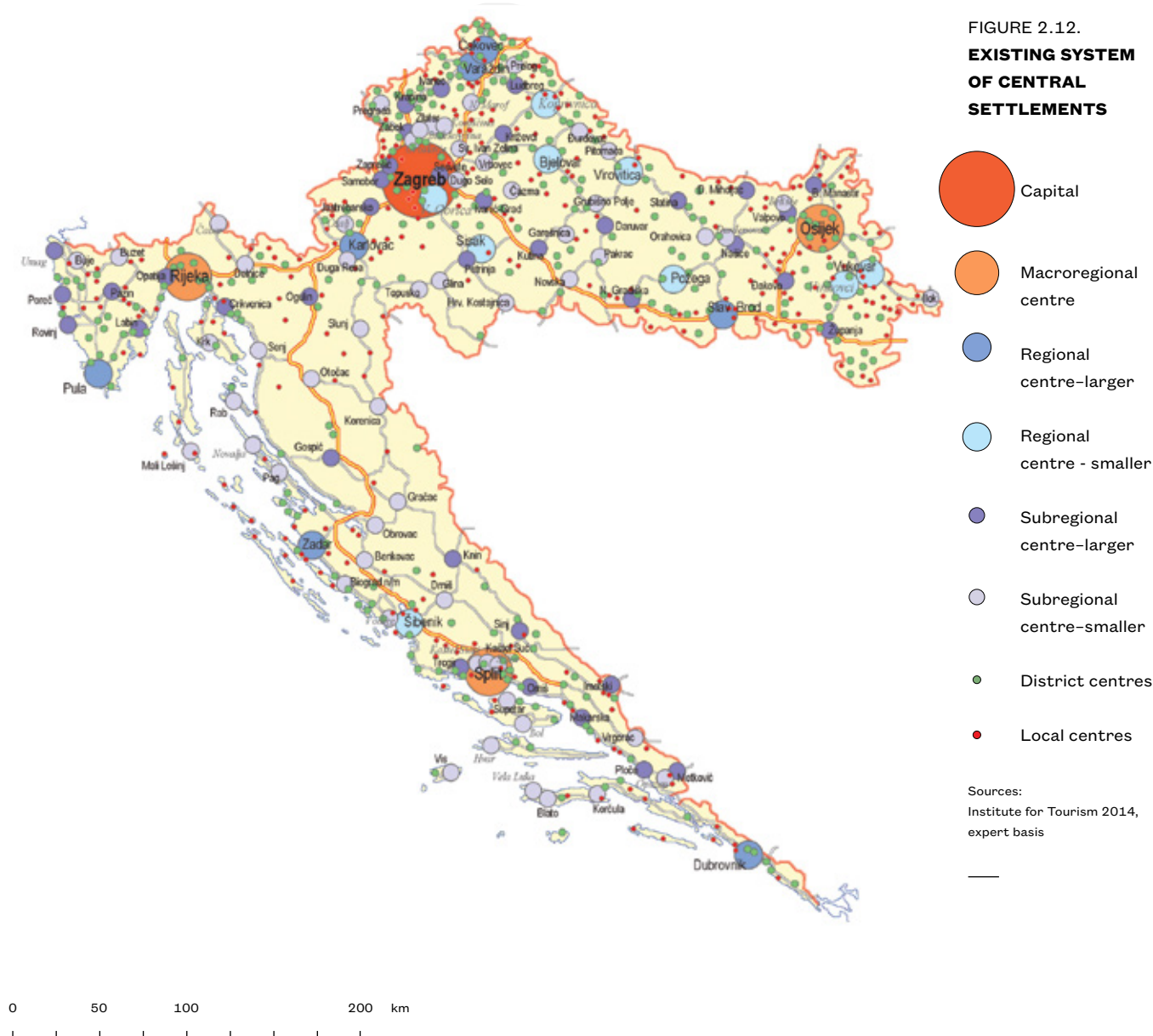
- pollution of the sea and coast through possible incidents during exploration and exploitation of marine and mineral resources, transport and trans-shipment of energy products and maritime transport
- import of foreign marine microorganisms and pathogens and foreign flora and fauna, many of which are invasive, into the marine environment as a result of increased share of transoceanic transport
- large number of interventions in the marine area, on the seabed and on the coast which alter the hydrographic characteristics of that area has not been entered into official maritime navigation maps or included in official navigation publications, which represents a systematic problem of ensuring navigation safety, protection of the marine environment and sea and underwater management, which contributes significantly to the risk for human lives and property at sea.

For decades Croatian islands have been characterized by the process of depopulation caused by years of emigration due to economic conditions (agrarian overpopulation, industrialization of the land, deagrarianization, crises of individual agricultural activities, monocultures on particular islands, etc.), but also due to natural and geographic features (being surrounded by the sea in the context of various historical and economic circumstances). The next essential feature of islands is the distinctiveness of the category of occasional residents, with a share of around 57% of the total population, which strongly affects the structure, development and life in settlements.

In terms of the administrative and territorial structure, islands are located in 7 coastal counties, 51 island towns/municipalities, and there are several small islands under jurisdiction of 7 coastal towns. Some islands and island groups have their own local self-government (one or more), some are part of coastal LSGUs, and others are part of island municipali-

³⁰ Agreed between the Croatian Government and the European Commission in August 2012, according to the criteria set by EU statistical office (EUROSTAT)

FIGURE 2.12.
**EXISTING SYSTEM
OF CENTRAL
SETTLEMENTS**



Sources:
Institute for Tourism 2014,
expert basis

ties. The fragmentation of the islands into several local self-governments, and especially, the jurisdiction of two counties (the island of Pag) strongly affects the planning of spatial development and physical planning. The management of the coastal area and planning of the development of islands must take into account the location of island groups: islands connected by a bridge, offshore islands, canal islands, islands on the open sea, since their position leads to different development models (autonomous approach, synergic with the coast, greater intervention of the region/state).

Traffic isolation and lack of connections between islands and with the land, as well as the inadequate social infrastructure are an additional development challenge. The Island Act defines the principles of sustainable development of islands and refers

to the 1997 National Programme of Development of Islands, which defines islands as development units managed integrally. The Act stipulates the adoption of Programmes of Sustainable Development³¹ for islands and island groups that form uniform spatial and economic units.

The applicability of provisions and requirements from international documents will depend on successful settling of administrative and other borders, especially at sea (maritime domain, coastal line, etc.).

2.2.6. Development of settlements and urbanization

According to the 1997 Strategy, the decision on polycentric development of Croatia was based on the then existing structure

³¹ Programmes of sustainable development of islands list and evaluate the overall natural and built property of islands or island groups, define how they are preserved, that is, their complete and sustainable use in accordance with the principles and determinants of the National Programme, State Programmes for the Development of Islands and Programme of the Government of the Republic of Croatia

The rate of built territory in Croatia is around 6.5%

and system of settlements. The policy of polycentric development implies advocating a careful distribution of population, economic activities, central and other functions and infrastructural systems. Accordingly, specific centres should have been developed jointly, interconnectedly and parallelly within metropolitan or agglomeration areas, urban regions or as a conurbation, sharing functions characteristic of specific categories of central settlements.

However, the polycentric concept of development has not been entirely successful. The polycentric development policy, which had to be achieved on the population area using practical measures, remained vague partly due to a too short time period planned for its implementation, partly due to sectoral unalignment of development plans, and partly due to a lack of a system for monitoring realization, which would, apart from basic functions, cover dynamic and qualitative factors.

Spatial distribution of central settlements at all levels of centrality is disproportional: the network of central settlements is clearly the rarest in mountainous and border regions of Croatia and some islands, that is, areas with numerous developmental limitations and poorer accessibility of high-level services. The network is most developed in the northern and north-western parts of central Croatia, and the far eastern part of Croatia.

The aggravating circumstance in planning the future network of central settlements is the already present trend of decline in the number of public services: closing down of branch primary schools or classes, healthcare institutions and post offices, as well as reorganization of the system of judiciary and state administration. The loss of manufacturing and service industries and the availability of services, particularly in smaller settlements and within walking distances, had very differentiated impacts on space.

Municipalities and cities in the vicinity of macroregional and regional centres become new commercial and business zones, whereas sparsely populated areas do not attract such or any other investments. All of the above deepens disparities, which affects the level of availability of central functions: some municipal centres in Croatia lack the most basic functions, while others dispose of functions available in smaller subregional centres.

Urban system

In the urban system, the majority are small towns, whereas medium-sized cities are lacking. In the period 2001 – 2011, the capital City of Zagreb and three other macroregional centres (Split, Rijeka and Osijek) as well as all county centres (except Zadar and Gospić) recorded a decrease in the total population.

Four large urban regions in Croatia were created around the largest cities: Zagreb, Split, Rijeka and Osijek, with a total of 1,661,924 inhabitants or 38.8% of the Croatian population. The central cities in most of the regions have up to 95% of workplaces, and only 5 to 10% in the surrounding area. This shows that the development of urban regions of Croatia is still in its early phase. However, large urban regions are becoming more and more decentralized, and the surrounding area takes over the demographic and functional development. Despite the decline in the number of inhabitants of central cities, the surrounding areas of Zagreb, Split and Rijeka experience a population increase, which results in the overall positive trend of these urban regions. Unlike them, the Osijek region experiences a decrease in the number of inhabitants in both the central city and the surrounding area. The peripheral areas of the city are especially important, showing positive trends in all four regions. That is why special attention should be paid to these contact areas when it comes to planning.

Rural and urbanized settlements

Rural areas of Croatia are characterized by negative demographic, economic and general trends. In addition to a large number of small settlements, the basic feature of rural areas of Croatia is scattered population, which results in a very branched, but not hierarchically well-structured, developed and connected network of settlements.

The typology of Croatian rural and urbanized settlements clearly proves their diversity in terms of natural and geographic, demographic, economic and functional aspects, and in terms of significance and character of agriculture.

There are seven basic types of rural and urbanized (settlements outside towns) settlements:³²

- 1 dynamic, structurally stronger settlements: settlements in direct vicinity of large cities – they extend

³² Institute for Tourism, 2014, expert basis

circularly around Zagreb, in a star shape along roads around Osijek and linearly along the coastline in urban regions of Split and Rijeka; settlements along road routes that connect central and eastern Croatia and large settlements at the far east of Croatia with better availability of central functions

- 2 more accessible settlements
dependent on circulation: settlements of the Zagreb ring and Hrvatsko zagorje
- 3 market-oriented agricultural settlements: settlements in compact plain areas of Slavonia, Daruvar, Bjelovar and Križevci region and part of Podravina and Međimurje
- 4 economically diversified, predominantly tourist settlements: settlements in the coastal area, on islands and to a lesser extent in the hinterland of attractive tourist zones
- 5 settlements of agricultural extensification and poor demographic dynamics are more frequent in northern and central Istria, as well as in border areas of Hrvatsko zagorje, parts of Cetinska and Imotska krajina, Konavle
- 6 settlements of rural periphery: settlements in Lika, Kordun, Banovina and Šibenik Zagora, distinct pockets of rural periphery are Žumberak and slopes of Slavonian mountains (Papuk, Psunj, Dilj and Krndija)
- 7 other settlements outside towns with a small share in the total group of settlements characterized by the spatial context.

The recognized types correspond to the general types of rural areas specified in the TA 2020.

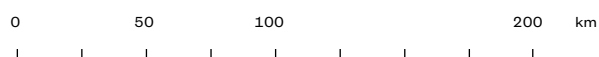
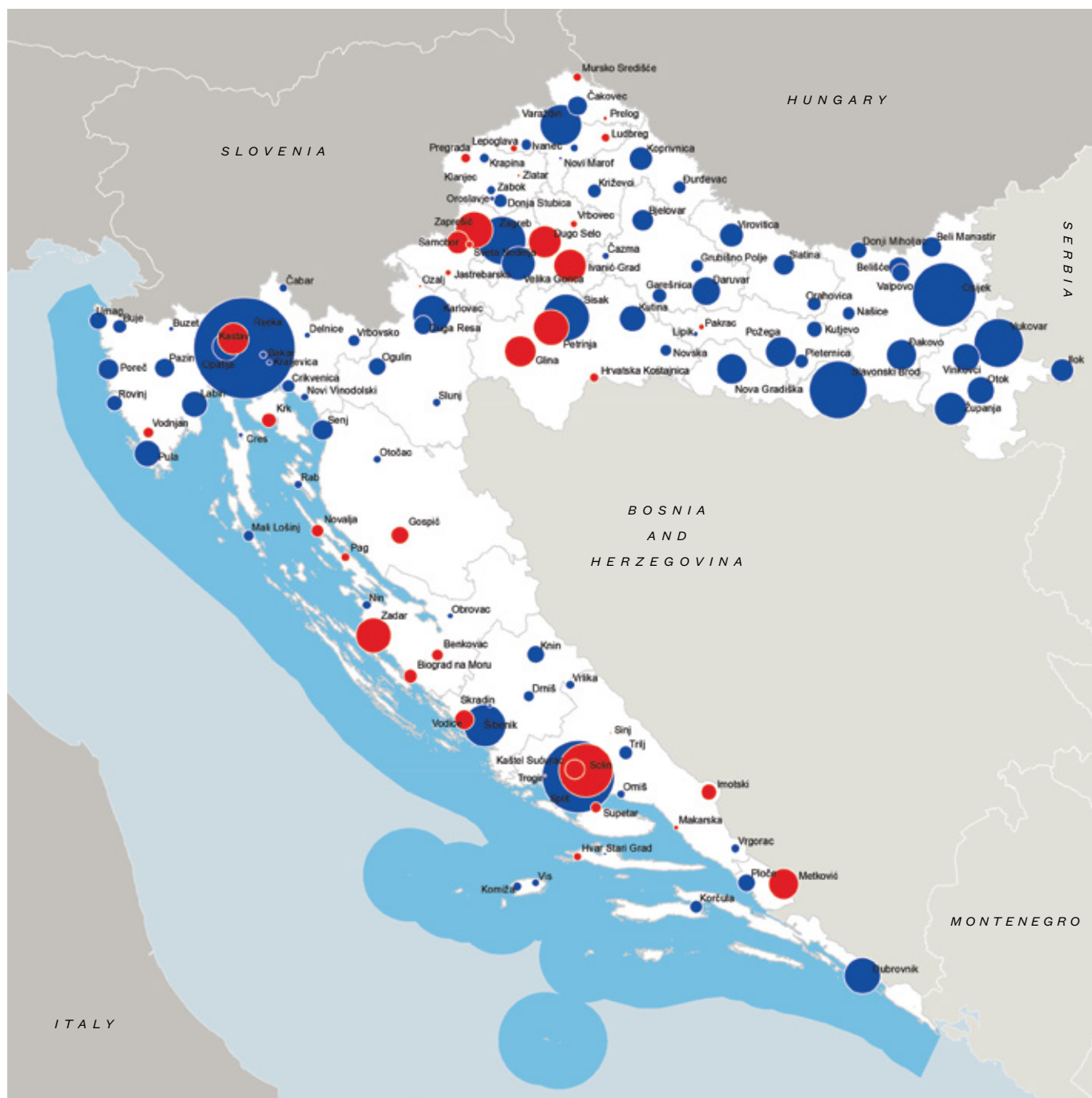
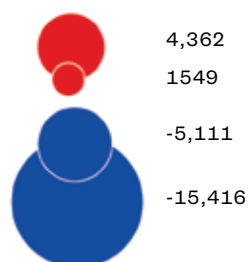


FIGURE 2.13.
**POPULATION
 INCREASE AND
 DECLINE IN URBAN
 CENTRES 2001-2011**



Sources: CBS, Census 31st
 March 2001, Census 31st
 March 2011

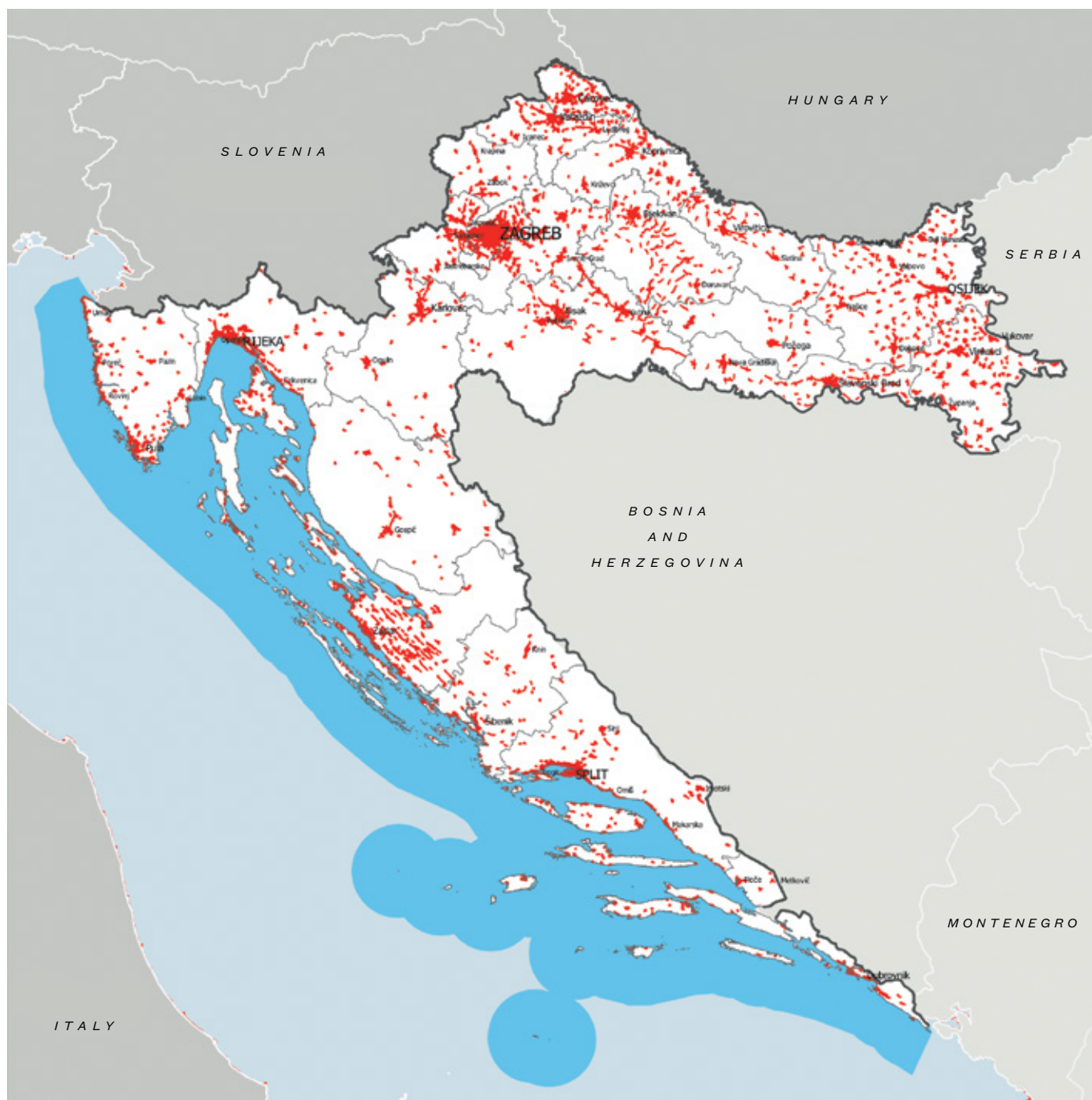


FIGURE 2.14.
BUILT SPACE

■ Built space

Source: Information system EEA
(Corine Land Cover)

CATEGORIES	settlements		inhabitants	
	number	%	number	%
uninhabited	150	2.2	0	0.0
1—500	5,418	80.2	766,721	17.9
501—2,000	967	14.3	897,679	21.0
2,001—5,000	143	2.1	434,201	10.1
5,001—10,000	39	0.6	264,060	6.2
10,001—35,000	29	0.4	532,237	12.4
35,001—100,000	7	0.1	406,323	9.5
more than 100,000	3	0.0	983,668	23.0
TOTAL	6,756	100.0	4,284.889	100.0

TABLE 2.2.
**SETTLEMENTS
 ACCORDING TO
 THE NUMBER OF
 INHABITANTS**

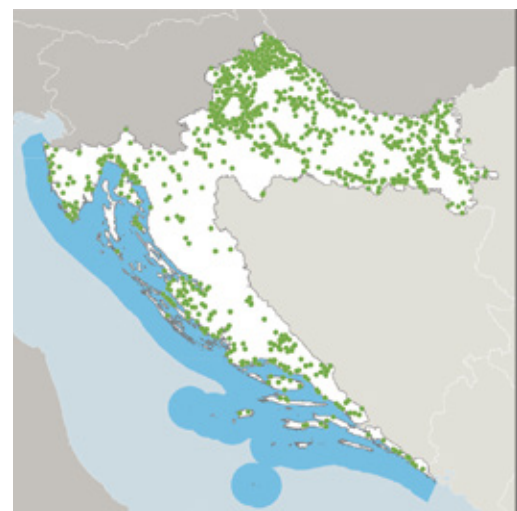
Source: CBS, 2011



uninhabited settlements



1 — 500



501 — 2,000



2,001 — 5,000



5,001 — 10,000



10,001 — 35,000



35,001 — 100,000



> 100,001

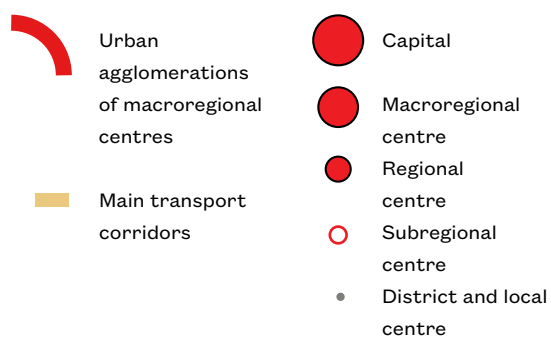
FIGURE 2.15.
**SETTLEMENTS
ACCORDING TO
THE NUMBER OF
INHABITANTS**

Source: CBS, 2011



0 50 100 200 km

FIGURE 2.16.
**LARGER URBAN
REGIONS AND
SPATIAL AND
TRANSPORT
CORRIDORS**



Source: Institute for Tourism,
2014, expert basis

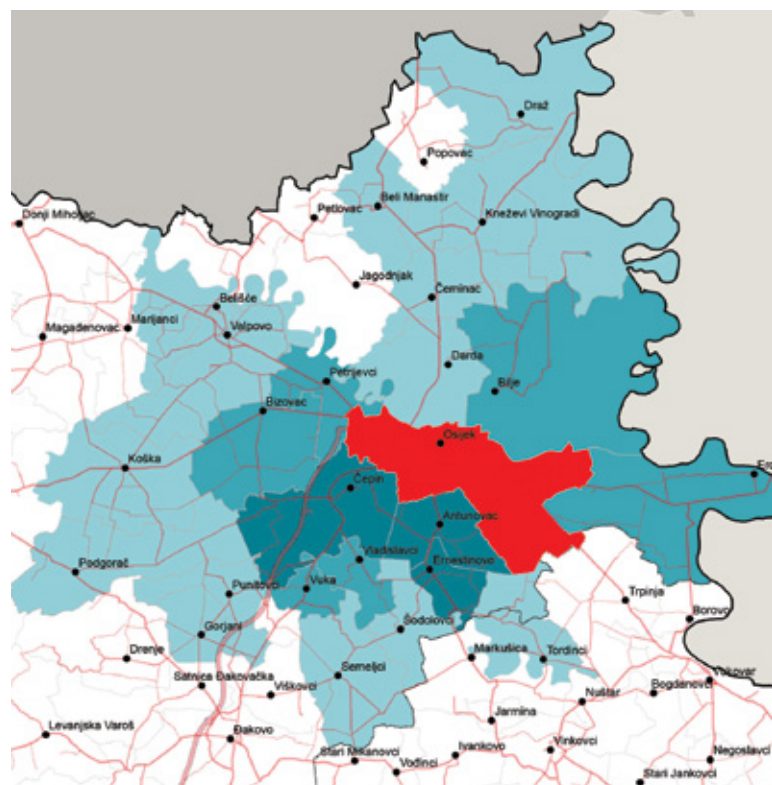
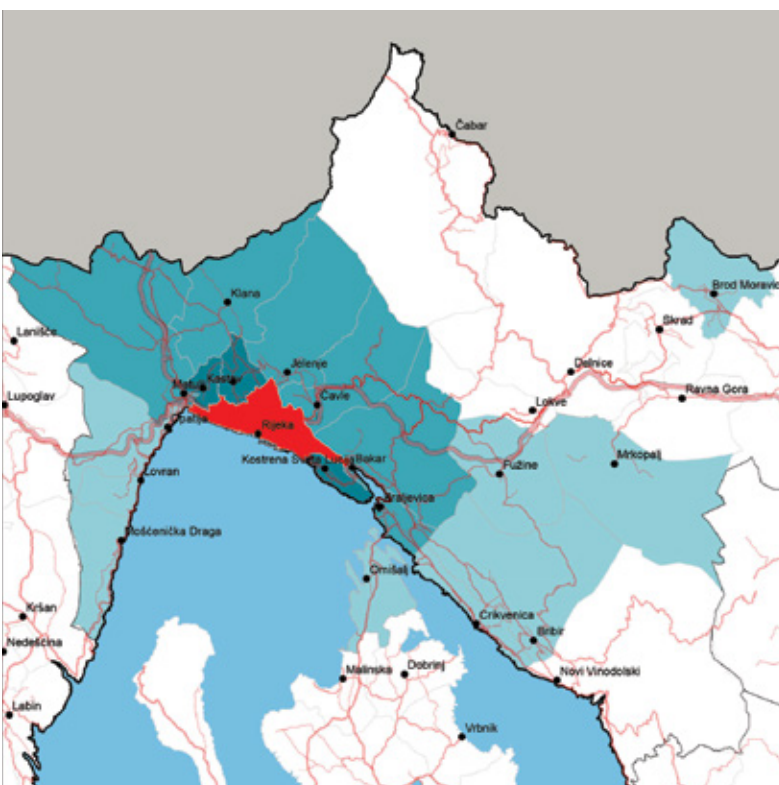
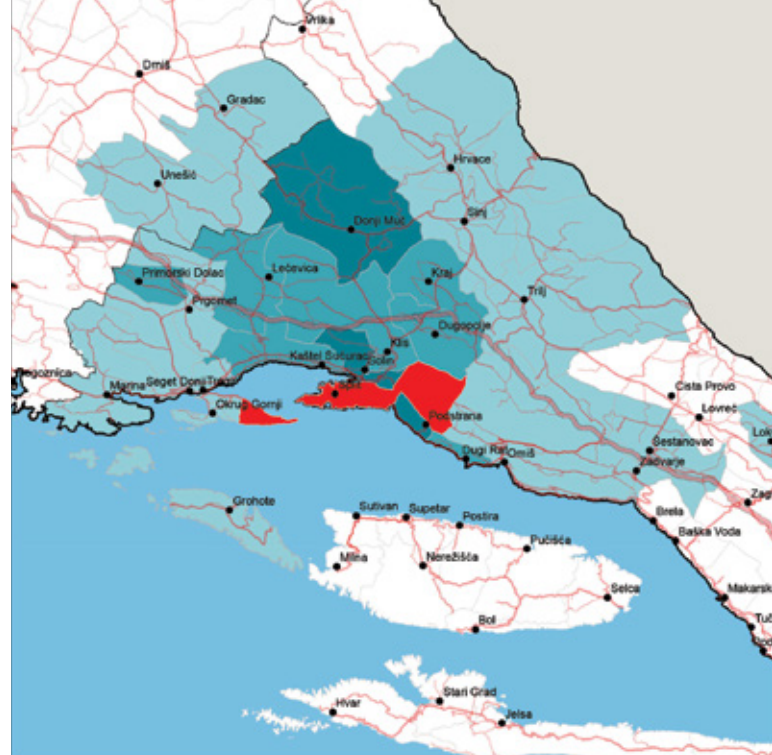
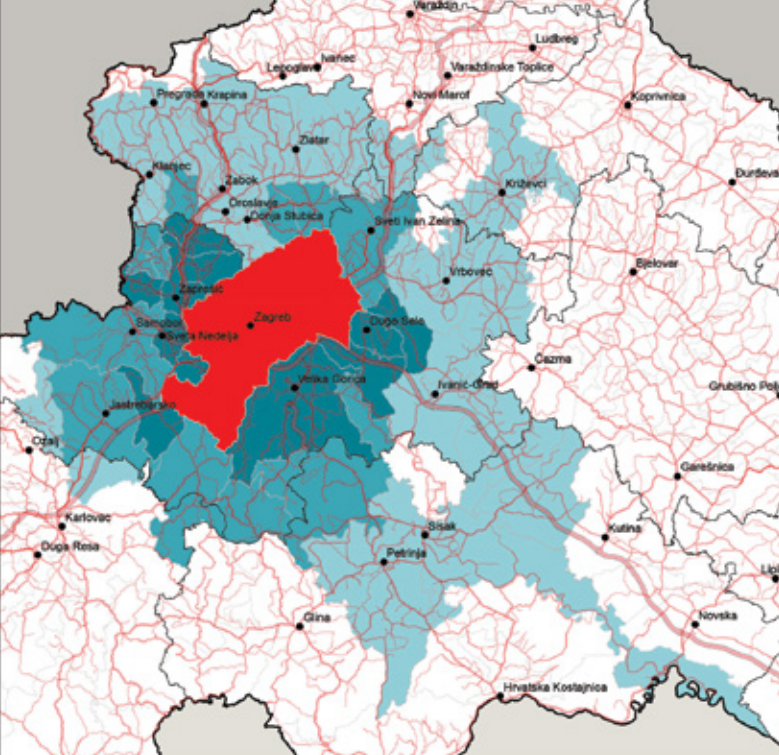


FIGURE 2.17..
**SHARE OF
COMMUTERS IN
ZAGREB, SPLIT,
RIJEKA AND OSIJEK
COMPARED TO THE
TOTAL NUMBER
OF EMPLOYED IN
LSGUs**

10.01—30.00%
30.01—50.00%
>50.01%

ROAD NETWORK
Motorways
State roads
Local roads
Unclassified roads

Sources: CBS, 2012, Census
31st March 2011
HC, 2014

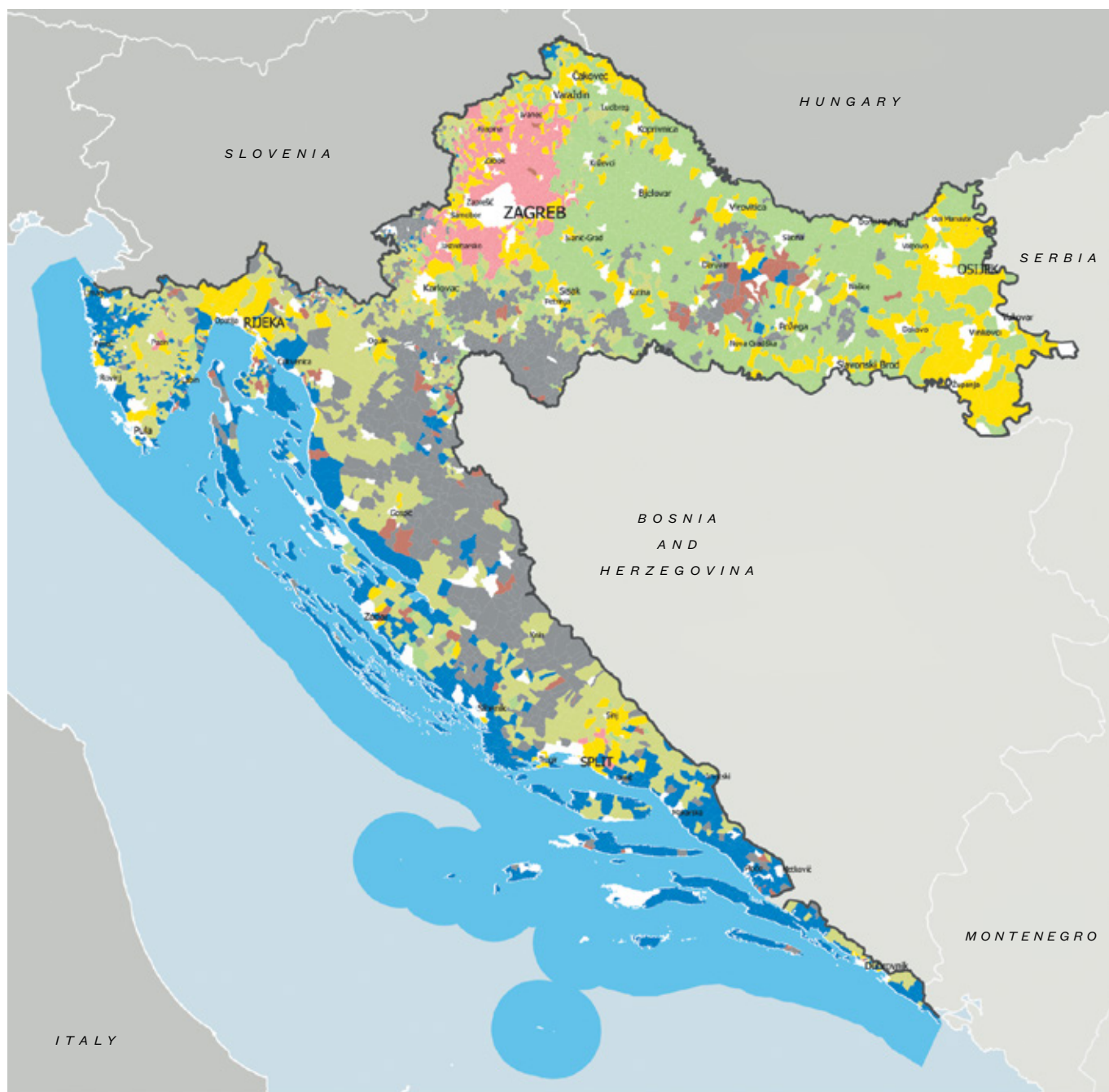


FIGURE 2.18.
**TYPOLOGY OF
SETTLEMENTS IN
RURAL AREAS**

- | | | |
|--|---|----------------------------------|
| ■ More accessible settlements dependent on circulation | ■ Other settlements outside towns | ■ Settlements of rural periphery |
| ■ Dynamic, structurally stronger settlements | ■ Market-oriented agricultural settlements | |
| ■ Predominantly tourist settlements | ■ Settlements of agricultural extensification | |

Source: Institute for Tourism,
2014, expert basis

2.3. Housing

The basic goal of modern civilization should be to ensure everyone a decent dwelling. This is achieved by combining simplicity and practicality. Through housing, we want to contribute to changing the general culturological attitude which is necessary for reaching a higher level of development of mankind.

— Josef Frank, Werkbund Exhibition catalogue, Vienna, 1932

Housing takes the largest part of urbanized space and is the predominant element of settlements and the area of market-motivated construction. Therefore, housing deserves special attention in spatial planning, design and construction, regardless of whether it is a result of individual, entrepreneurial or social endeavours to ensure residential space. Housing should be socially regulated and controlled, not only in terms of availability, but also in terms of securing the basic standard and quality, as well as making the price of an apartment acceptable to vulnerable groups of population. The document ApolitikA warns about the challenges of a comprehensive national policy for the purpose of availability of housing of an adequate standard, hygienically acceptable, including basic infrastructural services necessary for normal living and proposes different housing models depending on the material status, age and number of family members.

Furthermore, the quality of housing also implies the quality of broad and narrow housing environment. It implies the implementation of quality standards in planning residential zones and settlements ensuring necessary services for close neighbourhood, and mobility and access to the entire network of public and social infrastructure. Systematic improvement of the quality of housing is the precondition for improving the culture of housing, just as a high level of social awareness of the significance of built environment is the precondition for achieving its quality.

The current recession slowed down the construction of apartments and reduced its scope, but in the long run it should be regarded as a stimulating element of the economy as a whole and an important element of the market with a social aspect, as one of basic human needs. The problem is that a relatively small number of citizens is financially able to get and pay off housing loans of business banks offered on the capital market, so that research of new models of affordable housing will be a challenge in the future. The recession has also created the problem of the depreciation of the value of housing real property compared to the values in the period of economic growth.

Due to negative demographic and development trends, rural areas are experiencing a quick deterioration of the housing (and other construction) stock.

Characteristics of the housing stock

In 2011, there was a total of 2,246,910 apartments³³ out of which 1,912,901 for permanent residence. The total surface area amounted to 168,651,195 m², which means that the average surface area of all apartments was 75 m², and in multi-apartment buildings, the average surface area of these apartments was around 60 m², or somewhat lower than the total average surface area of all apartments. 18% of these are uninhabited apartments, and 3.87% vacated apartments.

The number of apartments which are used occasionally is 262,769, with total surface area of 15,116,934 m², and aver-

75m²
is the average
surface area of
an apartment

³³ CBS, Census of Population, Households and Dwellings, 2011

age surface area of 59 m². This group consists of apartments for rest and recreation and those used during seasonal works in agriculture.

Statistical data are also collected for apartments where only economic activity is carried out, a total of 60,100 apartments, out of which 84.36% are apartments for rent to tourists, and 15.64% for other activities.

Secondary housing - Dwellings for vacation and recreation

According to the 2011 Census, the number of dwellings for vacation and recreation amounted to 249,243 and has increased by 36.6% compared to the previous Census, when there were 182,513 dwellings. In 2001, the surface area of these dwellings amounted to 10,390,305 m², and in 2011 it increased to 15,116,934 m², by 45.5%.

The largest number of these dwellings can be found on the territory of Primorje-Gorski kotar, Zadar and Split-Dalmatia Counties in the narrow zone next to the sea shore, where their concentration is the greatest, but there is a relatively large number of these units in the continental part of Croatia, particularly on the territory of Zagreb and Krapina-Zagorje Counties.

Subsidized housing construction

Over a ten-year period starting in 2001, within the Programme of subsidized housing construction, 5,553 apartments³⁴ were built in 173 residential and residential-business buildings. In the period from 2005 to 2014, a total of 168,882 apartments were built.³⁵ The model of subsidized housing construction enabled citizens to satisfy housing needs and improve their standard of living, but also improved the situation in the field of construction, giving the Croatian citizens an opportunity to resolve their housing issue under conditions significantly more favourable than the market conditions. At the beginning, the design was guided by the Interim Ordinance on the Programme of Subsidized Housing Construction, and then the Ordinance of Minimal Technical Requirements for the Design and Construction of Apartments from the Programme of Subsidized Housing Construction.³⁶ This Ordinance is the only valid document in Croatia stipulating and structuring all elements of an apartment, and is a quality basis for possible regulation of standards of housing construction as a whole.

Sustainable housing

Conditions of the free market, changes in the culture of living and introduction of the principle of sustainable development changed the principles of construction and launched the phrase construction for the market based on the concept of investment and formal and technological standards. This process led to changes of numerous typological characteristics of individual buildings and neighbourhoods, those that once guaranteed a certain quality of housing construction.

Satisfying the human need for housing is the key element of human dignity and thus problems of residential construction directly affect the main goal of sustainable development - not restraining future generations in satisfying own needs.³⁷

For a long time, housing was regarded as a response to short-term needs of society, thus endangering the future of residential neighbourhoods, cities and regions. The development of sustainable lifestyles, optimizing the use of natural resources and meeting housing needs was gradually recognized as an important common goal and the focus of the construction industry shifted from the issue of quantity to the issue of quality.

Housing is very important for sustainable spatial organization since it is a basic living necessity and the right of every human, a great consumer of resources for construction, maintenance and use of property with a long life-cycle of key importance for the people's quality of living, affecting other areas (transport, health, employment and community).

The goal of sustainable housing is to meet the needs and requirements for a long period of time, which means that it has to be adaptable to the modern way of living and needs of residents, as well as their changes over time and resistant to negative impact of natural threats. The modern lifestyle and housing needs have considerably changed in the last few decades as a result of different social factors:

- changes in traditional families (couples without children, singles)
- growing independence within families, shifting individual needs
- conversion of housing spaces, multifunctionality
- a growingly important role of new IT technologies that affect the changes in lifestyles,

³⁴ Bobovec, Mlinar, 2013

³⁵ CBS, Statistical Yearbook 2016, Zagreb, December 2016

³⁶ OG 106/04, 25/06, 121/11

³⁷ Vezilić Strmo, Senjak, Štulhofer, 2014

- globalization and individualization
- labour market fluctuations related to economic instability
- accepting the idea of mobility
- changes in attitudes towards private ownership.

The idea of sustainable housing is difficult to grasp and analyse due to the complexity of the housing sector, but it is necessary to keep a broad perspective in order to identify goals and choose priorities. In order to establish the balance between ecological awareness, reducing risks from disasters, quality of living and technological progress and the development of new materials and systems, it is necessary to change the way we build and live.

Potential of renovation of the existing residential buildings

Construction of residential buildings, as an important segment of total construction, has a large potential in achieving goals of sustainable development. Taking into account that statistically in Croatia only 1 to 2% of new buildings are built annually, there are great opportunities in the domain of the existing residential construction. As the number of housing units increases and comes closer to the number of households, so the construction of new buildings becomes less important, and the importance of renovation of the existing residential buildings becomes increasingly more important. Unlike construction of new buildings, renovation of the existing buildings saves spatial resources, materials and energy.

Technical aspects of the housing stock and the availability of utilities

Through harmonization with EU directives, gradual transposition and introduction of new norms and technical regulations for construction in terms of thermal protection and noise protection, and other aspects of construction, as well as through introduction of new technologies used in construction, a qualitative step forward has been made.

It should be noted that when it comes to earthquake resistance of buildings in Croatia, as early as the beginning of 1960s, after catastrophic earthquakes in this region, very strict standards have been introduced in terms of design and statics of buildings with very high safety coefficients.

There are no adequate records on the construction condition of residential

buildings for collective housing, particularly of the older housing stock, within the competence of the superintendent.

When it comes to the availability of utilities, which as a rule does not refer to newly constructed apartments built according to modern standards of construction and utility provision, but only to the existing housing stock, it is not entirely satisfactory, since, within the older housing stock, there is a certain number of apartments not connected to the utility infrastructure and not having the infrastructure services that meet the standards of modern lifestyle.

2.4. Economy

In the development of the Strategy, special attention was paid to economic activities that occupy or use large spaces or to a large extent affect space.

Legislative and institutional framework

The Republic of Croatia does not have a comprehensive national strategic document for the development of all industries, and the development of the economy is planned at the sectoral level. The strategic framework for economic development is fragmented, incomplete and chronologically and substantially (partially) unaligned. A large number of institutions at all levels are responsible for its implementation, without adequate mutual coordination.

Without a comprehensive long-term strategic framework, development goals and strategic priorities are defined by the strategy of Government programmes³⁸ adopted on the basis of strategic plans of central state administration bodies. The current strategy, adopted in 2013 for the period 2014 – 2016, defines a series of goals related to the economy, but without including the spatial aspect. These goals are focused on macroeconomic and social stability, equal regional development and competitiveness of the economy, with special emphasis on agriculture and food industry, fisheries and tourism.

Counties, cities and municipalities autonomously adopt strategic development documents and plans in which economic development is an important component of the overall regional and local development. Unlike county development strategies, for which the obligation and methodology of preparation are stipulated, economic programmes at the level of cities and municipalities are prepared without uniform methodology and contents.

Since the adoption of the Strategy in 1997, the external environment has changed significantly. Upon accession to the EU,

and within the framework of accepting the EU *acquis communautaire*, Croatia is obliged to follow the European development strategy for the period by 2020 - Europa 2020.

Situation

In Croatia, negative economic trends prevail, with a slow recovery from the crisis which started in 2008. During the six-year recession, the gross domestic product (GDP) fell by 12%, and between 2000 and 2007, the GDP growth rate was 4 to 6% a year. Negative economic indicators are followed by a significant increase in unemployment (16.3% in 2013 compared to 8.4% in 2008).

There are also significant differences in development on the regional level, as well as in the structure of regional economy and specialization of regions. On the NUTS 2 level, in the structure of the economy of the continental Croatia, manufacturing activities (21.5%), services (18.5%) and public activities (16%) dominate, and in the structure of the Adriatic Croatia, services (23.5%), industrial (18.9%) and real property business activities (14.9%) dominate.³⁹ Within regions, we can also observe specialization of counties in specific industries. For example, counties with a high level of specialization in the primary sector are mostly found in the continental Croatia (Virovitica - Podravina, Bjelovar-Bilogora, Vukovar-Srijem, Požega-Slavonia and Koprivnica-Križevci Counties), and counties with a high level of specialization in services are mostly found in the Adriatic Croatia (Dubrovnik-Neretva, Istria, Primorje-Gorski kotar and Split-Dalmatia Counties). The Zagreb County and the City of Zagreb do not follow standard developmental and structural patterns.

³⁸ Each year, since 2010, the Croatian Government adopts the strategy of Government programmes for the next three-year period

³⁹ Data from 2011

The Republic of Croatia does not have a comprehensive national strategic document for the development of all industries

2.4.1. Agriculture

Agriculture is one of the economic activities of national significance with a large potential for development. According to spatial characteristics, the territory of Croatia can be divided into three agricultural regions: Pannonian, mountainous and Mediterranean region. Compared to other European countries, the Republic of Croatia has little polluted soil, which is a prerequisite for the development of ecological agriculture and large areas of meadows and pastures as a prerequisite for the development of livestock farming. Spatial requirements for livestock farming were regarded as a limiting factor of development and resulted in illegal construction.

In 2015, utilized agricultural areas amounted to 1,537,629 ha, which represents around 27% of the total land territory of Croatia. The most represented category in 2015 were arable fields and gardens with 841,939 ha (54.7%) and permanent meadows with 618,070 ha (40.2%), while other categories of agricultural land together accounted for around 5%. In 2015, the use of arable land and gardens decreased by 5.6% compared to 2011, while the area of permanent meadows increased by 78.4%. In 2010, 3,627 ha of arable land or around 0.2% of used agricultural land were irrigated, which is a decrease of 44% in relation to 5,219 ha in 2009.⁴⁰

Unsolved property and legal relations over agricultural land and fragmentation of agricultural property threaten the economic sustainability of large agricultural farms. Lack of records on forms and use of agricultural land and of a uniform IT system for all stakeholders are obstacles to solving this problem, particularly because both the agricultural and forest sector have claims on the same areas, since unutilized areas are actually naturally afforested. Due to the lack of data and the said shared claims, spatial plans specify the category AF –other agricultural land, forests and forest land.

2.4.2. Forestry

Forests have economic and generally useful functions. The generally useful functions of forests are important for the stability and survival of forest ecosystems, and they encompass ecological and social functions. Ecological functions include the hydrological, water protec-

tion, anti-erosion, climate and anti-emission role of forests. Social functions of forests encompass the effects of forests on the design of rural and urban areas (aesthetic, health, recreation and tourist effects). The combination of ecological and social functions of forests refer to the role of forests in preservation of nature and geological stock, biological diversity and capture of carbon and creation of oxygen.

Compared to 1997, we can observe a trend of growth of forests and forest land, which is visible from the RSRC and other documents. Data from various sources are unaligned, but they point to the conclusion that since 1997, there has been an increase in forests of around 8%, which achieved the target of increasing forest land set in the 1997 Strategy.

The total surface area of forest land in Croatia in 2015 according to statistical data⁴¹ amounted to 2,759,011 ha, which represents 48.8% of the total land territory of Croatia. Out of the total area of forest land, the area under forests amounts to 2,450,436 ha (88.8%), and the remaining area is other forest land (production, non-production) and infertile land. There are 73% of state-owned forests, managed by the company Hrvatske šume d.o.o., and the remaining forests are private property. The common feature of private forest properties in Croatia is fragmentation – their average size is 0.43 ha,⁴² and the average plot size is 0.15 ha. Efficient use of forests requires private forest consolidation. Areas in the category other forest land extend on 266,334 ha.⁴³ A high percentage of forests and forest land compared to the total surface area places Croatia at the very top of the list of European countries when it comes to the quantity of forests.

Forest management basis of the territory of the Republic of Croatia for the period 2006 to 2015, which is in force until the adoption of a new one, defines the ecological, economic and social basis of biological improvement of forests and increase in forest production. Forest management plans regulate the use of forests and forest land, interventions in forest land, the scope of cultivation and protection of forests, the level of utilization of forest land and management of wildlife.

In the forest sector, efficient use of resources means use of forest resources in a way which minimizes the impact on the

The Republic of Croatia has little polluted soil, which is a prerequisite for the development of ecological agriculture

⁴⁰ CBS, Statistical Yearbook, 2016

⁴¹ CBS, Croatia in numbers, 2016

⁴² Croatian Forests, Forest Management Basis of the Territory of the Republic of Croatia 2006 - 2015

⁴³ CBS, Croatia in numbers, 2016

Since the beginning of the crisis (2008 – 2014), the volume of industrial production and the number of employed has been decreasing

⁴⁴ MA, 2016, Draft of the Forest Management Basis of the Territory of the Republic of Croatia 2016 - 2025

⁴⁵ IDIR, 2014, expert basis

⁴⁶ TMRRC

⁴⁷ CBS, Production and commerce of industrial products (PRODCOM) in 2015, 2016

environment and climate and gives priority to forest production which has larger added value, opens more workplaces and contributes to better carbon balance.

The potential of forests and forest areas in stimulating the overall development of the Republic of Croatia is not fully utilized. The production potential of forests is undervalued having in mind that production forests represent 52%⁴⁴ of the total surface area of forests and forest land of the forest management area. Low representation of wood and non-wood forest products on the market is manifested in the low share of forestry in the national GDP (only 1.1%⁴⁵ in 2011). Compared to other European countries, Croatia is in the middle according to the share of the forestry sector in the GDP.

The most significant forest resources are found in rural areas, where there is a long tradition of heating using firewood. Therefore, the forest biomass as a source of energy is the potential for a step forward to modern and energy efficient forms of generation of energy and heating such as CCHP plants, which apart from power and heat, enable the generation of a cooling medium for air conditioning.

2.4.3. Industry

The position of Croatian industry in the global value chain dominates in production activities of low level added value. The reasons include low capital to labour ratio, low level of share of highly educated labour in the total number of employed persons, and extremely low level of investment in innovations and development of new products and services. The EU is focused on the levels of the value chain achieving a high level of added value, but also utilizing markets with low price of labour outside the EU. Alignment with the EU policies and goals means directing the development of industry towards areas in which there is actual possibility for strategic positioning on higher levels of added value. Prerequisites for such positioning are natural and human resources.

In the Republic of Croatia, during the transition and crisis (1990 – 2012) there has been a significant decline of employment (from 567,000 in 1990 to 207,000 in 2012) and share in GDP (from 38% to 15%) in the manufacturing industry.⁴⁶

Since the beginning of the crisis (2008 – 2014), the volume of industrial production and the number of employed persons has been decreasing, and the productivity of labour has been increasing due to a higher decrease in the number of employed persons in relation to the volume of production.

According to achieved income, the most important industry is food industry, which earns 20.4% of the total income of the processing industry, followed by the production of coke and refined petroleum products (10.3%) and production of finished metal products, except for machines and equipment (6.9%) (data for 2015).⁴⁷

In the 1997 Strategy, industry refers to the processing industry, which then had a share of 30% in the GDP, 21% in employment and 91% in export. It was mostly concentrated in cities and started to lose competitiveness on the global market. As the main development measures the Strategy identified procurement of modern technology, introduction of efficient organization, good management and conquest of new markets, privatization and attracting foreign investors. In addition, the Strategy envisages the restructuring or decreasing the significance of basic heavy industry that requires a lot of electrical energy and unqualified labour, pollutes the environment and does not have a sufficiently large market, and on the other hand the development of those industries that utilize position, natural resources, capital, tradition and knowledge.

The 1997 Strategy recognized the need for displacing industry from towns and its restructuring, including privatization. Areas in industrial and business zones, whose infrastructure and capacity is unequal, were planned for accommodation of industry and other manufacturing activities.

The 1999 Programme listed as a priority the transformation of the manner in which industry uses space, that is, a more rational utilization of space, followed by improvement of utility infrastructure, adjustment of the economic structure of cities to spatial conditions (abandoning large industrial complexes), displacing plants from narrow urban cores and valuable coastal areas, with necessary conversion to more suitable activities and development of smaller units, which could be integrated into settlements, as

well as the improvement of the condition of the environment.

The Croatian industry shows negative trends, whose continuation until 2020 could lead to further loss of workplaces. In order to achieve the volume of production larger than that in 2008, an active implementation of measures and alignment of sectoral policies are needed.

The sectors which the draft industrial strategy recognized as drivers could have negative impact on the environment (pharmaceutical industry) or have special requirements related to waste disposal (production of computers, electronic and optical products). The food and wood industries have been recognized as having the potential for growth, primarily due to spatial resources and possibilities of placement in tourism. This points to a mutual dependence of development in all areas and increases the need for coordination.

2.4.4. Tourism

Tourism is one of the most significant economic sectors in the Republic of Croatia. In 2014, the income from tourism amounted to EUR 7.4 billion (17.2% of GDP). In 2015, income from tourism rose to EUR 7.9 billion (18.1% of GDP).⁴⁸

Croatia has been recognized as a destination of rich cultural and historical heritage and a large number of tourists come motivated by cultural heritage.

The main tourist area of the Republic of Croatia and the centre of overall development of tourism is Adriatic Croatia. It is characterized by intense tourist activity in the coastal area around the development centres of Istria and Kvarner (Rijeka, Pula), central Dalmatia (Split, Zadar, Šibenik) and southern Dalmatia (Dubrovnik). In the coastal area, there is a significantly more intense tourist demand as compared to the continental region. In coastal towns, there is around 85% of tourist arrivals and approximately 95% of tourist overnight stays in Croatia. Accommodation capacities are concentrated in the northern and southern Adriatic (97%). There are only around 3% of accommodation capacities in continental Croatia.⁴⁹ The underdeveloped areas in the hinterland (Lika, Dalmatinska zagora, inland Istria, Gorski kotar) and smaller islands prevent the full touristic development of Adriatic Croatia.

Attractiveness and value of tourist land often leads to conflict of interest (economic and protection of space). The consequence of neglecting social interests is the violation of traditional construction and local environment and devastation of parts of coastal areas.

Traditional ties with the European emissive tourist markets and the EU accession contribute to creating conditions for faster development of tourism. The growth of tourist turnover increases the need for infrastructure. The growth of tourism in cities and of transit tourism stimulates the development of tourist activities along the main transport routes. The specific geographical and traffic position of the Dubrovnik area requires special attention when considering the development of the national transport policy and tourism.

2.4.5. Entrepreneurial infrastructure

Projects of construction of entrepreneurial zones have been developed and supported by the programmes of the Croatian Government since the mid-1990s, at the level of local and regional self-government units, for the purposes of a balanced regional development. The ultimate goal of the programme is the improvement of the standard of living of the population by renewing the quality of social and utility infrastructure in underdeveloped areas and areas which the state additionally supports (areas of special state concern, mountainous areas, islands). Mechanisms of incentives and supports to projects have been identified at the state level and include the allocation of properties owned by the Republic of Croatia.

Entrepreneurial zones have been defined by law⁵⁰ as infrastructurally equipped areas of economic purpose identified by spatial plans, in which specific types of entrepreneurial activities can be carried out. The advantage of such zones is the joint use of energy, utility, transport and communication infrastructure as well as other resources.

The programmes provide for an equal development of entrepreneurial zones by counties in the vicinity of larger settlements, whereby the counties, according to their strategic development documents, define the necessary number and locations. The speed of realization of zones should be accelerated by the stand-

3%

of tourist accommodation capacities in continental Croatia

⁴⁸ Ministry of Tourism, 2016, Tourism in numbers 2015

⁴⁹ Ministry of Tourism, 2016, Tourism in numbers 2015

⁵⁰ Act on Improvement of Entrepreneurial Infrastructure (OG 93/13, 114/13, 41/14)

ardization of contents and development of entrepreneurial support institutions (development agencies, entrepreneurial centres, business incubators, entrepreneurial accelerators, business parks, science and technology parks and centres of competence).

The surface areas of zones are also defined by spatial plans, and according to size, are divided into microzones (up to 10 ha), small zones (10 - 50 ha), medium-size zones (50 - 100 ha) and large zones (larger than 100 ha). The possibility of their realization and implementation of spatial plans depends on resolving property and legal relations – from the procedure of assigning the property to local self-government units, determining the real market value of the land to consolidation of a large number of plots in private ownership. The realization is hindered by the fact that a certain number of LSGUs have not adopted relevant executive spatial plans. On the other hand, formed and infrastructurally equipped zones cannot find users because in the course of zone planning and selection of location, the real or potential investment interest has not been studied.

2.5. Infrastructure systems

2.5.1. Transport infrastructure

Connection to the European area

The transport and geographic position of Croatia is extremely favourable and defined by the fact that it is situated in the contact area of large spatial regions of Europe: the Mediterranean, Danube river basin, the Alpes and the Balkans.

The geostrategic position can be considered an opportunity for the development of intermediate transport, economic and political functions between the Western and Central Europe and South-Eastern Europe and the Middle East, particularly due to the natural orientation of the countries of the central Danube region towards the Adriatic and the Mediterranean.

Within the EU Strategy for the Danube region (EUSDR), Croatia participates in the priority axis 1. Improving mobility and intermodality of transport for priority areas 1A. Inland waterways.

In the context of the EU Strategy for the Adriatic-Ionian Region (EUSAIR), Croatia participates within the pillar Connecting the Region (transport and energy) which focuses on three strategic themes: improvement of maritime transport, development of intermodal connections to the hinterland and energy networks.

Two corridors TEN-T⁵¹ of the central network pass through Croatia:

- **Mediterranean corridor** connecting ports Algeciras, Cartagena, Valencia, Tarragona and Barcelona through southern France with the connection towards Marseille and Lyon to northern Italy, Slovenia and through Croatia to Hungary and the Ukrainian border. It includes the railway and roads, airports, railway-road terminals, and in northern Italy inland waterways of the Po river. It is a road and railway corridor, and its integral part is the route Rijeka – Zagreb – Budapest, that is, the Rijeka transport route which is also the

Pan-European corridor Vb, that is, railway RH2. The main characteristic of the Rijeka transport route is the possibility of an intermodal approach, that is, connecting the port of Rijeka with the railway and the Danube navigable canal, which is the shortest route from the Adriatic to the Danube region. The continuation of the Mediterranean corridor and its integral part is also the road and railway corridor from Zagreb to Slovenia (Pan-European corridor X, or railway RH1). This corridor connects Croatia with the Baltic-Adriatic corridor, which extends from the Baltic Sea, through Poland via Vienna and Bratislava to northern Italy.

- **Rhine-Danube corridor** connecting Strasbourg and Mannheim with two parallel routes in southern Germany, one along Main and Danube, and the other through Stuttgart and Munich with a detour to Prague and Žilina to the Slovakia-Ukraine border and through Austria, Slovakia and Hungary to the Romanian ports Constanta and Galati. It includes the railway, roads, airports, ports, railway-road terminals and inland waterways of the Main River, Main-Danube canal, the entire lower course of the Danube in Kelheim and the Sava River. The Rhine-Danube corridor in Croatia is also the Pan-European corridor VII.⁵²

Road infrastructure

Economic development of Croatia largely depends on the development of road transport. The significance of road transport on the territory of Croatia derives from the spatial branching of the network and the most suitable access to users. In the previous ten-year period, the emphasis of the development of transport infrastructure was on the construction of the road network.

A high level of development of the network of motorways has been achieved, and the network of state, county and local roads is less developed. The network of constructed/reconstructed roads was

The geostrategic position can be considered an opportunity for the development of intermediate transport, economic and political functions

⁵¹ Trans-European Transport Network

⁵² Strategy of Transport Development of the Republic of Croatia for the period 2014 – 2030 (OG 131/14)



FIGURE 2.19.
**CROATIA AND
MAIN EUROPEAN
TRANSPORT
ROUTES**

Main European
transport routes
(TEN-T corridors):

- Baltic-Adriatic
- Eastern Mediterranean-Orient
- North Sea- Baltic
- Scandinavia-Mediterranean
- Mediterranean
- Rhine-Alpes
- Atlantic
- North Sea-Mediterranean
- Rhine-Danube
- Other transport routes
- Important inland navigable waterways
- Maritime transport routes

Source:
[www.promet-eufondovi.hr/
eu-prometnikoridori-i-ten-t](http://www.promet-eufondovi.hr/eu-prometnikoridori-i-ten-t)

Length of roads according to groups of classified roads (km²)

motorways	state roads	county roads	local roads	total
1,416.5	6,868.0	9,703.5	8,980.0	26,964.00

Length of railway tracks according to type (km²)

single-track	double-track	total	electrified
2,351	254	2,605	980

TABLE 2.3.
INDICATORS OF THE
ROAD NETWORK

Source: HC, March 2013.
Transport Development Strategy of the Republic of Croatia for the period 2014–2030 (OG 131/14), Annex I, Table 27

TABLE 2.4.
INDICATORS OF THE
RAILWAY NETWORK

Source: MSTI, 2016.

taken to the level that meets the current economic situation and is the basis for the forthcoming ten-year development, or, the potential for inclusion of Croatia into the European road system.

The transport sector in Croatia contributes to the total emissions of greenhouse gases with 24.6%, out of which road traffic accounts for 95.7%.⁵³

The road traffic consists mostly of individual traffic, which means that it sets more and more spatial requirements as compared to some other modes of transport.

The basic spatial development features of the road infrastructure in Croatia show specific weaknesses:

- in the dynamic of construction of fast and other state roads aimed at establishing an integral road network system
- in the dynamic of construction of key sections and facilities, primarily in the network of state roads and at access roads and bypasses of large cities
- insufficient construction and modernization of roads on islands and in other areas with development specificities
- insufficient road and transport connectivity of land and islands (e.g. tunnels, bridges).

Railway infrastructure

Railway transport is more environmentally friendly as compared to road transport. Extremely demanding technological characteristics require that its development is based on mass transport of goods

and somewhat less of passengers.

By the length of railways per capita, Croatia exceeds the European average, but the network is technologically unadjusted to today's needs with the exception of the main railway route from the border with Slovenia to the border with Serbia, and several modernized sections.

The existing railway network is an integral part of the network of international and national railway corridors. By reconstruction and recommissioning of the RH1 corridor as well as the reconstruction of the RH2 corridor, the existing railway network was put in full operation. The inclusion and joining of the railway network of Croatia to the European rail network (TER network) requires compliance with elements that determine the standards and spatial distribution of European rail communications.

The railway infrastructure in Croatia is characterized by:

- an obsolete railway network, lacking capacity and equippedness
- key parts of sections of railways (inclination, load, radiuses, speed, throughput) and railway transport facilities (main stations, stations, marshalling yards and rail yards, etc.), primarily in the network of state/European main railways
- insufficiently used transport power of the railway track
- unfavourable structure of use of railways in freight and passenger transport
- insufficiently developed public railway transport
- lack of requirements for the

⁵³ Data for 2014, Report on the Inventory of Greenhouse Gases on the Territory of the Republic of Croatia for the period 1990-2014 (NIR 2016)

Sava, Drava and Danube – large river systems

TABLE 2.5.
**INDICATORS OF
RIVER TRANSPORT**

Source: MSTI, 2012, Transport Development Strategy of the Republic of Croatia for the period 2014-2030 (OG 131/14), Annex I, Table 41

Number of ports/landings — 19
Length of navigable waterways — 1,016.8 km

Number of river ports according to size and river

size/river	Danube	Sava	Drava	Kupa
ports	1	2	2	1
landings	3	4	4	2

Classes and length (km) of navigable waterways

VI	V	IV	III	II
Danube	VKDS	Sava/Drava	Sava/Drava	Drava/Kupa/Una
138	60	33/14	255/41.5	14.5/6/4

TABLE 2.6.
**INDICATORS
OF NAUTICAL
CAPACITY**

Source: 2012, estimate based on analysis of spatial plans

Counties	Existing	Estimate of nautical tourism on rivers					Total	Share
	wet	dry	marina	small ports	dry	total		
1. Zagreb	0		500		1,000	1,500	1,500	28.3
2. Sisak-moslavina	300	-	300		300	600	900	16.9
3. Brod-posavina	300	-	300		200	500	800	15.1
4. Vukovar-srijem	200	-	500		200	700	900	17.0
5. Osijek-baranja	400	-	500		300	800	1,200	22.7
	1,200		2,100		2,000	4,100	5,300	100.0
Total land		1,200				4,100	5,300	

construction of the lowland railway Rijeka – Zagreb

- lack of connection of Istria and Dubrovnik to the existing railway network
- inadequate connectivity of the northern Croatia to Zagreb.

Infrastructure of river transport

Natural conditions with three large river systems of Sava, Drava and Danube, used also as transport infrastructure, are an economic potential that requires a minimum use of new spatial resources.

This segment of transport infrastructure is at the moment insufficiently utilized, for reasons of neglect, lack of equipment and difficulties in the application of international treaties on utilization of border rivers. River transport is currently active only on the Danube, to a small extent on Drava, and is completely negligible on Sava. According to the European Agreement on Main Inland Waterways of International Importance, which the Republic of Croatia signed and ratified, the navigable waterways of Sava, Drava, Danube and the future canal Danube – Sava are included in the network of European navigable waterways, and the ports in Osijek, Vukovar, Slavonski Brod and Sisak into the network of ports opened for international transport.

The Programme and county spatial plans envisage the possibility of extension of port areas and operational water areas in the master plans of ports Osijek, Vukovar and Brod. The Spatial Plan of Areas with Special Features of the multi-purpose canal Danube-Sava is in force.⁵⁴

River transport is characterized by:

- undeveloped existing river facilities, primarily the existing navigable waterways of Sava and Drava
- lack of accepted long-term plan of construction of ports and navigable waterways
- unfinished project of the Sava-Danube canal and project of development of Sava River waterway to Class IV/V
- unregulated interstate relations regarding the navigation regime of Sava and Danube.

Apart from commercial use, rivers enable the development of river (nautical) tourism. Based on the analysis of the existing situation and the analysis of spatial plans, the existence of initial steps for development of river tourism as well as possibi-

ties of development are defined.

Maritime infrastructure

The economic potential of Croatia sea-ports is primarily based on the favourable geographical position and the deep indentedness of the Adriatic Sea into the continent. The integration of Croatian ports into the network of European transport corridors represents the development potential for inclusion into the commercial flows within the European and global market and transformation of port systems into modern logistics and distribution economic centres. The port system basically meets the needs of international maritime transport so the focus of development of the port system should be shifted to the improvement of domestic maritime transport and nautical tourism as the recreational aspect of maritime transport.⁵⁵

Croatian ports are classified by their purpose and importance in accordance with the Maritime Domain and Seaports Act:

- ports opened for public transport
 - ports of (special) international economic significance for the state
 - ports of county significance
 - ports of local significance
- special-purpose ports:
 - special-purpose ports of state interest
 - special-purpose ports of county interest.

Depending on the activities that are being carried out, special-purpose ports are classified into the following categories: military ports, ports for nautical tourism, industrial ports, sport ports, fishing ports, shipbuilding ports and ports for the supply of fuel.

Seaports of international economic interest for the Republic of Croatia are Rijeka, Šibenik, Zadar, Split, Ploče and Dubrovnik. Croatia has a total of 42 ports of county significance and 285 ports of local significance.

The main freight ports in Croatia are Rijeka and Ploče, and more recently Split. They account for almost 90% of the total freight transport of Croatian ports of special economic interest. The majority of passenger transport is carried out through ports of Split and Zadar, while in the port of Dubrovnik traffic of cruise ships is carried out.

It can be concluded that the system of ports in the Republic of Croatia is

⁵⁴ OG 121/11

⁵⁵ Source: Strategy of Maritime Development and the Integral Maritime Policy of the Republic of Croatia for the period 2014-2020 (OG 93/14)

Around 90% of operational areas of ports are found in urban areas

TABLE 2.7.

Number of seaports — 308

**INDICATORS OF
MARITIME PORT
INFRASTRUCTURE**

Sources: MSTI, 2012
Transport Development
Strategy of the Republic
of Croatia for the period
2014–2030 (OG 131/14),
Annex I, Table 63

	state	county	local
	6	42	260

TABLE 2.8.

**CAPACITY OF
BERTHS IN
NAUTICAL PORTS**

Source: 2012, estimate
based on the analysis of
spatial plans of counties
2010/12

COUNTIES	Existing (2010)			Newly planned			grand total
	at sea	on land	total	at sea	on land	total	
Istria	3,890	772	4,662	7,330	7,100	14,430	19,092
Primorje-Gorski kotar	3,228	1,938	5,166	3,100	0	3,100	8,266
Lika-Senj	0	0	0	850	800	1,650	1,650
Zadar	3,676	1,030	4,706	1,800	0	1,800	6,506
Šibenik-Knin	2,795	900	3,695	2,140	0	2,140	5,835
Split-Dalmatia	1,581	390	1,971	3,185	0	3,185	5,156
Dubrovnik-Neretva	664	156	820	6,400	400	6,800	7,620
Total	15,834	5,186	21,020	24,805	8,300	33,105	54,125

well-managed and that all important state and county ports are mostly built. Around 90% of operational areas of ports are found in urban areas, and the consequence of that is limited or no possibility of their spatial development. Outside the system of maritime infrastructure, there are other existing traditional berths within settlements and outside construction areas, those in isolated construction areas outside settlements for purposes of the hospitality industry, tourism and sport and moorings and berths in protected areas.

Shipping is a cost-effective and competitive industry in national and international transport of goods. Development perspectives of line passenger transport are significant due to marked indentedness of the Croatian coast. Public transport in the coastal line transport is important for regular connection of island with the land and between islands. The transport connectivity of inhabited islands with the

land and between islands is insufficient and fails to ensure their sustainable development. Obstacles to the development of public transport in coastal line transport include unequal utilization of ships due to oscillations in the course of the year, high share of price of motor fuel in the total costs of transport and the need for investment into survival and modernization of the fleet.

The needs of the fishing fleet of the Republic of Croatia for port space are insufficiently recognized, both the need for permanent and temporary berths as well as specific need for unloading points.

Maritime transport is characterized by:

- lack of coordination between economic and tourist use of port areas
- inadequate maintenance and level of equipment of port areas according to the category and purpose of the port
- insufficient construction of port

superstructure and understructure in seaports opened for public transport of county and local significance.

The total capacity of berths at sea and places for accommodation of vessels on land in nautical ports is 21,020⁵⁶, 15,834 at sea and 5,186 on land.

Spatial plans of counties envisage the extension of the existing and construction of new accommodation capacities to around 300 potential locations, and 33,655 new berths are planned, which is one and a half times more than the existing capacity.

In accordance with the conducted studies and analyses, as well as the conclusions of the Nautical Tourism Development Strategy of the Republic of Croatia 2009 – 2019, a moderate scenario of development of nautical tourism was accepted (15,000 new berths planned) based on the identified load capacity of the area, moderate annual growth rate and the principle of balanced regional development

with the possibility of deviation due to the need for respecting the features of specific counties, which is aligned with the development of accompanying utility and other infrastructure and needs to ensure full employment of the population.

Infrastructure of air transport

International airports in Croatia are airports in Zagreb, Split, Rijeka (on the island of Krk), Osijek, Pula, Zadar, Dubrovnik, Mali Lošinj and Brač. According to the number of airports in relation to the surface area and population, Croatia is among the more developed European countries. The spatial distribution of the airports is relatively satisfactory.

Air transport has been developed on acceptable preconditions which allowed for an adequate network of airports.

Intermodal transport

Requirements for the rationalization of energy consumption and increasing the efficiency of transport infrastructure resulted in the development of intermodal

Intermodal terminals are extremely rare

⁵⁶ Strategy of Development of Nautical Tourism of the Republic of Croatia 2009 – 2019

Number of airports — 30

Airports with certificate	Airports with approval
9	21

TABLE 2.9.
INDICATORS OF
AIR TRANSPORT
INFRASTRUCTURE

Source: MSTI, 2015

Number of users
in the fixed network — 1,295,134
in the mobile network — 4,414,347

Total number of connections in the fixed network	1,405.010
Density of users of phone services in the fixed network	30.23%
Density of users of phone services in the mobile network	103.02%
Density of connections of the broad band internet access via fixed network	24.36%
Density of connections of the broad band internet access via mobile network	78.90%
Total number of connections of the broad band internet access	4,424.536

TABLE 2.10.
INDICATORS OF
THE ELECTRONIC
COMMUNICATION
INFRASTRUCTURE

Source: HAKOM, 2016

transport. The basic goal of this system is to ensure the optimal transport and economic service for goods. Intermodal transport is freight transport in one and the same intermodal transport unit by two or more modes of transport (road-rail-inland waterways or sea), whereby the switch of the intermodal transport unit is done without freight manipulation. Intermodal transport requires a very high level of organization supported by the fast IT development.

In Croatia, intermodal transport is insufficiently developed both in freight transport and public transport of passengers. Intermodal terminals are extremely rare, and bus and railway lines are often used in parallel.

The Cluster of Intermodal Transport has been founded, with which the Republic of Croatia participates in the EU development programmes:

- **Marco Polo II** is the programme for reducing the load on road transport, and reducing the negative effects of freight transport on the environment in EU countries and strengthening intermodality, with the aim of contributing to the efficiency and sustainability of the transport system
- **Intelligent energy in Europe (CIP IEE)** is the programme which contributes to the achievement of the targets of the European energy and environmental policy by promoting the use of renewable energy sources, energy efficiency and energy efficient transport by financing activities that contribute to eliminating market obstacles, changes in behaviour, creating a favourable business environment for the growth of energy efficiency and the market of renewable sources of energy
- **Ecoinitiatives (CIP EKO)** – the ecoinitiative primarily refers to organizations that developed an ecological product, service or process, but which have not been placed on the market due to remaining risk; this initiative is focused on overcoming these obstacles and so that those products and processes could become the successes of future European ecoinnovations
- **European transport corridors (TEN-T)** – one of the oldest EU programmes. The TEN-T Programme is designed for infrastructural investments in intermodal transport.

Electronic communication infrastructure

Projections show that by 2020 digital contents and applications will be delivered entirely via the Internet. The development of fast and ultrafast networks today has an equally revolutionary effect as the development of transport network or power grid a hundred years ago.

Based on the analysis of the level of development of electronic communications in the Republic of Croatia, it is clear that in terms of the number of connections of broad band internet access Croatia falls behind the average of EU member states. There is an unequal number and density of broad band connection among counties, as a result of unfavourable demographic structure, lack of knowledge about the use of information and communication technologies of one part of the population and lack of accessible infrastructure of broad band access in all regions of Croatia. Access nodes at all levels, from local to international, are connected by fibre optic technology, which enables further growth of traffic in electronic communications. The current technological representation shows the domination of one type of approach related to the existing communication network of copper pairs, which mostly meets the current requirements, but does not allow for a more significant qualitative step forward in the broad band internet access and greater access speeds. The access networks based on fibre optic technology have only started to be built and the number of connections is less than 1%.

There are two very characteristic forms of electronic communication networks; in urban units and in other areas (primarily the main network and base stations).

Electronic communication infrastructure and other related equipment is characterized by:

- unequal distribution of the fixed network
- technical and technological unevenness primarily of the fixed network
- incomplete cable canalization in the existing corridors
- coverage by wireless communication in some parts of areas of special interest.

Development of electronic communication infrastructure and other related equipment, that is, equal coverage of the

territory will enable the completion of the construction of the fixed and mobile networks, and by applying the state of the art technologies of broad band internet access, performing a large portion of business at the place of residence of the user, which decreases the traffic load on the space and allows for a decentralized development of the economy.

Authors of spatial plans of counties could not adequately follow the fast technological changes in the field of electronic communications, which resulted in unequal representation by counties, both in terms of importance of electronic communication infrastructure and other related equipment, and the method of selection of locations for specific types of electronic communication infrastructure and other related equipment.

2.5.2. Energy infrastructure

Energy-related activities affecting the use of spatial resources include production, transmission or transport, storage and distribution of energy and supply of energy. With regards to oil and petroleum products, there are significant needs related to the production of petroleum products, transport of oil by oil pipelines; transport of petroleum products by product pipelines; transport of oil, petroleum products and biofuel (by waterways or land – road, rail); storage of oil, petroleum products and biofuel.

An important role in planning the capacity of energy infrastructure is played by the necessary level of reserve capacity of energy facilities, necessary mandatory and operational reserves of specific types of energy and energy products, requirements related to efficient use of energy and share of renewable energy sources.

According to the applicable act regulating the measures of the supply, generation and use of energy and issues of common interest for all energy related activities,⁵⁷ the basic document for long-term consideration of needs and directing the development of the energy sector, that is, defining the energy policy and planning the energy development of the Republic of Croatia is the Energy Development Strategy.⁵⁸ The said Act defines the adoption of the implementing strategic document – the Programme of Implementation of the Energy Development Strategy for a ten-

year period, as the main instrument of coordination and monitoring, and development plans for specific energy sectors that should comply with the said strategy and programme. Strategic development documents at the local and regional level should plan the demand and energy supply in accordance with the said strategy and programme. The programme of implementation of the strategy has not been adopted, so the instrument of planned two-year revisions of monitoring the implementation of the strategy has not been applied, and the justifiability of specific planned projects have not been re-evaluated.

The basic legislative framework was complemented by the package of laws and regulations related to specific energy products or sources of energy (gas, oil, power, renewables) and energy efficiency, and certain sectors and competent authorities adopted their development plans.

The development of energy policy in Croatia was influenced by the process of EU accession and the goals of energy development were aligned with the strategic objectives of the EU in relation to: security of energy supply, competitiveness of the energy system and sustainable of energy and economic development. In order to achieve these key goals, it is basically necessary to build new and/or reconstruct existing production, supply, transmission and storage capacities and to increase energy efficiency and share of renewables.

Energy indicators⁵⁹ warn about the shortage of available energy in resource and production capacities. The total energy consumption in 2015 was decreased compared to the total consumption in the previous year by 0.9%, while during the period 2010-2015 the total energy consumption decreased at an average annual rate of 2.5%. The structure of specific forms of energy in the total consumption varied depending on the overall economic and market trends, and in period from 2010 to 2015, there has been a decrease in the consumption of coal and coke (average annual rate -0.7%), liquid fuels (average annual rate -3.0%), natural gas (average annual rate -4.8%), water power (average annual rate -6.7%) and power (average annual rate -11.3%), and there has been an increase in the consumption of wood and biomass (average annual rate 0.2%), thermal energy (av-

⁵⁷ Energy Act (OG 120/12, 14/14, 102/15)

⁵⁸ Energy Development Strategy of the Republic of Croatia (OG 130/09), defines development by 2020

⁵⁹ MEE, Energy in Croatia 2015, annual energy review

TABLE 2.11.
POWER PLANTS

Source: MEE,
2015
HEP, 2015

57.1%
**of own
production of
primary energy
products**

Within the HEP group
Hydro power plants

	available power (MW)
large	2,200.8
small	29.7

OTHER

Thermal power plants

number	available power (MW)
12	1,906.0

Cogeneration thermal power plants

installed power (MW)
165.0

Thermal power plants (biomass and biogas)

installed power (MW)
51.8

Solar power plants

installed power (MW)
47.8

Wind power plants

installed power (MW)
418.0

Small hydro power plants*

installed power (MW)
6.3

* outside the HEP system

TABLE 2.12.
**INDICATORS OF
CORRIDORS OF
OVERHEAD LINES 400
kV, 220 kV AND 110 kV**

Source: HOPS 2014

Power lines — Length (km) 7,464

Length			
400kV	220kV	110kV	medium voltage
1,247	1,210	4,884	123

71%
The energy sector contributes the most to greenhouse gas emissions

average annual rate 0.4%) and renewables (average annual rate 38.6%). Significant deviation in 2015 in relation to the indicators for the previous six-year period shows the decrease in consumption of water power and natural gas and increase in the consumption of power and energy from renewable sources. The total power consumption in the Republic of Croatia in 2015 was 17.6 TWh.

In terms of the structure of energy sources, there is a significant dependence of the Republic of Croatia on fossil fuels. The share of oil and gas in the total energy consumption in 2015 amounted to a still high 54.7%. That is why the aspect of achieving energy policy is important, that is, energy security, physical and economic stability of oil and natural gas.

The total production of primary energy in 2015 decreased by 6.7% in relation to the previous year. During the six-year period from 2010 to 2015, production of primary energy in the Republic of Croatia fell at an average annual rate of 3.4%. In 2015, the Republic of Croatia met its needs by own production of 57.1%. According to indicators for that same year in domestic production of primary energy products, most significant were firewood and biomass (28%), natural gas (27%), water power (27%) and oil (12.5%), and in the period from 2010 to 2015 there has been a significant increase in the share of renewables in the production of primary energy from the initial 1% to 5%. The possibility of exploitation of hydrocarbons, particularly natural gas, is becoming more and more important in the context of reducing dependence on energy import by utilization of own resources.

In the period from 1995 to 2015, energy efficiency was improved by more than 20%. In 2015, the trend of improvement of efficiency of energy consumption continued. Energy efficiency expressed by the index of improvement of energy efficiency was increased by 0.5 index points for all end consumers of energy.

Lack of new supply routes of gas import, uncompetitive prices and other affected the decrease of the share of gas in the total energy consumption even with the growth of domestic consumption in North Adriatic gas fields. The domestically produced natural gas covers around 70.7% of domestic needs, out of which more than half of the production (56.1%) is extracted

from the gas fields in the Adriatic Sea. Domestic production of natural gas in 2015 amounted to 1.8 billion cubic meters and covered around 71% of total consumption of natural gas, which amounted to 2.5 billion of cubic meters. The consumers with the most significant share in the total consumption are households with around 21%, public and industrial heating plants with 24%, industry with 8.5%, while the share of thermal power plants increased significantly compared to a six-year period from 2010 to 2015 and amounted to around 2%.

With regards to oil supply, there is a global insecurity due to decreased reserves, production, possible closures of refineries, low use of capacities, volatile oil market, etc.

The interests of the Republic of Croatia in the field of energy defined by the Energy Development Strategy are achieved through the use of renewable energy sources and highly efficient cogeneration, which primarily refers to the increase in the share of energy from renewable sources to 20% by 2020 based on the accepted EU obligations. At the same time, the use of own natural energy resources increases, dependence on import of energy products decreases and diversification of the energy generation and increased security of supply is achieved.

Production of power from renewable sources is continually growing, and the largest increase in installed power is observed in the field of utilization of wind power, biomass and solar energy. A total of 1300 plants using renewable energy sources have been built of total installed power of 673.71 MW, which represents a significant share in the power system of the Republic of Croatia. There are currently 20 built wind power plants of total installed power of 440.95 MW, and there are nine wind power plants of total power of 303 MW in the planning/construction phase. In 2015, the total production of power in the Republic of Croatia amounted to 11.4 TWh, out of which around 67.3% was generated from renewable energy sources, including large hydro power plants, which produced 57.5% of that energy, and 9.8% was produced in small hydro power plants and by using solar energy, wind energy and biomass. The share of renewable energy sources in the total energy consumption in 2015 was 31.4% (EIHP method), or around 23.2%

(EUROSTAT method). The total consumption of power was covered from renewables with a total of 42.2%, out of which 35.5% was produced by large hydro power plants and 6.7% by other renewables.

The use of geothermal sources for energy generation is almost negligible despite numerous deposits, particularly in northern parts of the country. A large number of concessions were granted for the use of thermal water for health, recreational and sport purposes.

Cogeneration plants, where power and heat are produced simultaneously in a single process, contribute to better efficiency of the energy sector. The basic advantage of cogeneration is increased efficiency compared to conventional power plants, where only power is produced, and industrial systems which produce only steam or hot water for technological processes. It also decreases harmful effects on the environment, especially if fuel comes from renewable sources. Cogeneration plants can also be a stable distributed source of energy for industrial plants in case of disruption in the operation of the main grid.

The demand for energy is continually increasing, primarily in the developing service sector of the economy, activity based on the quality of supply, which is in turn possible only with increased energy consumption. Emissions produced by fuel combustion have a predominant share in the total emissions of SO₂, CO₂, NO_x and floating particles. Emissions of greenhouse gases in 2014⁶⁰ amounted to 22,898.9 kt CO₂-eq. Due to the global impact on climate change, it is necessary to monitor the trend of emissions of greenhouse gases, particularly of CO₂, whose share in the total emissions of greenhouse gases in 2012 amounted to 72%. The energy sector contributed the most to emissions of greenhouse gases (71%). Emissions of greenhouse gases from the energy sector⁶¹ in 2014 decreased by 5.5% compared to the previous year, whereas in the period from 2010 to 2014 they decreased almost by 18%.

The problem of today's production and transmission facilities is unequal amortization (age) and structure (renewable and non-renewable energy resources). In reconstructions, primarily of grids, the existing corridors are used without significant extensions.

By adopting the National Energy Efficiency Programme 2008 – 2016 and use of renewable energy sources and the Ordinance on the Use of Renewable Energy Sources and Cogeneration,⁶² the prerequisites for development and exploration of locations for renewable/supplemental/alternative are introduced into all county spatial plans (in the phase of development or amendment), from the perspective of construction of generation, processing and distribution facilities. The National Programme includes the construction of small hydropower plants, utilization of solar energy, bioenergy (BIEN), wind power, geothermal energy (in the package of development and use of gas – PLINACRO), introduction of central heating systems of settlements, improvement of thermal insulation of buildings, and increase in energy efficiency as methods for use of renewable energy sources, that is, development of technologies for the purposes of promotion of renewable energy sources.

The bodies responsible for preparing the county spatial plans sought to apply the National Programme and Ordinance in the form most suitable to the county in question, which resulted in uneven representation by counties, both in terms of the importance of the renewable energy source and in terms of the level and method of selection of locations for specific types of facilities for renewable energy sources.

In the context of waste management, the construction of recycling waste collection centres was considered, which would have incineration plants in cogeneration with the generation of heat and electricity, but, due to the considerable resistance of local communities, this was not achieved.

Production systems

The basic energy system is electrical energy, which is supplied to around 95% of users, which is satisfactory. The overhead grid dominates, with the tendency to move the grid underground in urban areas, most often in the road corridor. Other energy products are used to a lesser extent and their spatial requirements are resolved by construction underground and within the existing infrastructural corridors.

Within the power system of the Republic of Croatia, electrical energy is generated mostly in conventional power plants – large hydro power plants and thermal power plants, and to a lesser extent in

⁶⁰ CAEN, Report on the Inventory of Greenhouse Gases on the Territory of the Republic of Croatia (NIR 2016)

⁶¹ CAEN, Report on the Environment in the Republic of Croatia (NIR 2016)

⁶² OG 88/12

Oil pipelines	Gas pipelines
Length (km)	Length (km)
622	2,694

TABLE 2.13.
**INDICATORS
OF PIPELINE
TRANSPORT – GAS
AND OIL PIPELINES**

Sources:
JANAF d.d.,
Plinacro d.o.o., 2017

industrial plants and small distributed sources, including small hydro power plants. The largest number of hydro power plants operational today were built in the period 1950-1980, and the largest number of thermal power plants between 1969 and 1978.⁶³ Overtime their capacity was upgraded, but taking into account their expected lifecycle, this system requires revitalization in the construction and technological sense.

Individual larger industrial consumers of electrical energy possess own power plants.

The Krško nuclear plant was commissioned in 1984 with the planned lifecycle of 40 years, which was later extended to 60 years. The total available power of that power plant for the needs of the Republic of Croatia is 348 MW,⁶⁴ which is around 9% of production capacity of hydropower plants and thermal power plants within the HEP system, the largest participant in the power system of the Republic of Croatia.⁶⁵

In recent years, many wind power plants have been constructed, so that in October 2015, a total of 18 wind power plants were connected to the transmission and distribution network, with a total installed power of 420,95 MW.⁶⁶

The planning of new power plants and their capacities depends on the planner's evaluation of possible variants and finding optimal ways to achieve the concept of the Energy Development Strategy in processes of its implementation.

Transmission and transport systems

The Croatian energy system is well developed and connected to the systems of neighbouring countries and the EU.

Transmission system of electrical energy on the territory of the Republic of Croatia is connected into 6 plants of 400 kV, and into 17 plants of 220 kV. The 400kV transmission network extends

from the eastern part of the Republic of Croatia (Ernestinovo), through the north-western (Zagreb) to the western (Rijeka) and southern part (Split). Production plants connected to the 400 kV network are RHP Velebit and Krško nuclear plant in Slovenia. The Croatian transmission system is connected to the systems of neighbouring countries by voltage levels 400 kV, 220 kV and 110 kV, and the transmission network is built enough to enable significant exchanges.⁶⁷

The state of connection by voltage levels is the following: 6% of power of power plants is connected at the 400 kV level, 33% at the 220 kV level, 54% at the 110 kV level and 7% at the mid-voltage level. Within the power system of Croatia, peak loads are achieved at the level of 3.200 MW.⁶⁸

The Croatian transmission system is characterized by old transmission facilities. The majority of stronger connected 110 kV and 220 kV plants, including lines that connect nodes and switchyards, are more than 30 years old.

The regulation possibilities of the system, along with old production facilities, are greatly hindered by hydrological dependence, which can be minimized by building modern and flexible thermal power plants. In general, the current state of the transmission network is satisfactory, that is, it meets all the needs of the economy and wider consumption. The war-caused damages have been fully repaired and the network has been reconstructed mostly within the existing corridors, while new ones are planned according to the development of production facilities.

Pipeline systems of oil and natural gas transport are distributed on almost the entire territory of Croatia. Available capacities of the oil and gas pipeline systems meet the needs of the domestic market and part of the foreign markets of the countries of the South-Eastern and - Central Europe.

⁶³ Institute for International Relations, Strategic decisions for the energy future of Croatia

⁶⁴ MEE, Energy in Croatia 2015, annual review

⁶⁵ 25 hydro power plants, 4 thermal power plants and 3 thermal power plants – heating plants

⁶⁶ A ten-year plan of development of the transmission network 2016-2025, with a detailed elaboration for the initial three-year and one-year period

^{67, 68} HOPS, Ten-year plan of development of the transmission network 2016-2025, with detailed elaboration for the initial three-year and one-year period

The construction of main oil, gas and product pipelines that would not necessarily involve new corridors, but would use the existing main corridors, is considered.

The oil and gas pipeline transport is characterized by:

- 1 greater security and convenience, better environmental protection, cost-effectiveness, etc. in relation to alternative forms of transport
- 2 application of modern technical and technological solutions (SCADA), modernization of the power system, GIS, information business systems, etc. for the purposes of security and reliability of transport, environmental protection, protection and security of people and equipment
- 3 availability of capacities of the oil and gas pipeline system for increasing oil and gas transport.

Storage capacities

Storage of crude oil and petroleum products is secured at the locations of refineries and terminals of Jadranski naftovod (JANAF) and in public-private storage facilities. The largest part of capacities is located in Sisak and Rijeka refineries, at JANAF terminals in Omišalj, Sisak, Virje and Zagreb and in INA's regional distribution centres. Others are owned by other distributors, primarily for the purposes of storing petroleum products. Croatia currently has one underground natural gas storage facility - Okoli, of total working volume of 550 million m³, with maximum injection capacity of 3,8 million m³/day and maximum capacity of withdrawal of 5 million m³/day. The construction of an underground gas storage facility (Grubišno Polje) is planned in order to cover the peak consumption in the winter period, with capacity of 40 million m³ and withdrawal capacity of 100,000 m³/day.

Energy efficiency

Croatia uses energy less efficiently than most countries of Western Europe. We spend more primary energy per unit of GDP than the EU average consumption.

In terms of total energy consumption, Croatia is in a moderate position – its energy efficiency is certainly better than in other countries in the region (Macedonia, BiH, Serbia, Montenegro, Albania) and most of the new EU member states (Czech Republic, Slovakia, Poland, Lithuania, Estonia, Bulgaria, Romania) and

other countries of Eastern Europe (Russia, Belarus, Ukraine). Compared to the countries of Western Europe, there is considerable room for improving energy efficiency in Croatia, particularly because of growing consumption. Households and the service sector jointly consume around 33% of energy, and households alone consume around 26% of total energy consumption in Croatia.⁶⁹

In 2015, the total supplied thermal energy of production units in centralized heating systems in Croatia amounted to more than 2 TWh. The total number of users of the centralized heating systems is around 154,314.⁷⁰ Many production facilities and networks for heat distribution use obsolete technology, and there lies the potential for increasing energy efficiency, primarily by installing modern pre-insulated pipelines.

2.5.3. Water management

Water management and protection within the Croatian legal system is the responsibility of several sectors and subject to several material regulations.

The legal status of water, water resources and water facilities and management of the quality and quantity of water, protection from harmful action of waters, meliorative drainage and irrigation, activities of public water supply and sewage, and other issues related to water and water resources are regulated by special laws⁷¹ and regulations as well as strategic documents adopted on the basis of them.⁷²

According to these laws, water management encompasses all activities related to underground and surface waters, with the exception of mineral and thermal waters in the context of their exploitation as mineral raw materials and waters of territorial sea and coastal waters, except in the part referring to their protection. Coastal waters and waters of the territorial sea are within the system of laws regulating the maritime and undersea areas and management of waters of the Republic of Croatia.⁷³ Mineral and thermal waters exploited as mineral raw materials are managed according to the Mining Act.⁷⁴ Coastal waters are surface waters within the line which extends one nautical mile from the line measuring the width of territorial waters and can extend to the outer border of transitional waters. With

^{69, 70} MEE, Energy in Croatia 2015, annual energy review

⁷¹ Water Act (OG 153/09, 63/11, 130/11, 56/13, 14/14), Act on Financing Water Management (OG 153/09, 90/11, 56/13, 154/14)

⁷² Water Management Strategy, Plan for Management of Water Areas, construction programmes, etc.

⁷³ Maritime Code (OG 181/04, 76/07, 146/08, 61/11, 56/13, 26/15)

⁷⁴ OG 56/13, 14/14

regards to the protection of maritime and coastal waters, within an integral approach to the management of the marine environment and coastal area, the Regulation on Drafting and Implementation of Documents of the Marine and Coastal Management Strategy⁷⁵ introduced the term of sea water.⁷⁶

The water protection system is also part of the system of protection of the environment and nature (especially maintaining biodiversity and conservation of ecosystems). Water protection always includes the protection of the water environment, and where applicable, other components of the environment.

Water management includes, among other things, water management, protection from harmful action of waters, management of water resources and their use, protection of waters and water environment from pollution and maintaining a good ecological state.

Water management is based on the principles of integrity of the water system and sustainable development, and key goals refer to ensuring necessary and sufficient quantities of quality water, intended for human consumption and water of adequate quality for various economic needs, protection of people and property from harmful action of waters, particularly floods, and achieving and preserving a good state of waters and related ecosystems. An important element of water management is also the need for cooperation with other countries because of cross-border impacts on water and water environment.

Measures for protection and use of waters are based primarily on the principles of caution, prevention and elimination of damage to the water environment, and must comply with special regulations on the protection of the environment and nature.

According to the law, water property includes riverbeds of surface waters with accompanying inundation areas and water sources (natural mineral, thermal and natural spring water) of specific characteristics of abundance and area size. They are primarily intended for construction and maintenance of water facilities for the purpose of maintaining and improving the water regime, navigation and protec-

tion from harmful action of waters and use and protection of sources.

For the purpose of water management, the following river basin districts have been identified: the Danube river basin district and the Adriatic river basin district, and the border between them is the dividing line between the Adriatic and Black Sea river basin. Cross-border river basins are also within the system of international river basin districts. There are 4,663 settlements in the Danube river basin district, and 2,091 settlements in the Adriatic river basin district⁷⁷.

Strategic and planning water management documents are the Water Management Strategy defining the state policy of long-term water management and River Basin Management Plan, which includes the management of waters and risks from floods and long-term construction programmes.

The protected areas are the areas of special protection defined by the Water Act,⁷⁸ and vulnerable areas are areas in which it is necessary to implement stronger measures of protection of waters from pollution by nitrates from agricultural sources.

The Act defines the category of sensitive areas and less sensitive areas in which it is necessary to implement a higher or lower level or degree of purification of municipal wastewater than those stipulated by a special regulation.

Areas intended for abstraction of drinking water are protected as zones of sanitary protection of sources. In Croatia, zones of sanitary protection of drinking water are registered on the total of 10,914 km² or 19% of land territory,⁷⁹ whereby the predominant zones are zones of restriction and supervision (Zone III).

Use of waters refers to the abstraction of surface or groundwater and utilization for: generation of electrical energy and operational purposes; breeding of freshwater fish and other aquatic organisms; navigation; rafting and navigation by other vessels; sport, bathing, recreation and other similar purposes; setting of floating or navigational facilities on water.

Protection from harmful action of waters refers to the protection from floods, protection from ice on water courses and protection from erosions and flash floods.

⁷⁵ OG 112/14

⁷⁶ pursuant to FMSP and UNCLOS

⁷⁷ River Basin Management Plan 2016 – 2021 (OG 66/16)

⁷⁸ OG 153/09, 63/11, 130/11, 56/13, 14/14

⁷⁹ River Basin Management Plan 2016 – 2021 (OG 66/16)

80 Primarily the State Plan of Flood Protection

81 OG 36/95, 70/97, 128/99, 57/00, 129/00, 59/01, 26/03, 82/04, 110/04, 178/04, 38/09, 79/09, 153/09, 49/11, 84/11, 90/11, 144/12, 94/13, 153/13, 147/14, 36/15

84%
of population
is connected
to the water
supply system

It is implemented in accordance with planning documents⁸⁰ and based on the Flood Risk Management Plan, which is an integral part of the River Basin Management Plan. Efficient protection from floods is based on preventive action and efficient action in regular circumstances and emergencies of direct danger or flooding.

As part of the development of the Flood Risk Management Plan as an integral part of the River Basin Management Plan, maps of threats from floods have been developed, which represent possibilities of development of certain flood scenarios and maps of risks from floods, which represent possible harmful consequences of scenarios represented in maps of threats. These maps are particularly important in terms of utilization of available spatial resources in planning new construction areas or expanding the existing ones for expansion of settlements, protection of existing settlements under unacceptable risks from flooding and/or directing economic activities in space. In spatial sense, areas exposed to erosions and flash floods are also sensitive, thus it is especially important to develop an efficient protection system for them.

Water management includes the construction of water facilities (for regulation, protection and melioration) and water maintenance to ensure unharmed flow of water.

2.5.4. Utility infrastructure

Provision of utility services means continuously meeting the needs of general social interest for residents of a particular social community and is one of the most important issues for each local community. Moreover, as utility services are of general social interest, life in cities and municipalities would be completely unimaginable without them. According to the Act on Utility Management,⁸¹ utility services include drinking water supply, drainage and purification of wastewater, disposal of municipal waste, transportation of passengers in public transport, maintenance of public spaces, farmer's markets, maintenance of cemeteries and crematoriums, chimney sweeping, public lighting and other similar activities meeting the needs of the local community. Utility infrastructure, e.g. facilities and devices of utility infrastructure are facilities and devices performing utility ser-

vices or facilities and devices used when performing these services.

Utility management includes performing utility activities, provision of utility services, financing construction and maintenance of facilities and devices of utility infrastructure as an integral system in the area of local and regional self-government units when stipulated by law.

In order to ensure the technical and technological uniformity of public water supply facilities from the source to the end user, technical and technological uniformity of public drainage facilities from the point of discharge to the natural receiver and a higher level of efficiency, cost-effectiveness and social fairness, a system of service areas has been established, whose borders are defined by a special regulation.

Public water supply

Drinking water supply includes abstraction, purification and delivery of drinking water. The right of abstraction of water from water courses and other natural deposits for drinking, sanitary needs and other needs of households – the right of general utilization of water, is granted exceptionally without concession.

The connectivity to the system of public water supply is not fully achieved and amounts to around 84%. The water supply network at the county level is unequally developed and depends primarily on the development of the county and degree of urbanization.

On the territory of the Republic of Croatia, 70 water supply areas have been identified. There is a total of 176 providers of water services and 589 water wells. Part of the population is connected to local water supply systems. Their number has been continually decreasing due to connections to water supply systems. The transition period until 31st December 2018 has been envisaged.

According to the data of Hrvatske vode (Croatian Waters), around 500 active interventions for the needs of public water supply have been registered, mostly on groundwater.

The residents not connected to the systems of public water supply are supplied with water from the so-called local waterworks or from individual water supply sources (wells, cisterns), which have not

established a system of water quality control, but it is carried out as needed and assessed by users.

Although population growth is not expected in the next fifteen years, the increase in the water demand will arise out of the increased level of connectivity of population to public water supply systems. In tourist areas, an increase in the demand for water is expected due to the expected increase in the number of tourists and achieving higher categories of tourist services.

Public drainage

Public drainage includes the collection and drainage of wastewater, purification, and then discharge into surface water and processing of sludge created as a result of purification.

Collection, processing and recovery of wastewater is also not satisfactory, which increases the risks of contamination and reduced possibility of drinking water supply.

A total of 767 agglomerations have been identified, out of which 281 are larger than 2,000 ES.⁸² The level of coverage by the public drainage service is on average 47%. Wastewater from around 35% of population or around 60% of population connected to the public drainage system is purified. There are significant differences in the level of coverage by drainage systems between counties, particularly between cities and municipalities. Larger shares of population covered by services of public drainage are characteristic of settlements with a larger number of residents. The transition period has been planned by 31st December 2023.

Construction of a system for purification of wastewater is a delicate task for every urban agglomeration and settlement. High standards of environmental protection require adequate technology and consideration of soil characteristics, particularly in karst areas.

Offshore outfall is a water facility for discharging purified wastewater into the sea, at the distance from the coastline not less than 500 m and at the depth larger than 20 m from the water surface. With the constructed and functional system of public drainage, with devices for purification of wastewater, the construction of offshore outfalls is an important additional measure for protection of waters.

82 River Basin Management Plan 2016 – 2021
(OG 66/16)

47%
is the level of coverage by the public drainage service

2.6. Spatial pressures

We have sound climate knowledge to inform climate action and to keep climate change impacts to a manageable level. The cost of inaction is high and will become even higher. — Michel Jarraud⁸³

⁸³ The Secretary
General of the World
Meteorological
Organization (WMO),
marking the World
Meteorological Day
23rd March 2015

2.6.1. Impacts of climate change

Climate change and associated greenhouse gas emissions, which are brought into connection with global warming and the occurrence of acid rains as a result of pollution of rainfall by sulphuric and nitric acid, are an important global issue of long-term sustainable development. Thus, the strategies of mitigation of climate change are aimed at control and reduction of greenhouse gas emissions produced as a result of human activity, primarily carbon dioxide, whereas the instruments of action are primarily related to the energy system, for example, more efficient use of energy and increased share of renewable and other energy sources which do not produce greenhouse gases and development of sustainable transport.

Extreme weather phenomena caused by global warming, such as heavy rainfall, heat waves and devastating wind gusts, strongly affect people and space. Apart from being a direct threat to people's lives and quality of life, floods, droughts, forest fires, melting icebergs and sea level rise, as most frequent consequences of these phenomena, significantly transform space and have destructive effects on specific ecosystems, landscapes and built structures and cause great economic and material damage.

There are two aspects of responses to risks and consequences of climate change: action in current conditions of climate variability and response to future climate change. In this regard, we should take into account that there are no precise mathematical models that could predict with absolute certainty the actual chronological

and consequential sequence of climate change, but scientific research warn about global trends and examine possible scenarios. Future developments also depend on the level and success of the global response to recognized risks, for example, the effects of reduction in greenhouse gas emissions. The possibility and efficiency of response also depends on the dynamic of future climate change. The Strategy on Adaptation to Climate Change, which is being developed and is expected to be adopted at the end of 2017, will assess the future impacts of climate change, which will allow for the elaboration and establishment of a system of adaptations and reduction of impacts of this change in the first half of this century.

A special problem is microclimate change in urban areas, especially in centres of larger cities. This change is largely a consequence of activities carried out in cities, but also partially of dense construction and an unfavourable ratio of built and natural areas. Apart from air pollution, the basic characteristics of a modified urban microclimate include higher average temperature, higher daily warming of surfaces and reduced possibility of overnight cooling and, as a consequence, changes in the precipitation regime and wind intensity. The temperature increase entails a series of direct consequences such as disruption in water supply (for drinking, but also due to increased watering), increased health problems of risk categories of population, pressures on the energy system (air conditioning), and changes in vegetation. Higher intensity and frequency of precipitation, which are not accompanied by adequate infrastructure and/or existence of larger absorption surfaces, lead

**Extreme weather
phenomena
caused by global
warming strongly
affect people
and space**

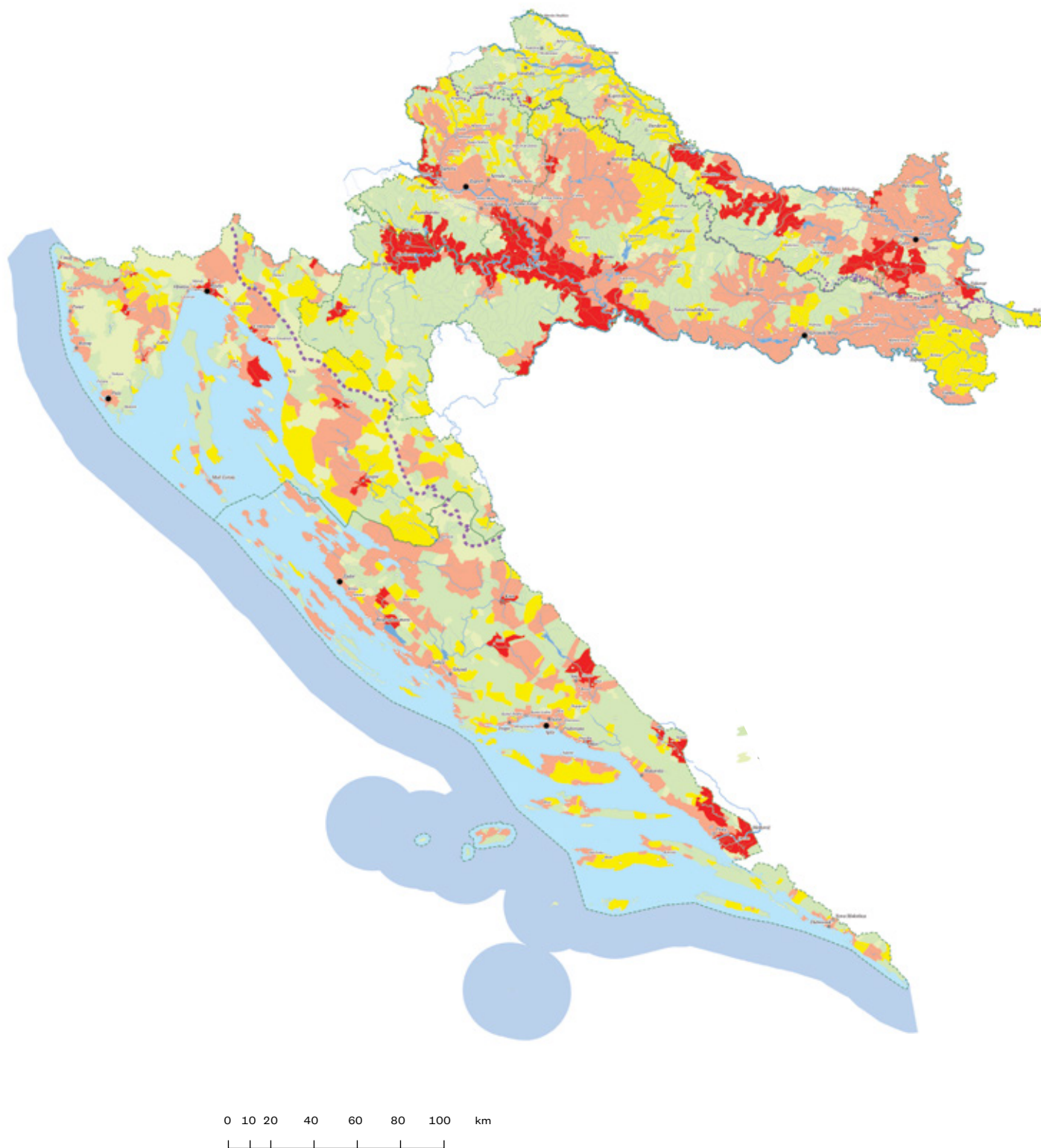


FIGURE 2.20.
**PRIOR ASSESSMENT
OF FLOOD RISK
LEVEL**

- Coastal sea
- Territorial sea
- 1A, very high risk
- 1, high risk
- 2, medium risk
- 3, low risk
- 4, very low risk

- SETTLEMENTS**
- 1000 – 2500
 - 2501 – 5000
 - 5001 – 10 000
 - 10 001 – 50 000
 - > 50 000

- Border of river basins
- Border of sub-basins
- Border of water management departments

Croatian Waters, 2013.

to local floods in cities and often result in landslides.

The impact of microclimate of urban areas, as well as the mutual impacts of global climate change and urban microclimate, are still insufficiently explored, but there are extensive studies aimed at grasping the interaction of climate impacts, economic activities, land use, traffic and construction of areas in planning resilient and adaptable cities.

Croatia participates in international activities for mitigation of climate change by signing all important treaties and agreements⁸⁴ related to climate change, global warming, carbon dioxide emissions and reduction of greenhouse gases and their incorporation into regulations and strategic documents.

84 UN Framework Convention on Climate Change (UNFCCC), Kyoto Protocol, Montreal Protocol

85 The Intergovernmental Panel on Climate Change (IPCC) was founded in 1988 at the initiative of the UN, World Meteorological Organization and UN Environment Programme (UNEP) to assess the risk of climate change caused by human activity

At the 21st Conference of Parties to the UN Framework Convention on Climate Change, a new global climate agreement, the Paris Agreement, has been adopted. It defines the obligations of reduction in greenhouse gas emissions for all countries of the world and is to be applied from 2021. The Intergovernmental Panel on Climate Change (IPCC)⁸⁵ warns that, due to carbon emissions, we can expect a dangerous rise in global temperature. That is why we need an international agreement to slow down global warming and postpone the irreversible impacts of climate change.

Consequences of climate change in Croatia

Climate indicators show that the climate in Croatia is changing. Three main characteristics of climate change have been recognized: rise of the average annual air temperature, precipitation decline and more frequent extreme weather phenomena such as thunderstorms accompanied by extreme rainfall and/or wind and heat waves. This all results in longer and more intensive droughts or rain periods, and the number of years that could be regarded as average or normal is decreasing.

The conducted studies show that climate change by 2050 could endanger sources of food and drinking water, slow down economic growth and increase the intensity of extreme weather phenomena. The Intergovernmental Panel on Climate Change announced that the Mediterranean region will be particularly affected, especially the vineyards and other agri-

cultural crops in the coastal areas, and the fish harvesting in the Adriatic Sea in the next 40 years could be cut in half. It is expected that there will be more and more droughts in these areas, which will endanger water resources, and forest fires, and the sea level rise will endanger the coastal areas.

Areas most exposed to **droughts** are coastal areas and agriculturally intensive plains, and the impact is aggravated by an inadequate and underdeveloped irrigation system. Another serious problem are **forest fires**, which destroy **the environment and change the landscape**, particularly in coastal areas during periods of dry weather in summer months, and often threaten human lives.

During the last few decades on the territory of the Republic of Croatia, extreme hydrological phenomena with extensive rainfall have often been observed, which result in unprecedented water waves and extremely high water levels with **floods**. Areas particularly exposed to natural floods are: catchment areas of large rivers of the Danube river basin (caused by heavy rainfall and/or sudden melting of snow), areas along smaller water courses (due to short-lasting intensive rain, these are usually areas outside the flood protection system), karst fields (due to heavy rainfall and/or sudden melting of snow in combination with insufficient absorption capacity of natural abysses), plains along inland waters and coastal areas (sea flooding).

Danger of large-scale floods is mostly characteristic of plain and hilly areas along the rivers Drava, Kupa, Sava, Danube and Mura. In addition to efficient implementation of flood protection measures and management of large water waves using regulatory and protective water engineering facilities, natural retentions, that is, natural flooding areas of Odransko, Lonjsko and Mokro polje are especially important for preventing floods and reducing the risks of floods.

A special problem are floods in urban areas caused by short-lasting precipitation of high intensity, which, due to a high density of population in a relatively small area, often cause great material damage. Protective measures for this type of flood primarily involve the planning of a rain-water drainage system in settlements at the local level.

Problem of microclimate change in urban areas

3.1%

**ecological
agricultural
production**

The sea level rise is a long-term problem, which could, according to the estimates, have a significant effect on people's lives and ultimately cause ecological migrations. It is expected that the sea level will rise up to half a meter in the next hundred years, which will endanger the low coastal areas, for example, the Neretva area, which could be partly flooded. Some Adriatic islands of low altitude could disappear in the next few decades.

The sea level rise will affect the water sources in coastal areas because sea water pushes out fresh water, so sea level rise endangers the freshwater reserves. If the sea level rises, it will threaten the security of structures near the sea, for example, bridges and other buildings.

A sea temperature rise is also observed in the Adriatic Sea, which more and more often causes the presence of immigrant types of fish from warm seas and spreading of alien species, some of which become invasive. This in turn has an unfavourable impact on its biodiversity, and ultimately leads to a decrease in tourist potential of that area.

2.6.2. Anthropogenic impact

Fossil fuels

Combustion of fossil fuels, coal, oil and petroleum products and natural gas produces greenhouse gas emissions, which leads to global warming and acid rains.

The following sectors contributed the most to greenhouse gas emissions in 2014: energy 70.9%, agriculture 10%, industrial processes 12.5% and waste 6%.⁸⁶

In mountainous parts of Croatia, especially in Gorski kotar, **harmful effects of acid rains** can be observed, which destroy the forest mass, contribute to extinction of microorganisms and plants in lakes, acidification of surface waters and soil, which results in contamination of groundwater courses and sources of drinking water.

Agriculture

Negative effects of agriculture on space are manifested in the pollution of soil, waters and the sea and in greenhouse gas emissions.

As a result of fertilization and tillage of soil, the soil is degraded and waters are

contaminated. In 2008, the consumption of mineral fertilizers in Croatia amounted to 178 kg/ha, and in the period from 2008 to 2010 it was decreased by 41%. Despite the fact that consumption again increased by 11% in 2011, in 2012 the consumption of mineral fertilizers fell to 135 kg/ha, or by 4.4% compared to 2011.⁸⁷ Agricultural activity has a small influence on soil pollution in relation to developed European countries.

Out of all cultivated agricultural areas, ecological production accounts for 3.1%. In the period 2007-2013, the number of areas under ecological production increased five times. On the other hand, utilized areas under ecological production in older EU member states (EU-15) in the period 2008-2012 on average accounted for 5.6% of total utilized agricultural land.⁸⁸

Greenhouse gas emissions amount to 10.0%⁸⁹ of total national emissions. A negligible trend of reduction is observed, caused by a decrease in livestock, but also by a decrease in consumption of mineral fertilizers and introduction of good practices on agricultural farms.⁹⁰

Use of renewables in agriculture is still at the level of individual farms.

Illegal building

Illegal building has characterized Croatian space for more than 50 years. Such construction is present throughout the country, and the most exposed areas are the largest urban centres, the entire coastal area and islands. It is characterized by low quality and/or inadequate construction and occupation of space outside the building area. Illegal building is an aggressive act which annuls the purpose of planning by degrading the existing values of space, weighing on infrastructure, increasing the risks of disasters and disabling a planned development.

A large number of submitted requests for issuing the Decision on the As-Built State, that is, the legalization of illegal building which amounts to 826,948 shows the scale of illegal building in Croatia.⁹¹ The largest number of requests in relation to the number of households was submitted in the Zadar County, while the largest number of requests in relation to the number of apartments was submitted in the Virovitica-Podravina County.

⁸⁶ National Inventory Report (NIR 2016)

⁸⁷ State of the Environment Report in the Republic of Croatia 2014

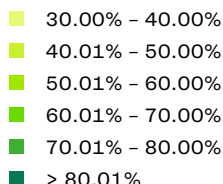
⁸⁸ Agriculture Annual Activity Report 2013, Ministry of Agriculture, October 2014

⁸⁹ National Inventory Report (NIR 2016)

⁹⁰ Rural Development Programme of the Republic of Croatia for the period 2014 – 2020

⁹¹ Act on Proceeding with Illegally Built Buildings (OG 86/12, 143/13)

FIGURE 2.21.
NUMBER OF
SUBMITTED
REQUESTS FOR
THE DECISION ON
AS-BUILT STATE
IN RELATION
TO NUMBER OF
HOUSEHOLDS



Sources: ALICB, March 2015
CBS, 2012, Census 31st March 2011



Changes in state structure, processes of transformation and privatization and the economic crisis left a visible mark on space

⁹² Law on Managing and Disposal Assets Owned by the Republic of Croatia (OG 94/13, 18/16)

The overall legislative framework, active at all levels, has not reached the level of efficiency that would prevent illegal building, and the situation is additionally complicated by war destructions. LSGUs responsible for spatial planning show low level perception of the need for illegal building cause and effect analysis, including developing ways to prevent it. The general public is also not fully aware of the fact that illegal building has a series of negative effects on space, and therefore has a significant impact on the quality of life.

Abandoned and overlooked areas

Changes in state structure, processes of transformation and privatization, global economic processes and the economic crisis and recession characterized the period of the last two decades and left a visible mark on space.

Restructuring of the defence system of the Republic of Croatia lead to the discontinuation of the interest and need of the armed forces of the Croatia military for use of large **military complexes** in cities. Abandoned military complexes thus became, particularly in cities, a significant spatial resource, whereby the applicable laws and regulations allow the local self-government units to use them to resolve public needs.⁹²

During the processes of transformation and privatization in 1990s, the process of restructuring of large **industrial manufacturers** also started, and individual sectors or administrative units of former companies became independent companies, which upon division of the company also gained an appropriate part of real property. By opening economic zones out-

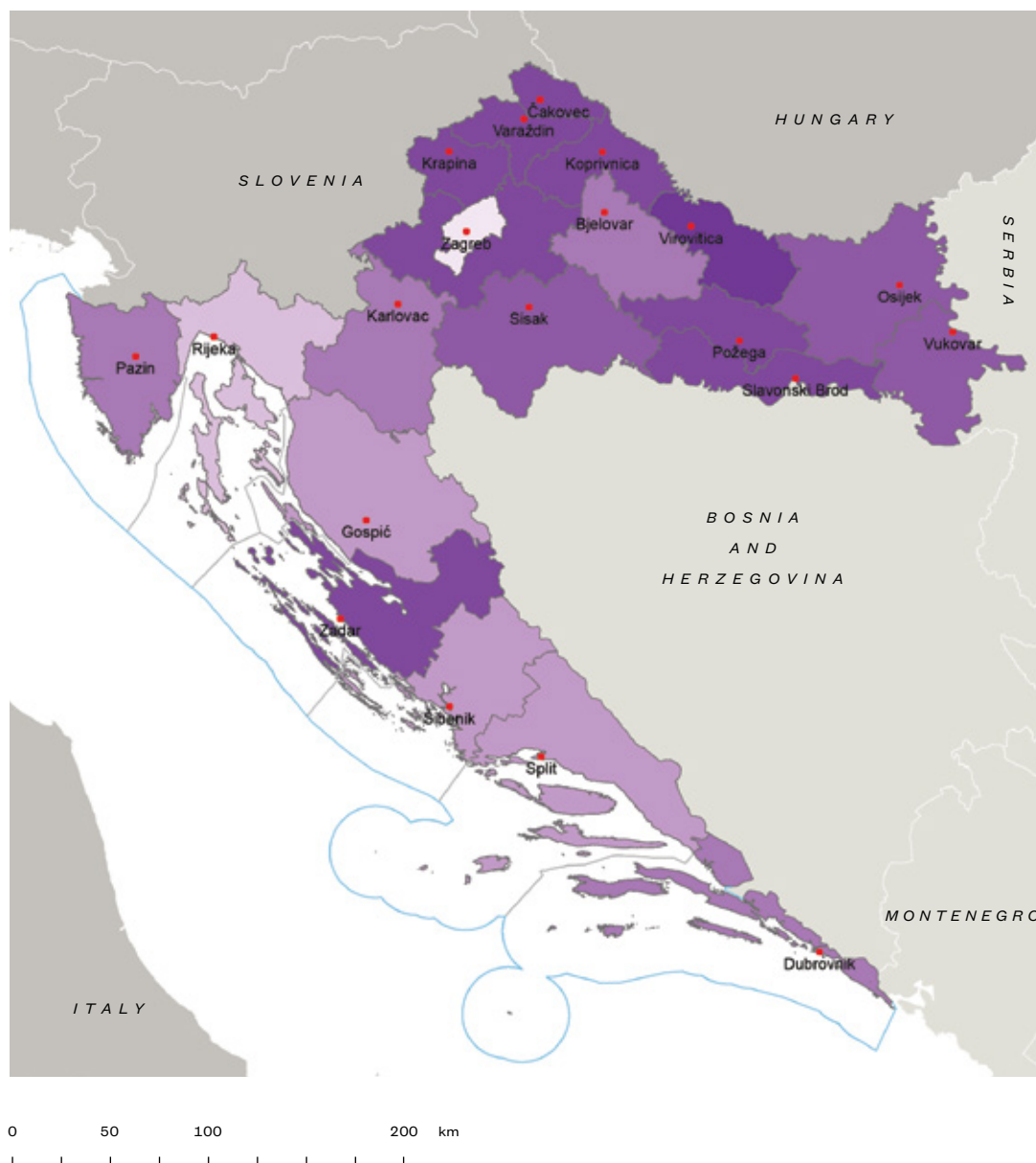
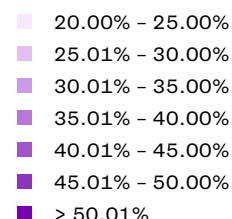


FIGURE 2.22.
NUMBER OF
SUBMITTED
REQUESTS FOR THE
DECISION ON THE
AS-BUILT STATE
IN RELATION TO
THE NUMBER OF
APARTMENTS



Sources: ALICB, March 2015
CBS, 2012, Census 31st March
2011

side settlements, part of the production facilities is moved away from cities, and that empty space is now available for new, different purposes, but the remainder of them remain at the same locations and slowly collapse.

Abandoned **hospitality and tourist** spaces on islands and coastal areas are a result of collapse of earlier tourist and hospitality companies and existing unresolved ownership and legal relations regarding real property. The conditions that additionally prevent new investments are long-lasting neglect and devastation, high costs of renovation or removal and the fact that the land they occupy was often not included in the property of the owner of buildings in the process of transformation and privatization, and thus the right of disposition thereof is an additional expense.

The abandoned facilities for residential and business purposes, utility facilities, areas of former shipyards and industrial ports and abandoned exploitation fields on the periphery of settlements or outside them have been recognized to a somewhat lesser extent.

As the said areas are parts of built areas of settlements, but no longer their functional part, we recognize them as so-called overlooked spaces, or brown-field zones. Most overlooked spaces are characterized by attractive positions in the urban fabric, size of the land, traffic access and high level of existing development of the land. However, unresolved ownership and legal relations that limit the possibilities and scope of conversion of specific buildings or complexes, the level of necessary investment, the required

**Overlooked
spaces /
brownfield zones
– attractive
position in the
urban fabric**

The most attractive areas are also the most endangered ones

development or modification of existing spatial planning documentation, inability to define a time schedule of interventions, and in some cases, regimes of protection of cultural heritage, make them unattractive to potential investors.

With regards to spaces that are no longer used and cannot be longer used as they were used before, it is necessary to, while respecting the spatial characteristics and actual needs, prevent their further devastation, carry out an urban transformation and use them for a new purpose.

Attitude towards cultural heritage

Architectural heritage is subject to many influences, from climate and global pollution, political situation, unresolved ownership and legal relations, changes in the economic system and attitude towards ownership, crisis of the economy, volatile relations on financial capital markets, liberalization of the real estate market, speculative abuses, disrespect of spatial planning documentation and the legislative framework, to war. Despite continuous investment in renovation and maintenance of cultural property, for the above said reasons, specific types of cultural property are in poor condition. Through programmes of protection works carried out by the Ministry of Culture and EU funds, integrated development programmes are renewed, which are based on the renovation of cultural heritage for the purposes of creating added value. Due to enormous costs of management and maintenance, an almost monocultural purpose is not developmental and economically viable. A complex legislative framework, difficult economic situation in recent years and low social awareness are limiting factors of protection of architectural heritage and its role in modern society. Registering and evaluating modern architectural production as well as those at the end of 20th century has not been completed.

Attitude towards landscape

The condition of landscape in Croatia observed at the national level can be evaluated as good. However, there are many areas with degraded landscape. The most attractive areas are also the most endangered ones. The expansion of building areas of cities, illegal building and inadequate protection of views in the coastal area and on islands devastated the ambient values of some localities. Degraded landscapes are open pit mines of mineral raw mate-

rials, landslides, areas affected by fires, brownfield zones, settlements created by illegal building, etc. Urban landscapes are changing fast and, because of intensive construction, often look similar, both inland and on the coast. Folk construction, such as dry stone walls in the coastal areas, disappear both as an ambience and as individual structures.

The above said puts a lot of pressure on the landscape, and it is expected to increase even more. This primarily refers to: urban sprawl of larger cities, death of small cities and rural areas, emergence of new tourist areas, construction of golf courses, large infrastructural projects and construction of power plants using renewable energy sources.

So far only landscapes within national parks, nature parks, regional parks, significant landscapes, few landscapes are protected as cultural property and some landscapes are protected by planning documentation. Although the Landscape Convention recognizes the importance of all landscapes, and not only exceptional ones because of their decisive impact on the quality of life, within the landscape policy, other landscapes, which occupy the largest part of the territory of the country, do not have attract adequate attention.

The 1997 Strategy and the 1999 Programme planned the development of the Landscape Study of Croatia, as the basis for an integral protection of diversity and identity of landscapes. It has also been established that such a study will enable the definition of areas of common characteristics, landscape units and their synthesized evaluation that provides an insight into benefits, vulnerability or endangerment of certain units of landscape in terms of potential purposes and spatial interventions. So far, as the first step, the Content and Method Study of the Landscape Study of Croatia has been developed.⁹³

Attitude towards quality of building

Most prerequisites for improving the quality of building and designing of space of Croatia, regarding professional stakeholders, already exists: systematic professional and life-long education in architecture and civil engineering, strategic and implementation spatial plans of more generations, territorial monitoring and satisfactory legislative framework. However, the state is not as it should be and as the population and space deserve.

⁹³ Physical Planning Institute, Ministry of Physical Planning, Construction and Housing, 1999

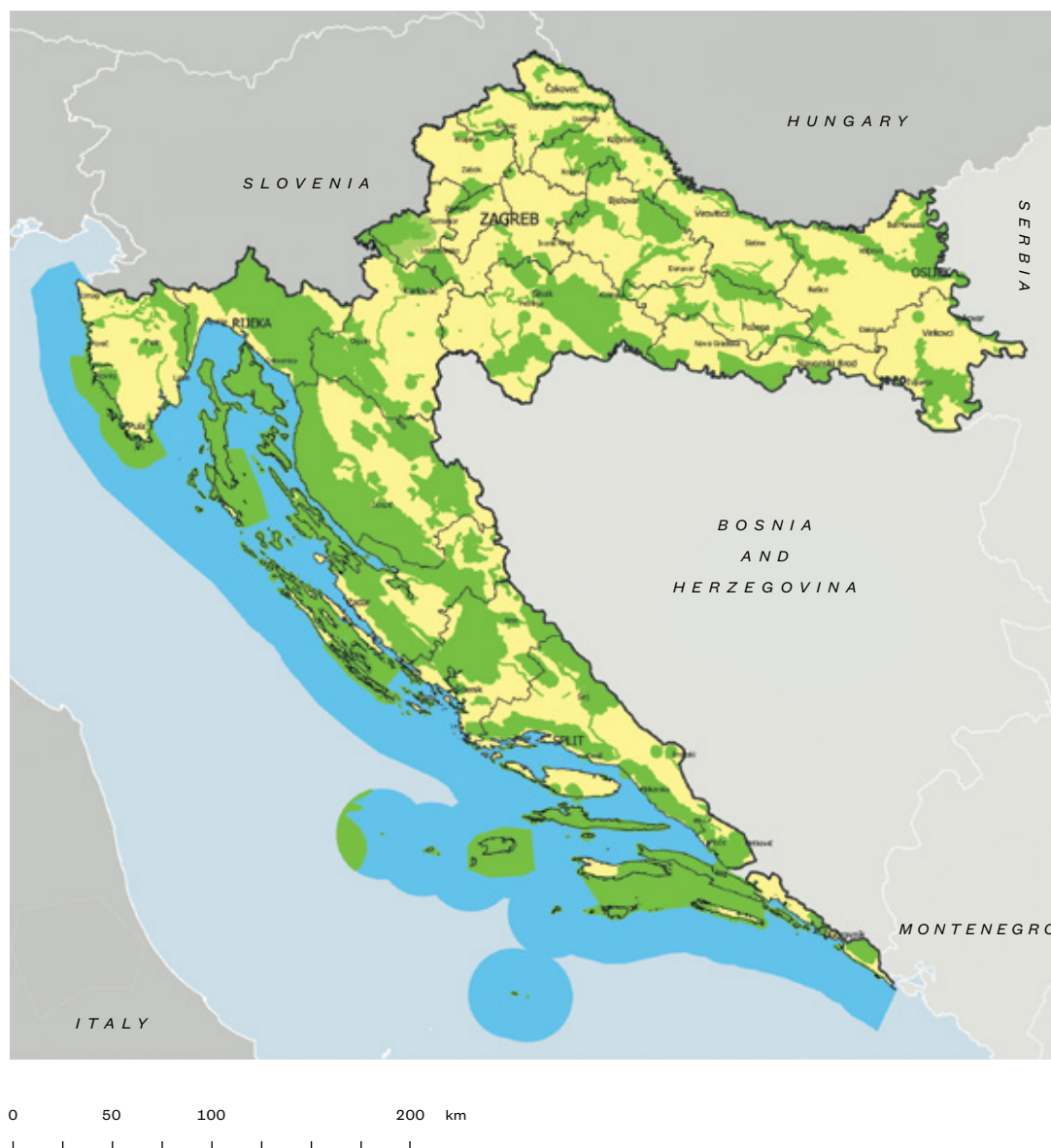


FIGURE 2.23.
**PROTECTED AND
UNPROTECTED
LANDSCAPES**

- Protected areas
(Protected nature
areas and ecological
network Natura 2000)
- Land areas
outside the system
of protection
- Marine areas
outside the system
of protection

Source: Nature Protection
Information System of the State
Institute for Protection of Nature

War destructions, displacement of population, abandonment of rural areas and islands, neglect of arable land and economic resources and new orientation of the economic system caused a lot of changes in Croatian space after gaining independence. At the same time, the population pressure around and in cities, and in attractive coastal areas along the sea and rivers increased. The construction and reconstruction of the housing stock in war-town areas is carried out without coordination.

Changed economic circumstances and liberalization of the market contribute to the import of new materials, technologies and aesthetic models, which are not always suitable to Croatian space, and the real estate market is flourishing in the most attractive areas. Due to disrespect for strategic and planning directions, land

use conversion is subject to profiteering interests of individuals or groups, which is particularly reflected on construction for residence and tourism, as the most represented category.

In parallel to intensive urbanization and strengthening of urban centres and concentration of capital within them, large construction projects of high visibility and with negative effects on the surrounding areas have been started, but not completed (for example, the University Hospital in Zagreb, business buildings along main roads, etc.). Construction of huge buildings (shopping centres, storage spaces, closed sport facilities), often defined by corporate rules in terms of design, energy efficiency and sustainability, when situated in building areas of smaller settlements, disrupt the views and scale of surrounding structures and space.

Even planners, architects and engineers of professions involved in building cannot resist the pressure of market economy, which leads to devastation of some areas through planned or illegal building. These are not merely individual structures, but whole stretches of land or areas, particularly along the Adriatic coast, on some islands and near large cities. This is a result of a lack of control of both the quality of spatial plans on the implementation level and the quality of building, and particularly the most common type that occupies the largest part of space – residential building. Residential building expanded in several directions – meeting the primary housing needs, secondary housing and housing for tourist purposes (registered or unregistered). The consequences are built zones in detached building areas for occasional use (during the 3,4 summer months), which reduce the quality of life by placing an enormous burden on the social, transport and utility infrastructure. This does not refer only to registered zones of illegal building, but also to old city cores whose population has succumbed to challenges of the market and moved out, which contributed to the death of the urban structure.

Waste management

Waste management in the Republic of Croatia is an integral part of the entire environmental protection system, and in spatial sense, implies the identification of optimal locations for waste management facilities, which should, in addition to minimal environmental impact, also meet the criteria and requirements stipulated by spatial plans, in accordance with the concept of spatial development.

The key components of sustainable waste management are:

- 1 waste prevention
- 2 preparation for re-use
- 3 recycling
- 4 other recovery procedures, for example, energy recovery
- 5 waste disposal.

Waste prevention⁹⁴ is one of the most important topics in preventing the excessive consumption of spatial resources and placing a burden on the environment by uncontrolled waste accumulation and is an ongoing process that includes legal instruments and comprehensive education on sustainable use of space and the consequent environmental impact. According to the Act on Sustainable Waste Manage-

ment,⁹⁵ a hierarchical sequence of waste management components has been defined: prevention, preparation for re-use, recycling, recovery procedures, disposal. This fits in with the concept of sustainable use of space, since its ultimate goal is to minimize the burden on space.

Based on these postulates, a legislative and strategic framework for setting up an integral waste management system has been established. The basic strategic framework of the system is the Waste Management Strategy of the Republic of Croatia⁹⁶ and national and local waste management plans. In order to establish a sustainable integral waste management system, it is necessary to develop the waste management infrastructure and establish waste management centres, which normally require space for the construction of waste treatment facilities, landfill cells, recycling yards and supporting infrastructure.

According to the law,⁹⁷ waste management facilities have a national (waste management centre, waste incinerator plant and landfill for hazardous waste), county (other landfills and cells for disposal of asbestos), or local significance (other facilities not classified into the first two categories) and their location is planned accordingly at relevant levels of spatial plans.⁹⁸ The general arrangement and criteria for future sites of waste management facilities are defined by the Waste Management Plan of the Republic of Croatia.⁹⁹

There are expected and/or required interventions in space for closing down and remediation of existing landfills, whose planned capacities have been utilized or exceeded, particularly when disposal on a new location has not been resolved. The most serious problems can be found in the largest cities, namely, Zagreb, Rijeka, Split and Osijek. A special problem in space are landfills created without adequate approvals and used without supervision.

Disposal of radioactive waste is part of a separate national and legislative EU framework¹⁰⁰ on the basis of which the Radioactive Waste, Disused Sources and Spent Nuclear Fuel Disposal Strategy has been adopted¹⁰¹ (Strategy of Disposal of RW). The Republic of Croatia has the obligation to dispose of radioactive waste and disused sources of ionizing radiation (created in the past 60 years in medicine, industry, science, military and public use

⁹⁴ 7th EU
Environment Action
Programme
2014-2020

⁹⁵ OG 94/13

⁹⁶ Waste Manage-
ment Strategy of the
Republic of Croatia
(OG 130/05)

⁹⁷ Act on Sustainable
Waste Management
(OG 94/13)

⁹⁸ Articles 83 and
179 of the Act on
Sustainable Waste
Management (OG
94/13)

⁹⁹ Waste
Management Plan
for the Republic of
Croatia for the Period
2017 – 2025 (OG
03/17)

¹⁰⁰ Act on Radiologi-
cal and Nuclear Safety
(OG 141/13, 39/15)

¹⁰¹ OG 125/14

in Croatia) and to ensure the disposal of the half of radioactive waste and spent nuclear fuel created by the operation and decommissioning of the Krško Nuclear Plant pursuant to the Bilateral Treaty.¹⁰² In addition, it has the obligation to recover the sites on which natural radioactive materials are found and establish continuous regulatory supervision.

At the moment, disposal of these types of waste is carried out unsystematically, and the concept of disposal of waste created as a result of operation of the Krško Nuclear Plant has not been elaborated. Natural radioactive materials that require regulatory supervision are found at three sites:¹⁰³ Plomin, Kaštel Sućurac and Kutina, and are a result of combustion of coal with higher concentrations of uranium and radium, that is, processing of phosphorite into fertilizer. Disposal of natural radioactive materials is planned at sites on which they are found, based on comprehensive remediation programmes which comply with safety standards for protection from radiation and environmental protection according to the requirements of the applicable regulation.

At the moment, a national framework is being established, which would ensure responsible and safe disposal of this type of waste, in a technologically safe and environmentally friendly manner and in accordance with the uniform standards prescribed on the EU level. The Act on Radiological and Nuclear Safety and the Strategy of Disposal of RW envisage the establishment of the Centre for Disposal of Radioactive Waste at a single site, with a central storage facility for institutional radioactive waste, disused sources, long-term storage facility for low and intermediate level radioactive waste from the Krško Nuclear Plant with supporting facilities for conditioning, testing and handling, as well as infrastructure. At the same site, detailed exploratory works will be carried out for the purposes of construction of the disposal facility for low and intermediate level radioactive waste from the Krško Nuclear Plant and possibilities of dry storage for spent nuclear fuel from Krško will be examined.

Establishment of the planned Centre for Disposal of Radioactive Waste implies a selection of the suitable site on which the central storage facility with accompanied facilities would be situated in the initial stage, where institutional radioac-

tive waste and disused sources of ionizing radiation generated in Croatia will be processed, and in the next stages of development, depending on the future agreements with the Republic of Slovenia, the storage facility for radioactive and disused nuclear waste from Krško and ultimately, the landfill for all said types of waste.

The search for the solution for the location of the disposal site for radioactive waste and research of a suitable location on the territory of the Republic of Croatia began as early as 1979, at the time Krško was being constructed. Since then, on several occasions, within different concepts of disposal and legislative framework, research has been conducted to find the suitable areas for the disposal site. Based on such research, which were carried out from 1991 to 1997, within the framework of development of a special study, but without conducted field research, four preferred areas were selected, with potential sites graphically represented in the Programme (PPPRC).¹⁰⁴ Trgovska gora, as one of these sites, was identified as an area for the construction of a disposal site for low and intermediate level radioactive waste, under the condition of further research being conducted in accordance with international standards and public participation and defining procedures which would ensure a partner role of the local community with clear access to all aspects of construction and use of that facility. Research and procedures which would confirm the acceptability of that site for disposal of low and intermediate level radioactive waste have not been conducted.

Exploitation of mineral raw materials

Croatia is not particularly rich in mineral raw materials, but their exploitation, as the primary industry in the economy of every state, is of great significance. Mineral raw materials are especially important for the energy sector, but also for the processing of mineral raw materials in specific industries, particularly in civil engineering and related industries – glass, ceramics, cement, heat-resisting products, brick industry and industry of architectural-stone. The most valuable industry is the oil and gas exploration and exploitation, while exploitation of mineral raw materials for metal manufacturing is negligible, and exploitation of non-metals meets most of the needs of the industry of construction materials. In terms of the quantity of recovered mineral raw materi-

102 Act on Ratification of the Agreement between the Government of the Republic of Croatia and the Government of the Republic of Slovenia on the Regulation of Status and Other Legal Issues Regarding Investments in Krško NPP, and its Exploitation and Decommissioning (OG – IA 9/02, 05/06)

103 Strategy of Disposal of Radioactive Waste, Spent Sources and Spent Nuclear Fuel (OG 125/15)

104 Schaller, Antun, Izbor mjesta odlagališta nisko i srednje radioaktivnog otpada u Republici Hrvatskoj (Selection of the site for disposal of low and intermediate level radioactive waste in the Republic of Croatia), (ISSN 1330-5743, special edition APO-news)

Waste management is an integral part of the entire environmental protection system

als and number of economic entities, the most significant activity is the exploitation of architectural-building and technical-building stone, sand and gravel and brick clays, whereby their potential and balance stock and production possibilities exceed current needs. There are more exploitation fields for technical-building stone than those for architectural-building stone, which are mostly located in Istria and in the coastal areas of islands of Central Dalmatia. Exploitation of bauxite has been almost completely discontinued, and coal production suspended (thermal power plants are supplied with imported low-sulphur coal).

Use of mineral raw materials depends, among other things, on the demand for energy and mineral raw materials, actual estimates of stock, assumptions on economic growth of specific regions and condition of the environment. According to the Mining Act, units of regional self-government must develop mining and geological studies for their areas as the basis for planning needs and methods of supply with mineral raw materials in development documents at the regional and local level. Based on these studies, and after alignment of all spatial, natural, environmental and other requirements and restrictions, according to laws and regulations, they decide on opening new or rationalization of use of existing exploitation fields, and sites for exploration and exploitation are defined by the State Spatial Development Plan. According to the applicable act,¹⁰⁵ borders of exploitation fields of mineral raw materials are determined according to the volume of confirmed balance reserves of mineral raw materials and requirements of the location permit, and exploitation is possible only within the boundaries of the mining project on the basis of which the concession was issued. Exploitation fields are as a rule defined until the expiration of the reserves of mineral raw materials, and their proprietor is the Republic of Croatia.

Mineral raw materials are exploited at 670 sites, and the total area of exploitation fields and exploration areas (including hydrocarbons) is 309,860 ha, or around 5.47% of the land territory of Croatia.¹⁰⁶

Consequences of exploitation of mineral raw materials

Unlike other types of developmental economic activities, mineral raw materials can be exploited only on sites where their

deposits have been found, and thus occupying space for exploitation of mineral raw materials is basically connected to site predisposition of individual mineral raw materials. Accepting a particular area as a potential site for exploitation depends on a series of factors (economic, spatial, ecological, etc.).

Exploitation of mineral raw materials is an activity that significantly affects the soil, relief, flora and fauna and partially or completely changes the original integral and recognizable image of landscape. In general, underground exploitations have the least infringement on the exterior, nature and the environment (for example, exploitation of architectural-building stone in Kanfanar and Vinkuran). Exploitation of mineral raw materials by open pit mining takes up larger areas and has many more direct effects on space and the environment. Having in mind ecological vulnerability, environmental protection has become a strong control mechanism in exploration and exploitation of mineral raw materials.

Apart from physical devastation of space – change of relief, landslides, loss of vegetation, ground subsidence (due to underground works and harmful effects of mining), etc., qualitative devastation is also possible as a result of various types of pollution (soil, water, air), microclimate change (due to removal of large forest areas, creation of artificial lakes), changes in ecosystems (by cutting down trees and because of dust, as a result of the exploitation process). The areas exposed to the greatest risk of degradation of space due to large-scale pollution are areas for exploration of deposits, oil exploitation and transport (particularly marine corridors).

Existing exploitation fields

Mineral raw materials are exploited across the territory of the Republic of Croatia, but the intensity of mining industry by counties is different.

A serious problem in space and the environment are illegally used and unremedied abandoned exploitation fields. Although the obligation of remediation of exploitation fields in accordance with the location permit and the mining project on the basis of which works are performed is stipulated by law, in practice it is often not implemented. Materials that are most often illegally exploited are building sand and gravel, architectural-building

¹⁰⁵ Mining Act
(OG 56/13, 14/14)

¹⁰⁶ TMRRC

and technical-building stone, and clay, mostly in the surrounding area of Zagreb, and Zagreb, Varaždin, Međimurje and Lička-Senj Counties.

In protected areas of nature, there are exploitation fields with long-standing tradition and confirmed significant reserves. There is a large number of inactive exploitation fields, that is, mineral raw materials on specific locations with valid approvals have not been exploited for years.¹⁰⁷ It is difficult to determine the actual number of active exploitation fields because many holders of approvals for exploitation fields have discontinued operation before 1991, and the decisions on approvals have not been annulled/revoked and requests for their deletion from the register of exploitation fields have not been submitted.

107 Data source:
Mineral Raw Materials
Management Strategy
of the Republic of
Croatia, July 2008

2.7. Spatial planning and management

108 Constitution of the Republic of Croatia (OG 56/90, 135/97, 8/98, 113/00, 124/00, 28/01, 41/01, 55/01, 76/10, 85/10, 5/14)

109 Local and Regional Government Act (OG 33/01, 60/01, 129/05, 109/07, 125/08, 36/09, 36/09, 150/11, 144/12, 19/13, 137/15)

110 Number of counties, cities and municipalities - state August 2014

111 Physical Planning Act (OG 30/94, 68/98, 61/00, 32/02, 100/04) - hereinafter referred to as the Physical Planning Act from 1994; Physical Planning and Building Act (OG 76/07, 38/09, 55/11, 90/11, 50/12, 55/12) - PPBA; Physical Planning Act (OG 153/13)

112 Regulation on Physical Planning in War-affected Areas (OG 44/92, 59/93, 14/94)

The physical planning system is based on the Constitution¹⁰⁸ and a special law¹⁰⁹ determining territorial organization, authorities and responsibilities of the Croatian Parliament, units of regional self-government:¹¹⁰ - counties / City of Zagreb (20 +1) or local self-government - cities (127 +1) / municipalities (428) and other public law bodies.

In procedural terms, the system functions by creating, adopting and implementing spatial plans. Spatial plans are drawn up by experts, coordinated by institutes or competent authorities, and adopted by the Croatian Parliament, the Government of the Republic of Croatia and representative bodies of units of regional or local self-government. The data for the preparation are provided by the competent public law bodies involved in the procedure.

Building acts are issued by the Ministry of Construction and Physical Planning (MCP), Ministry of Defence for special purpose buildings, administrative bodies of large cities and administrative bodies of counties.

Part of the structures and works can be done or performed without a building act, with or without the main design (simple structures and works).

During the development of spatial plans, one or more public debates are obligatory, thus ensuring the public participation and involvement of all stakeholders.

In terms of content, the system is based on cross-sectoral harmonization, harmonization of requirements and interests of users by the process of development and adoption of the Strategy and spatial plans.

The development, adoption, and implementation of spatial plans are subject to verification by issuing approvals for spatial plans, within administrative procedures for issuing building acts, inspection

and administrative supervision in accordance with the Physical Planning Act (PPA) and other laws.

System and levels of spatial plans

The system is defined in more detail by the law from the area of physical planning, and its relation to other areas by special laws.

Since the independence of the Republic of Croatia, the system has been changed by the adoption of laws in the area of physical planning in 1994, 2007, 2013 and by their amendments.¹¹¹ During the 1991-1995 Homeland War, a series of regulations on physical planning in war-affected areas of the Republic of Croatia were adopted.¹¹²

The basic feature comparing to the system prior to 1994 is the determination of PPSRC and PPPRC as the basic documents of physical planning, followed by county spatial plans (basics of use and spatial protection were used as a tool for the preparation of county spatial plans) and spatial development plans. Pursuant to the provisions of the 1994 Physical Planning Act, the State Spatial Planning Council, the Physical Planning Institute within the Ministry and the county physical planning institutes /Institute of the City of Zagreb were established. According to the Physical Planning and Building Act from 2007 (PPBA), the transformation of institutes into public institutions was carried out.

The Physical Planning Act of 1994 introduced the documents for monitoring the state of space: the Territorial Monitoring Report and the Programme for the Improvement of the Territorial State

First-generation physical plans of counties were adopted from 2000 to 2003 (3 - 6 years after the 1997 PPSRC and 1-4 years after the PPPRC, respectively 6 - 9 years after the Physical Planning Act from 1994). Physical plans were adopted in the period from 1996-2012 (2 - 18 years after the Physical Planning Act of 1994)

Number and structure of spatial plans in force:¹¹³

- Spatial plans of areas with special features: 20
- County spatial plans/Spatial plan of the City of Zagreb: 20 +1
- Spatial development plans of cities and municipalities: 127 +428
- General urban plans: 41
- Urban development plans: 1,155
- Detailed development plans: 1.024
- Implementation urban development plans: 211
- Physical plans of settlements: 5
- or a total of 3,032 spatial plans.

These plans are multi-generational plans (in the period from 1982 to 2014).

The system has not yet been able to resolve the mechanism for implementing spatial plans in relation to the ownership of individual lots, except in cases of state's interest. The Urban Land Consolidation Mechanism (PPBA) has not become operational.

Illegal building outside the system-specified procedures, and there are several types of illegal building (e.g. without a building permit, contrary to the building permit, etc.). The system has attempted to respond to illegal building through a series of legal solutions,¹¹⁴ of which the highest result was achieved by the legal decision of 2012 in the form of the number of recorded requests for legalization as a basis for future remediation. However, all these legal solutions have dealt with the consequences and a permanent solution to prevent illegal building is yet to be found.

Although individual sectors participate in the processes of drafting and adopting physical planning documents, they draft their sectoral documents independently. In the process of drafting and adopting spatial plans, the already adopted sectoral documents are undergoing the first serious verification in terms of their spatial dimension. Development strategies and projects under other laws have a similar spatial relation.

The PPA, as a replacement for the PPPRC, introduces the State Plan for Spatial Development into the system, State Plan for Spatial Development emphasizing the development, availability and implementation of the Physical Planning Information System (PPIS) in the process of developing and implementing spatial plans. These

changes operationalize activities of the implementation of the Strategy through the SPSPD striving to increase the efficiency of the system.

A novelty in the field of sectoral legislation that particularly influences the process of drafting and adopting the Strategy and spatial plans is the obligation to carry out a strategic environmental impact assessment and the process of Appropriate Assessment for the Ecological Network of the Strategy and spatial plans.

Protected areas and spatial planning

Spatial plans of areas with special features (SPASF) have been adopted for all national parks (NPs):

- 1 SPASF of NP Krka (OG 1/90 and 22/92)
- 2 SPASF of NP Mljet (OG 23/01)
- 3 SPASF of NP Paklenica (OG 23/01)
- 4 SPASF of NP Risnjak (OG 23/01)
- 5 SPASF of NP Brijuni (OG 45/01)
- 6 SPASF of NP Kornati (OG 118/03)
- 7 SPASF of NP Northern Velebit (OG 35/12)
- 8 SPASF of NP Plitvice Lakes (OG 49/14).

Spatial plans have been adopted for eight of the eleven nature parks:

- 1 PP for Np Učka (OG 24/06)
- 2 PP for Np Kopački rit (OG 24/06)
- 3 PP for Np Lonjsko Polje (OG 37/10)
- 4 PP for Np Vrana Lake (OG 58/12)
- 5 PP for Np Telašćica (OG 22/14)
- 6 PP for Np Medvednica (OG 89/14)
- 7 PP for Np Žumberak - Samobor hills (OG 125/14 and 5/15-amended)
- 8 PP for Np Biokovo (OG 108/15).

There are also SPASFs in force:

- of national importance:
 - 1 of the multi-purpose Danube – Sava canal (Official Gazette 121/11)
- of county importance:
 - 1 SPASF of Tramuntana (Official Gazette of the Primorje-Goran County 4/03)
 - 2 SPASF of Donji Kamenjak and the Medulin Archipelago (Official Gazette of Istria County 2/09)
 - 3 SPASF of the Vinodol Valley (Official Gazette the Primorje-Gorski kotar County 30/04)
 - 4 SPASF of Črnkovec - Zagreb Airport (Gazette of the Zagreb County 23/12).

¹¹³ Number of spatial plans - status as of August 2014, amendments and first-generation plans are not specifically indicated by number

¹¹⁴ Act on the Treatment of Buildings Constructed Against Spatial Plans and Without Building Permits (OG 33/92, 33/95); Act on Proceeding with Illegally Built Buildings (OG 90/11); Act on Proceeding with Illegally Built Buildings (OG 86/12, 143/13)

2.7.1. Institutional framework of physical planning

The Croatian Parliament, the Government of the Republic of Croatia and the representative bodies of the units of regional and local self-government ensure the effectiveness of physical planning by adopting spatial plans and other documents determined by law in the field of physical planning, which regulate the organization, use and purpose of land and the requirements for its development and protection in accordance with the goals and principles of physical planning. The state of the territory and evidence in the field of physical planning the physical planning area is monitored and analysed by drafting and adopting a Territorial Monitoring Report at the national, regional and local level for a period of four years. The physical planning system emphasizes the roles of the MCPP, the Croatian Institute for Spatial Development, institutes for physical planning of the counties and the City of Zagreb, legal entities and authorised architects who perform spatial planning tasks, ensuring the professional foundation of spatial plans and spatial development documents.

2.7.2. Regional and local-level spatial plans

The first generation of spatial plans of all counties was completed (only) in 2003 in accordance with the 1994 Physical Planning Act.¹¹⁵ This resulted in a significant delay in the development of the first generation of spatial plans for municipalities / cities in Croatia.

The 1997 PPSRC and the 1999 PPPRC¹¹⁶ stipulate that, when planning building areas, it is especially necessary to explain the occupancy of space per capita if it exceeds 300 m²/ inhabitant, and this criterion has been further elaborated by county spatial plans. The consequence is a significant reduction in the building areas of settlements in the first generation of spatial plans for municipal/urban development.

In accordance with the provisions of the Regulation on Protected Coastal Area Development and Conservation, adopted in 2004,¹¹⁷ in the process of adopting amendments, county spatial plans revised the building areas of hospitality

and tourism purposes outside (and some within) the settlements, determining their location, size, type, and maximum capacity. The consequence of that is the change of spatial plans of LSGUs, but also the frequent need to change some of the established spatial parameters.

Physical Planning and Building Act¹¹⁸ of 2007 defined the term of an undeveloped building area as one or more directly connected unbuilt and undeveloped plots with a total surface area of more than 5,000 m², for which they established an obligation to develop an urban or detailed development plan - which included both building areas of the settlement and detached building areas outside the settlement for specific purposes. The consequence was the redefinition of building areas in all LSGU spatial plans and prescribing an extremely large number of urban and detailed development plans. Such an obligation was a significant financial and time-consuming burden for the realization of a single spatial intervention.

The 1997 PPSRC and the 1999 PPPRC¹¹⁹ especially pointed out the importance of defining criteria (in county spatial plans) for:

- deployment of functions in settlements for the purpose of optimizing networks
- formation of building areas on the principle of rational use of space, utilization of reserves of formed structures and landscaping
- building outside the building area.

The analysis of the county spatial plans in relation to defining the network of buildings of social activities shows an uneven approach and level of elaboration, i.e., of defining the minimum contents of public functions. The elaboration of the requirements for the placement of social activities in an area differs from a very detailed elaboration with a fully defined network, across all groups of public services, to an undefined network and very basic provisions for implementation.

The analysis of the provisions for the implementation of all county spatial plans and the spatial plan of the City of Zagreb, in relation to the formation of building areas, found that, although the contents of regulations for the implementation of all plans were made in

¹¹⁵ Physical Planning Act (OG 30/94, 68/98, 61/00, 32/02, 100/04)

¹¹⁶ PPPRC (OG 50/99)

¹¹⁷ Regulation on Development and Protection of the Protected Coastal Area of the Sea (OG 128/04)

¹¹⁸ Physical Planning and Building Act (OG 76/07, 38/09, 55/11, 90/11, 50/12, 55/12)

¹¹⁹ PPPRC (OG 50/99)

TABLE 2.14.
**STATE OF EMPLOYED
AND SYSTEMATIZED
JOBS IN COUNTY
PHYSICAL PLANNING
INSTITUTES**

Source: CISD, April 2016

	NAME OF INSTITUTE	EMPLOYED	SYSTEMATIZED
1.	Croatian Institute for Spatial Development	16	20
2.	Physical Planning Institute of Zagreb County	11	17
3.	Physical Planning Institute of Krapina-Zagorje County	7	11
4.	Physical Planning Institute of Sisak-Moslavina County	9	23
5.	Physical Planning Institute of Karlovac County	6	8
6.	Physical Planning Institute of Varaždin County	9	11
7.	Physical Planning Institute of Koprivnica-Križevci County	9	11
8.	Physical Planning Institute of Bjelovar-Bilogora County	7	10
9.	Physical Planning Institute of Primorje-Gorski kotar County	20	30
10.	Physical Planning Institute of Lika-Senj County	5	10
11.	Physical Planning Institute of the Virovitica-Podravina County	7	14
12.	Physical Planning Institute of Požega-Slavonia County	7	12
13.	Physical Planning Institute of Brod-Posavina County	8	8
14.	Physical Planning Institute of Zadar County	15	21
15.	Physical Planning Institute of Osijek-Baranja County	5	10
16.	Physical Planning Institute of Šibenik-Knin County	6	8
17.	Physical Planning Institute of Vukovar-Srijem County	9	17
18.	Physical Planning Institute of Split-Dalmatia County	10	13
19.	Physical Planning Institute of Istria County	8	16
20.	Physical Planning Institute of Dubrovnik-Neretva County	8	10
21.	Physical Planning Institute of Međimurje County	6	8
22.	Physical Planning Institute of the City of Zagreb	24	49
	TOTAL	212	337

accordance with the content prescribed by the Ordinance on the content, scales of maps, compulsory spatial indicators, standard of studies and compulsory appendices of spatial plans¹²⁰ the approach to the criteria for defining and dimensioning building areas is very different (in some county spatial plans, the approach is directing, in some determining, and in some implementing).

Analysing the criteria for each type of building area, it can be concluded that the criteria within an individual county spatial plan also differ depending on the type of building area. There are no major differences in the manner of mapping of the building areas (as in the case of the textual part). All graphical presentations are defined as guiding with respect to the scale in which they are made (1: 100,000), with the exception of the Spatial Plan of the City of Zagreb, the graphic section of which is implementing since it defines building areas in the scale of 1: 5,000. The exceptions are the building areas outside settlements for catering and tourist purposes, in which the criterion of defining character is applied to a greater extent. The aforementioned definition is a consequence of the legal obligation for counties to determine this type of building area of a settlement, by defining the location, type and maximum capacity and size.

The analysis of spatial plans of counties in relation to construction outside the building areas revealed an uneven approach to the issue of construction of economic facilities intended for agriculture (with the possibility of providing catering and / or accommodation activities along with housing) building area. Most of the county spatial plans contain definite (numerical) criteria for the construction of this type of buildings (minimum size of property, number of livestock units, minimum distance from the building areas of settlements and roads and particular requirements and manner of construction of buildings).

In four county spatial plans, only some of the analysed criteria are provided in numerical form and are partially defining in this regard, since part of the requirements can be created in the physical planning documents of the LSGUs. Five county spatial plans provided descriptive guidelines, i.e., the criteria for physical planning documents of local self-govern-

ment units, or completely left to those plans to determine the requirements of this type of construction.

In conclusion:

- the county/urban and municipal spatial plans are inconsistent both regarding contents and presentation
- the cost and time of production is high due to the constant change of legislation
- areas of public use are generally substandard in quantity and quality.

2.7.3. Physical Planning Information System

The PPIS is established with the aim of collecting at a single location spatial plans of all levels and data on spatial interventions, presenting and making them available to all interested parties, including the general public wherever possible, to enable the overview of spatial data from other sources relevant to spatial planning and monitoring of the state of space and to facilitate the obtaining of information on possible uses of the area to expedite the process of issuing building permits.

By the end of 2015, the following had been done:

- The system infrastructure was set up, so the geoportal can be accessed via an Internet browser to visualize spatial layers with common functionalities for this type of application, such as managing the display of layers as desired (switching on / off, changing the order of layers, changing the scales, printing, etc.).) and the ability to search across multiple criteria
- The following spatial plans in force were published in a georeferenced raster format:
 - All 20 county spatial plans (CSP) and the Spatial Plan of the City of Zagreb, of which the web service (Web Map Service - WMS) from the competent county physical planning institutes is used to display 2 CSPs
 - 548 spatial development plans of cities or municipalities (SDPM/C), or more than 98% of the total required number, maps 1 and 3 and part of maps 2; the remaining plans are being processed. A system of updating published maps has been put in place after the amendments to the

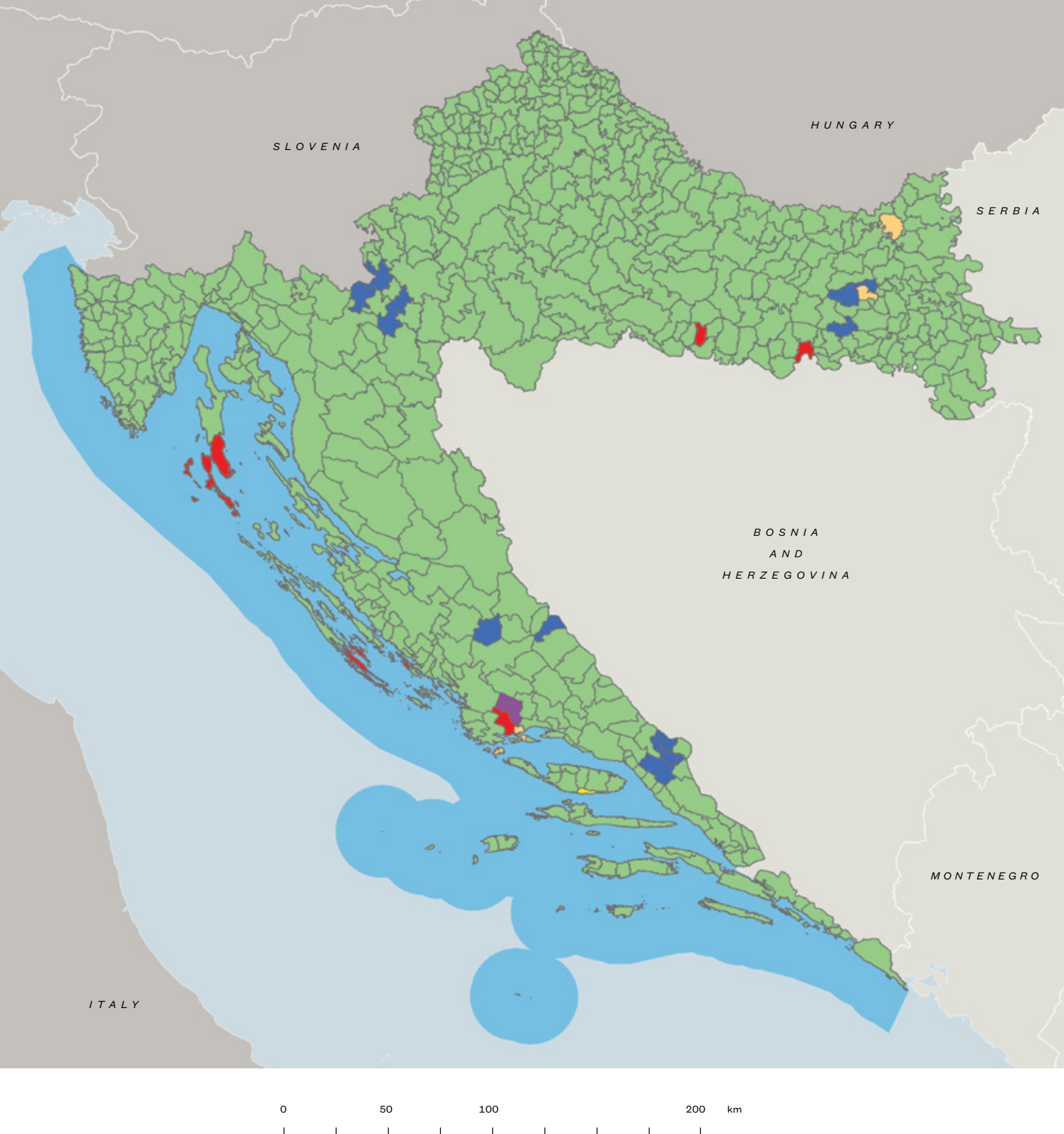


FIGURE 2.24.
**PUBLISHING STATUS
OF SDPM/C IN PPIS**

- Plan submitted and published
- Submitted but returned for processing
- Submitted, for publishing
- Not submitted
- Not submitted, PPIS contains plan from the archives of the SPI
- Not required to submit (reduced content SDPM)

Source: CISD, April 2016

previously published plans have been adopted. All published raster maps are available publicly and without restriction through the WMS

- The e-Catalogue module was created and put into operation, which integrates the functionalities of the spatial plans register and metadata catalogues in accordance with the implementing rules for NSDI metadata¹²¹ to enable data retrieval on spatial plans, but also the spatial plans themselves or parts thereof not yet published in the PPIS; in December 2015, 10 users from physical planning institutes of all counties and the City of Zagreb, as well as the CISC, had the authority to enter and / or verify metadata in the e-Catalogue; more than 7,400 metadata sets were processed, of which about 4,800 have been verified; a complete set of verified metadata is publicly available without restriction
- the e-Permit module for issuing building permits was created and put into operation. e-Permit was introduced by the end of 2015 to the Directorate for issuing permits of national significance at the MCPP and 50 administrative departments of counties and cities, and the City of Rijeka, Primorje-Gorski kotar County and the City of Zagreb will connect their applications to the e-License, which will fulfil the prerequisites for all building acts to be issued in a unique way
- a PPIS locator was created and linked to the e-License module; the PPIS locator is a tool for entering spatial parameters for spatial interventions and provides access to data from all spatial layers relevant to any selected location
- a link has been established between the e-Catalogue and the e-License, so that the e-License always provides an up-to-date list of spatial plans in force for selection during the process of issuing building permit
- PPIS provides access to notices on the preparation of spatial plans, dates for public debates and public debate reports, as well as a list of regulations in force in the field of physical planning and construction
- the e-Plans module was established within the contracted scope, and in parallel and in accordance with it, the PPIS Regulation (Official Gazette, 115/2015) and Ordinance on the

State Plan for Spatial Development (Official Gazette 122/2015) were drafted and adopted. Establishing the e-Plans module involves: developing a business process and data model, and developing a creation application, upload and download layers of spatial plans, and to edit the attributes of the spatial plan layers; installation of tools for creation of symbology and signs for all spatial themes specified in the Ordinance; designing forms for entering additional metadata that will allow monitoring the dynamics and legality of the process of creation and adoption of spatial plans and facilitating the issuance of necessary approvals for the plans; installation of an authorization system for registered users. E-Plans allow the geoportal to automatically generate reports Data on the selected area which also includes data for the so-called Location information according to Article 36 of the PPA

- PPIS is connected to systems of other state administration bodies to enable the display of vector or raster layers within their jurisdiction in the geoportal (e.g. digital orthophoto maps, topographic maps, the digital cadastral map, data from the Central Register of Spatial Units, etc. are taken from the State Geodetic Administration, and the layer Natura 2000 is taken from the Croatian Agency for the Environment and Nature)
- PPIS provides access to land registers, the book section of the cadastral department of the State Geodetic Administration, data on concessions of the Ministry of Finance and information on the legalization process for illegally constructed buildings.

Status of information on space

Spatial planning and effective implementation of planned spatial development depend to a large extent on high-quality spatial data, inventory and evaluation of space: on the up-to-date data on the real state, ownership and possession of land, precise and unambiguous data on particularly valuable areas for which certain protection measures are applied, on the forest cover, agricultural land, and on the transport, energy and utility infrastructure.

The PPIS geoportal enables the display of layers within the competence of other state administration bodies

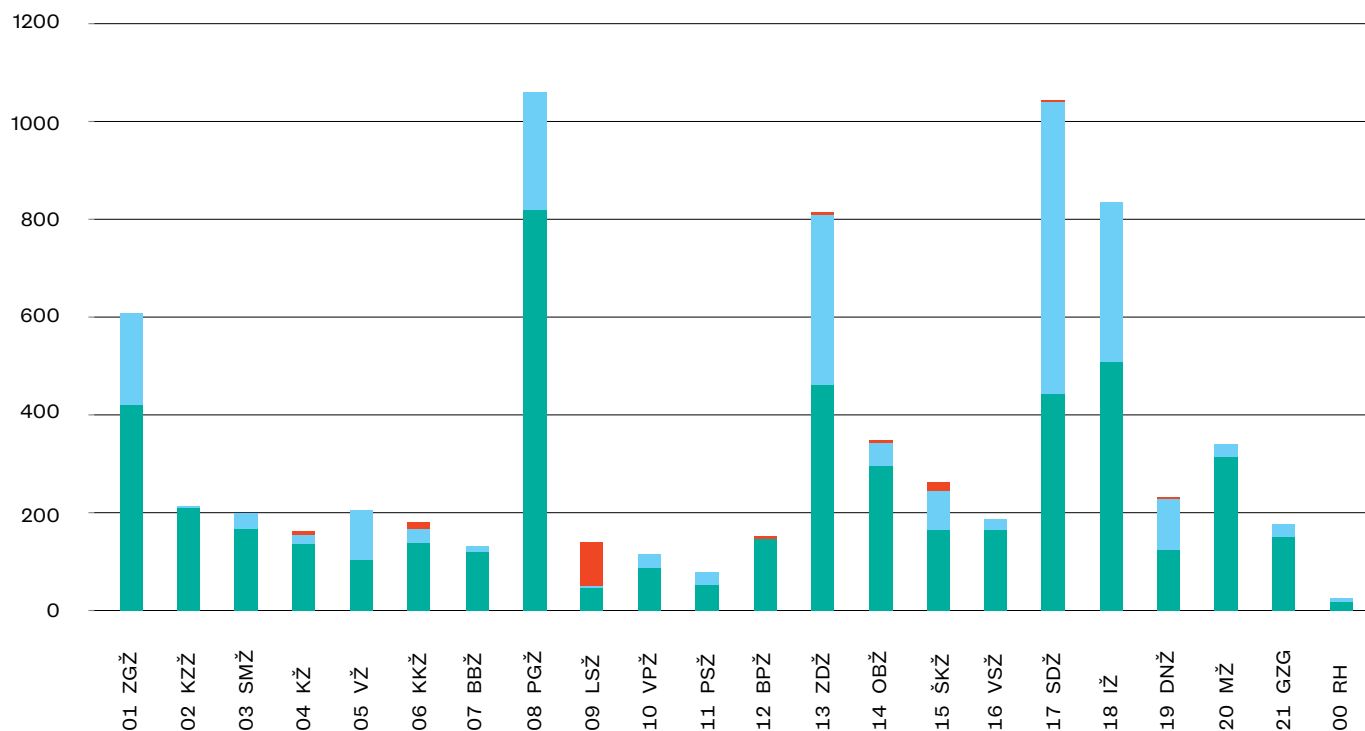


TABLE 2.15.
**STATE OF
PROCESSING
OF METADATA IN THE
E-CATALOGUE**

■ Verified
■ Processed,
unverified
■ Not processed

Source:
CISD, April 2016.

Note:
All of the processed metadata is not verified for a number of reasons (for example, plans are under construction or they are old plans that have not been digitally created, etc. so the metadata cannot be complete and thus verified).

Code	County	Number of plans	Number of updated metadata	Number of verified metadata	Verified, unverified	Datum zadnjeg ažuriranja	% of updated
01	Zagreb County	606	606	421	185	14.4.2016.	100.00%
02	Krapina-Zagorje County	219	219	212	7	19.4.2016.	100.00%
03	Sisak-Moslavina County	201	201	157	44	30.3.2016.	100.00%
04	Karlovac County	166	159	138	21	19.2.2016.	95.78%
05	Varaždin County	204	204	94	110	1.4.2016.	100.00%
06	Koprivnica-Križevci County	174	159	107	52	12.4.2016.	91.38%
07	Bjelovar-Bilogora County	136	136	119	17	5.4.2016.	100.00%
08	Primorje-Gorski kotar County	1.066	1.066	816	250	22.1.2016.	100.00%
09	Lika-Senj County	144	56	52	4	12.4.2015.	38.88%
10	Virovitica-Podravina County	116	116	88	28	9.10.2016.	100.00%
11	Požega-Slavonia County	86	86	56	30	22.3.2016.	100.00%
12	Brod-Posavina County	155	152	150	2	6.4.2016.	98.06%
13	Zadar County	814	809	473	336	19.4.2016.	99.39%
14	Osijek-Baranja County	331	329	282	47	12.4.2016.	99.40%
15	Šibenik-Knin County	260	243	164	79	29.5.2016.	93.46%
16	Vukovar-Srijem County	179	179	156	23	21.3.2016.	100.00%
17	Split-Dalmatia County	1.062	1.060	459	601	19.4.2016.	99.81%
18	Istria County	840	840	505	335	11.4.2016.	100.00%
19	Dubrovnik-Neretva County	237	236	124	112	19.4.2016.	99.58%
20	Međimurje County	312	312	276	36	13.4.2016.	100.00%
21	City of Zagreb	160	160	130	30	22.3.2016.	100.00%
00	Republic of Croatia	24	24	17	7	19.4.2016.	100.00%
Total:		7.492	7.352	4.966	2.356		98.13%

Practice shows that spatial databases are partly not established, or the spatial component is not included.

INSPIRE directive

Infrastructure for SPatial Information (INSPIRE) is a Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing a Spatial Information Infrastructure in the European Community. INSPIRE is based on the existing Member States' spatial data infrastructures and does not require new data collection, but does require harmonization of the existing data.

The basic principles of the INSPIRE Directive are as follows:

- Spatial data is stored, available and maintained at the most appropriate level
- It provides for consistent combination and use of spatial data from different sources across the EU between different users and applications
- Spatial data collected at one level of state government is shared with other state bodies
- Spatial data has to be available under conditions that do not unreasonably limit their widespread use, enable easy detection of the available spatial data, evaluation of their suitability for reaching the goal and determination of the requirements that apply to their use.

INSPIRE covers 34 spatial data topics, divided into three annexes (Annexes I, II and III) required for the successful development of an environmental information system.

NSDI

The National Spatial Data Infrastructure (NSDI) is defined as a set of technologies, measures, standards, implementing rules, services, human resources and other factors enabling efficient integration, management, and maintenance of the sharing of spatial data to meet needs at the national, as well as at the European level, which will be an integral part of the European Spatial Data Infrastructure defined by the INSPIRE Directive. The NSDI provides the basis for the discovery, review, and use of spatial data in government bodies, the economy, non-commercial and public sectors, academic community and citizens in general. The Croatian NSDI must be in line with the development of spatial data infrastructure at the European (INSPIRE) and global (GSDI, UN-GGIM)

levels, but in addition to development at the national level, it has to influence the development of spatial data infrastructure at the local level.

The spatial data covered by the NSDI are grouped into spatial data sets corresponding to topics from *Annexes I, II, and III* of the INSPIRE directive:

- Annex I: Coordinate reference systems, Geographical grid systems, Geographical names, Administrative units, Addresses, Cadastral parcels, Transport networks, Hydrography, Protected sites
- The specificity of the Croatian NSDI with respect to the INSPIRE Directive
- is an additional topic in Group I: Data on mine suspected areas
- Annex II: Elevation, Land Cover, Orthoimagery, Geology
- Annex III: Statistical units, Buildings, Soil, Land use, Human health and safety, Utilities and governmental services, Environmental monitoring facilities, Production and industrial facilities, Agricultural and aquaculture facilities, Population distribution and demography, Area management/restriction/regulation zones and reporting units, Natural risk zones, Atmospheric conditions, Meteorological geographical features, Oceanographic geographical features, Sea regions, Bio-geographical regions, Habitats and biotopes, Species distribution, Mineral resources.

The subjects of NSDI are state bodies, bodies of local and regional self-government units and legal entities with public law bodies within whose competence lies the establishment or maintenance of spatial data and who are obliged to participate in the establishment, maintenance and development of NSDI. NSDI should make it easier for entities to view information from the competences of other entities and to analyse their impact on their own area of competence. Regarding spatial development planning, it is expected that data collection and processing will be easier and faster for the development of spatial plans.

Although the National Spatial Data Infrastructure Act does not require the production of new spatial data, its implementation raises awareness of the need to produce and exchange spatial data in areas that have been neglected or inadequately regulated so far.

Real Property Registration and Cadastre Joint Information System (JIS)

Since 2003, the Government of the Republic of Croatia, through the Ministry of Justice and the SGA, has been implementing the Real Property Registration and Cadastre National Program, abbreviated as “Organized Land” - one of the key goals of which is the creation of the Real Property Registration and Cadastre Joint Information System (JIS), i.e., the establishment of a unique database of cadastres and land registries and a unique application for managing and maintaining the above data.

Since 21st November 2016, the JIS has been in full operation in all 108 land registry departments (LRD) and 112 cadastral offices in Croatia and the Zagreb City Office for Cadastre and Geodetic Activities, thus putting digital cadastral plans into official use in the new official geodetic datum and map projection - HTRS96/TM - and shortens the time required to access data and register real estate, and in one place you can see the ownership structure of the property and its location in space.

The JIS is planned to be upgraded with additional functionality as needed.

2.7.4. Publicity of spatial development management

Today’s social framework for spatial development and spatial planning essentially consists of the legal state (a regulated system of physical planning, legal certainty of ownership), democracy (a higher degree of public participation in the planning process) and market relations (requiring greater flexibility).

Public participation in the decision-making process increases the legitimacy of decisions, without diminishing their legal basis (provided by legislation and other stakeholders - e.g. experts and government institutions). The aim is to provide more citizens with maximum insight into the process, while at the same time providing better information about the needs, opinions and attitudes of citizens, bearing in mind that the goals, in which their executors are involved, are more realistic to implement. Therefore, spatial plans, in which citizens participate as beneficiaries of these plans, more realistically

reflect their needs and they will be more willing to implement them.

New ownership relations, market competition and a new way of managing public property require new framework conditions that will ensure the transparency of decision-making in the spatial development process and the establishment of models of public participation in this process. In this process, public involvement in the form of cooperation and partnership is crucial, and if all stakeholders in the decision-making process bear in mind the public interest and a fair method of public participation in the process, it is possible to achieve democratic decision-making and avoid conflicts which hamper the development of the economy but also the right of everyone to a healthy life and sustainable development.

The essence of the issue concerning public participation in the planning and decision-making process is the creation of a relationship between stakeholders in the process. Interaction models, which also determine the degree of public involvement, depend on the direction of information flow:

- the flow of ideas and information can be unidirectional towards users / the public
- the public expresses their needs, which are incorporated into appropriate planning solutions
- the flow of ideas and information is mutual and continuous throughout all stages of the process.

Modalities of communication relate to the publicity of action (public sessions and publication of regulations), systematic contacts with the interested public (consultations and meetings, public debates, petitions of citizens, questionnaires) and communication via the media.

The Croatian government passed a regulation¹²² with the aim of establishing interaction with citizens and representatives of the interested public in the process of passing legislation and other acts. According to this regulation, the concept of participation of the interested public (citizens, civic groups / initiatives, associations, private institutions, trade unions, representatives of the academic community, chambers, public institutions and other legal entities) encompasses four stages:

- informing, i.e., a unidirectional process in which state bodies inform citizens

122 Code of Consultations with the Interested Public in the Procedures for Adopting Laws, other Regulations and Acts (OG 140/09)

at their discretion or citizens obtain information on their own initiative (access to public acts, official gazettes and websites of state bodies)

- counselling, i.e., a bidirectional process during which state bodies seek and receive feedback from citizens or the interested public
- involvement, i.e., a higher degree of the bidirectional process through which representatives of the interested public are actively involved in determining
- public policy (membership in working groups for drafting laws or acts)
- partnership, which implies the highest degree of cooperation and mutual responsibility of the Government of the Republic of Croatia and representatives of the interested public for the process of adoption and implementation of programmes, laws, other regulations and acts.

Users of space are often involved in spatial decision-making processes only when they feel the consequences of implementing a spatial plan, and the effort to improve public awareness and facilitate the participation of users of space in the development of spatial plans is often not sufficient. In the absence of understanding of the consequences that could arise in the future from the inappropriate and irresponsible use of space in the present and the individual's intention to impose their views as general, the procedure is reduced to a conflict between investors, the public and planners, with the state, regional or local self-government institutes having the final say. The latter should guarantee by their constitutional and legal obligation the protection of general interests in the planning (designing) and / or physical planning.

The state of space is a consequence of the actions of man and nature, whereby man bears full responsibility for the physical planning and use of space. Therefore, in order to achieve the desired and planned development goals, it is necessary to achieve an adequate level of awareness of the importance of preserving space and the environment at all levels - planning, investment and user.

2.7.5. Other development documents with a spatial aspect

The Act on Regional Development of the Republic of Croatia¹²³ further supports

the strategic planning process at the level of territorial units, especially counties. In the past, county development agencies have been established in all counties, and first-generation county development strategies (CDS) have been developed and adopted on the principle of partnership. County partnerships have also been established to reach consensus on defining county development priorities and identifying priority development projects.

County development strategies (CDS) are documents relating to integrated territorial development, which in their goals and subsequently in the developed measures cover spatial development, i.e., planning and management of activities taking place in the county area. Almost all of the counties developed Regional Operational Plans (ROPs) before the CDSs, and for a number of them, this is the third strategic document in a decade, although most of them were revisions of the same documents. Although valid CDSs are of a short-term nature as they relate to a three-year period (2011-2013) which was subsequently extended, they are based on long-term development determinants that consist of vision, strategic goals, and priorities. The measures, given the period for which they were defined, have in many cases become specific activities and even projects.

Local Action Groups (LAGs)

The modern definition of the term rural development implies the integral and multi-sectoral and sustainable development of rural (non-urban) space. Integral and / or integrated development of rural areas is important because of the diversification of rural economy, which, in the course of modern structural processes and developments, faces numerous problems such as depopulation, aging of the population, fossilization of the landscape and, in general, poorer socio-economic indicators that make this area passive and undesirable for life.

The LEADER approach defines LAG as a homogeneous unit that has some commonalities such as social connections, a sense of shared identity, and history. The subsidiarity approach (bottom-up) focuses on stimulating the local community in achieving development decisions. LEADER promotes an innovative and integrated approach, networking, collaboration, local financing and management. An important part of the implementation of the LEAD-

¹²³ NN 147/14

ER principle is the establishment of LAGs which represent the body that decides on the local development strategy and is responsible for implementation. LAGs have the role of mediators with the EU through which it is possible to secure funding from EU funds for specific projects.

A LAG should bring together and join partners from the public and private sectors, ensuring a balanced representation of representatives of existing local stakeholders from different socio-economic sectors. At the decision-making level, at least 50% of members must come from the business and civil society sectors. A LAG can be established ad hoc or it can build on existing partnerships. A LAG area may be a rural area with more than 5,000 and less than 150,000 inhabitants, including smaller cities and towns with less than 25,000 inhabitants. At the decision-making level, the LAG governing body represents the interests of different public and private groups of an area and the rural population, ensuring that at least 50% are members representing economic partners and civil society. At least 20% of representatives are from local authorities.

A total of 53 LAGs operate at the level of the Republic of Croatia. In larger regional units, there are seven LAGs in the Northern Adriatic, ten in Dalmatia, three are in mountainous Croatia, ten in Northern Croatia, nine in Central Croatia and 14 in Slavonia.

The LAG governing body is representative, ensuring age diversity (at least one member should be under 25) and gender equality (minimum share of 30% of women). The LAG should propose an integrated local development strategy based on the guidelines by the governing body. The LAG will implement local development strategies and manage public funds.

Development programmes of cities and municipalities

The methodology and content of development strategies are prescribed for the counties. Pursuant to Article 15 of the new Regional Development Act,¹²⁴ Guidelines have been developed to develop strategies for the development of urban areas, to monitor their implementation and to evaluate them.

The implementation of guidelines will thus be applied to urban agglomerations, larg-

er urban areas (13 in total) and smaller urban areas (25 in total), in accordance with MRDEUF data on the number of larger and smaller urban areas. Sustainable urban development strategies stemming from the Operational Programme Competitiveness and Cohesion should be developed by the candidate cities for Integrated Territorial Investment (ITI).

In conclusion, at the level of urban areas, a strategic development document will be drafted, which will be entitled the Urban Areas Development Strategy under the new Law, and in the Operational Programme Competitiveness and Cohesion, it will be referred to as the Sustainable Urban Development Strategy (the difference is in the name only). The aforementioned Guidelines for developing urban development strategies are a unique document and will be used in the preparation of both of these documents.

In line with the foregoing, it appears that there is a large number of LSGUs for whom there is no prescribed methodology or guidelines for the development of their development strategies, so their methodological coherence, as well as the quality of the documents themselves, is questionable.

A special set of documents produced for cities and municipalities are the Sustainable Development Programmes for Islands (SDPI), for a total of 26 islands and island groups. These programmes have been developed in accordance with the Methodology of development of Sustainable Development Programmes for Islands and are uniform in this respect. However, no comprehensive evaluation of the implementation of these documents has been made so far, and no opinion and conclusions have been reached on the preparation of future SDPIs and the necessary improvements in their preparation, adoption and implementation.

Development projects in Croatia

County development projects (CDPs), joint development projects and development projects of statistical regions, arise as a consequence of the strategic planning process and become an important tool for directing financial resources intended for the development of counties and statistical regions. This is the only way to manage regional development in a systematic and coordinated way and to link different stakeholders into a coherent

¹²⁴ NN 147/14

system in accordance with the principle of partnership and cooperation. Each county and the City of Zagreb designate their own regional coordinator (governing body, development agency or other legal entity) to effectively coordinate and encourage development at the county level, or at the level of a statistical region, through cooperation with other counties and the central level.

Regional coordinators are in charge of setting up and managing project bases in the counties. As the process of setting up project bases started from different national bodies, lists of potential regional and local level projects for 3 project bases were prepared in parallel:

- 1** Database of economic development projects: investment record in the Republic of Croatia kept by the Central State Office for e-Croatia, integrated in early 2012 into the Ministry of Public Administration, represented an integrated database of all existing and future investments of domestic and foreign legal or natural persons engaged in economic activity and participating in the transport of goods and services in the Republic of Croatia. Investment records established to stimulate economic growth, development and economic policy making in Croatia, its involvement in the courses of international exchange and strengthening the competitiveness of the Croatian economy.
- 2** The Central Electronic Database for Development Projects (CEDDP) established by the MRDEUF: refers to projects for the construction and/or renovation of communal, economic, social, environmental and energy and other support infrastructures for the development, construction and/or strengthening of educational, cultural, scientific and other capacities, the strengthening and construction of social capital, and for other projects contributing to regional development. The projects are divided into: a) local; b) county; c) regional; d) national.
- 3** Foreign Assistance and Cooperation Projects Database: An instrument by which the Government of the Republic of Croatia provides a comprehensive overview of programmes and projects financed from foreign sources in order to avoid overlapping and duplication of projects and to achieve synergy and maximum impact of the overall assistance. The database con-

tains information on completed, ongoing, and planned projects of foreign assistance to the Republic of Croatia. The responsibility for the database rested with the former Central Office for Development Strategy and Coordination of EU Funds (CODEF), and after a restructuring in early 2012, the Strategic Planning Directorate at the MRDEUF became the responsible authority.

Each county has started the process of collecting project proposals in its own way and is trying to keep up to date with information from the national level. It is important to distinguish the maturity levels of a project proposal, which can be done as follows:

- 1** The project design, the developer ready for networking and project proposal development - a design concept should be developed
- 2** A project proposal with developed concept note - technical documentation should be prepared
- 3** A project proposal with prepared technical documentation and permits - can be financed.

2.8. SWOT analysis

Area	Determined strengths
Spatial basis	Natural resources (water, forests, agricultural land, geothermal resources, sea, etc.)
	Mostly preserved natural, cultural and landscape values
Spatial organization and spatial systems	Optimal spatial distribution of macroregional centres (ZG, RI, ST, OS); settlement structure formed in the area of Central and Eastern Croatia and in the narrow coastal area
	Appropriate social infrastructure in more developed areas
	Good basic transport links with Europe
	Satisfactory coverage of the territory by the state level road network
	Established network of seaports (state, county and local)
	Established network of river ports (state, county and local) and prepared spatial documentation for river transport development
	Satisfactory network of airports in relation to surface area and population
	Rapid development of electronic communications systems
	Satisfactory electricity supply
	Good coverage with pipeline infrastructure (oil and gas transportation system) in almost the entire Republic of Croatia
	Availability of capacities for a significant increase in oil and gas transport
Spatial development management	Up-to-date knowledge and continuity of spatial planning in Croatia
	Regulated spatial planning system, with elaborated levels of spatial plans and recognized physical planning entities
	Regulated system for monitoring the situation in the area and in the area of physical planning, with the obligation to manage PPIS
	Regulated procedure for the preparation and adoption of spatial plans with public participation
	Awareness of the need to protect biodiversity and landscape diversity at an institutional level - established ecological network in 36.7% of inland and 16.4% of marine territory
	Established Rules for spatial planning in the protected coastal area of the sea (PCA)

strengths

Area	Identified weaknesses
Spatial basis	Endangered natural resources and landscapes through unplanned construction and urbanization
	Neglected and underutilized resources, limited use of agricultural land due to depopulation, de-ruralization and/or mining
	Insufficiently developed framework for evaluating the landscape
	Endangering areas of exceptional value and contact areas by illegal or inappropriate construction
	Insufficiently active approach to the protection of cultural property - long abandoned facilities and buildings
	Decline in the total population, continuous natural depopulation and aging of the population, negative migration balance in relation to abroad
Spatial organization and spatial systems	An inefficient model of polycentric development
	Underemphasized role of medium-sized and small cities
	Absence of comprehensive reflection on the development of urban agglomerations
	A large proportion of settlements affected by depopulation and negative changes in age structure
	Less developed urban network in areas affected by development challenges, spatial isolation and inaccessibility
	Rural areas with dispersed population and endangered by depopulation
	Developmental sensitivity of border areas, especially dual cities and riverside cities towards neighbouring countries
	Uneven distribution of social infrastructure and lack of central functions in areas of lower development
	Lack of research, data and housing estimates
	Planning of residential areas without basic infrastructure (including public / social)
	Inadequate maintenance of the existing housing stock and low energy efficiency
	Illegal building that distorts identity and creates numerous conflicts in space
	Insufficient equipment and unequal occupancy of planned industrial and business zones
	Unused and oversized tourist zones
	Irrational use of the most attractive sites in coastal tourist areas, neglecting areas in need of remediation/transformation
	Poor integration of tourist capacities in settlement and landscape structures
	Expansion of holiday home construction, often with inadequate basic utility infrastructure
	Unspecified boundaries of maritime domain
	Insufficient investment in maintaining and building road infrastructure at the regional and local level
	Obsolete railway network of insufficient capacity and equipment
	Poor transport connections between islands as well as between islands and the coast Insufficient utilization of river transport potential
	Insufficient utilization of river transport potential
	Disintegration of the inland waterway network
	Absence of a harmonized river port development plan
	Unsatisfactory overall connection to public sewerage systems (44%), with significant regional disparities and particularly low connection of smaller agglomerations
	Poor overall connection to wastewater treatment plants
Spatial development management	A considerable number of local self-government units do not have sufficient financial, institutional and professional capacities to fulfil their physical planning obligations.
	Unharmonized sectoral policies
	Unharmonized cadastral and land registry records and actual situation
	Unpreparedness and unavailability of sectoral spatial data
	Lack of instruments to ensure public interest in physical planning
	Incompatibility of spatial standard system in spatial planning
	Difficult implementation of plans due to slow processes of resolving property issues
	Determining building areas without professional argumentation of a development need
	Lack of awareness of spatial planning as a means of achieving the common good, instead of fulfilling partial interests
	Insufficient application of geoinformation systems in the planning and monitoring of the state of space

Area	Identified opportunities
Spatial basis	High share of agricultural and forest land in the total area of the state and other significant natural resources
	European standards and procedures for the protection of resources, natural, cultural and landscape values
	Exploitation reserves of non-energy mineral raw materials
	Landscape potential as a basis for economic development (especially tourism development)
Spatial organization and spatial systems	Territorial cohesion policy and integrated urban and rural development perspectives
	Implementation of new technologies to ensure social infrastructure availability
	Possibility of transboundary cooperation in border areas
	Possibilities of co-financing housing stock renovation
	Trends in the development of selective forms of tourism - cultural, nautical, health, sports, ecotourism, agricultural tourism, etc.
	New forms of island traffic accessibility
	Possibility to participate in the development of international transport and infrastructure corridors/systems
	Possibility of involvement in European logistics/transport networks and routes
	Modernization of railway transport in corridors X and Vb and introduction of the Adriatic-Ionian corridor
	Impact of development of Vb/Vc and the Adriatic-Ionian corridor on the development of Croatian ports
	The potential of the European river transport system of the EU (Rhine - Main - Danube channel)
	Available capacities of the oil and gas pipeline system to increase oil and gas transport for domestic and foreign users with the aim of increasing security of supply and integration into the EU energy network
Spatial development management	Review of the administrative and territorial structure
	Orientation towards abandoned, neglected, and underutilized areas in operational programmes and sectoral development documents (e.g. Tourism development strategy)
	International cooperation in the field of spatial development, planning, and monitoring of the state of the space
	Access to spatial data (INSPIRE Directive)
	Possibility of financing projects/development activities and implementation of spatial plans with EU funds

Area	Identified threats
Spatial basis	Consequences of climate change
	Adverse transboundary environmental impacts
	Mined areas and suspected minefields
	Unfavourable ownership structure of agricultural and forest land, fragmentation of properties
	Natural disasters
Spatial organization and spatial systems	Increasing regional disparities
	Uncontrolled expansion of edges of large cities
	Disappearance of rural settlements
	Long-term structural effects of the economic crisis
	North Adriatic ports competition
	Little opportunity for spatial expansion of major seaports
	Imbalanced market demand for freight transport on rivers
	Air traffic sensitivity to international terrorism
	Uncertainty in oil supply due to falling reserves, production, threats of shutting down refineries, poor capacity utilization, fluctuating oil market, etc.
Spatial development management	A new wave of illegal building, as a response to insufficiently preventive action or failure to implement remediation procedures
	Inability to manage the entire territory - border disputes

3. Starting points and the concept of spatial development



The overall spatial development goal —

A balanced and sustainable spatial development based on the principles of territorial cohesion aimed at improving the quality of life and mitigating depopulation trends while preserving the identity of space

With a view to balanced and sustainable development, increasing the quality of life and mitigating negative demographic processes, the concept principles are:

- 1 affirmation of polycentricity**, in particular by strengthening the role of macroregional centres, but also of other higher and middle-ranking centres important for shaping a balanced spatial structure, empowering cities of sub-regional and local importance in depopulation-threatened areas and encouraging their networking into polycentric alliances as the basis of sustainable and resilient regions
- 2 mitigating the rate of depopulation of the most vulnerable areas** encouraging natural regeneration of the population and creating preconditions for appeal to the younger population, according to the concept of social inclusion, equal access to public and other amenities, the right to work and personal progress, using the potential of new technologies, green business and appeal to tourists
- 3 preserving the identity of Croatian areas** through planned consideration of the entire territory and planned integration of the natural and cultural heritage based on a comprehensively perceived and valued landscape into the system of physical planning as well as through equal planning treatment of land and sea in sustainable development settings
- 4 taking advantage of the geographical and traffic position** for the development of intermediary transport, economic, and political functions between Western and Central Europe and South-Eastern Europe and the Middle East, in particular the natural orientation of the central Danube Basin countries towards the Adriatic and the Mediterranean
- 5 sustainable development of the economy and infrastructure systems.** Moderate use of space and directing development activities towards already used land, more intensive development of rail, sea, river and air transport systems and improvement of the network of road transport links
- 6 connecting to the European territory**, applying the principle of territorial cohesion, achieving common environmental standards, participating in the realization of European transport and infrastructure networks, and participating in the development of common documents and the implementation of

research and other projects related to spatial development

- 7 integrated access to physical planning** by aligning sectoral policies and development documents with principles of protection and promotion of fundamental principles, priorities and orientations of spatial development and consideration of potential instruments for implementation of the planned spatial development in all sectors
- 8 active adaptation to the dynamic of change** by strengthening the capacity of the Croatian space and the physical planning system to adapt to the effects of climate change, social change, economic trends and technological progress, and to reduce the risk of disasters.

The achievement of the general goal and concept principles is planned by guiding the activities with the help of 5 identified development priorities with strategic orientations of spatial development with a projection until 2030.

Guiding character of the document enables the planner evaluation of possible options and finding optimal ways to realize the concept of the Strategy in the processes of its implementation.

Given the view scale, different scales and years of data sources as well as the guiding character of the Strategy which contains the basis and organization of spatial development, all views are schematized and detailed locations of the contents presented are not retrieved from them. Graphic presentations are solely for the purposes of this document and should not be linked to the process of determining international borders.

The fact that a project, route, facility or a building are not explicitly stated in the Strategy does not exclude the possibility of their evaluation through spatial plans in accordance with the orientations of the Strategy.

All projects and activities which arise from the general goal through concept principles and in line with the orientations but are not individually separated Projects/Activities within individual orientations, can be equally allocated for implementation through the EU and other projects.

Table 3.1. shows the estimated impact of established strategic orientations on the realization of spatial development concept principles.

TABLE 3.1

**ESTIMATED IMPACT OF ORIENTATION
ON THE REALIZATION OF
CONCEPT PRINCIPLES**

- direct impact
- indirect impact
- neutral

PRIORITIES	ORIENTATIONS	
4.1 Sustainability of spatial organization	4.1.1.	Optimizing settlement systems
	4.1.2.	Coordinating the development of cities and their functional regions
	4.1.3.	Developing comfortable and developed cities
	4.1.4.	Improving the vitality and attractiveness of rural space
	4.1.5.	Sustainable development and use of the coastal area
	4.1.6.	Reducing regional disparities and sustainable planning for development-specific areas
	4.1.7.1.	Improving the accessibility of social infrastructure
	4.1.7.2.	Improving accessibility of transport infrastructure
	4.1.7.3.	Improving utility infrastructure
	4.1.8.	Carefully considered use of space
4.2 Preservation of the identity of the space	4.2.1.	Sustainable development of nature protected areas and ecological network areas
	4.2.2.	Preservation and sustainable use of cultural heritage
	4.2.3.	Improving the quality of building and space design
	4.2.4.	Affirmation of landscape features and values
4.3 Traffic connection	4.3.1.	Developing a transport system
	4.3.2.	Joining the European transport network
	4.3.3.	Developing infrastructure for broadband Internet access
4.4 Energy system development	4.4.1.	Increasing and improving security of energy supply
	4.4.2.	Developing production, transmission, transport, storage, distribution, and supply of energy
	4.4.3.	Increasing the share of renewable energy sources
	4.4.4.	Further integration into the EU and international energy networks
4.5 Resilience to change	4.5.1.	Adaptation to climate change
	4.5.2.	Strengthening natural capital by planning the development of green infrastructure
	4.5.3.	Increasing energy efficiency
	4.5.4.	Sustainable Waste Management
	4.5.5.	Sustainable management of mineral raw materials
	4.5.6.	Adapting to changing business environment
	4.5.7.	Developing sustainable tourism

[illegible]

4. Priorities and strategic directions of spatial development



4.1. Sustainability of spatial organization

Polycentric development is the basis of sustainable spatial organization

The sustainability of spatial organization should still be based on a polycentric model of development.

Accepted in the EU as an optimal model of spatial development, the model of polycentric development offers itself also with regard to the territorial shape, geographical features and the present development of the territory of the Republic of Croatia.

A particular challenge for the development of a polycentric model are specific geographical features that have a significant impact on development opportunities: coastal areas, islands, mountain areas, plains, river valleys and basins, and other types of territories that have special - often transboundary - features or are marked by severe and enduring natural and demographic handicaps. The basic goal of the chosen model of polycentricity is ensuring a balanced spatial distribution of the population and mitigating the depopulation process in the national territory.

With its legislation, the Republic of Croatia strengthens the implementation of the intentions contained in the principles of territorial cohesion, and by further activities, both nationally and internationally, will seek to affirm these principles by applying a holistic approach to the territorial cohesion policy, including the urban-rural, social, economic and cultural development component.¹ Polycentric development has been identified as a key element for achieving territorial cohesion according to TA 2020 as well. By promoting polycentric and uniform territorial development, polarization between the capital, metropolitan areas and medium-sized cities at national level is avoided. Medium-sized and small cities must play a key role at a regional level. TA 2020 refers to patterns of multi-level governance in territorial management as a management and implementation mechanism (horizon-

tal and vertical coordination). The role of ESPON programmes in methodological support and creation of a knowledge base is emphasized, and projects and programmes Interreg EUROPE, INTERACT and URBACT stand out through good practice networking, knowledge transfer and innovative projects.

The EU is continuously researching spatial development processes. The position of the Republic of Croatia in the EU, which intensively studies spatial processes and invests in funds for spatial and social development, commits to an active role in discussing and shaping materials that are accepted as agendas, declarations or other formal form of expression and taking stands on processes in space and calls for involvement in as many international initiatives, programmes and activities as possible.

In the context of the European space, the importance of complementing infrastructure networks is considered a priority. The efficiency and density of secondary networks is considered vital for the integration of regional and urban economies and their competitiveness, especially for the purpose of strengthening medium-sized and small cities and their functions in generating general regional development.

4.1.1. Optimizing settlement systems

Particular importance should be given to strengthening the role of the capital and regional centres in the European context and, at the same time, to their linking and solidary commitment towards strengthening of the role of medium-sized and small cities in the national system of settlements.

Of particular importance is the strengthening of the role of medium-sized and small cities, which may seem less significant in the European or national network, but are

¹ TMRRC

The key role of medium-sized and small cities at regional level

extremely important at the regional and local level, especially in areas with specific features and development-specific areas, e.g. hilly and mountainous areas and areas along the national border and on islands. Maintaining basic functions and ensuring traffic accessibility is a prerequisite for their development perspective.

Based on the implementation of the PPSRC so far, analysis, assessment of the state and recommendations of the TMRRC, the expert basis Regional development, development of systems of settlements, urban and rural development and transformation of space from 2014, other individual studies and proposals of settlement systems from county plans, imbalances of methodologies and criteria, changes in the legal regulations and permanent processes in space, it is necessary to continue monitoring and research of the state and development of settlement systems.

In the context of the PPSRC, which stipulates that the system of central settlements, as developmental focal points of the Republic of Croatia, should consist of a settlement network, hierarchical and functional, with about 650 to 750 cities and major settlements in urbanized and rural areas, and within the context of PPPRC, according to which the status of the city in the Republic of Croatia was to be acquired by about 120 to 150 settlements, and 550 to 600 settlements, predominantly in rural areas, had to be designated as development centres and developed by state incentive measures - a need to correct the established system could be identified. The system planned by PPSRC has reached its peak with the current number of LSGUs, and the sustainability of the system with this number of self-government units is the subject of constant review in the context of efficient and cost-effective public sector services.

Besides, recognition of existing public services the levels of centrality of the central settlements necessary for balancing the spatial development of the country should be planned. This also implies the determination of functions, i.e., social contents, a settlement should not be left without, in cooperation with public bodies in whose jurisdiction the basic functions are (administration, judiciary, education, science, sport, health, infrastructure, citizens' safety, etc.). Ensuring minimum social, transport, and utility

infrastructure is a basic prerequisite for the availability of work and personal progress, key factors in deciding on a place of residence. It is particularly important to ensure that the social infrastructure for the upbringing and education of children is equally accessible in all spatial units or local and regional self-government units in the Republic of Croatia.

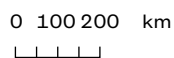
The development of a planned polycentric settlement structure depends on the potential of the population, public services available, transport accessibility and competitiveness of the economy, which should be encouraged by a series of collective or individual measures. For this purpose, it is necessary to connect physical planning documents with other policies and instruments of territorial development (regional development, sector strategies and planning, etc.). Spatial plans should be used to create a framework for uniform development of the territory of the country, by planning social and technical infrastructure and directing investments. In the planned polycentric structure of settlements, it is necessary to preserve the values of natural environments of cities and the identity of smaller settlements, i.e., regions, regardless of the level of perspective.

In the Croatian urban network, the optimal location of the capital Zagreb and major development centres Rijeka, Split and Osijek is recognized as a special quality. It is necessary to find a way for Zagreb, as the capital for which the PPSRC has set the goal of empowerment as a national metropolis and one of the European centres, to actively engage in supporting a sustainable spatial structure while mitigating the negative processes that occurred, although the goals were set - loss of population and functions in other cities and settlements in the system of settlements of the country.

In the sustainable settlement system, it is particularly important to strengthen the capacities of macroregional centres (Rijeka, Split, Osijek) and regional centres to really take on the assigned roles and to strengthen the functions of medium-sized and small cities in order to regionally connect and generate general regional development.

Projects/Activities

- Scientific research and expert analyses related to monitoring the



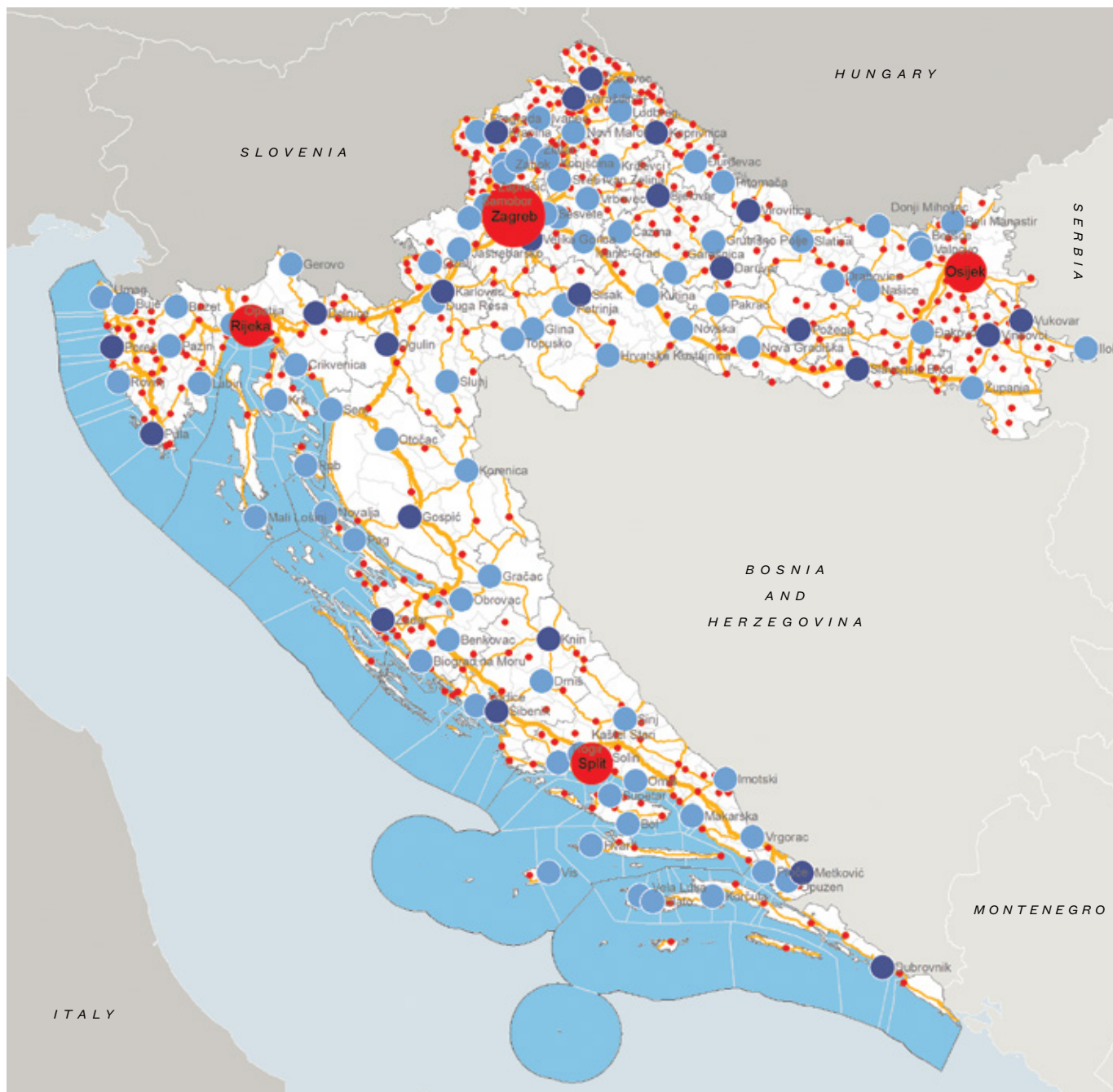
The diagram illustrates the European network of cities through three levels of urban hierarchy, each represented by a red circle of decreasing size:

- A global city**: Represented by the largest red circle.
- The main centres of the European network of cities**: Represented by a medium-sized red circle.
- Secondary centres of the European network of cities**: Represented by the smallest red circle.

Additional symbols on the right side of the diagram represent:

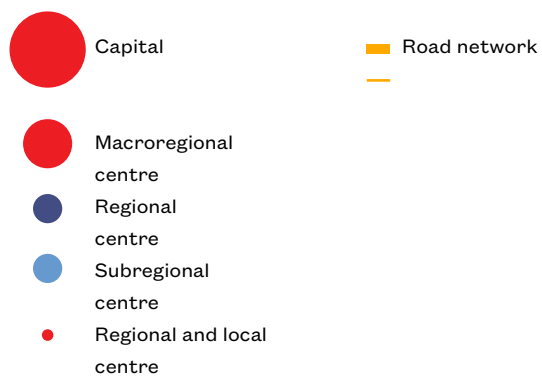
- Capital cities, centres of European regions**: Represented by a red circle with a black dot in the center.
- Other cities**: Represented by a small red dot.
- Network of small and medium-sized cities**: Represented by a cluster of small orange dots.

Sources:
GIS database EuroGeographics
(EuroGlobalMap EGM 7.0)



0 50 100 200 km

FIGURE 4.2
**PLANNED SYSTEM
OF CENTRAL
SETTLEMENTS**



Networking of cities and smart development of urban regions that go beyond administrative boundaries

development of settlement systems, developmental constraints, the interplay of settlement development and demographic trends, and the effects of seasonal activities and flows

- Coordination of competent public law bodies in the implementation of settlement system settings at three planning levels and their corrections by actively adapting to the dynamic of change
- Identifying development potential of settlements in the network and creating incentive measures to strengthen the role of medium-sized and small cities
- Encouraging the promotion of cooperation and networking of cities/settlements in polycentric areas of interest
- Using EU financial support and programmes as a mechanism for achieving system development, engaging in international initiatives, programmes and activities.

4.1.2. Coordinating the development of cities and their functional regions

Integrated urban development policy

TA 2020 encourages cooperation and networking of cities and long-term smart development of urban regions that go beyond administrative boundaries.

Particularly important for further development is the integrated urban development policy as a process in which the spatial, sectoral, and temporal aspects of key areas of urban policy are coordinated. This implies the need to incorporate urban development visions into development documents at all levels.

Designated as places with strong forces for social inclusion, outstanding opportunities for economic development, knowledge centres and sources of growth and innovation, agglomerations are also areas of demographic problems, social inequality and exclusion of specific population groups, with a lack of affordable and suitable housing and environmental problems.

All levels of government are marked as responsible. Recommendations for integrated urban development (as a set of instruments) are strengthening of coordination at the local and regional level in matters of housing development, economic and infrastructural development, development of services, creating preconditions for an

energy policy, taking into account, inter alia, the impact of the existing aging and migration trends.

Integrated urban development directs cities towards their functional urban areas (FUAs) and their surrounding rural (and peri-urban) space, creating urban-rural links. The use of European Structural Funds is very important for integrated urban development programmes, so it is necessary to strengthen the capacities of LSGUs (especially medium-sized and small cities) for their implementation. In the 2014-2020 programming period, a significant role was given to Integrated Territorial Investments (ITIs), co-financed by EU funds and managed by cities. Other EU initiatives, JESSICA and JEREMIE, should also be used which support the establishment of urban development funds and small- and medium-sized enterprise funds, and the use of financial engineering instruments to encourage private equity investment in the implementation of integrated urban development strategies.

Given the concentration of the population and the impact on their surroundings, planning the spatial development of large cities, which is in line with the development of the respective urban regions, is one of the tasks of the Strategy, the State Plan for Spatial Development of the Republic of Croatia and the spatial plans of the counties/City of Zagreb.

The greater institutional and fiscal capacity of the capital and major development centres also implies their spatial responsibility for the balanced development of the country and functional regions, which are manifested by initiating the preparation of common development starting points, coordinating the process of setting development goals and priorities, and by initiating projects leading to their realization.

Particularly important topics for the harmonious development of major cities and their environs include:

- development of a common urban-suburban public transport with emphasis on sustainable mobility
- preservation of the identity of settlements in the functional region and controlling the outskirts of the big city
- planning complementary economic development in which special attention is paid to the placement of products and services of the functional

- region on the big city market
- addressing key environmental and utility infrastructure issues
- analysing and solving other problem areas.

Urban agglomerations

Urban agglomerations are considered to be groups of urban settlements and other settlements around cities at relatively short distances which have, by the development of common infrastructure, created larger and predominantly built areas, as a new spatial and functional unit made up of several settlements (in several municipalities and cities), with a distinct division into central zones and periphery, and major infrastructure corridors.

Agglomerations create strong concentrations and polarize the development of a region, completely changing the landscape and losing or fragmenting areas of valuable land resources. They are also areas with the highest economic dynamics and the largest number of jobs, and often with pronounced traffic problems that accompany internal and external migration.

The process of urbanization, also recorded by the PPSRC, is still ongoing, especially in the direction of the concentration of the population in several cities with emptying of rural areas, which is one of the main problems of the country. Measures should be put in place that will be applied simultaneously to urban agglomerations and rural areas and research and monitoring should be carried out to this end.

Urban agglomerations must plan their development, both spatial and functional. Sustainability is reflected in the state of social and technical infrastructure in relation to the planned development and environmental protection. In the development of the settlement structure of the historic core, new parts of settlements - parts planned for further spatial expansion and connection with transitional forms, unfinished parts of settlements - must be carefully planned. Otherwise, the agglomeration will develop uncontrollably, and infrastructure systems will not be able to provide the same level of service in all parts of the agglomeration. Depending on the type of urban agglomeration, its existing and planned role in the overall settlement system and its existing and planned role in the narrow space, it is necessary to set development preferences and direct development.

According to the Regional Development Act,² urban areas are organized as urban agglomerations, larger urban areas and smaller urban areas with the criterion of population size and county seat status for more efficient planning, harmonization and implementation of regional development policy, especially its urban dimension and allocation of funds intended for urban development. To this end, it is necessary to improve the coordination of actions in relation to the implementation of laws in the field of physical planning and regional development, which overlap in these issues.

Projects/Activities

- Development of approaches for the identification of urban agglomerations and urban areas, with particular emphasis on the urban agglomerations of Zagreb, Split, Rijeka, Osijek and in other areas of higher population concentrations, including cases of urban centres at short geographical distances with the potential for joint planning of development activities: Varaždin - Čakovec, Sisak - Petrinja, Karlovac - Duga Resa, Vukovar - Vinkovci and others
- Development and monitoring of currently unexplored indicators of urban agglomeration development
- Strengthening the capacity to implement integrated development mechanisms at the local level.

Improving urban-rural links

Directing spatial development towards polycentric spatial structures means directing it towards preserving the value of the natural environments of large cities and the identities of regions and small settlements, as well as tourist visibility and reduction of greenhouse gas emissions (shorter transport of food, efficient use of social infrastructure). In this way, it is possible to achieve a harmonious development of the community, which does not erase the identity of regions and cities but is aimed at reducing disparities. European documents thus speak of urban-rural partnerships and the re-establishment of urban-rural links, in particular by linking complementary urban and rural economies.

Cities in rural regions are designated as an integral component of rural development, and the rural-urban relationship in densely populated regions is different from that in sparsely populated regions. In sparsely populated rural areas, cities

² OG 147/14

Urban agglomerations - areas with the highest economic dynamics

Cities in rural regions - an integral component of rural development

The right to affordable and quality housing

Balanced interweaving of functions and activities

Cities for all generations

can offer certain standards in the provision of infrastructure and services and attract economic activity. In these areas, cities are particularly important for the conservation of settlement structures and cultural landscapes.

According to TA 2020, various connections link urban and rural territories across Europe, from peri-urban to peripheral rural regions. The urban-rural interdependence needs to be respected through integrated management and planning based on a broad partnership.

Today, when many countries have a developed system of regional planning (economic, social and spatial subsystems) with specific regional policies and instruments for its implementation, Croatia is developing these systems, while striving for a synergic effect with co-ordination and integral planning so as not to develop unrelated parallel systems.

4.1.3. Developing pleasant and organized cities

The basis for the transformation of urban areas and sustainable urban development is to increase the quality of life in the entire (especially peripheral) urban area, with the assumption of integral consideration of economic and social issues, issues of protecting the urban environment and improving the quality of urban design.

Housing, as a core function of the city, should be given special attention at the national and local level by establishing appropriate measures for exercising the right to affordable and quality housing. Spatial plans of cities and municipalities and general urban development plans for new and existing residential areas need to ensure accessibility of public transport and public facilities and develop business opportunities complementary to housing in their vicinity. When planning new residential areas, it is desirable to have a variety of residential typologies in accordance with the spatial and climatic characteristics and habits and needs of the people. Particular attention should be paid to planning and systematic land development for individual housing, since it occupies most of the space intended for housing. Incentive measures need to be created to control, maintain and modernize the existing housing stock and to re-

vitalize neglected public spaces in existing housing areas.

When planning urban development, it is necessary to strive for a balanced interweaving of functions and activities, especially the availability of well-designed public facilities and areas.

In the dynamics of urban development there are frequent changes in the use of urban territory, so re-use of land should be encouraged and development activities directed to abandoned or underused areas that have lost or are losing their previous function. Interventions that will remediate the existing situation, improve the environment and contribute to the revitalization of the area and the initiation of economic dynamics (employment, incentive effects on the development of other activities, land development) are a priority of urban development. Large marginal, typically sparsely constructed and inadequately equipped construction zones (often illegal) should be integrated into the urban system and prevented from spreading further, while preserving the landscape with important ecological and recreational functions.

Sustainable urban mobility is achieved through the planning and implementation of pedestrian zones, traffic-calming zones, bicycle infrastructure and public urban transport networks, with a constant increase in the quality and safety of services. Pedestrian zones, especially those that are more difficult to access (city centres), should be accompanied by appropriate facilities and infrastructure to avoid them dying out.

Cities must deal with environmental issues in an innovative and effective way: noise protection, air and water protection, traffic congestion and pollution, waste generation and treatment, climate change mitigation and adaptation, reduction of energy consumption and the use of energy from renewable sources. It is necessary to analyse and through planning procedures create new or preserve existing systems of urban green infrastructure - a network of green spaces which contribute to the conservation, improvement, and restoration of nature, natural functions and processes in cities.

Given the stagnation of the population and their aging processes, special atten-

Sustainable mobility

tion in urban development planning should be paid to the development of cities for all generations, taking into account the needs of families, children, elderly citizens and all vulnerable groups.

When planning purposes in city centres and historical city cores, priority should be given to mixed uses that contribute to the continuity of vitality of these spaces.

Supporting the development of medium-sized and small cities

The network of cities particularly emphasizes the need for special support to the development of medium-sized and small cities crucial for the survival of predominantly rural areas, especially those affected by depopulation, restructuring of socio-economic foundations and the loss of public functions and contents.

Urban in character, medium-sized and small cities are the link between larger urban areas and rural areas.

Possible approaches to revitalizing the economic role of medium-sized and small cities include:

- Business based on the use of information technology that goes beyond the classic centre - periphery division
- Processing industry based on locally grown agricultural products
- Tourism based on the attractiveness of cultural heritage, which includes industrial heritage, landscape features, traditional religious shrines, health and spa traditions (unused or underused geothermal water potentials), regionally designed tourist routes, traditional local festivals and innovative cultural products, gastronomy.

The preservation of the historical fabric and the careful renewal of the identity elements of such cities are important both for increasing their tourist attractiveness, economic development and investment, as well as for keeping the existing population and attracting new inhabitants.

Projects/Activities

- Development of spatial standards for public urban infrastructure planning
- Development of spatial standards for planning of residential zones and settlements

- Encouraging non-profit housing and developing systems of renting publicly owned apartments
- Inclusion in the European thematic networks of cities under the URBACT III programme
- Identifying and highlighting examples of good practice at the national level, especially in the medium-sized / small cities segment.

4.1.4. Improving the vitality and attractiveness of rural space

The revitalization of rural areas, i.e., areas outside cities and settlements of urban character, is primarily about stopping the process of leaving villages and encouraging immigration by creating conditions for economic development, strengthening and establishing infrastructure systems (including IT technologies) and redefining city-village relations.

In addition to the basic principle of sustainable use of space and resources, the need to preserve traditional identity is emphasized. The potential has been recognized for the development of ecological agriculture, the development of tourism based on natural features and traditional values (the economic potential of traditional, cultural and other values).

The prerequisites for improving the vitality and sustainability of rural areas are the promotion of knowledge and innovations in agriculture and forestry, the improvement of sustainability of agricultural holdings and the competitiveness of all types of agricultural activities, the organization of food chains with processing and marketing of agricultural products, as well as the restoration, conservation and improving of ecosystems, promoting resource efficiency and social inclusion. In agriculture, production and tourism, priority should be given to quality over quantity, focusing on local recognition (branding), ecological production of food, domestic seasonal menus, short supply routes and good relationship, developed communication and mutual trust of producers and consumers.

Renovation of villages and basic services in rural areas requires updating of development plans, investment in improving all types of infrastructure as well as development of services for the rural population, including leisure and cultural activi-

Sustainable use of space and resources while preserving traditional identity

Improving all types of infrastructure and developing services

ties, and planning for recreational use and tourist infrastructure that is typologically aligned with landscape features. For the purpose of survival and vitality of remote, isolated and very sparsely populated rural areas, solutions should be found that can achieve infrastructural self-sufficiency.

It is of the utmost importance that rural development policies promote economic and demographic renewal, with the needs of all age groups being considered when planning settlement development. The solution to the employment of young people in rural areas should be sought in areas of new activities that rely heavily on local potentials including local labour, local cultural identity, traditions, resources and community needs. A variety of possibilities is provided by areas of ecological-social economy, information technology, social innovation, creative and cultural industries which offer employment of a local character, motivate the application of fresh ideas and approaches, and open up spaces for young people's affirmation.

In addition, the importance of protecting, renovating and improving spatial features and encouraging the renovation of individual buildings and complexes of traditional construction and development of settlements (public spaces, recognizable ambient units, etc.) has been identified. In order to ensure the attractiveness and vitality of the rural area, activities need to be conducted in a planned manner to preserve the characteristics, values and diversity of the rural landscape in the long term, and in the case of damaged and degraded areas, especially by illegal building, the aim is to improve and advance the situation.

Projects/Activities

- Creating a rural atlas, as a dynamic and active tool into which data on rural space is constantly entered and, as needed, revalued: data about protected or environmentally valuable elements of natural and cultural, especially ethnological heritage; archival research of historical cartographic documentation as a contribution to the genesis of the observed rural area, data on agricultural and forest areas, architectural forms, etc.; data on central functions in settlements
- Exploring the features and extent of change in rural areas as a basis for directing activities

- Identifying and highlighting examples of good practice at the national level
- Strengthening social awareness of the necessity of the village-town connection
- Strengthening the role of local action groups (LAG).

4.1.5. Sustainable development and use of the coastal area

Balancing the interests of users of coastal resources and agreeing on their use is a long and dynamic process. Integrated Coastal Zone Management (ICZM) is a specific response to the problem of existing partial/sectoral planning and management in the coastal zone with the aim of achieving ecologically sustainable development based on its physical, social and economic conditions and the legal, administrative and financial framework. ICZM involves comprehensiveness and coordination, adaptability and gradual implementation, public participation and development of communication strategies, and respect for local specificities.

Due to the lack of coordination at the managing and expert level as well as the lack of managing capacities, the following is necessary: establishing an effective system of cooperation and coordination for integrated coastal zone management (at the managing, expert and administrative level); establishing a coastal zone management system at the national and regional level; capacity building and training of public administration; improving data systems and monitoring the state and processes of coastal areas.

The need for an integrated approach to marine areas planning and management is the result of an increasing demand for marine space for various purposes (renewable energy facilities, oil and gas exploration and exploitation, extraction of raw materials, tourism, mariculture, maritime and fishery activities) as well as multiple pressures on coastal resources. In this regard the purposes and uses of this area should ensure the growth of maritime economies, the development of marine areas and the use of marine resources while preserving ecosystems and biodiversity and underwater cultural heritage.

It is necessary to establish a system of integrated management of coastal and

marine area that includes the development of spatial data infrastructure for the coastal area and the associated waters under the National Spatial Data Infrastructure (NSDI), and to ensure connection with national, regional, and global initiatives and data infrastructures to ensure the availability and interoperability of data in accordance with relevant regulations. Furthermore, it is necessary to establish and maintain the Hydrographic Information System (HIS) and correlate it with the marine cadastre institute and the Marine Spatial Data Infrastructure (MSDI) as a system for collecting, sharing and managing the exchange of data and network services of HIS as part of the NSDI, as well as to create the basic records necessary for the management of the marine area, seabed and underwater areas and to provide prerequisites for the electronic exchange of data.

Spatial structures and requirements of use of space

From the aspect of preserving the spatial identity of this area, an important component of the integrated approach is the recognition and preservation of the richness of the diversity of coastal units derived from their natural-geographical features and their layered historical heritage.

In establishing a network of central settlements, particular attention should be paid to:

- fragmentation and dispersion of building, especially in the rural hinterland
- the impact of two macro-regional centres (Rijeka and Split), the growing influence of Zadar and the importance of ports
- planned overcapacity of tourist zones.

In the context of a comprehensive view of coastal zone planning, more attention should be paid to planning of the sea area and establishing a basis for spatial planning for the purpose and use of the sea by considering:

- development of economic activities (e.g. fisheries, off-shore activities)
- ensuring the necessary mariculture sites (cultivation and associated infrastructure)
- maritime transport
- resolving conflicts among sea users
- the protection and conservation of the marine environment and marine ecosystems and the conservation of ecologically sensitive areas of the sea

- multi-purpose use of a marine area
- specifics of ownership relations
- ensuring systematic and standardized performance of hydrographic activity for the purposes of spatial planning, construction, and other human activities at sea.

Planned sea uses are now displayed in PPSRC and PPPRC and in the spatial plans of counties and local self-government units (major maritime routes, hydrocarbon exploration and exploitation areas, ports of national and county significance, mariculture, nautical tourism ports and their waters, etc.). Within the transposition of the Directive FMSP, the sea will be planned at the national level by the SPSD and spatial plans within the borders of the Republic of Croatia continental shelf, and at the regional and local level, via spatial plans of counties that include the sea and spatial development plans of cities and municipalities within their boundaries.

The completeness of marine planning, consideration of mutual impact, effective monitoring and reporting on the state of the marine territory will be achieved by integrating all levels of next-generation spatial plans in the PPIS.

For the sake of completeness of coastal area planning, it is necessary to define unique units of development and protection of the coastal area by considering the interplay between the sea and land, as well as taking into account the specific features of individual sub-units arising from their natural, geographical, economic and historical-developmental conditions.

Measures for the integrated management of the coastal zone will be elaborated by the Marine Environment and Coastal Zone Management Strategy, in which the spatial measures should be in accordance with the concept of physical development of the Republic of Croatia and the regulations governing the area of spatial planning and construction. The objectives to be achieved by the management and protection of the marine environment and coastal zone, relating to the achievement and maintenance of good environmental state, should be achieved by 2020.³

The above requires the following:

- In order to control the occupation of new premises for construction on land and in the maritime

³ Regulation on Drafting and Implementation of Documents of the Marine and Coastal Management Strategy (OG 112/14)

Harmonizing the planned use of space with actual needs

Limiting excessive space consumption

domain (land and water area), it is necessary to determine, in addition to the legal restrictions, the permissible load on space

- In determining the conditions for the development of settlements and infrastructure (especially roads and drainage), it is necessary to find solutions to key infrastructure constraints (peak and off-season load disproportion)
- Systematic addressing of secondary housing issues
- More detailed and careful setting of criteria for locations of economic activities, especially tourism with the additional exclusion of particular uses
- Finding effective measures to prevent coastal merging of settlement building areas and ban or restrict construction in the narrow coastal zone, restricting excessive space consumption (construction control, maximum use of the existing built-up areas)
- Establishing development guidelines for active monitoring of the state of space
- Space purpose optimization:
 - reducing the pressure on space by oversizing building areas
 - review of planned areas for development
 - harmonizing the planned use of the space with actual needs and opportunities for realization in the planning period
 - directing development into less vulnerable areas
- Minimizing conflicts of the use of space in relation to vulnerability, natural and cultural values and landscape
- Determination of more detailed construction requirements in the narrow coastal zone, depending on the particularities of particular areas
- In order to preserve and develop rural areas in the narrow coastal zone and in the hinterland, typification is required in rural areas:
 - for intensive agriculture
 - for tourism
 - for valuable landscapes and vistas
- Systematic addressing of the degraded quality of the built-up area (urban environmental damage) arising from illegal building (of both individual buildings and entire settlements with substandard infrastructure)
- Consistency of spatial-planning measures in addressing growing pressure on areas of high natural and landscape values,

agricultural and forest land for the construction of tourist facilities, and overuse of coastal resources

- Systematic monitoring and directing the process of urbanization.

One of the development opportunities of rural areas along the coast and in the hinterland is to exploit the potential for organic agriculture, with particular emphasis on growing indigenous crops (medicinal plants, olives, vines, citrus fruits) and activating pastures, while expanding the tourist offer by branding products.

In order to improve planning efficiency, it is necessary to develop high-quality sectoral bases and analytical tools and to establish measurable indicators for monitoring implementation, and one of the key exogenous conditions is to identify and establish appropriate instruments of land policy and distribution fairness. A building area should become an instrument for directing and controlling spatial development, with legal certainty for landowners and information for the valuation of real property.

It is also necessary to solve the problem of uniformly defining maritime domain boundaries by adapting land borders to natural conditions, as well as property claim issues and registering maritime domain, and to revise and adapt the boundaries of the Protected Coastal Area to natural conditions.

Projects/Activities

- Development of a pilot project for the implementation of the FMSP Directive into spatial plans, with the study of cross-border cooperation models.

4.1.6. Reducing regional disparities and sustainable planning for development-specific areas

Reducing regional disparities

In pursuit of the general objective of spatial development, special attention should be paid to areas with poorer socio-economic indicators expressed with a composite indicator of the level of development of local and regional self-government units (development index), which, according to regulations in the area of regional development, receive the status of assisted area.

Measures for the development of assisted areas are determined by the operational four-year programmes of the Government of the Republic of Croatia and tax policy measures.

Hill-mountain areas

The preserved integrity and diversity of landscapes, and especially rare natural forms, are comparative advantages of these areas, which should be carefully used as a tourist potential. Sustainable use of valuable untapped natural resources according to established environmental criteria is the basis for their development and mitigation of developmental lag compared to other parts of Croatia.

Agriculture has the potential to spur development, where the traditional approach to agricultural activities and organic food production should be encouraged, as well as the connection with the Adriatic tourism market and Central Croatia as a space for product placement. At the same time, it is necessary to activate own tourism potentials: rural, sports and recreational, health and hunting tourism.

Good transport links with the coastal area and Central Croatia are a prerequisite for the development of these areas.

Due to the sparse population and the specific network of mostly dwarf-sized settlements with less than 100 inhabitants, it is necessary to ensure the basic functions of the settlements by developing specific models of public service organization and social infrastructure and using IT technologies.

Areas along the state border

The main development goals of the areas along the state border relate to the creation of prerequisites for their development, starting with the need to improve living conditions of the population of this sparsely populated and population-endangered area in comparison with other areas. In order to achieve these goals, it is necessary, among other development measures, to strengthen the functions of settlements and the overall infrastructure. Addressing common challenges in border areas, such as lack of infrastructure, use of untapped and/or neglected growth potentials, taking over information and communication technologies, creating a favourable business environment etc., can be realized through cross-border cooperation programmes

(e.g. INTERREG or similar programmes).

Within the environmental protection segment, areas along the border need to be viewed in the context of a complete ecosystem, i.e., in transboundary cooperation with neighbouring countries, with which joint activities should be undertaken to prevent environmental risks and to preserve common landscapes.

We distinguish between the internal border of the Republic of Croatia within the EU and the external border of the Republic of Croatia: the internal border towards the Italian Republic, the Republic of Slovenia and Hungary, and the external border, also the external border of the EU, towards the Republic of Serbia, Bosnia and Herzegovina and Montenegro.

The areas along the land border with Slovenia and Hungary, i.e., EU countries, must build their development on the involvement in European transboundary cooperation, development of joint economic and cultural programmes with the assumption of population mobility. Account should be taken of traditional links between the population on both sides of the border. Through identification of joint challenges and development potentials spatial development should be encouraged by joint documents.

Along the state border with Bosnia and Herzegovina, within the mountainous areas, due to topographic segregation and inaccessibility, the main focus is on defining a functional hierarchy of settlements with the necessary social infrastructure as the backbone of development and prevention of depopulation. For the most part, it is an area within a narrow land belt towards the coast, so that its development, apart from the settlement system, requires inclusion into the development systems of the Adriatic tourist area.

In the border area towards non-EU countries, care should be taken not to disrupt the existing forms of cooperation upon Croatia's entry into the Schengen Area. Particular consideration should be given to dual cities in border areas.

Eastern Croatia

In order to achieve the basic goal of balanced development, i.e., to harmonize development indicators, it is necessary to stimulate the economic development of this area.

Demographic renovation is a precondition for the development of hill-mountain areas

Transboundary cooperation on environmental risk prevention

Maintaining the existing forms of cooperation after Croatia's entry into the Schengen area

Considered use of space in accordance with development requirements while maintaining biological balance and environmental quality

It is an area with the largest share of medium and large settlements (between 500 and 10,000 inhabitants), with spatial expansion of suburban settlements along the largest urban centres, with depopulation and strong regression in almost all, especially western parts of the region. Almost every fifth settlement has a level of functional equipment at least at the level of the local centre.

Owing to their natural-geographical predispositions, traditional agrarian space has the potential to link agricultural production and tourism and further develop the existing industries that face the challenges of adapting to changing business as well as of strengthening urban-rural links.

It is an area with several key infrastructural projects in the Republic of Croatia: the multipurpose canal Danube - Sava, the port of Vukovar (as a point of a future intermodal system), the project for the regulation of the Sava river waterway to classes IV/V, the development of passenger and freight air transport, continuation of construction of the A5 motorway from Osijek to Mohač on corridor 5C.

Projects/Activities

- Development of key infrastructure projects
- Tourism development based on local values and offer, especially river tourism on Sava, Drava and Danube
- Revitalization of industries on a modern and competitive basis
- Utilization of geothermal energy (in energy, agriculture, tourism, etc.)
- Transboundary cooperation through EU programmes or in line with common challenges and potentials
- Collaboration in landscape valuation and affirmation
- Establishment of common ecological criteria for the use and protection of natural resources.

4.1.7. Improving the accessibility of infrastructure systems

The accessibility of social, transport and utility infrastructure is necessary for optimum development of the settlement system as well as for functioning at the settlement level. When planning infrastructure systems, priority should be given to areas that have the most pronounced negative demographic trends.

4.1.7.1. Improving the accessibility of social infrastructure

The system of social infrastructure, i.e., spatial needs of groups of public services and functions (administration, judiciary, pre-school, primary, and secondary education systems, higher education systems, science and technology and culture, health, social care, sport, religious communities, citizens' associations, political parties and other organizations) should be planned in accordance with specific development plans, social plans, regulations and standards for each group or subgroup, with rational organization implying optimal utilization of the existing spatial capacities.

In order to mitigate the depopulation of the most vulnerable areas, it is necessary to adapt spatial standards for the placement of social infrastructure to the actual situation, and in particular to find solutions for ensuring the basic preconditions for quality of life: access to education and health care.

When planning social infrastructure through cross-sectoral cooperation, it is necessary to determine the needs and location of social contents of national, county and local importance. When planning social purpose areas in a settlement, special attention should be paid to their attractiveness, even distribution and accessibility.

In the process of planning social infrastructure, it is necessary to include social plans adopted by regional/local self-government bodies in order to determine the priority areas of social policy development. Social plans provide an insight into the network of social services and the specific goals of the development of institutional and non-institutional services, with a particular emphasis on services for groups at higher risk of social exclusion.

The use of information and communication technology should be particularly encouraged to ensure access to basic and other amenities of social infrastructure as well as to exercise the right to social inclusion and quality of life. Traditional social content and service networks need to be upgraded with a range of e-services, enabling a better level of public service to citizens, a more rational use of resources and less environmental impact, with a prerequisite of simultaneously promoting

When planning infrastructure, give priority to areas with the most pronounced negative demographic trends

information literacy and accessibility of information and communication infrastructure (e-inclusion).

Projects/Activities

- Establishing criteria for determining social infrastructure of national, regional and local importance
- Harmonization of health development plans and spatial plans
- Establishing spatial standards for social infrastructure planning
- Development of specific e-services to compensate for the absence of certain public services in depopulated areas, while at the same time securing the right of access to information and communication infrastructure.

4.1.7.2. Improving the accessibility of transport infrastructure

The transport infrastructure system should support the development of an optimal settlement system, balanced regional development, complementarity of rural and urban areas, and interconnection with European transport systems and the urban network.

Transport infrastructure should enable mobility and equal accessibility in all areas. It is necessary to develop an integrated approach to accessibility and connectivity, optimally utilizing all forms of transport in order to make the best use of the developmental characteristics inherent in different spaces.

It is necessary to improve accessibility in long-distance passenger transport within the country, regional connectivity in passenger transport, accessibility in passenger transport within and towards major urban agglomerations, and accessibility in freight traffic within the Republic of Croatia.

Due to the specific form of the Croatian territory, particular attention should be paid to the accessibility of islands and the Dubrovnik-Neretva County, in accordance with the characteristics of each of these areas.

Considering the basic transport network beyond the scope of its transit role or connecting parts of the territory, i.e., through the prism of development potential, the high throughput of the motorway network as well as its degree of completion should be taken into account when

planning development and economic activities, by enabling additional motorway connections for better traffic connectivity of less developed LSGUs and planning of economic zones in the catchment of motorway connections.

The principle of providing access to all public services for all citizens in the context of transport means ensuring access to public transport and other forms of mobility. The urban transport system should provide residents of a particular urban area with simpler, faster, cost-efficient, and sustainable carrying out of activities and fulfilment of needs through the use of public transport.

Introduction of environmentally and economically justified public transport systems is envisaged, namely road transport for smaller urban areas, combined road and light rail systems for larger urban areas, and intermodal systems for the largest urban areas: road, light rail and rail.

It is important to promote non-motorized transportation, especially the use of bicycles. The bicycle network should be planned by taking into account that it is connected to public transport stations and public parking areas.

4.1.7.3. Improving utility infrastructure

Water supply:

- Exploring the possibilities of new and securing the existing pumping zones for the purpose of water supply
- Expansion and renovation of the existing water supply network in order to provide the highest quality of supply to the population and to enable the connection of new users
- Provision of quality and controlled drinking water in sufficient quantities, especially on islands
- Planning of water supply systems in accordance with modern technological achievements
- Providing the necessary space in cities for facilities, water storage and laying of pipelines
- ensuring quality maintenance and functionality of water supply facilities and assemblies to avoid system losses
- Protecting ecosystems and especially aquifers from pollution, especially in the vicinity of urbanized areas, to enable further exploitation

Mobility and equal availability in all areas

Provision of quality and controlled drinking water in sufficient quantities

Provide the necessary space for the location of modern, environmentally friendly wastewater treatment plants for growing urban structures and settlements

Use and modernization of the existing infrastructure capacity before planning new ones

Activating abandoned and underused spaces by planning new and sustainable uses

Sustainable urban development involves the rational use of space and available resources

- and ensure a constant supply of the required quantities of water
- Protection from salinization of groundwater and surface-water resources for water supply needs (estuaries and smaller watersheds of the Adriatic basin), primarily those providing water supply on islands and the coastal area
- Provision of adequate protective areas around pumping stations in spatial plans, with continuous monitoring of revisions of the sanitary protection zones of pumping station
- Planning the expansion of the water supply network according to need assessments
- Ensuring the conducting of activities related to the abstraction, treatment and delivery of drinking water under principles of sustainable development.

Drainage and wastewater treatment (sewage):

- European standards are introduced into water supply in accordance with regulations, and a transitional period for fully meeting the municipal wastewater treatment obligations is planned by the end of 2023.
- For the first group of agglomerations (with a load exceeding 15,000 PE (population equivalent)) the municipal wastewater collection and treatment is envisaged by the end of 2018. An exception are certain predominantly tourism-oriented coastal agglomerations (with a load of 15,000 - 50,000 PE), which would be completed by the end of 2020
- Giving priority to finding a solution to drainage in zones of sanitary protection of springs and in settlements where there is water supply
- When planning the space for the placement of sewerage and wastewater treatment systems, the quantitative and chemical state of the grouped groundwater bodies must be taken into account and priority must be given to areas that are at risk of not achieving a good state
- Provide the necessary space for the accommodation of modern wastewater treatment plants while respecting the necessary environmental conditions for growing urban structures and settlements
- Wastewater treatment plants should be planned outside of inundation zones/floodplains

- Improve drainage systems, especially the sewage network and adapt to sustainable use
- Provide flexible systems (e.g. modular solution) for treatment in tourist resorts where the number of users fluctuates repeatedly during the year
- Modernize and upgrade the existing sewage network of settlements as well as treatment systems
- Coordinate activities between water management and utilities services at the regional level
- Systematic disposal of sludge resulting from the operation of wastewater treatment facilities (upon additional treatment, it can be used as raw material in agriculture, material in the production of bricks, as an energy-generating product, etc.).

4.1.8. Rational use of space

Purposeful organization of space requires a thorough reflection on its future prudent use in accordance with developmental requirements. The area of Croatia is constantly changing due to dynamic natural, economic, and social processes.

Demographic conditions, economic interests and the regional position are the main factors impacting spatial development whereas central settlements provide functions according to the position in their catchment area. Infrastructure, as essential amenities and services provided by the public sector, are necessary for the functioning of society. Therefore, the role of good spatial planning practices is important for improving population distribution and the use of natural resources that best serve national competitiveness, sustainability, disaster risk reduction and a high quality of life, while taking into account the impact on biological balance and quality of the environment.

When drawing up planning documents, intended uses should be determined according to the suitability model as the optimal ratio of attractiveness of space for functioning of the intervention and the minimum vulnerability of space to the intervention. This applies in particular to site planning for energy and industrial plants, taking into account environmental criteria.

Infrastructure systems

Before planning new infrastructure systems, it is necessary to examine whether the reconstruction of the existing ones can achieve the level of service that is needed and such solutions should be preferred. The principle of integrating infrastructure corridors wherever possible in space should also be applied.

The planning of infrastructural, energy and other interventions in the area that may have a negative impact on the landscape or cultural heritage should be directed to less sensitive areas, with particular attention to vistas. Interventions that cannot be moved from areas valuable in terms of their landscape should be designed to adapt to the visual features of the space. Infrastructure systems in the function of enabling the accessibility of spatially separated cultural heritage elements should be designed to avoid negative impacts on their basic features and the value of the landscape.

Building areas

Cities and settlements must achieve a balanced development, based primarily on urban transformation and remediation of built-up parts of building areas, and then on the construction/filling-in of the undeveloped parts of building areas.

Given the existing demographic projections, further expansion of building areas is not justified. Possible expansion should be based on expert analysis and arguments, with a presentation of the development problem or need to be addressed by the programmes of construction and land development. An expansion should be also based on the statement of utilization of the existing building area with the explanation of reasons for not using particular parts and the measures taken for exploitation, with prior examination of the space reserves within the existing building area.

Existing coastal protection standards should be maintained and revised based on spatial monitoring in order to tighten the conditions for designation of construction sites and limit the interconnection and extension of existing construction sites. It is essential to ensure free access to the coast, passage along the coast and public interest in the use of maritime domain.

Physical planning of settlements should be planned and implemented on the basis

of identified spatial possibilities and optimal utilization of space, while securing public space and developing the respective infrastructure.

Agricultural land

Soil use should be planned according to the criteria of benefits for agricultural production and the principles of integrated and sustainable development, taking into account the possibility of revitalizing remote rural areas and hill-mountain areas, bringing overgrown and unused agricultural land to its original purpose, functional land consolidation, maintaining and enhancing landscape and biological diversity, development of eco-tourism and extensive agriculture, revitalization and enhancement of protected areas of nature, with an emphasis on branding of agricultural products, development of agricultural forestry, etc.

Projects/Activities

- Establishment of a single comprehensive database of agricultural land assessment, as part of the NSDI data registry.

Forests and forest land

When planning and using land intended for forests and forest land, other potentials for integrated sustainable development of a particular area should also be taken into account, such as the possibility of developing eco-tourism, the use of biomass and forestry by-products, and the enhancement of biological and landscape diversity, with adequate valorisation of all forest functions (ecological, social, and economic). These areas should also be planned to increase the appeal of the area and ultimately lead to the achievement of the objectives set by the Strategy (improvement of vitality and appeal of rural areas, reduction of regional risks and development-specific areas, sustainable development of protected areas, improvement of stability of energy supply, etc.).

Effective use of used space

In the context of conservation and moderate use of spatial resources, development activities should be prioritized towards the space already used, whether it is the transformation of abandoned or underutilized spatial assemblies that are no longer in the function of their basic purpose, urban remediation of areas of initially illegal building or remediation of parts of an urban territory with specific problems and needs.

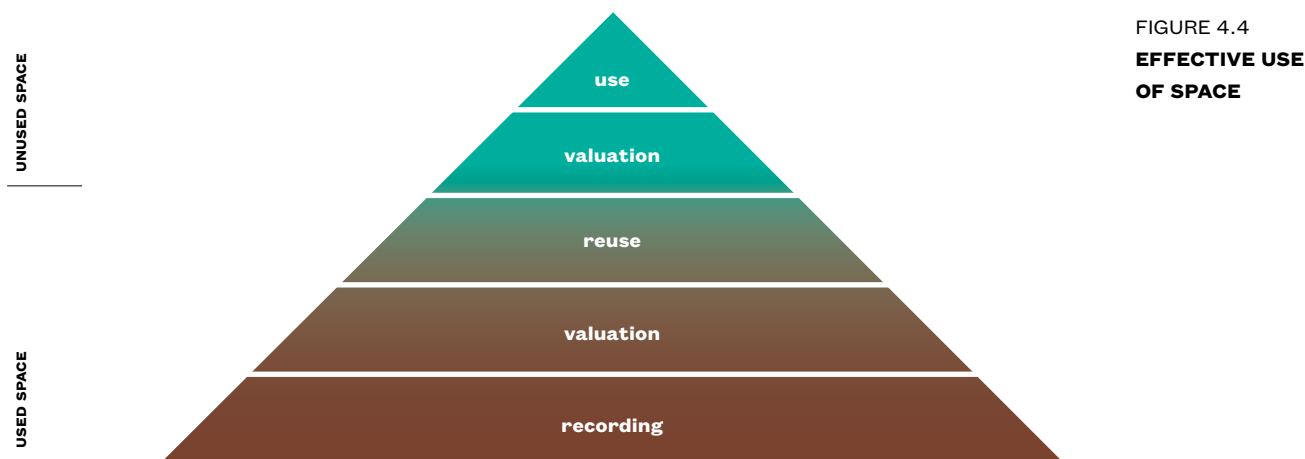


FIGURE 4.4
EFFECTIVE USE
OF SPACE

The importance of activating abandoned and underused spatial units and publicly owned real property and the associated task of their recording, valuation and planning of new and sustainable forms of use while improving the quality of a settlement as a whole is especially emphasized. Opportunities must be considered and methods of making land owned by the Republic of Croatia available for development programmes of LSGUs and counties must be developed.

By defining the scope of urban development plans, which, in addition to the unbuilt, include the built part of building areas of a settlement (which to a greater or lesser extent requires some level of urban transformation), and whose drawing up does not result from the criteria established by law, the increase in costs and time necessary for drawing them up is negligible, but long-term well-being increases because the implementation of these plans, in which space is viewed as a whole, results in articulated or thoughtfully designed, and to a considerable extent, defined space, especially in the segment of public, utility and other infrastructures.

Urban transformation

Amorphous zones do not exist in the city, or where they do, they are moments of a process of transformation; they represent inconclusive times in the urban dynamic. — Aldo Rossi

Sustainable urban development involves the rational use of space and available resources. In this sense, it is necessary to improve the state of urban environment

in cities and settlements with an urban character, revitalize abandoned and neglected urban facilities and their immediate environment and, if necessary, decontaminate the area where any form of pollution is recorded.

Urban transformation encompasses the complete planning and implementation of the transformation of military, industrial, exploitation, resort and other assemblies which are no longer needed for their primary purpose or because they, due to neglect and obsolescence of the constructed structures, are no longer able to serve this purpose in a modern way.

Due to long-term planning and continuity in the implementation of urban projects that address essential public needs of cities for the benefit of their citizens, it is necessary to develop strategic documents that will recognize the challenges to which cities are exposed, define priorities and envisage appropriate measures/projects for their solving. The new EU mechanism for the period 2014-2020, introduced with the aim of strengthening the role of cities as drivers of economic development, which can finance complex urban transformation activities in the coming period, is integrated territorial investments (ITI). No less important is the monitoring of the implementation of these measures as well as recognizing the need for possible amendments thereto over time. When planning transformation, it is necessary to evaluate the potential of the existing constructed structures, with a necessary shift in the institutional and individual attitude towards cultural heritage and space memory.

In order to look into the spatial, locational, property-rights and value characteristics of each of the neglected, i.e., brown-field spaces and the entire space, as a resource from the national to the local level, must be inventoried and evaluated. Areas of large cities are a priority.

Projects/Activities

- Creating a *Brownfield* register within PPIS as a single and publicly accessible data viewer on areas planned for urban transformation, with a precisely defined data model on a specific area
- Creating an UDP for urban transformation – Sustainability in use and vitality of the space must be ensured by avoiding uniform and single-purpose solutions and by ensuring the representation and high quality of public amenities and public open spaces, modelled on good European practice.

Urban remediation

Urban remediation is foreseen for settlements and parts of settlements where a number of adverse spatial and social processes have been recorded: initial unplanned and illegal building, degradation of built structures, traffic congestion, aging of the population, loss of economic activities, as well as for built-up spaces that were left neglected during the expansion of cities in terms of public amenities and infrastructure and often contain a high proportion of illegal building.

Particularly sensitive are urban areas where there is social segregation or a particular social problem is present (unemployment, criminal behaviour, etc.). The approach to urban remediation should be comprehensive and, in addition to the remediation of infrastructure and form, take particular account of socio-economic and environmental issues, responding to the various issues of today - from area revitalization to affordable or energy-efficient housing, quality of life for older citizens, employment of young people, preventing all forms of segregation as well as the creation and expansion of ghettoized areas, increasing appeal to tourists etc.

Urban remediation processes and procedures can also be applied to large inherited residential estates, exposed to decay and degradation of public spaces, with a need for comprehensive energy renovation and adaptation to the standards of modern life.

Urban remediation of illegal building areas involves the preparation of remediation plans and the establishment of detailed remediation measures for legalized construction, with the aim of achieving a satisfactory standard of infrastructure, social standard and a better contribution to urban landscape.

All processes of drawing up remediation plans must be largely open to the local population, whose participation and co-operation in the implementation of the remediation will be crucial to the success of the process, and particular attention should be paid to the evaluation and promotion of local identities.

Projects/Activities

- Preparation of thematic reports related to the legalization of illegally constructed buildings on a local level /level of the City of Zagreb. The thematic report contains the starting points, analysis and assessment of the state and trends of spatial development, analysis of the implementation of spatial plans and other documents that affect the area, and proposals for the improvement of spatial development with basic recommendations of measures for the next period thematically related to the programme of remediation of illegally constructed buildings. The thematic report must state:
 - Typology, number and spatial distribution of legalized buildings or parts of buildings inside or outside the settlement area, or inside or outside the planned building areas
 - Number and layout of dwellings/inhabitants
 - Spatial distribution of non-residential activities
 - Sets of building requirements if they can be evaluated
 - State of the existing transport, utility and social infrastructure and improvement measures
 - Influence on the character and morphology of settlements and landscapes
 - State of public spaces and measures necessary to improve the situation
 - Analysis of the consequences of the retention of legalized buildings in the space in relation to the purpose planned by spatial plans, infrastructure capacities, restrictions and risks (flood areas, landslides, etc.)
 - Analysis of development opportunities.

Comprehensive approach to urban remediation

- The thematic report determines:
- The need to make amendments to spatial plans
 - The need to develop an UDP for urban rehabilitation of illegal building areas
 - The need to develop programmes and projects for transport, utility and social infrastructure
 - Dynamic and financial plan for implementation of planning, design and building activities.
 - Development of an UDP for urban remediation of illegal building.
- The primary objectives of the development of an UDP for urban remediation of illegal building areas are planning the necessary network of public spaces, public facilities and infrastructure, identifying opportunities and rules for the construction and reconstruction of buildings and preventing adverse environmental impacts, especially with regard to remediation of the devastated landscape.

Engaging and educating the local population at the initial stage is crucial for the success of urban rehabilitation process, but also for preventing future illegal building activities.

Temporary use

The current economic crisis, accompanied by an investment stalemate and significantly reduced activity of the construction sector, points to the need to temporarily activate abandoned and unused real property for which it is not possible to anticipate the moment of bringing it to the intended purpose, or to provide the means for implementing a high-quality urban transformation or rehabilitation. This problem needs to be highlighted in the context of the fact that the current situation is not only a consequence of the recent crisis, because even the period of stable economic growth until 2008 did not contribute to resolving the issues of sites neglected and unused for decades, often burdened by the scope of future interventions, special restrictions on protection and high investments needed to implement projects.

The benefits of temporarily activating abandoned and unused real property have been globally recognized - possible creation of multidisciplinary platforms for culture and cultural industries, improving public perception of locations and local identity, preventing vandalism and further devastation, developing civ-

ic participation and short-term financial benefits for property owners are some of the examples.

The concept of temporary use contributes in a dynamic manner to general adaptability of the urban structure to the circumstances present in real time.

Recommended forms of temporary use are:

- public open spaces: public parks, urban gardens and farms, playgrounds, areas for pets, etc.
- interventions, activities and events related to culture and arts
- sports and recreation: skate parks, adrenaline parks, urban beaches etc.
- encouraging entrepreneurial activities: spaces for start-up businesses, outdoor shopping, entertainment
- public car parks.

In implementing the concept of temporary use, LSGUs and the City of Zagreb take on the roles of active agents or stakeholders who, through their actions, support high-quality civil and private sector initiatives by realistically evaluating the possibilities and timing of temporary use.

UDP for urban remediation of areas of illegal building

The concept of temporary use contributes to the overall adaptability of urban structure in a dynamic manner

4.2. State of preservation of spatial identity

In protected nature areas, plan the use of the area without compromising its basic characteristics

4.2.1. Sustainable development of protected areas of nature and ecological network area

Protected areas of nature

Recognized areas of special natural value should, although protected, become central, focal points of new rural strategies to enable humans and nature to coexist. These strategies would emphasize the need for sustainable development, i.e., combining nature conservation and restoration of traditional rural economy, indigenous communities and the inclusion of ecotourism, to ensure better living conditions, economic growth and visible benefits for the protected areas.

Once the area is declared protected, good planning and management becomes crucial. The division of protected areas into protection zones, based on the objectives of protection and management or spatial zoning, enables a high degree of protection of certain parts of protected areas, while at the same time allowing for the rational and harmless use of others.

Protected areas, especially national parks and nature parks are national single administration and management assets, and stationary, service, utility and other capacities need to be refined, setting lasting standards for both existing and new buildings. Amenities that are contrary to nature protection should be removed or redeveloped, and new ones should generally be located outside parks, thus encouraging the development of settlements outside park boundaries.

Valorisation of natural heritage as a resource for economic development is needed in order to create new adequate facilities for extending the tourist offer and extending the season. Balanced and stable economic growth and tourism development should be achieved in accordance with spatial plans and reception capacity, with the aim of preserving biodiversi-

ty and the natural and cultural heritage. Depending on the protection category, in protected areas the purpose of the area should be planned so that the basic characteristics for which the area has been declared protected are not jeopardized. Visitor infrastructure should be planned in such a way as to allow for maximum experience of the area while reducing the pressure of visitors on the most vulnerable parts and preventing devastation.

The preservation of overall biological, landscape, and geological diversity as a core value and potential for further development of the Republic of Croatia should be achieved through integrated protection in cooperation with other sectors.

Ecological network area

Planning the use and purpose of areas within an ecological network should be based on the ability to use the potential of the ecological network area by recognizing the economic benefits and ecosystem services that it offers, without compromising the conservation objectives and integrity of the ecological network area. In this way, sustainable use and development of an ecological network area will be achieved.

This applies in particular to the planning of areas of major economic activities and infrastructure corridors on land, sea and rivers, as well as the reconstruction of the existing and construction of new river routes (due to the possible hydro-morphological loads of water bodies).

Projects/Activities

- Preparation of fundamental documents for the management of protected areas
- Monitoring the implementation of spatial plans for areas with special features in national and nature parks, as well as drafting amendments to better manage protected areas
- Setting priorities for land acquisition

Spatial zoning enables a high degree of protection of certain parts of protected areas of nature, while allowing for the rational and harmless use of others

in individual protected areas and resolving property-rights relations

- Urgent digitization of boundaries of all protected areas and continued revision of the existing protected areas
- Development and adoption of the remaining spatial plans for nature parks: Papuk, Velebit and Lastovo islands and active monitoring of the implementation of all spatial plans of national and nature parks
- Determination and assessment of the state of biological, landscape, and geological diversity and the establishment of a nature protection information system with a database connected to the national information system
- Improvement of institutional and non-institutional ways of education on biological diversity and public participation in decision-making processes
- Developing enforcement mechanisms by strengthening legislative and institutional capacity through education, development of scientific resources, information and development of funding mechanisms
- Research and evaluation of areas with potential for protection.

4.2.2. Preservation and sustainable use of cultural heritage

Construction is the most common form of identity and characterization of every social and historical circle, be it architectural or engineering. Defining and completing the architectural identity based on spatial values and regional architectural features related to the natural phenomenon, historical heritage, mentality and habits of the local population, transport possibilities, stage of development, production typology, development potentials, role in the entire state structure, is a permanent care and obligation of the state.

A large number of recognized finds and cultural assets indicates the likelihood of new finds in different historical strata. Therefore, plans that envisage spatial interventions should include the possibility of additional research based on expert principles. The planned purpose of any space, whether on land or at sea, should therefore be re-designed, adapted or delayed, depending on the result of

the study. These procedures can affect the value and conditions of managing the property, as well as increase its value.

The area of Croatia is interspersed with architectural monuments from all historical periods, from prehistoric times to the present. Its diversity requires a specific approach to successful development planning, planning that will promote regional peculiarities in their natural and socio-developmental traits, promoting and stimulating public interest in sustainable management of architectural heritage with due care and diligence.

Croatia has more than 5,000 years of tradition in construction and almost 2,500 years of urban culture, partly threatened by weather, climate, social, political and economic changes, war. In order to improve the condition, causes and reasons for the decline need to be identified, so architectural heritage may be integrated into the daily life of society as its active participant. Recognized value is a potential driver of cultural and economic development, where creative use of heritage implies the adoption of spatial criteria, methods, models and scenarios for improvement.

The challenges of preserving, recording, improving and managing require solutions resulting from the systematic cooperation of conservationists, planners, owners and other stakeholders to improve the condition of cultural heritage and to actively protect it.

Architectural heritage has always had its useful value. Modern lifestyle, needs, technical capabilities and technological advancements must be integrally applied to the heritage management system. Single-purpose orientations of historical settlements or parts thereof, motivated by short-term market interests, should be avoided, as this leaves lasting negative effects on the urban, societal and social structure. The optimal solution requires a careful selection of the purpose, content and method of use, appropriate to the size and character of the space.

A balanced relationship between the basic original historical forms of the architectural heritage and contemporary phenomena, especially in the area of historical urban units, for their use for residential purposes, and tourism, cultural,

The area of Croatia has been interspersed with architectural monuments of all historical periods, from prehistoric times to the present

A balanced relationship between the basic original historical forms of the architectural heritage and contemporary phenomena is a prerequisite for their active protection

A high-quality and egalitarian contact between historical and contemporary, global and regional architectural expression creates new opportunities

Vistas are an inseparable part of experiencing an ambience or an individual cultural monument

Construction that starts from the analysis of ambient values of a natural phenomenon and introduces modern achievements into it contributes to the quality of space

educational and economic activity is a prerequisite for their active protection.

Promotion of overall values of Croatian architectural heritage as a first-class humanistic and economic factor, while systematically educating owners, users and managers of architectural heritage about the opportunities, rights and obligations, is needed to support the sustainable use of the heritage.

Folk and marginal construction and dry stone wall, both on the coast and on the islands, are symbols of human labour, disappear as ambiences and individual objects by becoming building materials and raw materials (stone or wood) for other projects. Strong criteria should be established for this type of recycling.

An important component of architectural heritage are vistas. Although intangible, vistas are an integral part of experiencing an ambience or an individual cultural monument. Korčula or Dubrovnik, Veliki Tabor or Zagreb Cathedral (and many other places) are looking for a scenario that affirms them. Therefore, vistas should be recognized, registered, and preserved as an integral part of architectural heritage.

Continuous evaluation of contemporary architectural production of the 20th and 21st centuries needs to be carried out, since this is the way to affirm a contemporary architectural expression as the heritage of the future. Recognizing this fundus as heritage must be geared towards proper use while enhancing social awareness. A high-quality and egalitarian contact of the historical and contemporary, global and regional architectural expression is not a conflict, but a door opened to new possibilities and opportunities.

Projects/Activities

- Developing studies of areas of historical urban or rural units, as well as spaces of pronounced cultural, historical and aesthetic values for their optimum inclusion in development programmes
- Integrating cultural heritage into spatial planning documents, with continuous cooperation of expert bodies in charge of cultural heritage protection
- Linking the Register of Cultural Property to the PPIS
- Developing cultural property management plans

- Evaluating production from the end of the 20th century.

4.2.3. Improving the quality of building and designing of space

Construction culture is a precondition for the quality of built environment as a basis for the good life of each individual. — Apolitika

Every project and transformation of space directly affects the health, safety, climate and overall living conditions. Well-constructed space, as an everyday and lasting environment for every individual, is a prerequisite for allowing optimal social, economic, cultural and environmental needs for a high-quality life, as meaning and general interest. The quality of built environment is not a result of chance, but of systematic work of professionals with the support and encouragement of policy, and the understanding and acceptance of quality goals in all segments of a complex process - from spatial planning, design and implementation to use and maintenance. Procedures and measures to improve the quality of planning and architectural design, sustainable construction and quality of execution contribute to ensuring the quality of space.

Architectural excellence is the basis of quality of every project, be it buildings, engineering structures or landscape architecture. It is based on a successful blend of harmonious integration with the landscape, protection of vistas, innovative ideas, high-quality design, functionality, efficient use of resources, material sustainability and environmental sustainability. It is the result of conscious multidisciplinary planning, design and development of projects, and incorporation of the necessary scientific methods, artistic skills and creative innovations.

Components of architectural excellence, such as location selection, orientation, scale, materials, element composition, durability, sustainable use, quality of execution, energy efficiency, etc., result in a well-formed living space from which health, safety, economic development, and ultimately, sustainability directly derive.

With due regard for planning and more informed planning, construction should not take place in inappropriate locations - in floodplains, drifts and landslides, with

catastrophic consequences for space, people, and property.

Spatial planning is the starting point of every action in space, directing the spatial development of Croatia towards new values and respecting the challenges posed by EU accession. For all spatial development stakeholders (construction professionals, policy makers, legislators etc.), planning and design are required to transpose global trends to local conditions and circumstances, with a pronounced development component and the ability to actively adapt to changed conditions. Impact of world trends (technological processes, technical solutions, functional, constructive and design elements) on spatial development and construction in Croatia can make them their active participant only through creative action of maximum quality. The Croatian architectural heritage imposes an obligation not only to preserve and protect, but also to encourage architectural expression towards the creative juxtaposition of the traditional and the contemporary.

Excellence of any project in space must respect the particularities and principles of individual situations, depending on whether they are: urban and rural areas where the architectural language has defined the entirety of the expression; contemporary urban units, urban and rural areas in which a mix of historical or regional expressions has already been carried out; a natural environment in which no construction work has been carried out or the landscape is protected. The construction itself, which starts from the analysis of the ambient values of a natural phenomenon and introduces the achievements of the modern moment in it contributes to the quality of space.

Planning for the development of Croatia must, therefore, have its foundation and stronghold in the nature of the Croatian being, the space of its habitation and the architectural tradition, with appropriate forms of formal-legal and institutional behaviour, and established and generally accepted criteria of quality. The interventions run by the state, as a permanent promoter of sustainable construction, are at the forefront of this and are the minimum from which all other market-motivated construction starts.

The prerequisite for securing and pre-

serving the quality of the built space is respecting and implementing laws and by-laws in the field of protection of architectural heritage monuments, physical planning and construction, with control of the whole process by continuous, coordinated and responsible action of all stakeholders - planners, designers, protection services, contractors, investors, real estate agents, maintenance services, users.

Projects/Activities

- Regulation of the criteria of construction quality, improvement of the system of evaluating the architectural success of all projects in space conducted by competent professions
- Improvement of the existing building stock
- Development of a model for urban remediation of illegal building sites
- Development of a system for monitoring the quality of building (development of new spatial standards for planning and designing and quality standards for construction and equipping, construction process control, etc.)
- Development of a system for recognizing the quality of spatial plans at implementation level and the transfer of knowledge
- Development of a construction culture platform
- Systematic public education.

4.2.4. Affirmation of landscape features and values

According to the commitments taken by the Republic of Croatia by signing international and European documents related to landscape protection, it is necessary to ensure their application and implementation, while ensuring an integral and multidisciplinary approach in the spatial planning system and cross-sectoral co-operation.

Recognizing and evaluating the character of the landscape within the national territory is a priority task, taking into account the created landscape characterizations made by neighbouring countries, by dividing them into landscape regions, followed by guidelines for the planning and management of each landscape region and directing recommendations for implementation in strategic environmental impact assessment procedures, as well as

Ensuring the implementation and enforcement of international and EU landscape protection documents

Recognizing and evaluating the character of landscapes within a national territory

in other land use improvement projects and programmes.

Guidelines should be drawn up to develop a more detailed characterization at the regional/county and local level and to suggest areas for more detailed research such as high sensitivity landscapes (coastal and marine landscapes) or areas exposed to development pressures.

Particular attention should be paid to urban landscapes that are rapidly changing due to intensive construction and are acquiring a similar appearance, both inland and on the Adriatic coast, as well as to degraded areas such as surface mining for mineral mines, landslides, burned areas, spontaneously formed settlements of illegal buildings which are foreseen for renovation.

The need for an interdisciplinary approach and participation of inhabitants and all those concerned in making decisions about the future development and protection of landscape features is also emphasized.

Projects/Activities

- Creation of a Landscape Atlas of the Republic of Croatia whereby the process of recognizing the landscape must be of an integral character so as to explore and consider all aspects of landscape formation, both anthropogenic and natural.

The Atlas will contain:

- a typology of landscapes throughout the national territory at the regional level
- the quality objectives of each identified landscape region
- methodological and operational guidelines for the implementation of the next sub-regional level.

4.3. Traffic connection

The notion of mobility of people and goods is closely related to the notion of space. Too often, physical planning is identified with its fixed aspects, such as industrialization, urbanization, agriculture land classification, colonization, environmental protection, etc. but of equal importance is the dynamic aspect, the development of communications.

– Ante Marinović-Uzelac, 2001

4.3.1. Transport system development

The main objective is to effectively connect all parts of the national territory and islands with the mainland, respecting all economic, social and environmental needs, while achieving continuity of transport and territorial integrity, as well as a role within the EU, with minimal adverse effect on the environment, space, economy and society.

The developed transport infrastructure is one of the basic prerequisites for sustainable and balanced development of the country: it strengthens its competitiveness, reduces traffic isolation and creates conditions for balanced regional development. It is of particular importance for economic growth but also for social integration as an important element of social equality and justice.

Good integration of all parts of the national territory is necessary in order for the transport system to be sufficient for all economic and social needs, while at the same time minimizing its undesirable environmental impact.

When planning the transport network, account should be taken of the reduction of greenhouse gas emissions and energy efficiency, and transport should be shifted from road to more energy efficient and environmentally friendly modes of transport such as rail, sea and river transport.

In order to reduce road transport, it is necessary to encourage the development

and use of public transport networks, and in the function of regional, urban and sub-urban transport of larger cities, it is necessary to strengthen the use of non-road transport and to shift to rail transport.

All transport hubs (e.g. seaports, river ports and airports, etc.) should also be considered as potential areas for the development of economic and other activities and infrastructural projects.

The planning and construction of transport infrastructure corridors must be carefully undertaken with a high level of environmental protection, prudent use of space and natural resources, and taking into account the landscape value of space. In case an individual infrastructure system occupies a natural floodplain, it is necessary to provide retention/inundation areas at the basin level.

4.3.1.1. Road transport development

Elements of development of road transport of general interest include connecting central settlements and headquarters of local and regional self-government units, centres of interstate economy, speed, safety, comfort, maintenance cost and easement.

It is necessary to complete the construction of motorways and further develop the network of state, county and local roads: semi-motorways and express roads on the main interstate routes within the main corridors. Preparations for the construc-

Effectively connecting all parts of the territory and islands to the mainland

FIGURE 4.5
ROAD TRANSPORT

- Motorways—existing
- - - Motorways—planned
- - - Routes under research
- Express roads—existing
- - - Express roads—planned
- State roads
- - - Ferry connections

Sources:
HC, HAC, MSTI
GIS database EuroGeographics
(EuroGlobalMap EGM 7.0)



tion of alternative express roads and other modern roads within other state traffic corridors should be continued as well. In addition to the network of roads shown in Figure 4.5. ROAD TRANSPORT, exploration and planning of other transport corridors shown in Figure 2.16 STRONGER CITY REGIONS AND SPATIAL-TRAFFIC CORRIDORS is enabled to support the development of a polycentric settlement system, i.e., to improve the accessibility of transport infrastructure.

The reconstruction and modernization of state roads should be planned in accordance with the intensity of transport and the development of particular areas. Critical sections and facilities need to be addressed first and foremost in the network of state/main roads, as well as on access routes and bypasses of major cities. Procedures for modernization and proper equipping of roads do not require

significant expansion of the road corridor, thus preserving and protecting the space and environment.

Access to ports, airports and other relevant nodes needs to be improved depending on local and regional transport service needs.

Road infrastructure that needs special attention is that on islands as well as the one connecting the mainland and islands. Construction and modernization of road links to islands and on islands indirectly contributes to their better interconnection, better connections with the coast and, ultimately, to reducing their isolation from the rest of the territory by inclusion in the country's transport system. It allows for further exploration of the possibilities of connecting islands to the mainland and to other islands by roads, as well as the realization of projects (bridg-

Developing a network of state, county and local roads



FIGURE 4.6
RAIL TRANSPORT

- Main (corridor) railways for international transport
- Other railways for international traffic
- Regional railways
- Local railways
- Planned network of high efficiency/speed railways
- - Possible routes and alternative routes of high efficiency railways
- - Other planned railways
- == Motorways
- Roads

Sources:
HŽ, MSTI
GIS database EuroGeographics
(EuroGlobalMap EGM 7.0)

es, tunnels) planned by current county spatial plans.

Non-motorized road transportation should be promoted within cities, and pedestrian and bicycle traffic areas should be expanded according to plans by limiting access to vehicles and providing adequate parking areas.

Projects/Activities

- Construction and modernization of state roads in accordance with traffic intensity and development needs of particular areas
- Construction of the Pelješac Bridge and express roads across Pelješac with connections to the motorway
- Motorway Osijek - border with Hungary
- Road and motorway border crossings
- Construction and reconstruction in accordance with the priorities of strategic documents

• Construction of express roads:

- from the border with the Republic of Slovenia via Varaždin, Koprivnica and Virovitica towards Osijek (the so-called *Podravina express road*)
- connecting Međimurje, Varaždin and Krapina-Zagorje counties with Zagreb and the motorway network (the so-called *Zagorje express road*).

Direct the development of railway infrastructure to compete with other modes of transport

4.3.1.2. Railway transport development

Elements of general European interest include linking of state centres, centres of the interstate economy and modernization of the existing railways to the highest standards of service.

The economic conditionality of the Republic of Croatia suggests that railway traffic must be considered selectively,

at two levels - one is making connections to European networks and the other is consolidating the remaining network in use.

An important prerequisite for the economic development of the Republic of Croatia is the construction, reconstruction and modernization of the rail transport system, which is planned to be carried out on the most vital routes and corridors, within economic possibilities, by 2020. Such interventions as well as the proper equipping of the railway network and facilities do not require significant expansion of the railway corridor, thus preserving and protecting the space and environment. It is necessary to direct the development of railway infrastructure in order to be competitive with other modes of transport, i.e., to increase the efficiency and reliability of railway traffic.

The development and construction of suburban railway infrastructure would reduce pressure on large cities and increase the development potential of the entire agglomeration area.

Further improvement of accessibility in freight traffic within the Republic of Croatia is necessary because of its territorial organization, i.e., the development of a system of sustainable freight transportation.

Projects/Activities

- Identification of the corridor for railway connection between Rijeka and Zagreb and its realization
- Establishment of a plan for priority modernization of the railway network, which would gradually resolve the use of other railway routes of particular interest to the Republic of Croatia
- Using the existing network for public urban and suburban transport
- Resolving spatial conflicts caused by railway routes within urban agglomerations
- Identification of high efficiency/high speed railway corridors with the aim of effectively connecting the north of Croatia with Zagreb and the remaining Croatian railway network.

4.3.1.3. River transport development

First of all, it is necessary to include and integrate river transport and the port network into the European waterway

and port networks while respecting the elements that determine the standards and spatial distribution at the European or national level.

River transport requires a different approach to its development than in times before Croatia gained independence. Since then, conditions relating to border areas have changed significantly, requiring the following issues of importance for river transport to be addressed:

- Regulation of international borders of the Republic of Croatia and coordination of activities related to river transport with the neighbouring countries
- Divert individual types of cargo to river traffic in the Danube, Posavlje and Podravlje regions
- Enable by means of legal regulations for small economic systems to be involved in the development and use of this mode of transport (ferrying, river fishing, gravel exploitation)
- Anticipate the beginning of the possible commissioning of the Danube-Sava Canal and the new port (about 500 ha of land is intended for economic and transport activities) as a driver of development of river traffic (two countries directly concerned, as well as Central European countries showing significant interest)
- Enable tourist navigation / river *yachting* and sport, i.e., river navigation (nautical) tourism should be considered as a supplement to the overall tourist offer, with the possibility of exploring potential locations for small ports in the function of tourism.

Projects/Activities

- Completion of the reconstruction of inland waterways from the effects of war, renovation and modernization of capacities
- Completion of the first phase of the New Port of Vukovar (includes 12 km of the Danube-Sava Canal)
- Research on the needs and possibilities for the development of river navigation, in particular on Sava, Kupa and Drava Rivers.

4.3.1.4 Maritime transport development

The construction of port infrastructure as a development element will continue

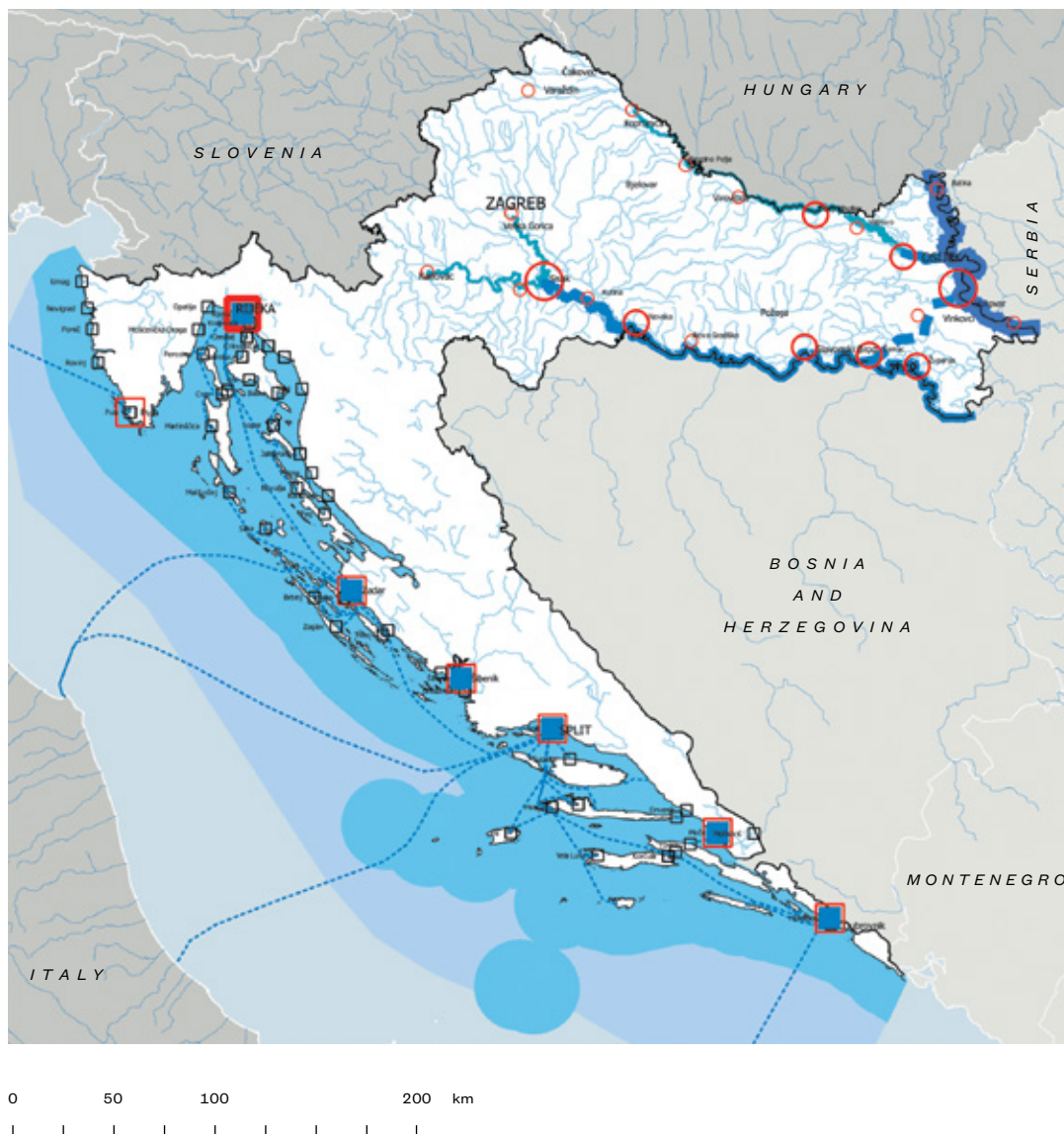


FIGURE 4.7
**MARITIME AND RIVER
TRANSPORT**

- Maritime transport
- Basic TEN-T network port
 - Comprehensive TEN-T network port
- Seaports open to public transport
- Ports of particular (international) economic interest
 - Ports of county significance
 - ⋯ Ferry connections
- River transport
- class VI waterway
 - class IV waterway
 - class III waterway
 - class II waterway
 - Multipurpose navigation channel
- River ports
- Large ports
 - Mid-sized ports
 - Small ports

Source: MSTI

to be based on market requirements and established criteria, on qualitative and technological modernization and on transport links with major European road and rail corridors in order to achieve better integration and create preconditions for the development of intermodal traffic. Croatian ports need to be developed as modern logistics hubs, especially in the context of expanding the economic market upon joining the EU.

Built state and county ports need to be modernized and equipped and transport routes need to be diversified. It is important to encourage the development of port infrastructure in the function of the development of coastal line maritime transport as well as passenger and Ro-Ro transport, primarily in county ports, as well as the construction and modernization of land traffic infrastructure in port areas and the connection of ports with the hinterland.

Further development of ports is directed towards their specialization. In doing so, it should be possible for economic operators who have been granted a concession for the economic use of the port to develop it in a different direction appropriate to the space and the environment.

The economic development programme of the Republic of Croatia refers to maritime transport as an element of development, and the specific circumstances of the location of almost all ports in urban areas require that all plans for the development of this transport activity be based on development decisions that will primarily evaluate the possibility of spatial conditions for their development /expansion. Special purpose ports of significance to the Republic of Croatia may be reconstructed and constructed within the framework of approved concessions. A spatial plan of the appropriate level can

The primary objective of maritime transport is to ensure that islands are connected to the mainland and to other islands

be used to plan the expansion of the concession area for the purpose of technical and technological improvement and the establishment of a functional unit.

The possibility of conversion of unused *brownfield* locations for the revitalization of the existing and construction of new port facilities should be primarily considered, and the planning of port modernization and their adaptation to new needs must be a part of integral coastal zone management.

In order to realize the moderate scenario of nautical tourism development, it is necessary to reduce the planned capacity of accommodating vessels foreseen by county spatial plans and to perform strategic environmental impact assessments. The construction of new and relocation of the existing dry berths (e.g. to storage and service centres or economic zones) outside restricted areas should be encouraged, and the construction of new nautical tourism ports should be planned wherever possible in areas with developed utility infrastructure, especially with wastewater treatment systems in place.

For the purpose of developing economic activities, it is necessary to carry out a review of the adequacy of port infrastructure for the need of fisheries in accordance with defined sectoral needs (e.g. for fisheries, areas in ports for fishing fleets and unloading of caught fish, mariculture facilities, etc.). In connection therewith, the frequency of planning of sporting ports should be re-examined, since practice has shown that the needs of the local population can be better met through municipal and fishing berths of ports open to public transport.

However, when referring to shipping industry as a tradition, it is stagnating on our islands and, if we do not take significant measures, the depopulation and desertification of the island area will be even greater. The main objective of maritime transport is to ensure that islands are connected to the mainland and to each other for the purpose of improving the living conditions on the islands, thus enabling the retention of the population as a minimum of stability of the state system.

In order to improve the regional connectivity of islands, it is necessary to plan an increase in the number of short lines, especially the development of island cabotage.⁴

Projects/Activities

- Linking maritime transport with other modes of transport in accordance with the transport strategy of the Republic of Croatia
- Analysis of the possibility of extending port areas to all facilities intended for mooring vessels and extending the waters of port areas for anchoring purposes
- Establishment of a ship waste management system under a special law
- Analysis of possibilities for increasing the capacity and construction of utility areas of the existing public ports or construction of new ports open for public transport with predominantly municipal berths
- Raising the safety and security of ports and the safety of navigation
- Regulation of status of the existing traditional moorings inside settlements and outside building areas, those in detached building areas outside settlements with a hospitality, tourism and sporting purpose and berths and moorings in protected areas.

4.3.1.5. Air transport development

With relatively small additions to the existing airport network, it is possible to achieve an optimum for the national territory. This would improve regional connectivity and accessibility to urban agglomerations.

Air transport needs to be developed especially for the purpose of connecting the most isolated parts of the territory, connecting islands to other islands and with other parts of the country, thus improving living and economic conditions.

When determining the locations of airports, in addition to considering the requirements of air navigation safety, environmental and nature protection, and remoteness from settlements, the actual needs of the areas should also be taken into account.




The system of spatial plans requires the provision of detailed spatial criteria for the location of a whole range of needed small airports. Except for those shown in Figure 4.8, further exploration of potential locations through spatial plans is possible. Airport location should take

⁴ Maritime Code (OG 181/04, 76/07, 146/08, 61/11, 56/13, 26/15), Article 9



FIGURE 4.8
AIR TRANSPORT

-  Domestic and international transport airports
-  Potential airports

-  Airports on the water
-  Motorways
-  State Roads

Source: MSTI

Key points of an intermodal system: Rijeka and Vukovar

into account the existing air traffic infrastructure, spatial capabilities and the constraints arising from the specific characteristics of each particular area. Possibilities for connecting to other forms of traffic should be considered. Airports should be designed to minimize greenhouse gas emissions from energy installations as much as possible.

4.3.1.6. Development of intermodal systems

Addressing the problem of mobility at the level of cities, municipalities and counties by introducing the principle of intermodality creates the foundations for the interconnection of regions and provides cross-border connectivity and access to the main European transport infrastructure (TEN-T).

The development of an intermodal system does not generally require new transport corridors but is based on the existing or planned spatial planning documents. Particular attention should be paid to the planning of intermodal platforms that enable the transition from one form of transport to another.

In ports of national importance and large cities, it will be necessary to plan platforms in freight traffic and therefore to consider the necessary spatial capabilities.

The key points of the future intermodal system are Rijeka, as a point of connection of sea routes with European road and rail corridors, and Vukovar, as a point of connection of domestic river transport with the European waterway network. In this context, it is possible to explore and plan the potentials of other ports, especially Split, Ploče and Zadar.

The introduction of intermodal forms of public transport at the urban area/urban agglomeration level, in a single tariff system, will make public transport more accessible and reduce car dependence. In the planning of such intermodal systems, it is necessary to promote the linking of automobile transport - public transport and cycling - public transport (Park and Ride and Bike and Ride forms of intermodal transport).

4.3.2. Joining the European transport network

The existence of transport infrastructure is a prerequisite for taking the functional advantage of the transport and geographical position, as well as of transport connectivity and coordination with the neighbouring countries. Therefore, the priority is to develop the transport network within the central multimodal Trans-European Transport Network (TEN-T).

It is necessary to direct the development of transport infrastructure towards increasing mutual integration and interconnection of the entire internal transport system in order to achieve better accessibility of European transport corridors and better integration with the transport network of the neighbouring countries, while respecting environmental criteria.

Attention should be paid to considering the spatial requirements of border crossings towards non-EU neighbouring countries after Croatia's accession to the Schengen area. Likewise, by abolishing the border with EU countries, border crossing infrastructure will become unused.

4.3.3. Development of infrastructure for broadband Internet access

The Republic of Croatia has opted for a balanced and clear policy of development of broadband infrastructure and broadband services. First of all, it refers to the continuous monitoring and implementation of the policy of development of information society and its technological infrastructure in the EU and other activities promoting the development and promotion of broadband access.

The development of broadband services is essential for economic development and crucial for facilitating the creation of a knowledge-based society. The construction and use of a broadband communication network should be based on the principle of neutrality. The main values of a developed network include the establishment of infrastructure for the provision of public services such as e-government, e-health, e-education, e-business, e-banking, e-entertainment and others.

Development of an intermodal system generally does not require new transport corridors

Developing a transport network within TEN-T

Equal coverage of the territory with broadband access contributes to a balanced regional development by enabling equal access to services and information in all parts of the country, which is especially important in peripheral urban areas, rural areas, areas of special state concern, islands and economic zones.

Projects/Activities

- Creation of appropriate spatial planning prerequisites for the development of electronic communication infrastructure and related equipment.

4.4. Energy system development

4.4.1. Increasing and improving security of energy supply

In the coming period, energy development will depend on a number of factors - from technological development, growing needs and consumption and an increase of energy efficiency up to resource constraints, climate change responses and demographic trends. Security of supply also has significant impact and implies further development of transmission and transport of all forms of energy, which also enables greater integration of Croatia into the EU as well as into the international energy market. A necessary prerequisite for increasing security of supply and energy efficiency is the development and application of information and communication technologies, especially in establishing *smart* networks.

Considering that energy is the largest contributor to total greenhouse gas emissions in the Republic of Croatia, one of the strategic topics of energy policy is the establishment of a model for reducing this share, in both production and consumption. General energy measures in this regard relate primarily to increasing the share of renewable energy in production and total consumption and increasing energy efficiency, and in the transitional period to improving the existing technologies in production, use and consumption of conventional sources. The implementation of these measures depends on a number of factors, among which economic and financial circumstances, implementation of legal framework and level of awareness and contribution of all stakeholders and individuals play an important role.

Croatia strives for an energy system that, regardless of uncertain circumstances, will ensure the stability of supply, guided by the principle of diversification of sources and economic and environmental sustainability. In order to increase security and competitiveness of the supply,

Republic of Croatia opted for an elastic energy system with diversified sources and directions of energy supply, as well as for the improvement of energy efficiency and an increase of the degree of energy self-sufficiency and independence.

Long-term security of supply will be achieved through the construction of new and more efficient use of existing buildings, with continuous investment in the development of new technologies. In doing so, the principle of maximizing the use of locations of all the existing facilities should be adhered to as much as possible, through revitalization, replacement and upgrading, and the use of new technologies.

By upgrading the existing and building new gas and oil routes, storage capacities, LNG terminals, by offshore and onshore exploitation of hydrocarbon as well as by increasing all hydro and thermal potentials, plans for a safer energy future of the country may be made as well as for its positioning as a key energy hub.

Planning and/or implementation of infrastructure projects of national and regional/local importance should be based on strategic documents and development programmes and plans adopted in accordance therewith, as well as on applicable regulations, with a prudent and rational use of spatial resources and in support of spatial development.

This will be achieved through wider use of own resources and potentials, efficient use of energy, use of various forms of energy, creation of mandatory reserves, use of diversified supply routes, better use and building of storage capacities and use of renewable energy sources.

In order to improve the use of our own resources, it is necessary to provide for hydrocarbon exploration in the areas of potential oil and gas deposits throughout the territory of the Republic of Croatia

(including the Adriatic Sea with the continental shelf).

In identifying areas for exploration, it is necessary to consider the total spatial constraints arising from natural, environmental and other conditions, and in particular potential impacts on:

- areas and other values protected by special laws:
- areas of special water protection and protection against harmful effects of water⁵
- ecological network (Natura 2000), Ramsar and other internationally protected nature areas
- national parks, nature parks, strict reserves and other protected areas of nature⁶
- world heritage sites and other protected cultural property⁷
- protected and special purpose forests⁸
- landscape features with an emphasis on vistas important for the recognition of Croatian tourist destinations
- important economic activities:
- nautical tourism, which is an important and prosperous economic branch, especially in the wider waters of the islands of Žirje, Šolta, Brač, Hvar, Korčula, Vis and Lastovo
- development of agriculture, especially in areas that lack valuable agricultural land (e.g. hill-mountain areas in the coastal area)
- areas particularly relevant to fisheries
- maritime transport and waterways.

From a spatial point of view, site selection should be in line with the basic concept of the use of spatial resources and priorities and strategic directions in accordance with this Strategy. Particularly important is also the analysis of possible cumulative load in the case of simultaneous implementation of activities in a large number of explored areas and the determination of the optimal number of explored areas where exploration is carried out.

From the point of view of identifying development priorities, decision-making on hydrocarbon exploration areas, especially in the Adriatic Sea, should be preceded by the analysis of social and economic benefits and damages which would take into account all aspects of mutual impacts - from environmental, natural and landscape to economic (especially the economic effects on tourism in tourist

areas) as well as socio-cultural. In this way, unexpected and unintended consequences that may exceed the benefits will be avoided and the conflicts of space use and endangering vulnerable areas of the sea will be reduced to a minimum.

For potential hydrocarbon exploitation activities, environmental impact assessment will be carried out for each intervention, within which an environmental impact study will be prepared to assess the cumulative impact with respect to the activities carried out during the exploration phase as well as to the potential number of exploration wells.

Harmonious energy development involves directing and encouraging own technological development in the field of energy and domestic production of equipment, especially for those energy sources that reduce import dependency. The efficient elimination of supply disruptions in the energy market will be facilitated by the formation of mandatory reserves (in accordance with special regulations) and the further building of storage capacities.

Given the increasing dependence on imported oil and gas, the Republic of Croatia will use its geographical position to participate in international transit and import projects, thus securing new supply routes for crude oil and natural gas.

Owing to the available pipeline capacities and development of new projects, the Republic of Croatia will strengthen the strategic route of oil imports from the direction of Omišalj to EU Member States in accordance with the EU's and the Republic of Croatia's energy policy objectives. With the purpose of better utilization of geostrategic position, space, and the capacity of the oil pipeline and storage system as well as of increasing the security of supply, improving operations and better interoperability of transport and storage activities in conditions of the changing oil market, further upgrades and reconstructions of the oil and gas pipeline and storage system are envisaged.

It is necessary to equalize the conditions of energy supply in Croatia's entire territory. This applies in particular to the availability of networked forms of energy, i.e., electricity and natural gas, and liquefied gas (natural or oil) in places where it is economically unjustified to network the gas system, such as islands and dislocated rural areas.

Energy efficiency - an additional source of energy and a fundamental principle

⁵ In accordance with the law and regulations governing water and maritime goods issues; the Water Act (OG 153/09, 63/11, 130/11, 56/13, 14/14) is in force.

⁶ In accordance with the law and regulations governing the system of protection and complete conservation of nature and its parts; the Nature Protection Act (OG 80/13) is in force.

⁷ In accordance with the law and regulations governing the system of protection of cultural property; the Act on the Protection and Preservation of cultural property (OG 69/99, 151/03, 157/03, 100/04, 87/09, 88/10, 61/11, 25/12, 136/12, 157/13, 152/14, 98/15) is in force;

⁸ In accordance with the law and regulations governing the system of protection of forests and forest land; the Forest Act (OG 140/05, 82/06, 129/08, 80/10, 124/10, 25/12, 68/12, 148/13, 94/14) is in force;

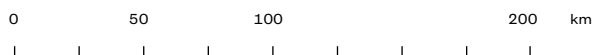
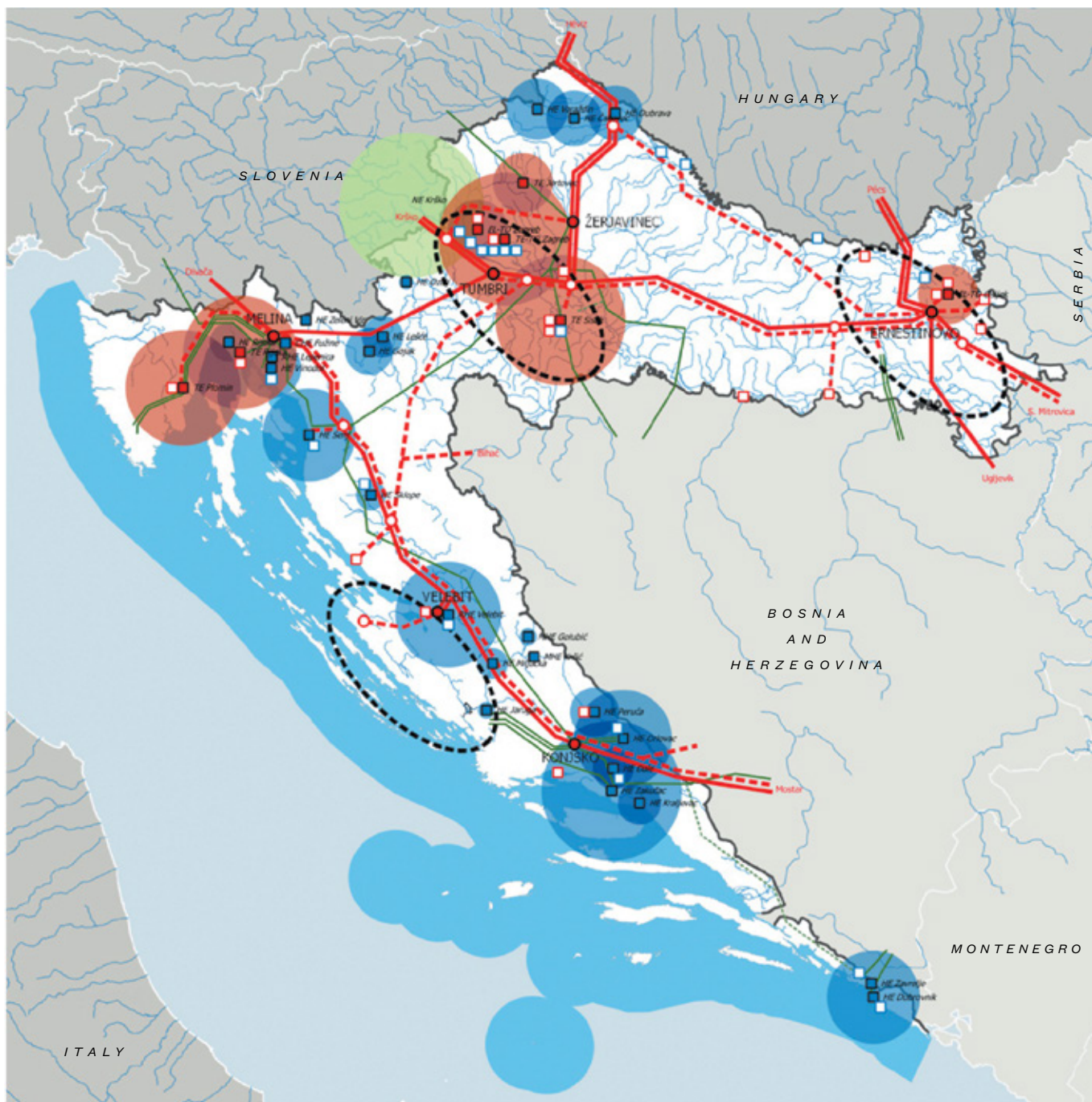


FIGURE 4.9
**BASIC ELEMENTS
OF THE ELECTRICAL
ENERGY SYSTEM**

Power plants - existing

- Thermal Power Plants - existing
- Hydropower Plants - existing

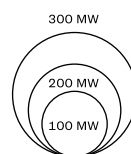
Potential locations for new power plants

- Potential locations for new thermal power plants
- Potential locations for new hydropower plants
- Areas for priority accommodation of new energy facilities
- Elektroprijenosne građevine

Electricity transmission facilities

- Plant 400/220/110 kV existing
- Plant 400/220/110 kV planned
- 400 kV transmission line existing
- - 400 kV transmission line planned

- 220 kV transmission line planned existing
- 220 kV transmission line planned



Installed maximum power of the existing power plants

Sources:
HEP, HOPS

Increase of energy efficiency will be encouraged in all segments of the energy sector, especially in direct consumption. Energy efficiency is seen as an additional source of energy and as a fundamental enduring principle according to which the energy system will be developed.

4.4.2. Development of production, transmission, transport, storage, distribution and supply of energy

Production systems until 2030 must adapt to the planned economic development. These circumstances condition:

- reconstruction/upgrading/ replacement of the existing plants with the best available technology (capacity increase with minimum spatial and environmental requirements)
- increasing the product portfolio by optimizing systems of the existing production facilities (working in peak mode, providing ancillary services)
- construction of new power plants with a focus on renewable energy (with an increased share of private investors and/or public-private partnerships) taking into account the volatility associated with the use of renewable energy sources, it is necessary that the system has conventional energy sources characterized by greater reliability and predictability and stability of technical parameters regarding the requirements of the electricity grid, which will provide the reserve power needed for stable, safe and reliable operation of the electric power system and to develop and apply other measures of increasing regulatory capacity through the application of systems of storage of energy produced from renewable sources
- opening new hydrocarbon exploration fields onshore and offshore
- increasing the use of district heating (DHS)
- construction of new TPPs and biomass cogeneration power plants (BE-TO).

PRODUCTION SYSTEMS

When planning the locations of energy production systems at all levels, it is necessary to evaluate the needs and priorities in relation to possible negative impacts and to find through cross-sectoral cooperation, in particular spatial planning, energy, water management and environmental and nature protection, spatially

and environmentally acceptable locations for their realization. Consideration should also be given to the constraints associated with the ecological network and planning of long-distance corridors in sensitive areas should be avoided to the greatest extent possible.

In determining the locations of energy generation facilities that may affect air quality, it is necessary to ensure a sufficient distance from populated areas.

Linking or connecting of planned power plants and other special users to the existing or planned power grid comprises of all the necessary technical structures.

Thermal Power Plants (TPP)

The Energy Development Strategy of the Republic of Croatia indicates the need to build thermal power plants with a total capacity of at least 2,400 MW by 2020. It is necessary to optimize the locations of thermal power plants with regard to energy, production and uses.

Natural gas-fired TPPs

The need to build gas-fired thermal power plants of a total power of at least 1,200 MW by 2020 has been determined. Lower environmental impact, better public acceptance and simplified location and licensing procedures, openness of the electricity market in the region and availability of the most favourable technology are the basis for the preferred construction of gas-fired thermal power plants. Construction of gas-fired thermal power plants along the planned main gas pipelines is desirable.

TPPs using imported coal

The construction of coal-fired thermal power plants of total power of 1,200 MW is planned by 2020 together with initiating the exploration of locations for the construction of new coal-fired thermal power plants for the purpose of timely preparation of locations for the construction of the necessary power as well as to anticipate the required line infrastructure.

Cogeneration

Construction of units of total capacity of at least 300 MW is planned by 2020. Most of this power relates to industrial cogeneration units and less to cogeneration units in district heating systems.

Increasing the share of combined heat and electricity production can be achieved by replacing obsolete equipment with more

Increase in the share of combined heat and electricity production (cogeneration)

Adaptation of production systems to the planned economic development by 2030.

When planning the locations of energy production systems, needs and priorities need to be evaluated in relation to possible negative impacts

efficient technologies at existing locations or by constructing and operating new plants. The development of high-efficiency cogeneration, i.e., technologies that provide primary energy savings of 10% as compared to separate generation of heat and electricity (with the exception of small and micro plants with no defined minimum savings), is encouraged.

Nuclear energy programme

By 2020, the Republic of Croatia will initiate the activities of the first phase (preparation and exploration), estimated at 3 to 4 years, of the Croatian nuclear energy programme.

Capacities for production of oil and oil derivatives

In order to increase the security of supply of oil and oil derivatives and to take advantage of domestic and gravitational foreign markets, the existing locations of facilities in the area, business experience, etc., an increase in the capacity and expansion of locations for oil (and gas) production and modernization of refinery capacities are anticipated.

Projects/Activities

- Define locations for new energy facilities of national importance in the SPSPD, including line and point infrastructure (transmission lines, gas pipelines, oil pipelines, storage capacities, transformer stations, compressor stations, etc.), in accordance with the Regulation on the Definition of Construction Works, Other Projects and Surfaces of State and Regional Significance and the Energy Development Strategy of the Republic of Croatia
- Programmes of protection, management and use of rivers and the shore areas - multifunctional construction works and projects
- In spatial plans of regional and local importance, define locations for new energy construction works, including line and point infrastructure (transmission lines, gas pipelines, oil pipelines, storage capacities, substations, compressor stations, etc.).
- Linking the energy sector database to the PPIS.

TRANSMISSION AND TRANSPORT SYSTEMS

Transmission lines

High-voltage facilities and 110-, 220- and

400-kV voltage facilities are significant energy infrastructure facilities.

Among the most important factors having impact on the planned construction of the transmission network are the dynamics of construction of new power plants, possible significant deviations in the increase of load on the power system, dynamics of inclusion of renewable energy sources in the system, significant changes in the development of the neighbouring countries' systems and development of the electricity market at the national, regional and European levels.

The solution of the existing problems of regulation in the system is possible by activating all the existing hydropower plants that are technically capable of ensuring active regulation, and by strategic commitment to the construction of gas-fired power plants and reversible hydropower plants when planning new generation plants.

The necessary construction of the transmission network is primarily conditioned by the achievement of satisfactory security of electricity supply to customers, and by connection to the network of the existing and new production facilities. Additional transmission network construction is required due to the integration of renewable energy sources.

The construction of the transmission network as part of a wider European and regional network is determined by the cooperation of transmission system operators in the EU. Good connectivity with the neighbouring systems is a significant potential for export, import and transit of electricity, and it positions the Republic of Croatia as an important link between the electrical energy systems of Central and Southeastern Europe.

It is necessary to keep the corridors from existing spatial plans as much as possible, i.e., to optimize the routes so that the same corridor is used spatially for a larger number of transmission lines, and new ones should be planned in cases where the existing ones cannot be increased to a larger capacity.

The revitalization of facilities and equipment continues in parallel with the construction of replacement transmission lines and transformer stations.

Revitalization of transmission lines to higher voltage level lines can be achieved by increasing the transmission power (2 x 110 kV, 2 x 220 kV, 2 x 400 kV, use of new technologies) by adapting the existing lines, in accordance with the technical regulations governing the manner and conditions of construction of power plants.

Strengthening of links between individual Croatian regions and the network within them will increase the security of electricity supply.

The increase in electricity consumption will be monitored and located and, consequently, the supply for large consumption areas and other consumers will be ensured, with due regard for the environment and populated areas.

It is necessary to enable the connection of new power plants and to spatially provide corridors for connection.

Parts of the 220 kV network to which the power plants are connected will be upgraded and/or transferred to a higher voltage level (x400 kV) during their revitalization and/or increase of the rated power when technically and economically justified, and PCI projects in line with the EU energy policy will also be realized.

Projects/Activities

- A cluster of projects of the Republic of Croatia and Bosnia and Herzegovina, which includes the construction of an interconnected 400 kV transmission line between Lika and Banja Luka and a new 400 kV transmission line between Brinje and Konjsko.

Oil pipelines and product pipelines

Given the growing dependence of the Republic of Croatia and the countries of Southeast Europe on imported oil, the Republic of Croatia will take advantage of its geographical location, space availability and capacity for its companies to participate in projects of common interest to the EU and other international projects of transport, transit and import of oil and petroleum products.

Extensions and reconstructions at terminals and within the existing corridors - oil pipelines are envisaged, which will enable:

- implementation of projects of common interest to EU JANA F - Adria whose purpose is to increase se-

curity of crude oil supply from Omišalj to EU Member States

- increased security of supply of oil and derivatives in the Republic of Croatia, the EU and the countries of Southeast Europe, improving operations and interoperability of transport and storage activities, improving the use of existing capacities and corridors, through reversibility and upgrading of the oil pipeline system, by establishing the Adriatic oil & petroleum products storage centre, by the construction of product pipelines, etc.

Gas pipelines

- The main gas pipeline Dravaszerdahely - Donji Miholjac DN 800/75 and the main gas pipeline Slobodnica - Donji Miholjac DN 800/75 which was built and connects the Republic of Croatia with the important Varosfeld gas hub. The capacity of the interstate connecting gas pipeline of 6.5 billion m³ is primarily a new supply route for Croatia. In the future, it will be possible to change the direction of gas transport by building compressor stations, according to market requirements.
- Construction of associated transit 100-bar and 75-bar pipelines and their inclusion in Croatia's transport system with a final annual capacity of 6 billion m³/ year with the potential to expand to 15 billion m³/ year for transportation of natural gas from the direction of the planned reception LNG terminal towards the markets of the surrounding countries.
- Construction of the Ionian-Adriatic Pipeline (IAP), i.e., construction of a 75-bar gas pipeline Split - Zagvozd - Ploče - Dubrovnik - Prevlaka. The pipeline route is laid straight from the Albanian port of Fier to Split and connects the Croatian gas transportation system with the TAP project (*Trans Adriatic Pipeline*) and thus enables the realization of a new supply and transit route for natural gas from the Caspian region, etc., with the possibility of realizing gas transport from the north (from the reception LNG terminal) to the south.
- Construction and completion of 50-, 75- and 100-bar pressure gas pipelines in all areas of the Republic of Croatia where this is economically and technologically justified, including the reconstruction of certain parts of the transport system in order to raise

FIGURE 4.10
**TRANSPORT OF
HYDROCARBONS**

**Gas transportation
system**

- ▲ Reception terminal for liquefied natural gas (LNG) - planned
- ▼ LNG distribution centres - potential locations
- Underground gas storage - existing
- Underground gas storage - potential locations
- Existing international main gas pipelines
- - - Planned international main gas pipelines

Oil transportation system

- Oil refinery - existing
- Oil pipeline terminals
- Oil pipelines - existing
- - - Oil pipelines - planned
- - - Product pipelines - planned

Sources:
ME, INA d.d., JANAF d.d., LNG
Hrvatska d.o.o., Plinacro d.o.o.



35%

**share of
electricity
production
from renewable
sources
by 2020**

security of supply and the connection with transport systems of Slovenia, Bosnia and Herzegovina, Serbia, Montenegro, Italy and Hungary, or through them with other systems.

- Construction of above-ground technological facilities (compressor stations, metering and regulating stations, metering and reduction stations and gas nodes) in all areas of the Republic of Croatia where this is economically and technologically justified, to ensure safe and reliable gas transportation for users of transport capacity.

STORAGE CAPACITIES

Given the increase in geopolitical tensions and potential disruptions and crises in the energy markets (global and regional instability), the Republic of Croatia and energy companies will seek to increase the security of supply of the domestic market

with oil, petroleum products and natural gas through the formation of operational and mandatory oil and petroleum product reserves and the construction of underground natural gas storage facilities and storage tanks for oil and derivatives in the territory of the Republic of Croatia.

Petroleum and petroleum products

For the purpose of forming mandatory reserves, additional storage capacities will be built, which will be deployed in the territory of the Republic of Croatia, depending on regional consumption. The aim is to modernize the existing capacities and, where possible, to increase storage capacities at the existing locations.

The projection from the Energy Development Strategy,⁹ according to which, in the Republic of Croatia, the production of liquefied petroleum gas (LPG) would amount to about 770,000 tonnes by 2014 was not

⁹ OG 130/09

realized. According to the annual energy audit *Energy in Croatia 2015*, LPG production in 2015 amounted to 209,000 t. The use of LPG remains an option for the purpose of balancing the conditions of energy supply in the entire territory of the Republic of Croatia, especially on islands and in other areas outside the scope of supply of other energy-generating products, either as a precursor to other energy sources or as a long-term solution in places where these energy-generating products will not be available. In case of economic unjustifiability of own production, the construction of a reception LPG terminal is foreseen.

Natural gas

Given the expected increase in natural gas consumption and the large seasonal imbalance in hourly consumption of natural gas in the general consumption sector and, to a lesser extent, the industry, it is necessary to build additional capacities of underground natural gas storage facilities. The construction of new storage facilities is planned in old drill-wells, which technically and technologically allow for storage.

Based on projections of economic development and potential regional users, the line ministry is competent to provide the withdrawal capacity to be determined when designing new storage capacities based on projected consumption characteristics, the system user structure, gas storage and their diagrams of consumption.

In the first phase of development, the existing disused gas wells will be the backbone of increasing natural gas storage capacity.

Liquefied natural gas (LNG) system

- Construction of a reception terminal for LNG in Omišalj, island of Krk, with an estimated capacity of 6 billion m³/year with the potential to expand to 15 billion m³/year with storage tanks 2 x 180,000 m³ and appropriate equipment for gasification and delivery into the gas transmission system. The construction of a terminal on the island of Krk will ensure the stability of natural gas supply for domestic, EU and regional needs.
- Construction of the terminal will diversify the sources of natural gas supply and the presence of the largest natural gas suppliers will also signify Croatia's inclusion in the

European single energy market.

- The Republic of Croatia will encourage the use of liquefied natural gas in areas outside the gas pipeline, in order to balance the conditions of energy supply in its entire territory.
- At the local level, possible locations for the distribution of liquefied gas should be explored, especially on islands and in sparsely populated areas, and areas should be provided for distribution purposes.
- In accordance with Directive 2014/94/EU of the European Parliament and of the Council of 22nd October 2014 on the establishment of alternative fuel infrastructure, locations for the supply of natural gas in transit should be foreseen. Potential locations for distribution centres are all major cities, such as ports on the Adriatic with greater maritime traffic, river ports and key locations of the TEN-T corridor, with the necessary spatial conditions.

4.4.3. Increasing the share of renewable energy sources

At the EU level, a target of 20% of renewable energy in total direct energy consumption by 2020 has been set.

The Republic of Croatia has set a target of maintaining the share of electricity from renewable energy sources in the total electricity consumption at 35% by 2020.

Therefore, the development of renewable sources and technologies with low CO₂ emissions is required, which would multiply their share in the structure of energy sources. Many of these sources make it difficult to manage the system, and their production is variable and difficult to anticipate.

Renewable energy sources are considered to be aerothermal, biomass, marine, wind energy, hydro potential, geothermal and hydrothermal energy, gas from landfills, gas from wastewater and biogas treatment plants and solar energy.

As the increase in electricity production from large hydropower plants is expected to be much lower than the increase in total electricity consumption, the set target of maintaining a 35% share of production from renewable energy sources will require extremely high rates of increase in

Planning power plants using renewable energy sources requires extremely efficient space management as a basic resource

Implementation measures for increasing the share of renewable energy sources depend on improving cross-sectoral cooperation

electricity production by 2020 from other renewable energy sources (wind power plants, biomass power plants, small hydropower plants, solar power plants, municipal waste power plants, geothermal power plants).

Planning of plants with renewable energy sources requires extremely efficient management of space as a basic resource, especially planning of solar power plants and wind farms which take up a lot of space, while being located as close as possible to the area they supply.

When selecting locations for power plants, their potential impact on biodiversity should be considered, and endangered and protected habitats and areas of exceptional flora and fauna value should be avoided.

When developing guidelines for the selection of locations for solar power plants and wind farms, consideration should also be given to the characteristics of the ecological network area as one of the suitability factors for locations.

Taking into account the technical and financial elements and the ability to connect to the power grid, the 2020 targets have been revised by the National Renewable Energy Action Plan by 2020.

Hydropower plants

The newly installed capacity in hydropower plants is expected to be around 300 MW by 2020. This amount does not include small hydropower plants.

Small hydropower plants

The Republic of Croatia has set the goal to build at least 100 MW of small hydropower plants by 2020. These are specific investments that face constraints arising from impacts on biodiversity, environment, cultural heritage and landscape.

The Republic of Croatia will encourage exploration of the remaining watercourses to determine the exact locations and potentials for construction. When planning hydropower plants locations where weirs already exist should be used, the reconstruction/conversion of abandoned mills should be encouraged, and the continuity of water flow (fish trails, etc.) should be ensured to the maximum extent possible.

Wind energy

In all scenarios for the construction of power plants according to the Energy De-

velopment Strategy of the Republic of Croatia, the planned installed capacity of wind farms is 1,200 MW by 2020, which is about 10% of the total electricity consumption.

According to estimates,¹⁰ it is not possible to integrate wind farms of total power of more than 400 MW into the current system. The construction of new wind farms with a higher total installed capacity depends on the possibilities of improving the available secondary control within the system.

Considering that wind farms are a cost-effective investment, it is expected that in the following period it will become a very important spatial element, which requires careful selection of location, both in terms of natural conditions and environmental impact.

Solar Energy

The Republic of Croatia is setting a target of installing 0.225 m² solar collectors per capita until 2020 for the preparation of hot water. Installation of solar collectors on as many new and existing buildings as possible will be encouraged.

Solar energy power plants cannot yet compete with other renewable energy sources. Considering the likely development of technology and thus an increase in competitiveness of solar power plants, it is necessary to explore suitable locations for their accommodation in the following period. 52 MW in photovoltaic systems are planned to be installed by 2020.

Geothermal energy

The Republic of Croatia will encourage the production of electricity in the multi-purpose use of geothermal energy and the development of economic zones with the use of waste heat from geothermal power plants. In addition to generating electricity, the Republic of Croatia will encourage the use of geothermal energy for tourist and recreational facilities, but also for space heating, preparation of domestic hot water, agricultural production, industrial processing of agricultural products, fish farming, etc.

Exploitation of the existing geothermal wells, economically advantageous development of drill-wells for the use of geothermal energy and utilization of medium-temperature beds for development are economically justified.

Biomass

Biomass exploitation should be carried out through cross-sectoral cooperation to ensure sustainable management of forests and agricultural land.

The use of biomass requires the synergistic action of development policies of several sectors: development of the wood processing industry will be encouraged, forest management will be developed and forest biomass use will be encouraged, afforestation and cultivation of short rotation coppices on forest land will be encouraged, biomass power plants with power-heat cogeneration (bio energy-thermal powerplants) and the use of biomass for heat generation and pellet production will be encouraged.

It is planned to use 26 PJ from biomass by 2020, and part of that biomass will be used in biomass power plants of total power of about 85 MW.

The development of biomass utilization should be based on the existing available biomass originating from sustainable forest management or wood processing industry, and the number, location and capacity should be planned based on actual available biomass data, without creating additional pressure on the forest communities.

In addition to forest, there is an important source of biomass and agricultural biomass: agricultural residues and energy crops. Poorly used agricultural residue such as maize, wheat straw, rye, barley, etc. and energy crops can be used for energy purposes in the production of liquid advanced bio-fuels. The utilization of agricultural production residues and putting into operation of previously neglected and untreated areas for planting energy crops should be carried out without reducing the existing arable land and in a sustainable manner. The development of agricultural biomass utilization should be based on sustainable agricultural production and additional value creation.

Biogas

The Republic of Croatia aims to use the equivalent of at least 20% of the total livestock units from agricultural production for energy purposes in 2020, thus producing about 2.6 PJ of energy from biogas, or about 100 million m³ of biogas, equivalent to 40 MW. The production and

use of biogas, domestic production of biogas plants and construction of distributed energy sources will be encouraged.

Implementation measures for increasing the share of renewable energy sources depend on the improvement of cross-sectoral cooperation in the fields of construction and physical planning, energy, industry, agriculture, forestry, water management and environmental protection.

The use of renewable energy sources, except at the national level, needs to be considered at the regional and local level as well.

The spatial planning documentation enables these interventions in space, while respecting environmental and nature protection conditions. Completely new locations for renewable energy systems will be considered in the process of adopting the SPSP and spatial plans at the regional and local level.

Projects/Activities

- Development of guidelines for site selection and planning of wind farms, solar power plants and small hydropower plants.

4.4.4. Further integration into the EU and international energy networks

Since joining the EU, Croatia has been working to open and develop the Croatian energy market and integrate it into the EU internal energy market.

The Republic of Croatia will use its favourable geopolitical and transit position. It has opted for an active role in the regional energy sector and wants to position itself as a regional energy hub.

The Republic of Croatia accepted the Energy Community Treaty, which includes EU Member States and the countries of Southeast Europe. The specific objectives proclaimed by the Energy Community Treaty are to increase the security of energy supply in the region by linking with the Caspian, North African and Middle Eastern oil and gas reserves, and using the region's oil and natural gas, coal and hydropower reserves.

An important aspect of the Energy Community Treaty includes harmonization with the *acquis* in the field of environmen-

Actively participate in the implementation of the EU energy policy and regional initiatives to improve the security of energy supply

tal protection and social issues related to energy supply.

A common strategy has been adopted to create a regional electricity and natural gas market based on common interests and solidarity with a view to its final integration into the European single market.

The Republic of Croatia will actively participate in the implementation of EU energy policy, regional initiatives to improve security of energy supply through interstate agreements, joint ventures and projects on the European list of projects of common interest (PCI). The Republic of Croatia and its companies will also participate in other projects of importance to the EU and the Republic of Croatia in accordance with the goals of their energy and economic policies.

Projects/Activities

- LNG terminal Krk
- JANAFA - Adria project
- The TAP project (*Trans Adriatic Pipeline*)
- Ionian-Adriatic gas pipeline (IAP)
- Other EU projects having the status of a project of common interest (PCI).

4.5. Resilience to change

4.5.1. Adapting to climate change

Increased risks of climate change impacts and respond to their effects by adapting and/or reducing impacts should become an integral part of overall sustainable development, whereby the prerequisites for successful adaptation are an integrated approach and cooperation between science, practice and institutions. Therefore, all development plans, including the promotion of spatial development, must take into account the strengthening of resilience to these disruptions on the basis of scientific projections and targeted expert analyses/studies that determine the forms and levels of vulnerability of the country as a whole and of particular areas .

A long-term solution to climate change is to increase the use of sustainable energy sources and to implement climate policies that underpin the synergistic effect of mitigating and adapting to these changes. Adaptation to climate change implies measures that respond to present and future changes and vulnerabilities in terms of protecting against adverse impacts and reducing potential damage in the future, and exploring and applying new technologies to reduce carbon dioxide emissions in line with strategic low-carbon development trends (including carbon dioxide extraction, transport and storage technologies, e.g. in used gas and oil wells).

Climate change mitigation is primarily concerned with the reduction of environmental pollution, and greater flexibility in responding to these changes can be achieved through the use of various adaptation measures, including the so-called grey (technological and technical), green (environmentally based) and non-investment (legal and political) solutions and customization options. In the field of spatial planning, this primarily means adapting and upgrading spatial standards and creating conditions to strengthen the resilience of new and constructed structures to the ef-

fects of climate change and finding a model for raising the resilience of the existing structures to risks. A general response to adaptation to climate change is to prescribe specific construction conditions in areas of increased risk - from selecting the least risky areas for construction to prescribing the distances and levels of the entrance floors of buildings in areas of increased exposure to floods, planning green roofs and walls etc. In order to reduce the impact of climate change in the long term, it is also important to prescribe requirements in terms of increasing the energy efficiency of buildings.

Given that a positive impact on climate change cannot start without changes in individual behaviour, it is a key task of each individual to contribute to climate change and environmental protection through responsible environmental behaviour, energy and water savings and the use of renewable energy sources, so that fight against climate change may result in health benefits, greater energy security and mitigation of other harms.

Climate change mitigation in the Republic of Croatia

Simulation of the future climate for the territory of Croatia shows that a further general increase in temperature will affect the water cycle, which will contribute to the occurrence of more arid periods with an undoubtable impact on agriculture and the environment in general. Therefore, it is necessary to create a more proactive and progressive climate policy as soon as possible, both domestically and internationally, and to define measures to prevent the devastating effects of climate change.

Some of the negative impacts can be mitigated and/or eliminated by focusing development on less risky areas and planning construction in more acceptable areas of nature. Climate change adaptation measures depend on the recognized and identified risks and sensitivity (whereby geo-

Adapting to climate change and mitigating the effects of climate change

Climate change adaptation measures depend on the risks and the sensitivity of the space, population typology, purpose and economic activities

Spatial plans should plan grey and green uses and implementation measures

Effective and sustainable protection to reduce flood risk

graphical features, such as the diversity of continental and coastal parts, play an important role, but also the typology of population (urban, rural), purpose of the area and economic activities that take place in it (in the continental areas, agriculture is most affected, and tourism in the coastal areas), infrastructure (particularly vulnerable are water supply, water drainage and overhead lines at the settlement level), and energy (particularly sensitive are hydro-power plants and some forms of renewable energy - solar and wind energy).

The response to climate change depends on whether climate change is the result of global or local activities, and whether its consequences are related to the natural-biological or socio-economic aspect. The direct impact on ecosystem changes and disturbances and the quality of life of people individually is indisputable, and direct and indirect impacts can be observed at the community and economic levels, for example:

- direct: loss of yield, physical destruction of infrastructure and structures built
- indirect: environmental and ecosystem changes affect the tourism offer based on natural beauty.

Based on analyses according to different criteria (number of people, size of endangered/risk area and possible financial consequences of destroyed property - buildings and infrastructure), the vulnerability/sensitivity of particular areas and possible forms of adaptation should be determined.

The response to climate change at the settlement level is primarily related to the efficiency of the utility infrastructure system (drainage, public transport, security of water supply, etc.) and provision of appropriate spatial standards and conditions that are implemented through the implementation of spatial plans. Spatial plans need to plan for grey and green purposes and implementation measures. In the case of extreme precipitation, for example, this involves technical and infrastructural solutions that will be able to sufficiently mitigate the negative consequences (floods, etc.), sizing of infrastructure lines for extreme precipitation and other climate changes, as well as forming absorbent areas, e.g. green spaces in settlements, public parks, etc.

In planning settlements and other built structures, climate adaptation is pos-

sible through identification of building standards and principles, considering the natural ventilation of residential areas, harnessing the energy potential of roofs, planning and promoting sustainable transportation, etc.

Responses to climate change in urban areas are related to the construction of green infrastructure, planning of the ratio of built structures to natural and green spaces, landslide greening, adequate infrastructure capacity, the formation of dual-use reservoirs (e.g. planning of recreational areas which are activated as retention areas in the event of floods) etc.

Effective and sustainable protection is of particular importance in order to reduce the risk of floods. In this regard, the construction of a flood defence system (a large number of reservoirs and retention areas) plays a major role, along with a systematic improvement of risk management and implementation of flood protection measures throughout the Republic of Croatia. From a spatial point of view, it is important that all these systems and measures are in line with the strategic commitments of spatial development, and with spatial plans at the implementation level. In cooperation with the competent water management authority, it is necessary to review the intended use of space in natural river floodplains at national and regional levels. In this respect, it is crucial to clearly delineate competences, powers and obligations and to establish an effective model of cooperation and coordination at the sectoral level - from drafting and adoption of strategic and operational documents to the instruments for their implementation. The possibilities of applying a modern and environmentally friendly approach to flood protection (give space to a river) should also be explored, and the purpose of the space planned accordingly. Wherever possible, uninhabited floodplains should be used as natural retention areas and new construction should be directed outside of floodplains.

As part of drought mitigation measures, irrigation systems should be planned in accordance with available water resources and spatial requirements, taking into account the maintenance of biological balance. It is particularly important to explore the possibilities of using infrastructure to reduce the risk of one disaster in order to reduce the risk of another.

Areas that are potentially sensitive to sea level rise should be identified and protection measures should be envisaged when designing spatial plans. In strategic documents and spatial plans, special attention should be given to addressing the threat to drinking water and arable land resources in coastal areas and islands due to sea level rise.

By intensive and continuous provision of information to the public about all the problems and dangers of climate change, each individual's awareness of their importance and scale will be developed and individuals will be encouraged to participate in solving them.

Projects/Activities

- Preparation of planning and technical documentation for more efficient management of the flood defence system and mitigation of the effects of droughts, with emphasis on the defence of the most deprived urban areas, with consideration of multifunctional hydrotechnical systems
- Valuation of spatial, historical, natural, and infrastructural features of rivers, and integral consideration of system development: flood protection, navigability, water supply, energy use, settlement development, protection of natural and cultural heritage, transport and tourism, with emphasis on the protection of the most sensitive areas along a river (water protection areas, protected areas of nature and significant habitats), with international expert coordination of all countries in the river basin
- A programme for the protection, regulation and use of the Sava River and areas along the banks from the border with the Republic of Slovenia to Sisak
- Development of Disaster Risk Assessment in the Republic of Croatia
- Development of the Low Carbon Development Strategy of the Republic of Croatia for the period up to 2030 with a view to 2050, with an Action Plan.

4.5.2. Strengthening natural capital by planning the development of green infrastructure

In the development of plans at all levels, it is necessary to promote the develop-

ment of green infrastructure - a network of green spaces through which natural functions and processes take place, with multiple benefits: improved efficiency of natural resources, climate change mitigation and adaptation to that change, disaster prevention, water management, efficient land and soil management, conservation of habitat and species diversity and genetic diversity for future generations, multi-functional and resilient agriculture and forestry, low carbon transport and energy, benefits to the health and well-being of the population, tourism and recreation development and, in general, ecosystem resilience. Green areas should be planned to be accessible to as many people as possible while planting low-allergen pollen plants to reduce the potential for allergic reactions in humans.

The physical characteristics that contribute to green infrastructure are diverse, specific to each site or area. At the local level, those are elements rich in biodiversity: bio-diverse parks, gardens, green roofs, ponds, streams, forests, avenues, hedges, meadows, restored abandoned industrial areas and corridors of line infrastructure, crossings for wildlife and fish trails and other elements contributing to green infrastructure by enabling more ecosystem services. In urban agglomeration areas, priority in green infrastructure planning should be given to areas where heat island effects can occur.

At the regional or national level, these are large protected natural areas, large lakes, river drainage basins, forests of high natural value, large pastures, low intensity agriculture areas, coastal lagoons. Cross-border elements can be planned at the EU level - international river basins, forests and mountain ranges are examples of EU transnational green infrastructures.

The inclusion of green infrastructure issues in planning processes is based on an approach of green infrastructure assessment, taking into account its location, threats, constraints, priorities, opportunities and other specific factors: geographical, environmental, social, political, economic, etc. Green infrastructure planning emphasizes urban and suburban green infrastructure, green infrastructure as part of integrated marine and coastal planning, and green infrastructure as a process for the remediation of degraded areas, i.e.,

Energy efficiency is a prerequisite for a long-term comfortable and healthy living space

Manage waste in a way that human health and the environment are not endangered

during urban transformation, remediation and temporary use.

4.5.3. Increasing energy efficiency

Energy efficiency is a prerequisite for a comfortable and healthy living environment in the long run, with the state regulating, encouraging and implementing the principles of sustainable planning and building. Standards for building financed by the state are the minimum criteria for any private investor.

Given that planning solutions have a decisive influence on the need for energy, an integrated approach to spatial and energy planning is needed, in which spatial planning provides a framework for the development of sustainable energy systems. Planning should be based on an analysis of the location and its potential and current energy supply options.

The reduction of energy consumption is already carried out during the early planning phase, considering the relief, insulation, orientations, microclimate. Planning should be based on the analysis and selection of the optimal location. Integrating the specificity of energy efficiency into spatial planning should be combined with strengthening knowledge about energy efficiency, provision of information, building capacities and skills of target groups.

Developing long-term plans for the area of energy supply at the level of counties, municipalities, cities and settlements, and determining the optimum areas of supply results in a reduction of transmission systems and, consequently, an increase in energy efficiency. Therefore, the application of district heating systems should also be integrated into the development planning at the city level.

Buildings, as the largest individual consumer of final energy, are at the heart of energy efficiency policies. In the period from 2014 to 2030, 30% of buildings are planned to be renovated to near zero energy and high energy efficiency properties,¹¹ and methods and techniques for the restoration of historic buildings, with a view to energy efficiency, especially of protected cultural property, are planned to be developed with regard to the historical architectural features and monumental value of individual buildings and in particular to specific conservation requirements and guidelines.

Projects/Activities

- Energy renovation of existing buildings
- Encouraging the construction of high-efficiency buildings
- Developing special methods and techniques for energy renovation of historic buildings.

4.5.4. Sustainable waste management

The prerequisites for sustainable waste management are investments in the development of waste management infrastructure and the implementation of appropriate regulations and measures, but also the provision of information to the public and continuous education in order to raise the level of environmental awareness. In this regard, it is necessary to continuously improve the environmental sustainability of the waste management system in order to move from a linear to a circular economy model. Prescribing and implementing measures to reduce the amount of landfilled waste, such as reducing biodegradable waste by reusing, separating, and recycling, also contributes to reducing the pressures on storage and landfill space.

Waste management should be carried out in all segments in such a way that human health is not endangered and that there are no adverse effects on the environment, nature and the ecological network, in particular:

- pollution of the sea, water, soil and air and threatening biodiversity
- unpleasant noise and/or odours
- damage to cultural, historical, natural and landscape values
- explosion, fire, etc.

When determining the conditions for location and prescribing the requirements for construction of waste management facilities, the above requirements should be taken into account, and when selecting locations, careful consideration should be given to the relation to settlements that may be affected (distance, impact on the microclimate, establishment of visual barriers) as well as fitting into the landscape and preserving vistas. The locations of waste management facilities should be planned outside the floodplains and sanitary protection zones. In determining waste management sites, the possibility of using constructed space, i.e., the possibility of reconstruction of the existing landfills should be examined and priority

¹¹ Long-Term

Strategy for Mobilising Investment in the Renovation of the National Building Stock of the Republic of Croatia (OG 74/14)

should be given to such solutions over the occupation of new surfaces, and indigenous plant species should be used during biological remediation of space.

Waste management facilities, depending on their importance as defined by special regulations, should be planned in the spatial plans of the appropriate level so that they are placed in zones:

- in a separate building area outside a commercial-purpose settlement
- in a building area of a commercial-purpose settlement
- specifically designated for waste management.

The development of closed and rehabilitated landfill sites and their potential redevelopment should be in accordance with the requirements and conditions prescribed in the spatial plans, and when prescribing the conditions for remediation priority should be given to remediation in stages, while active use is still in progress.

The storage, treatment and disposal of radioactive waste must meet the highest safety standards for the protection of individuals, society, and the environment.

The remediation programmes and the purpose of locations containing natural radioactive materials should be aligned with the spatial plans at the appropriate levels and the results of analyses of risks for human health and the environment.

Management of radioactive waste

*Radioactive Waste Management Centre,*¹² which covers the storage, treatment and disposal of radioactive waste, should meet the highest safety standards to protect individuals, society, and the environment from harmful effects of ionizing radiation, while avoiding unnecessary burdens on future generations. Final determination of the Centre location, i.e., confirmation of eligibility of the location where the preliminary explorations were conducted for the location of a low and intermediate-level radioactive waste disposal site, requires prior explorations and appropriate decision-making transparency. The location must be suitable for carrying out the necessary safety analyses and environmental measures, and from a spatial development point of view it should be integrated into the basic concept of the use of spatial resources as well as into the priorities

and strategic directions, especially for the sustainability of spatial organization, in accordance with this Strategy. It is also necessary to carefully determine how the land is used in relation to the activities of the Centre. In accordance with national and legal regulations, transparency of deciding on the location is of special importance, i.e., provision of necessary information to the public and public participation in the decision-making process regarding the disposal of different types of radioactive waste.

4.5.5. Sustainable management of mineral raw materials

When making strategic decisions on the management of mineral raw materials, awareness of geological potentials (along with valorisation of exploitation fields on the basis of the occurrence of mineral raw materials, the geological structure and the existing extent of exploitation), spatial-planning conditions and restrictions related to the protection of nature, water, soil, landscapes and cultural property should be integrated. In addition to deciding on the economically justifiable opening of new exploitation fields in places that are spatially and environmentally acceptable, it is of great importance to establish a system of accountability during exploitation and recultivation of space during and after exploitation.

From the spatial aspect, locations and boundaries of new exploitation fields should be carefully planned in relation to distances from the existing buildings, boundaries of building areas of settlements, tourist zones, economic zones, recreational and special purpose zones and established infrastructure corridors, taking into account the type of mineral raw material and the method of its extraction. Particular attention should be paid to landscape and vistas.

Degraded areas for remediation

It is necessary to rehabilitate abandoned exploitation fields according to previously prepared remediation plans and to develop them in accordance with the purpose specified in spatial plans.

The technology and method of remediation of an exploitation field is under direct impact of the method of extraction of mineral raw materials. For example, the contours of surface mines of archi-

Strategic decision-making on the management of mineral raw materials requires the integration of knowledge about geological potentials and spatial-planning conditions and protection restrictions

¹² SDSRC, chapter 2.6.2. Anthropogenic impacts, sub-chapter Waste management

Adapting economic structure of cities to spatial conditions and new business requirements

tectural-building stone are well-ordered and cleaner due to the use of technology of separation in pieces by sawing and breaking off rocks without explosive destruction, and the exploitation of technical-building stone involves blasting and construction of a technological grinding plant, which has a greater temporary and permanent impact on space. Technical remediation and biological and landscape reclamation of exploitation fields should therefore be an integral part of the technological exploitation process.

By performing technical and biological remediation, the geomechanically stabilized edges are greened through biological recultivation, with priority given to indigenous plant species. Landslide remediation is especially important, as well as providing the area with protective fences until its final conversion. Biological recultivation, i.e., the introduction of compensatory landscape elements into the space, can also mitigate the impact on microclimate. In addition to an adequate location of intervention, in order to prevent water pollution, it is important to establish an effective precipitation and wastewater drainage system.

Upon biological rehabilitation, exploitation fields can be converted primarily for the purpose of parks as a places for visiting, culture, sports and recreation, education and other complementary activities for public and tourist purposes. Attention needs to be given to numerous exhausted and abandoned exploitation fields, especially to their remediation and integration into the environment by determining a different purpose of this space in spatial planning documents, e.g. public, tourist, and similar.

In protected natural heritage areas such as nature parks and national parks, in accordance with the regulations on nature protection, it is not allowed to expand the existing or open new exploitation fields, and exploitation fields within parks must be remediated and, after the completion of the procedure of approved exploitation for remediation purposes, they must cease operation. These activities must ultimately result in redevelopment and landscaping in accordance with the basic values of the park space and spatial planning solutions.

Appropriate adaptation and harmonization of regulations is necessary, as well as cooperation and interaction between

stakeholders at all stages - from planning, design, administrative and implementation stage to, ultimately, the supervision stage. In this regard, it is important to build an information system for mineral raw materials, which should include a register of mineral raw materials and a register of exploration and exploitation fields. This would provide an overview of the state of reserves, dynamics of production and demand for mineral resources in the Republic of Croatia and users of exploitation fields (licenses issued, time of expiry of concession rights, etc.), and at the same time it would be easier to reconcile conflicting interests of different users of the space (e.g. agriculture, water management, tourism). Establishing such a system, while enhancing supervision, would also accelerate landscape remediation and closure procedures of exploitation fields used without proper permits.

Projects/Activities

- Complete inventory of mineral raw materials
- Unique information system for mineral raw materials
- More effective control over illegal exploitation
- Research and exchange of expertise on remediation methods
- Adoption of the State Plan for Spatial Development.

4.5.6. Adapting to business environment changes

Adapting the economic structure of cities to the spatial conditions and new demands of business is a process that is reflected in the relocation of plants from the narrow urban cores and from valuable coastal areas, with changes to facilities more appropriate for integration into settlements.

Overcoming the consequences of the economic crisis and increasing employment will depend to a large extent on the ability to adapt to new technologies and business conditions and on the spatial and planning preconditions for such adaptation.

Spatial plans must present to the economic operators in a transparent and timely manner the spatial frameworks, conditions and opportunities from the point of view of strategic goals of development and protection of space, thus achieving the conditions for the adoption of entrepreneurial initiatives.

It is particularly important to enable the implementation of various models of support and entrepreneurial infrastructure through spatial plans and to actively monitor knowledge of new forms of organizing economic zones.

When planning space for economic development, priority should be given to investing in abandoned industrial, military and commercial sites (brownfield locations) at all levels of administration and planning.

In new investments in an undeveloped space, new locations should be viewed in a broader context, considering, first of all, the economic specialization of the area, human and natural resources, and alternative locations should be verified through strategic environmental impact assessment.

At the local level, a proactive policy in relation to economic zones is important, and above all it means providing the planned surfaces with infrastructure in accordance with current physical development plans. New building areas for economic purposes should be planned when an LSGU has the intention and possibilities to finance their development (to develop a UDP, build utility infrastructure), upon prior assessment of needs and analysis of existing capacities.

Larger economic activities should be planned solely on the basis of a detailed investment programme, in accordance with the constraints and possibilities of space (mainly in areas designated as other land outside valuable natural areas, outside landslides, aquifers, floodplains, etc.), avoiding landowners to speculate on land prices and misjudgment of spatial requirements when drawing up the spatial plan.

Active adaptation to business environment also implies adaptation to new entrepreneurial concepts that are increasingly turning to business in the digital world, and in physical space they require new types of space supported by spatial plans (e.g. coworking spaces, clusters, new accommodation types: diffused hotel/integral hotel or new mixed-use concepts).

Projects/Activities

- Utilization of EU funds for construction land development for development of economic activities.

4.5.7. Developing sustainable tourism

Tourism is based on the attractiveness of space and the preserved environment as the most valuable tourist potential that significantly contributes to the Croatian economy. The desirable development of Croatian tourism includes the management of resources that meet the basic economic, social, and aesthetic criteria of long-term sustainable business while increasing prosperity, preserving cultural, landscape and architectural integrity and vital ecosystems and biodiversity.

Accordingly, it is necessary to further emphasize the importance of integrating spatial, ecological, economic, cultural, and transport policies with Croatia's global tourism policy and to base the vision of further spatial development of tourism on principles relevant to the use of space:

- Priority development measures should focus on the use of already occupied space and the existing tourism capacities, i.e., their renovation, modernization, and improvement of quality, and tourism should be strongly oriented towards implementation of environmentally responsible, green concepts at the level of individual service providers and entire destinations, respecting environmentally responsible development as one of its basic strategic guidelines.
- It is necessary to evaluate the development potentials of planned tourist zones and reconsider the compliance of spatial plans of local and regional self-government units with investment needs in tourism (out of 550 planned tourist zones outside settlements, 72% have not been built).
- Adapting tourism to the conditions and specificities of space, which implies due regard for the load capacity of space, flexibility, integration into settlement and landscape structures and energy constraints, environmental protection and revenue generation from local resources, as well as the promotion of traditional activities.
- Tourism should be developed throughout the entire area, and differences in tourism development and spatial valorisation between the coastal area, the hinterland and islands should be reduced.
- It is necessary to reduce pressure on coastal areas by strengthening

When planning space for economic development, priority should be given to investments in *brownfield* locations

The attractiveness of space and the preserved environment are the most valuable tourist potentials

Ensuring free access to the coast for all

continental tourism (spas, hill-mountain areas, numerous cities and cultural destinations). In addition to the sun, sea, natural and cultural resources, it is necessary to create spatial preconditions for the development of new types of tourist experiences: nautical tourism, health tourism, tourism for the elderly, cultural tourism, business tourism, new attractions (theme parks, amusement parks, interactive museums, aquariums, etc.), cycling tourism, adventure-sport, golf, etc.

- Traffic connection is a prerequisite for the development of tourism and an increase in the quality of life of the local population. The islands require regular shipping lines and the availability of air traffic, therefore it is necessary to harmonize the transport system, especially in Adriatic ports and connecting the mainland with the islands and the islands mutually, with contemporary requirements and needs, develop a road network on islands, work on the realization of planned airfields of island areas, use waterways, review river navigation (tourist sightseeing), revitalize and economically integrate and complement the tourism of continental Croatia with the tourism of Adriatic Croatia.

It is possible to contribute to the realization of strategic goals of sustainable tourism through spatial planning solutions. In the process of drafting spatial plans, strategic plans for the development of tourism should be used as expert basis for the rational use of the available tourist space, and by determining precise construction conditions, uncontrolled construction within planned tourist zones should be limited.

The increase in urbanization of the coastline should be systematically regulated by more effective control of the implementation of spatial and urban development plans and the implementation of measures to preserve the coastal and island areas from inappropriate construction and to ensure free access to the coast for all.

When planning the development of sustainable tourism, the main emphasis for spatial interventions should primarily be on:

- preference for devastated areas with adequate infrastructure and

exploration of sustainable spatial capacities, high-quality space transformation and preservation of landscape and cultural and historical values, the analysis of carrying capacities and the manner of management aimed at protecting the natural appearance of the space

- encouraging building in already urbanized areas and existing tourist areas in order to reduce the cost of infrastructure provisions and to preserve, in the long run, the total available development space from excessive construction
- settlement development, following the basic rules and regulations in the field of urban and physical planning, respecting elements of traditional construction and local environment, remediation of devastated areas, identifying (prescribing) elements of traditional architecture and the local environment for each characteristic area separately, while respecting the landscape features, affirming the physiognomy and appeal of architectural tradition of coastal and continental settlements.

The hotel industry is a key driver of the investment cycle, so the structure of tourist accommodation should be directed primarily to hotel capacities with the priority of building high-rated hotels, raising the quality of private accommodation and transforming family accommodation into small hotels, guesthouses and diffuse hotels, construction of new health tourism facilities, golf courses, camps, convention centres and landscaping facilities (beaches, promenades, trails, transportation, car parks, traffic signalization, bike lanes, green areas, etc.).

Nautical centres should primarily be located and built within urban areas and urban settlements with a port already built or adjacent to smaller settlements, with priority being given to the existing nautical tourism ports and ports open to public transport. The construction of new berths should be planned in the existing ports and devastated areas with the necessary infrastructure, and the construction of marinas for mega-vessels and additional ports for cruise ships, in order to improve conditions for the development of nautical and yachting tourism, should be stimulated in the most attractive destinations with the possibility of year-round supply by evaluating the impact of

Nautical centres should primarily be located within an urban area and in city-like settlements with an already constructed port

construction on the vistas, landscape and the local community. A key criterion for the eligibility of these investments will be the use of modern technologies that will eliminate the risks of coastal devastation and environmental pollution.

Encouraging the linking of sustainable tourism development with rural development, the sustainable use of natural and cultural heritage and the protection and use of landscapes will ultimately result in the strengthening of off-season tourism and tourist experience of the entire territory of the Republic of Croatia.

By accepting tourism as one of our major economic activities, we must also embrace changes in space, but at the same time make appropriate decisions about basic resources that must continue to retain values and distinctive features in the immediate and wider region.

Projects/Activities

- Development of guidelines for typology of individual tourist structures.

5. Implementation framework



Planning of changes in space is one of the factors that also monitors and directs dynamics of development, adjusts planning determinants and monitors implementation success. Strengthening the system of planning spatial changes implies the establishment of successful space management. Structural changes to the planning system are proposed in order to achieve a higher level of feasibility of planning decisions and to improve planning excellence. — Prof. Srečko Pegan, Ph.D.

5.1. Institutional framework

The Physical Planning Act (PPA) regulates the system of physical planning, competences of state authorities and bodies of local and regional self-government units in administrative and other procedures, as well as administrative control. Taking the existing legal solution as a basis, there is no need to change the institutional framework, but to systematically research and propose improvements in order to increase clarity, rationality, and ease of implementation of procedures, in order to find and protect citizens in the exercise of their rights and to achieve a stimulating investment environment. Institutional cooperation in the form of cooperation between state authorities and bodies of local and regional self-government units, as well as cross-sectoral cooperation, is indispensable in the implementation of the Strategy.

The Croatian Parliament adopts the SDSRC and spatial plans on the state level, the Government of the Republic of Croatia participates in the drafting process, and MCPP is the competent development authority

Croatian Parliament

The Croatian Parliament, as the supreme legislative body in the Republic of Croatia, in addition to adopting state-level spatial plans and other documents prescribed by the Physical Planning Act, monitors and reviews the state of space and the realization of spatial development, and establishes and adopts appropriate core values for physical planning of the country.

Government of the Republic of Croatia

In the exercise of executive power, the Government of the Republic of Croatia determines, directs, and coordinates the implementation of policies and programmes and proposes and adopts strategies for this purpose, provides guidelines, adopts acts and takes other measures necessary to regulate relations within its area of competence. The Government of the Republic of Croatia proposes laws and other acts to the Croatian Parliament, as well as the state budget and the final statement of accounts, enforces laws and other decisions of the Croatian Parliament, adopts regulations for the implementation of laws, conducts

foreign and internal policy, directs and supervises the work of the state administration, takes care of economic development of the country, directs the activities and development of public services and performs other tasks specified in the Constitution and law.

In the context of spatial development planning, the Government of the Republic of Croatia participates in the processes of drafting and adopting state-level spatial plans and other physical planning documents in the manner established by the PPA.

Ministry of Construction and Physical Planning

MCPP ensures the mutual harmonization of spatial plans and their implementation, and as the competent authority for the preparation of state-level spatial plans, contributes to their professional foundation, compliance with the PPA and special regulations and the clarity of implementation of the drafting and adoption process. The MCPP establishes and develops PPIS in cooperation with the CSD and the

physical planning institutes of counties or the City of Zagreb. The MCPP also supervises the implementation of all activities determined by the PPA and the regulations adopted on the basis thereof, as well as the legality of work of administrative bodies, professional administrative bodies, Croatian Institute for Spatial Development, spatial development institutes of counties or the City of Zagreb, physical planning institutes of large cities, legal entities with public law bodies, persons performing professional physical planning activities and certified architects and engineers in this regard.

The MCPP is directly involved in the implementation of the PPA and the BA by issuing acts related to the construction and use of certain buildings, and indirectly, by supervising the conduct of administrative bodies of local and regional self-government units and other persons who participate in the design, construction, use and maintenance of buildings and the implementation of administrative and other procedures.

Considering the decades-long problem of illegal building identified by the analysis of the state and processes in the space, the role of the MCPP in the implementation of inspection activities bears great importance, but also in establishing and implementing a communication strategy with the aim of educating citizens on the consequences of illegal building and sustainable use of space, based on awareness of space as a national good.

Local and regional self-government units

Physical planning within the competence of local and regional self-government units especially includes directing the spatial development of local and regional self-government units with specific goals and guidelines for physical planning in accordance with starting points and guidelines from state physical planning documents, adoption of physical planning documents of the regional and local level, and adoption of reports on the state of space, planning interventions in the space of county and local significance, implementing measures for the realization of physical planning documents at the regional and local levels, implementing measures of active land policy and construction land development and keeping a register of data from the Physical Planning Information System.

The governing bodies of large cities, the City of Zagreb and counties responsible for administrative affairs in the field of construction participate in the implementation of the PPA and the BA by issuing acts relating to the construction and use of certain buildings. The governing bodies of the LSGUs in charge of municipal services are involved in the supervision of construction and execution of works in accordance with the Building Inspection Act.

Croatian Institute for Spatial Development

Expert activities of physical planning for the state are performed by the CISD, and the activity of the Institute includes, in particular: drafting or coordinating the preparation and monitoring of implementation of the SPSP and other spatial plans adopted by the Croatian Parliament or the Government of the Republic of Croatia, drafting or coordinating the drafting and cooperation in the preparation of other documents of importance for physical planning and protection of space of the country, development and management of the Physical Planning Information System, preparing lists of indicators for territorial monitoring, drafting or keeping a Territorial Monitoring Report of the country, performing expert tasks for determining the content and methodology of spatial planning in the development of spatial plans and monitoring of the state of space, cooperation with persons, international bodies, institutions and associations in the preparation and implementation of projects and programmes in the field of physical planning, participation in the implementation of international commitments of the Republic of Croatia in the field of physical planning, ensuring conditions to access the information on space at its disposal and participating in the development of sectoral strategies, plans, studies and other documents of the state level which are prescribed by special laws.

In addition to the tasks of the CISD identified by the PPA, its role in fostering and promoting cooperation with the scientific and expert community in conducting research and implementing new expertise in order to improve planning integrity and more effectively implement planning solutions should be emphasized. Special cooperation should be established with higher education institutions, identifying the need for additional/specific knowl-

Physical planning institutes – expert activities of physical planning of the counties and the City of Zagreb

Encouraging large cities to set up physical planning institutes

edge in the field of physical planning and continuous improvement of education in undergraduate and graduate studies, as well as specialist studies and professional consultancy.

Strengthening the professional and technical capacities of the CISC is therefore a priority for action in the period up to 2020.

Physical planning institutes of counties and the City of Zagreb

Expert physical planning activities for a county or the City of Zagreb are performed by a county or the City of Zagreb physical planning institute. The activities of a county or the City of Zagreb physical planning institute includes, in particular: drafting and coordinating the preparation and monitoring of the implementation of spatial plans of the regional level of the City of Zagreb; drawing up reports on the state of space, running and managing the physical planning information system within the scope of its authority, preparing the starting points for drafting or abolishing spatial plans of narrower areas, providing expert advisory assistance in the preparation of local spatial plans and other tasks in accordance with the PPA and the statute of the Institute. The physical planning institute of a county may also prepare a spatial plan of a town and municipality, an urban development plan of significance for the state or county and perform expert analytical tasks in the field of physical planning, if requested by the MCPP or the county prefect.

Considering the prominent role of the physical planning institute of a county or the City of Zagreb as an expert level which is a key link in the implementation of professional physical planning activities, participating at the same time as expert and analytical support to the activities of the state level and as expert advisory assistance to the local level, it is necessary to monitor the state of human capacities and equipment of institutes in the short-term and take measures for their unification and further strengthening.

Physical planning institutes of large cities

Given the importance that urban areas of large cities have in the national economic, social and spatial development, the particularities of the challenges that large cities face and the need to implement integrated development measures, this Strategy encourages large cities to

establish their own physical planning institutes, in accordance with funding available in the budget.

Public law bodies

State administration bodies, other state bodies, administrative departments or services of large cities, the City of Zagreb and counties competent to perform tasks in certain administrative areas, legal persons with public authority and other persons determined by special laws take part in procedures of planning and achieving the goals of physical development by issuing requests and opinions in the process of developing and adopting physical plans and/or setting specific conditions.

For the purpose of quality and comprehensive physical planning, public law bodies undertake to prepare and submit to the PPIS data relevant for physical planning and the development of spatial plans whose structure and content complies with the regulations adopted on the basis of the PPA as well as with the regulations defining the National Spatial Data Infrastructure.

Legal persons and certified architects

Legal persons, i.e., certified architects, who, on the basis of a special regulation, develop draft proposals and draft final proposals of spatial plans and perform other professional physical planning tasks, are crucial for achieving a higher level of planning decisions feasibility and improving planning quality. Continuous professional training and competence development in this particular segment of the profession, which has an immeasurable role in drawing up plans at all levels, and is exposed to competition and the overall economic crisis, is a task in the period of up to 2020.

Other stakeholders in spatial development

In the future, it is necessary to establish better cooperation with civil society organizations at all levels and to develop awareness of civil society as a partner, that offers clearly formulated requirements of competent stakeholder groups.

The business sector, as a driver of economic and social development, actively participates in the consideration and implementation of the spatial development process. Affirmation of cooperation between the business sector and all

Better cooperation with civil society organizations

institutional stakeholders in spatial development is crucial for achieving an environment that supports entrepreneurial initiatives in line with the goals of physical planning, related to economic development and new employment, but also to the development of social infrastructure.

The system of physical planning must protect citizens by enabling them to express themselves, streamlining processes, ensuring the availability of data and information and providing professional assistance.

5.2. Coordination of development measures in space

PPIS will consolidate all data relevant for physical planning and construction

5.2.1. Development of the Physical Planning Information System

The development of PPIS and its modules (e-Permit, e-Plans, e-Catalogue, e-Archive, e-Inspection, etc.) will integrate all data relevant for physical planning and construction and make them available to the public, potential investors and authorized users from state and public administration bodies in order to effectively manage spatial data to plan and monitor the state of the space and to implement plans more effectively.

The prerequisites for the introduction and successful functioning of the PPIS, as well as the full benefits of modern technologies available for the generation, loading, and exchange of data and automation of processes where possible, are as follows: establishment of a clear system of responsibility of the physical planning entities for individual parts of the system:

- defining technical standards and methodology for developing the next generation of spatial plans using GIS tools
- strengthening the PPIS Service within the CSD as a body responsible for maintaining the existing functionalities and for the continued further development of the system, with appropriate human and technical resources
- educating all entities whose area of activity includes the production and processing of spatial data in the field of physical planning.

Prerequisite for the introduction and successful functioning of the PPIS is the establishment of a clear system of competencies for physical planning entities

The PPIS development plan for the forthcoming period envisages:

- strengthening of the administrative capacity of CSD, especially for employees with knowledge of GIS technologies, to enable it to fulfil its role as a PPIS umbrella organization
- complete the development of

the e-Plans module and bring it to full functionality to ensure technical conditions for the next generation of spatial plans to be loaded seamlessly into the PPIS

- conduct training on the application of GIS technologies in the development of spatial plans for CSD employees, physical planning institutes and professional services of competent development authorities and expert developers, so that spatial plans are designed to enable their loading into the PPIS and the use of all anticipated functionalities
- align the e-Catalogue data model with the applicable National Spatial Data Infrastructure metadata Specification
- further develop new PPIS functionalities (e.g., enable downloading of data through exchange services to all parties concerned and the public, prepare forms for the drafting of standard reports, etc.)
- assist in the development of applications that would allow expert developers to draft spatial plans using tools familiar to them and transform the data thus produced in the simplest way into the format required to load it in the PPIS
- improve some existing functionalities and further interconnect modules for mutual use of data once entered into the system wherever possible (e.g. establish a registry of public law bodies)
- carry out further integration into the PPIS of other sources of data relevant to spatial planning and space in general (e.g. data from other state administration bodies, depending on their availability)
- prepare project assignments for the creation of additional modules within PPIS, such as e-Inspection, e-Real Estate and e-Archive. Preparation includes analysis of business processes, development of data models and lists of required functionalities,

- development of codebooks, contracting with contractors, etc.
- development of the modules e-Inspection, e-Real Estate, e-Archive, etc.

The development of PPIS over a longer period (beyond 2018) will include:

- linking the e-Catalogue to the database of architects authorized by the Croatian Chamber of Architects
- development of concept and module e-Dokumentation which would in nature be a central repository of spatial documentation (e.g. studies used for the development of spatial plans, scientific papers on the topic of spatial planning and physical planning, various analyses and programme studies, etc.)
- development of concept and module e-Forum to allow everyone to participate in public debates on proposals of spatial plans of all levels, submission of proposals and raising questions in the field of physical planning
- automation of monitoring of territorial monitoring indicators
- constant upgrading and improving of the system with regard to the availability of new technologies and capabilities.

It is necessary to ensure the hosting and availability of PPISs throughout the observed period in accordance with the implementing rules arising from the relevant regulations, creation of backups, protection against unauthorized intrusion, and to establish adequate administrative capacities to maintain the codebook and to regularly update all data.

When implementing the PPIS, it is necessary to observe the implementing technical lists resulting from the National Information Infrastructure Act¹ and the National Spatial Data Infrastructure Act² which will form an integral part of the European Spatial Data Infrastructure defined by the INSPIRE Directive in order to format data so that it can be found and exchanged with other related information systems at the level of the Republic of Croatia and the EU.

5.2.2. Editing and harmonizing spatial evidence

The lack of up-to-date land survey maps and the lack of regulation of cadastres and land registers are a challenge, both in

spatial planning and in procedures related to the implementation of planned spatial development.

Priority activities are the implementation of cadastral survey/technical reambulation procedures and the implementation of new cadastral records for construction areas defined in spatial plans, i.e., areas of economic, traffic, tourism and other significance.

An additional challenge in spatial planning is the lack or outdatedness of sectoral data on the existing or planned use of space.

The efforts of the competent bodies to harmonize cadastral and land data need to be intensified.

Using state budget funds and EU funds, it is necessary to establish spatial databases of public law bodies where they do not exist or to expand the existing databases to include a spatial component where it has not been covered so far. Spatial data exchange mechanisms should also be put in place to facilitate the monitoring of spatial conditions and the analysis of sectoral requirements and the resolution of possible spatial conflicts.

5.2.3. Development and implementation of next-generation spatial plans

The Physical Planning Programme of the Republic of Croatia (PPPRC) shall remain in force in the part that does not contradict this Strategy, until the adoption of the State Plan for Spatial Development.

Next-generation spatial plans imply the introduction and use of GIS technologies in their design and preparation for publication in PPIS. A by-law drafted on the basis of the PPA will prescribe standards and the methodology for the preparation of all types and levels of spatial plans (mandatory content of plans, data structure and layers, layer designations, mandatory and conditional attributes, format, etc.).

This will ensure:

- reduction of costs and time necessary for drawing up spatial plans by stabilizing legislation and establishing uniform planning practices
- uploading spatial plan proposals at all stages of development and valid spatial

The lack of up-to-date land survey maps and the lack of regulation of cadastre and land registers are a challenge in spatial planning and in procedures related to the implementation of planned spatial development

¹ OG 92/14

² OG 56/13

Establishment of a planning model based on the principles of integrated spatial planning approach, horizontal and vertical integration, and by reviewing concrete forms of cooperation and coordination

- plans in PPIS via the e-Plans module
- complete and transparent records of the entire procedure for the development and adoption of a spatial plan in the PPIS
- IT connection of e-Permit and e-Plans databases to the PPIS for efficient implementation of procedures and faster issuance of acts for construction, which will positively affect the investment climate and business environment
- easier spatial analysis and monitoring of conditions and trends in space
- greater availability of valid spatial plans and easier sharing of spatial planning data for the purposes of drafting amendments to spatial plans and for the needs of the sector and the general public.

5.2.4. Models of cross-sectoral cooperation and coordination

When planning and implementing spatial development activities, it is necessary to explore the possibilities of improving the current planning model based on the principles of integral approach in spatial planning, horizontal and vertical integration, by looking at concrete forms of cooperation and coordination.

Horizontal integration

The close cooperation of public law bodies and the harmonization of regulations, sectoral mechanisms, sectoral documents and projects that imply actions in space or impact on space and contain a territorial aspect are necessary preconditions for the implementation of this Strategy.

First of all, there is a need for constant cross-sectoral coordination of bodies and institutions responsible for the care of core values of the Croatian space and their sustainable development, especially in the areas of environmental and nature protection, protection of cultural assets and physical planning.

Furthermore, the cooperation of all sectors, that within their competence have the development of social infrastructure, economic development and development of all infrastructure systems with the physical planning system, is necessary, especially through harmonization of sectoral documents with this Strategy and spatial plans and active participation in the development and adoption of spatial plans.

Continuous coordination must also be established between the physical planning system and the regional development system, in order to coordinate annual and multi-annual development programmes and projects, especially those aimed at promoting regional development, urban development and development of areas with particular development challenges, with this Strategy and spatial plans, but also for the effective implementation of this Strategy through strategic and operational documents, in particular through the use of EU funds and other international sources of funding the development of the Croatian space.

In the process of drafting and adopting development documents, it is necessary to include social plans of local (regional) self-government units in order to ensure better vertical coordination between all stakeholders in order to comply with social policy.

Depending on the level for which the document is being passed, the competent county physical planning institutes or the Croatian Institute for Spatial Development should be involved in the procedures for drafting and adopting sectoral development documents at the earliest stage and conduct appropriate *ex ante* evaluation of potential impacts of the proposed goals, measures and activities on the spatial development of the area for which the document is being adopted.

Vertical integration

Vertical integration involves linking authorities competent for spatial development and stakeholders at the national, regional, and local levels, most notably by implementing a comprehensive programme of developing a new generation of spatial plans in a common physical planning information system, according to the principle of incorporating each of the territory in question in the broader context and taking into account goals and interests expressed in documents of higher level, i.e., of the wider space.

Vertical integration can also cover transnational levels through specific programmes and projects.

The goal of vertical integration is to increase awareness of development problems and needs and to find the best solutions, by facilitating the flow of information in both directions, local initiatives

Next generation spatial plans imply the introduction and use of GIS technologies

from the bottom to the top, as well as by launching quality initiatives from the higher to the lower level, especially by providing professional and financial support for their implementation.

Territorial integration

The strategy encourages spatial planning that goes beyond administrative and territorial boundaries by addressing common issues and processing spatial units of common characteristics.

Territorial integration is achieved through:

- identification of goals and interests of the state and inter-county levels by the SPSP
- creation of expert bases for the development of spatial plans that, from a thematic point of view, consider spatial units of common characteristics and development specificities
- drawing up of physical plans for areas with special features for the areas of national and nature parks
- drawing up of spatial plans for the areas with special features whose obligation is determined by the SPSP, for areas of significant natural, landscape, cultural, historical, economic and other features, or for areas exposed to common natural risks
- cooperation of several local or regional self-government units in the preparation of common goals and programme starting points for the development of spatial plans of counties or spatial plans of cities or municipalities, by considering a legal solution that will enable the development of common spatial plans.

5.2.5. Development of a participatory model

Obviously, one of the greatest difficulties in the establishment of the conditions for the realization of democracy lies in the contradiction between a planned economy and active cooperation of each individual. A planned economy of the scope of any big industrial system requires a great deal of centralization and, as a consequence, a bureaucracy to administer this centralized machine. On the other hand, the active control and cooperation by each individual and by the smallest units of the whole system requires a great amount of decentralization. Un-

less planning from the top is blended with active participation from below, unless the stream of social life continuously flows from below upwards, a planned economy will lead to renewed manipulation of the people. Solving this problem of combining centralization with decentralization is one of the major tasks of society.

—Erich Fromm *Escape from Freedom*

Planning of the development and use of space, as well as the realization of plans, are specific and complex activities, since they manage the sphere of public interest. Contemporary society, on the one hand, is characterized by the development of disciplines and its strong specialization, as well as the complexity of processes, administrative and legal frameworks. On the other hand, such development of the entire system resulted in mutual distancing of actors in the development processes, i.e., the lack of coherence and cohesion both between individual professions and with respect to the beneficiary, and consequently the loss of all concomitant positive effects. Some of the recognized negative social phenomena that appear to a greater or lesser extent may include distancing of an individual from the system and associated socio-political passivity/resignation, disciplinary disconnection and lack of professional consensus, difficult or non-implementation of planned activities or measures, 'futility' of plans and the like. That is why, no matter what level it is, in contemporary planning trends, the notion of participation as a cohesive and communicative tool has become absolutely indispensable.

Participation roles

The ultimate goal of participation is to ensure socially sustainable development. This implies social communication at several levels: on the one hand, communication between experts and the public, but also between politics and governing bodies and the public, as well as the communication of different social actors who appear on the public scene with different and sometimes opposing goals and interests. It is a process that enables a broader social dialogue to be opened in order to overcome conflicts.

Participatory processes play a multifaceted role in spatial development procedures and activities, primarily those that ensure that public interest in a particular space is recognized and incorporated into the planning of its future. Participation

The ultimate goal of participation is to ensure socially sustainable development

Spatial planning that goes beyond administrative and territorial borders

also ensures the involvement of users in the planning processes, which results in the identification of the individual and the public with plans and increases the success of implementation and use. Communication between experts and users in participatory processes bridges the gap between theory and practice, professional principles and current needs; the expert connects with real conditions and the real user, while at the same time developing the capacity of the user to understand the professional principles, arguments and decisions made.

An inevitable problem in conducting participatory processes is the concept of public interest, understanding what it is and to what extent. In interpreting the needs and capacities of users, it is necessary to make a distinction which, to a lesser extent, relates to the common welfare of the community. On the other hand, the involvement of users in the processes indirectly nurtures them in the spirit of cultivating the common/public interest as the primary criterion as compared to the individual/private. In terms of sustainable development, all activities that they contribute to the community in the fields of environment (preservation and improvement of the environment), social (quality and intensity of social processes and social capital and community strength), and ultimately economic and industry processes, are priorities of public interest.

The main problem of participation in spatial development procedures and activities, apart from defining and understanding the public interest, is communication with a heterogeneous public, which seeks different approaches and methods. Therefore, there is a need for systematic research of the Croatian society - its structure, identity, values, attitudes and aspirations, in cooperation with scientists in the field of social sciences, i.e., for relying on pre-existing scientific research in order to be able to properly apply the participatory model in concrete situations.

The topics that require constant investments to overcome the current problems are:

- **education:** recognizing the value of public interest by the user as well as of professional principles by which it can be realized
- **understanding:** the problem of interpretation of public interest within needs and capacities of the user

- **common language:** conducting user-level communication - selecting a method that is appropriate for the user's level of interest and a language that ensures understanding
- **interest:** using different methods of participation to naturally motivate the user and to keep them involved in the process
- **availability:** using different research methods to reach as wide a range of users as possible
- **bridging:** bridging the gap between professional concepts of the *top-down* method and practical information obtained through the participatory *bottom-up* approach, channelling and transformation of exclusively private interest into interest that simultaneously fulfils the requirements of private and common/public
- **immediacy:** insistence on communication immediacy, direct conversations and discussions, as well as on-site presence, are a necessity
- **promptness:** insisting on involvement and information from the earliest stages of planning
- **community:** conduct the participatory process so that it communicates clearly, despite the actors having different roles and competencies, that planning is a common process with a common goal to make progress for the benefit of the public interest, i.e., all those involved in the use of the space.

Opportunities and methods of ensuring the participatory process

User involvement in the participatory processes can be accomplished through a variety of methods to choose from, depending on a number of factors: what stage of planning/implementation is involved, what is the purpose of involvement at a given time, or what is aimed at, whether it is a large or small group of users, etc.

In the process of adopting a spatial plan, users should be actively informed from the earliest stage about the stages which the plan is currently in and the points at which they can be more intensely involved. Implementation of participation methods as early as the stage of determining the existing state, starting points and goals of the development of a spatial plan can bring the greatest benefits to the process (informing the public about the purpose

In the process of adopting a spatial plan, users should be actively informed from the start about the stages which the plan is currently in and the points at which they can be more intensely involved

of the development of a spatial plan and the reasons for its preparation, motivation for inclusion, examining public opinion on the existing situation, problems and needs in space).

It is desirable for each plan-making process to develop its own participation strategy, depending on the specifics of the area and other given circumstances, and the development and testing of new methods is also encouraged. In testing new methods of participation, it is recommended to use the experiences and resources of EU programmes (URBACT, LEADER and others) and the knowledge and experience of the civil society in leading and moderating the participation processes.

5.2.6. Developing a culture of sustainable use of space

In order to reduce the pressure on space and promote the positive orientations of this Strategy, a comprehensive communication strategy will be developed, which will determine the scope, objectives, and methods of communication with the public regarding the development of a culture of use and the change of negative behaviours in space.

The communication strategy will be divided by thematic units and goals (preventing future illegal building, raising awareness of the need for high-quality space management, raising awareness of positive behaviour in space). For each topic, the strategy establishes a targeted public, basic and specific goals, key messages and a media campaign.

Depending on the topic, information channels and key messages can be the following: brochures, leaflets, advertisements and posters, elaborated systems of promoting good practices of the local level at the national level, media appearances by MCPP leaders and CISD staff.

A special part of the communication strategy will refer to communication with the targeted public and the public concerned (expert bodies at the state, county, city, and municipal levels, representatives of local and regional self-government units, professional associations, civil society organizations). To this end, a series of round tables, expert conferences and trainings, interactive educational

workshops and counselling sessions are planned to be held with the purpose of providing information on the basic goals and principles of the Strategy.

An important tool in conveying key messages are the MCPP and CISD web sites.

5.2.7. Recommendations for further research and improvements to the system

Spatial planning methodology

In the implementation of the Strategy, continuous cooperation with the scientific and professional community is planned in relation to further development and establishment of methods, criteria, and standards of spatial planning and monitoring of the state of space, and in particular monitoring of dynamic changes that rapidly change the spatial-development context and require timely identification of new modes of action.

Reviewing the administrative and territorial structure of the country, which would, in the context of spatial development, contribute to the optimization of the physical planning system, is a challenge to the scientific community, but also requires a broader socio-political consensus.

More effective implementation of spatial plans

In order to implement spatial plans more effectively, it is necessary to establish systematic rules for the assessment of real property values, preventing the occurrence of irregularities in practice. Regardless of whether it is real property owned by the Republic of Croatia, local and regional self-government units, legal entities or natural persons, effective management and use of real property as a prerequisite implies knowledge of the value of such real property. Real property values are essential to their owner in certain proceedings, for example in expropriation proceedings or in the proceedings of using real property owned by local and regional self-government units of that country.

New research, as a basis for enacting regulations, should also be directed towards establishing a feasible model of land development and incentive measures for development of abandoned real property and sustainable use of heritage.

A comprehensive communication strategy will be created, which will determine the scope, objectives, and means of communication with the public concerning the development of a culture of use and changing negative behaviours in space

5.3. Monitoring of implementation and reporting

The monitoring of implementation of this Strategy is primarily related to the monitoring of the state of space at the national level, i.e., the Territorial Monitoring Report of the country for a period of four years, which, on the basis of the PPA, is prepared by and whose preparation is led by the CISD, and is considered by the Croatian Parliament.

The Territorial Monitoring Report contains the starting points, analysis, and evaluation of the state and trends of spatial development, analysis of the implementation of spatial plans and other documents that affect the space, and proposals for improvement of spatial development with basic recommendations for measures for the following period.

The Minister shall stipulate by an ordinance the detailed contents of the report, mandatory spatial indicators, the manner of participation of public law bodies in the preparation of the report and other requirements regarding the monitoring of the state in the field of physical planning by an ordinance. Therefore, the Ordinance on the content and required spatial indicators of the territorial monitoring report³ shall be amended in the part related to more detailed content and indicators of the report at the level of the Republic of Croatia.

In addition to reporting in four-year periods, it is possible to produce thematic reports on the state of space when special attention is paid to one or more topics.

Special reporting on some spatial indicators is provided in the thematic studies of ESPON, the publication of CBS, EUROSTAT etc.

Any scientific or expert work, study, plan and project, publication, public involvement on the topic of spatial and urban development planning is also welcome in enhancing the knowledge of the space.

In order to adapt to changes, it is necessary to monitor trends in the development of individual activities and activities in space. The challenges of development need to be answered by monitoring and research, proposing solutions, applying the principle of physical planning, and if necessary, amending legislation and regulations.

³ OG 48/14 and 19/15

List of abbreviations

ALICB	Agency for Legalization of Illegally Constructed Buildings	ICZM	Integrated Coastal Zone Management
ASSC	Areas of Special State Concern	IDIR	Institute for Development and International Relations
BA	Building Act (OG 153/13, 20/17)	INA	INA industrija nafte d.d. (INA Oil Industry plc)
Ba	Building area	ISDP	Island Sustainable Development Programme
BE-TO	Biomass cogeneration power plant	ITI	Integrated territorial investment
CAEN	Croatian Agency for the Environment and Nature	JANAF	Jadranski naftovod d.d. (Adriatic Oil Pipeline plc)
CBS	Državni zavod za statistiku (Croatian Bureau of Statistics)	JIS	Real Property Registration and Cadastre Joint Information System
CCAA	Croatian Civil Aviation Agency	LAG	Local action group
CDP	County development project	LNG	Liquefied natural gas
CDS	County development strategy	LPG	Liquefied petroleum gas
CISD	Croatian Institute for Spatial Development	LRD	Land Registry Department
CROMAC	Croatian Mine Action Centre	LSGU	Local self-government unit
CSP	County spatial plan	MA	Ministry of Agriculture
DHS	District heating system	MAP	Mediterranean Action Plan
EEA	European Environment Agency	MC	Ministry of Culture
ESDP	European Spatial Development Perspective	MCPP	Ministry of Construction and Physical Planning
ESIF	European Structural and Investment Funds	ME	Ministry of Economy, Entrepreneurship and Crafts
ESPON	European Spatial Planning Observation Network	MEE	Ministry of Environment and Energy
EU	European Union	MH	Ministry of Health
EUROSTAT	EU statistical office	MOD	Ministry of Defence
EUSAIR	EU Strategy for the Adriatic-Ionian Region	MRDEUF	Ministry of Regional Development and EU Funds
EUSDR	EU Strategy for the Danube Region	MSE	Ministry of Science and Education
FMSP	Framework for Maritime Spatial Planning	MSFD	Marine Strategy Framework Directive
GDP	Gross domestic product	MSTI	Ministry of the Sea, Transport and Infrastructure
GIS	Geo-information system	NP	National park
HAC	Hrvatske autoceste d.o.o. (Croatian Motorways Ltd.)	Np	Nature park
HAKOM	Hrvatska regulatorna agencija za mrežne djelatnosti (Croatian Regulatory Authority for Network Industries)	NSDI	National Spatial Data Infrastructure
HC	Hrvatske ceste d.o.o. (Croatian Roads Ltd.)	NUTS	Nomenclature of territorial units for statistics
HE	Hidroelektrane (Hydropower plant)	OECD	Organization for Economic Co-operation and Development
HEP	Hrvatska elektroprivreda d.d. (Croatian Electricity Company plc)	PCA	Protected Coastal Area
HMA	Hill-mountain areas	PCI	Projects of Common Interest
HOPS	Hrvatski operator prijenosnog sustava d.o.o. (Croatian Transmission System Operator Ltd.)	PPA	Physical Planning Act (OG 153/13)
HŽ	Hrvatske željeznice (Croatian Railways)	PPBA	Physical Planning and Building Act (OG 76/07, 38/09, 55/11, 90/11, 50/12, 55/12)
IAP	Ionian-Adriatic Pipeline	PPIS	Physical Planning Information System
ICPDR	International Commission for the Protection of the Danube River	PPPRC	Physical Planning Programme of the Republic of Croatia (OG 50/99, 84/13)
		PPSRC	Physical Planning Strategy of the Republic of Croatia (1997, OG 76/13)
		RW	Radioactive waste

RES	Renewable energy sources
RH	Republika Hrvatska (Republic of Croatia)
ROP	Regional operational plan
SDPC	Spatial development plan of a city
SDPM	Spatial development plan of a municipality
SDSRC	Spatial Development Strategy of the Republic of Croatia
SGA	State Geodetic Administration
SPASF	Spatial plans of areas with special features
SPSD	State Plan for Spatial Development
TA 2020	Territorial Agenda of the European Union 2020
TAP	Trans-Adriatic Pipeline
TEN-T	Trans-European Transport Network
TMRRC	Territorial Monitoring Report of the Republic of Croatia 2008 - 2012 (OG 61/13)
TPP	Thermal power plant
UDP	Urban development plan
UNCLOS	United Nations Convention on Law of the Sea
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization

List of figures

Note to all figures

Given the scale of the figures, various scales, years of data sources, and the guiding character of the Strategy which contains the basis and organization of spatial development, all figures are schematized and they are not used for detailed locations of the content presented. The fact that a project, route, plant or building is not explicitly stated in the Strategy does not mean that it is impossible to plan them in spatial plans in accordance with the directions given by the Strategy.

Graphic representations are schematic diagrams or guiding representations and do not imply detailed planning designs.

The guiding character of the document enables the planning evaluation of possible variants and finding optimal ways to realize the concept of the Strategy in the processes of its implementation.

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- 2.15. State of processing of metadata in the e-Catalogue

3. Starting points and the concept of spatial development

- 3.1. Estimated impact of orientation on the realization of concept principles

Source list

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EUROGEOGRAPHICS

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