

Regional report on small ports phenomenon in the Šibenik-Knin County

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1. Introduction

The FRAMESPORT project has the aim to create a coordinated initiative to support the sustainable development of the small ports of the Adriatic basin in a strategic perspective. Therefore, the objective is to turn small ports into a proactive driver of the socio-economic development of this coastal area. This strategic goal requires a multifaced and interdisciplinary approach, including both the adoption of concrete pilot projects as well as identification of priority themes to be promoted within the overall strategy. These actions are going to be performed by adopting a bottom-up approach, involving local and national stakeholders since the beginning of the project. Also, the various project partners have been selected to guarantee a wide territorial cover. Their aim is to address the planning and management topics, the business models implementation, the enhancement of training and competence, as well as the development of Information and Communication Technologies (ICT) tools and services. In addition, the project aims at developing an ICT platform that collects and systematizes the key data on small ports in order to use this information to drive sustainable development. The portal is going to work as a bridge between the two sides of the Adriatic basin, the Italian and Croatian one. In this way, it is possible to create a more consistent and united network of small ports, businesses and institutions, and promote their sustainable performance, infrastructure and policies in order to favor their development and growth.

The point was to extract the most valuable information regarding the ports and harbors that present a safe haven for many domestic and international passengers. Report has been split into several chapters, each of which had a mission to provide a summary keeping in mind few key points.

The beginning of the document starts with an introduction to the necessity of this report and a description of Šibenik - Knin County in a nutshell.

Following chapter was based on listing all of the port areas under the management of county port authorities, current state of the art which was illustrated through tables and figures, showing percentage-wise how are Šibenik – Knin County's ports comparing to other regions. The key take-away was to provide the reader with statistic data presenting the levels of adoption of certain trends, port infrastructure and superstructure, as well as an overall offer port has.

After that, a SWOT analysis was made in order to simplify the external and internal elements that North-Dalmatian ports have to face. Despite being an up-and-coming competitor on the

Mediterranean, ŠKC is facing a lot of the opportunities to further develop this segment of business and tourism. Nonetheless, there are also some threats, therefore during the decision-making process all of the elements have to be considered.

Final chapter focused on some of the key metrics that greatly impacted charts and thus should be considered to place county ports within the current timeframe and final remarks were made.

1.1. Purpose of the document

This document is region-based and has the aim to depict an overall picture of the current state of the ports and harbors within a given territory, by presenting relevant information on the existing facilities and single port characteristics and services, on the basis of the data collected through the questionnaire provided under WP5¹. Each document is regionally based so each individual region gets appropriate attention when describing their initial status. The content of this regional report is extracted and fragmented, so the partner is able to provide a document which consists of a full set of data on ports and harbors under the management of county port authorities inside of a region. The key is, after collecting the data from questionnaires present the baseline information on the existing facilities and individual port characteristics and services it provides.

Such information will then serve as to compose the overall puzzle drawing the detailed picture of the two coastlines of the Adriatic Sea, as well as representing a first source of information for ultimately filling the FRAMESPORT platform.

It has to be mentioned that this report in its statistics does not encompass privately held marinas (e.g., ACI Marina), but only ports of regional and local significance.

¹ https://ec.europa.eu/eusurvey/runner/IUAV_questionnario_framesport_servizi_porti

2. The region in a nutshell

2.1. Socio-economic description of the region/county

It is located in the central part of northern Dalmatia, and includes the most beautiful Croatian islands, historically and geographically the most valuable part of the Adriatic coast, and the vast, rocky Zagora. In the north of the county is the mountain Dinara with the eponymous highest mountain peak of the Republic of Croatia (1,831m), and in the south, far out to sea, the lighthouse Blitvenica. In the east there are Primošten vineyards in stone, Rogoznica, and in the west Murter and Kornati.

Figure 1 Šibenik - Knin County in regards to Republic of Croatia



Source 1 https://hr.wikipedia.org/wiki/%C5%A0ibensko-kninska_%C5%BEupanija

Šibenik-Knin County covers a total area of 5,670 square kilometers, of which the land area is 2,994 square kilometers in 5 cities: Šibenik, Knin, Vodice, Drniš, Skradin, and in 15 municipalities: Bilice, Biskupija, Civoljane, Ervenik, Kijevo, Kistanje, Murter-Kornati, Pirovac, Primošten, Promina, Rogoznica, Ružić, Tisno, Tribunj and Unešić, according to the 2011 census, have 109,375 inhabitants. The area of the county is physically separated into two parts by the deeply incised canyon of the rivers Krka and Čikola, as well as by Prukljansko Lake and the Šibenik Channel

At the same time, the Krka River is the link that has always integrated a part of the area of northern and central Dalmatia into a unique part - the Šibenik area. For the Šibenik-Knin County, the Krka River has a special significance, both because of the water supply and hydropower potential, and because of its natural and tourist attractiveness.

According to the geographical position, the area of Šibenik-Knin County represents a specific and complex natural entirety, and according to the relief, climatic, vegetation, demographic, social, cultural and economic characteristics, the island area, the Zagorje area with Drniš and Knin while

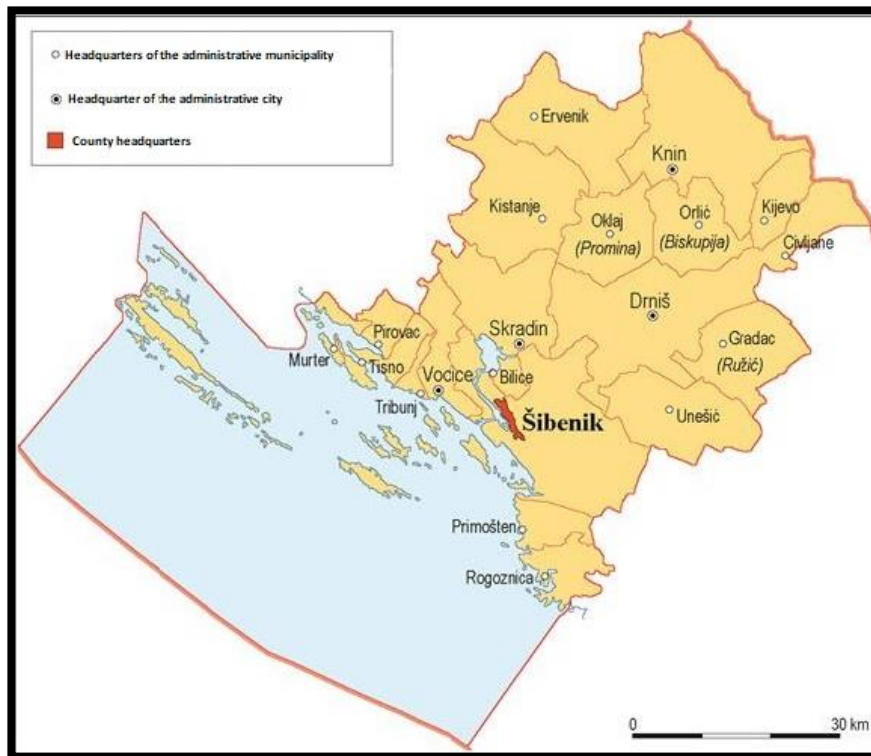
the coastal area with the city of Šibenik stand out and represent the cultural and administrative center of the county.

The coast is very indented with numerous bays and harbors comprising of 285 islands, islets and reefs, of which seven are permanently inhabited islands. The Kornati group of islands stands out the most in terms of number and picturesqueness. The air length of the coast is 56.2 km, and the actual 805.9 km. The city of Šibenik with 51,553 inhabitants (according to the 2011 census) is the seat of the county. Šibenik stands out for its unique position on the slopes of the hills on the north side of the picturesque and spacious bay at the mouth of the river Krka, which is the channel of St. Anne connected to the sea.

Šibenik is first mentioned under its present name in 1066 in the charter of King Petar Krešimir IV, which is why it is called Krešimir's city. Šibenik was founded by Croats more than a thousand years ago, so it is the oldest native Croatian town on the eastern Adriatic coast.

In Šibenik-Knin County there are two national parks NP Krka and NP Kornati, rivers Krka, Čikola, Krčić, Cetina, Orašnica, Kosovčica, Butižnica, lakes Visovačko, Pukljansko, Golubičko, Bjelober, Torak, Šarena jezera (Borum), Bobodolsko, Zmajev and Vrana Lake, which makes the county especially attractive for tourism development.

Figure 2 Šibenik - Knin County Territory



Source 2 <https://proleksis.lzmk.hr/6367/>

Krka National Park encompasses the area along the river Krka, which springs northeast of Knin, flows through a deep and picturesque canyon, 75 km long; forms side waterfalls-Krčić, Risnjak, Miljacka, Roški slap (26 m high) and the famous Skradinski buk (Krka waterfalls 46 m), which is the largest travertine barrier in Europe. With its lower course, the river Krka flows through Lake Prukljansko, and flows into the 9 km long Šibenik Bay. Two cultural and historical monuments stand out in the Krka National Park: the Franciscan monastery on the island of Visovac and the Krka monastery, and in a number of picturesque settlements in the park area, the most interesting is Skradin, a town protected as a cultural monument.

Kornati National Park includes a group of 125 islands, islets and reefs, and they got their common name from the island of Kornati. Landscapes and panoramas are specific and unrepeatably, and numerous bays are ideal for any type of vessel owners. The wild beauty of the stone, the clear blue of the sea, the hidden coves, the unusual contrast of nature, and especially the world of silence, are a unique experience for visitors.

2.2. Regional transport and mobility overview and main features

The county center of Šibenik and other coastal towns are connected by the Adriatic Highway with the entire Croatian coast and the cities on it - Biograd na Moru and Zadar in the north, as well as Trogir, Split, Makarska and Dubrovnik in the south. Regional roads connect larger county centers in the inland direction, i.e., Šibenik and Knin with the border with BiH. In 2005, the completion of sections of the A1 motorway, popularly called Dalmatinska, from Karlovac to Split enabled an even faster connection of the county with the continental interior of the country, as well as with the southern part of Dalmatia.

The Šibenik railway is connected via Perković with other county centers - Drniš and Knin, as well as with the second largest city in Croatia - Split. Knin is the most important railway hub in Dalmatia, since it is connected to Zadar via Benkovac, via Gračac to Gospić, Karlovac and Zagreb, and via Bihać in Bosnia and Herzegovina to Sisak and Zagreb. The port of Šibenik represents an important connection of the county with other port centers of Croatia - Zadar and Rijeka in the north and Split and Dubrovnik in the south, as well as islands in the Šibenik archipelago. [62] There is no airport in the county, so air traffic to Zagreb and the rest of Europe and the world takes place via neighboring airports Split in Kaštela, 45 km from Šibenik and Zadar in Zemunik Donji, which is 50 km from Šibenik.

2.3. Overall governance and transport planning references

Šibenik-Knin County has an extremely important traffic position: it is connected by the Adriatic Highway with the coast, the main road to Knin and Bosnia and Herzegovina, and the highway to the interior of Croatia. There is a significant road and railway leading to Zagreb and Split. In maritime transport, the importance of the port of Šibenik should be emphasized, as well as ferry connections with Italy. Šibenik-Knin County has a good air connection with Zagreb and the world via the airport "Split" in Kaštela (45 km) and Zadar airport in Zemunik (50 km).

The economy of Šibenik-Knin County is focused on the activities of trade, tourism and construction, as well as on the activities of the processing industry as the most important economic branch. In addition to the leading aluminum industry in the county, there is a shipbuilding and construction materials industry, and larger capacities have been built to finalize mineral products.

The opening of economic zones in all cities in the county, and especially the economic zone "PODI", which was declared an economic zone of county importance, enabled faster development of the economy and thus increase the number of employees. Apart from the Podi zone, the most important business zones are in the Drniš area: the Drniš zone and the Radonoć zone, in the area of

the City of Skradin: The Kosa economic zone, the Preparandija business zone in the Knin area and the Čista economic zone in the area of the City of Vodice. counties designated as a zone of county importance.

The development of tourism is extremely important for the economy of Šibenik-Knin County. The tourist offer is still focused on the coastal belt, where over 5 million overnight stays are realized annually and about 822,000 tourists stay. Investments in tourist facilities in the hinterland, which has great tourist potential, will certainly enable the development of new forms of rural tourism. Amendments to the spatial plan of Šibenik-Knin County have opened the possibility of investing in new accommodation facilities. Accommodation capacities in the Šibenik-Knin County are over 8,000 beds in hotels, over 40,000 beds in private accommodation, over 13,000 in camps and more than 3,000 berths in 12 marinas.

Investments in wineries and the construction of oil mills have intensified the planting of new vineyards and olive groves. The main wine-growing areas are Pirovac-Skradin-Šibenik, Knin, Drniš-Promina and Primošten. The already prepared Study "Irrigation Plan" will certainly give a new impetus to the development of traditional agricultural production (fruits, vegetables). In addition to the mentioned agricultural products, Šibenik-Knin County has become recognizable for the production of prosciutto, cheese and shellfish.

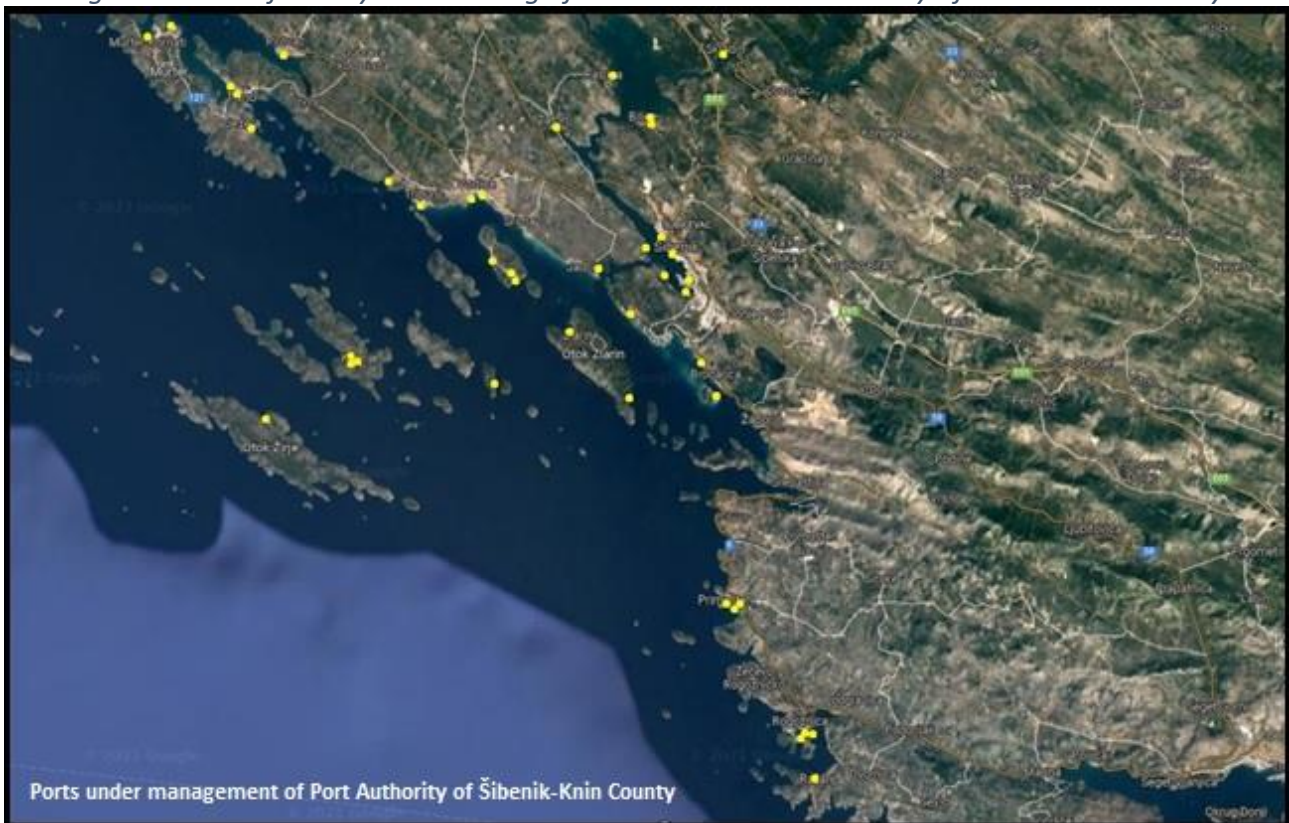
The two national parks and the tourist orientation are the reason why the Šibenik-Knin County places a lot of emphasis on environmental protection and was among the first to develop a Waste Management Plan, and systematic work is being done to protect the Krka River.

Thanks to its good geostrategic position, significant investments in economic and transport infrastructure, Šibenik-Knin County is an attractive location for investments by domestic and foreign investors.

3. Analysis of regional ports phenomenon

3.1. Overall description of available infrastructures (position, visualisation, berth details and capacities, hinterland connection)

Figure 3 Ports of county and local significance under Port Authority of Šibenik-Knin county



Source 3 Google Maps

Technical data relating to connections with the hinterland:

Port Authority of Šibenik – Knin County has 43 ports and harbours across the county, ranging from well known ports to lonely coves and anchorages providing shelters and safe havens for nautical clientele looking to spend their time in Croatian ports. With a little bit over 2500 ports and harbours (excluding privately owned marinas such as ACI), Šibenik – Knin county port expands and upgrades their nautical offer in a manner that puts them on a map with other touristic hotspots.

Near the town of Šibenik, located at the mouth of the river Krka, numerous islands can be found, the biggest of which are Zlarin, Prvić, Kakan, Kaprije and Žirje. Mooring in the berths of small island

towns presents an ideal occasion of ensuring safety for the vessel while having the opportunity for enjoying an evening walk among the stone streets with a range of possibilities of swimming and relaxing in numerous coves and secluded bays.

Apart from being close, protected from harsh weather conditions and full of beautiful scenery, these islands also offer various activities, such as visiting the museum of the Croatian inventor Faust Vrančić in Prvić Luka, one of the most interesting museums on Croatian islands.

However, when one is departing from Šibenik, it offers the ideal chance to visit one of the most visited protected areas in Croatia, the Krka National Park where many sailors choose to stay in the town of Skradin on their journey. It is also possible to visit the famous Krka waterfalls created by the river flowing into the sea one needs to sail through the impressive river canyon and then take a National Park boat ride departing from Skradin.

A visit to the waterfalls can be perfectly timed with a visit to Šibenik, the oldest native Croatian town on the coast, surrounded by four fortresses, with the Cathedral of St. James inscribed on the UNESCO World Heritage List and an enchanting old town.

After Šibenik, possibilities are endless but most local would suggest visiting Kornati, another national park of surreal beauty. In this archipelago you can spend a good part of your vacation. Kornati islands are a magnet for visitors, and the numerous coves with crystal-clear blue seas fit well in the overall wondrous seascape. If the weather conditions are favorable, it is highly recommended to spend the night in the protected coves of the National Park.

After staying on Kornati, and on the way back to Šibenik, it is also possible to take the other route back via the strait Proversa where it is possible to have the chance to sail around the northern side of the Veliki Kornat island, alongside the island of Žut, and enter into new waters. If the weather conditions allow it, a great idea can be taking a swim at the islet Tetovišnjak Mali, located 9 miles southwest from the entrance of the Šibenik channel. It has beautiful beaches on the southern and northern sides. This is a natural oasis perfect for enjoying the sea, with the popular Tijaščica cove as its "rival", offering the final touch of nature on the entertaining route full of activities.

Figure 4 Ports under management of PA of ŠKC with number of berths

1. Port of Šibenik	63 berths	8. Krapanj port	44 berths	18. Skradin port	31 berths
Duboka cove	0 berths	9. Murter port	270 berths	19. Tisno port next to the bridge	2 berths
Martinska cove	4 berths	10. Obonjan port	1 berth	Tisno pier and new area	86 berths
Tef cove	1 berth	11. Pirovac port	142 berths	20. Tribunj port	174 berths
Sveti Petar cove	10 berths	12. Primošten port - old harbour	45 berths	Sovlje harbour	50 berths
Vrnaža cove	650 berths	Primošten anchorage	17 berths	21. Vodice small port	154 berths
2. Betina port	2 berths	Primošten ferry port	20 berths	Vodice - Stražara port	200 berths
3. Brodarica port	7 berths	13. Prvić port	27 berths	22. Zablacé port	4 berths
4. Bilice port (construction in progress)	0 berths	Prvić anchorage	10 berths	23. Zaton port	30 berths
Bilice anchorage	4 berths	14. Prvić Šepurine port	72 berths	24. Zlarin port	34 berths
5. Jadrija port	17 berths	15. Raslina port	15 berths	Zlarin anchorage	12 berths
6. Jezera port	18 berths	16. Ražanj port	2 berths	Zlarin Boci (construction in progress)	0 berths
7. Kaprije port	93 berths	17. Rogoznica port	117 berths	25. Žirje port	51 berths
Kaprije anchorage	18 berths	Rogoznica fishing port	5 berths		
Kaprije ferry port (construction in progress)	0 berths	Rogoznica anchorage	16 berths		

Figure 5 Port Authority of Šibenik - Knin County - General information on port areas

Port Authority of Šibenik - Knin County	Maximum vessel length in meters	Minimal seabed depth in meters	Maximal draught in meters on berths	Total port area in square meters
1. Port of Šibenik	100	2	1,8	144548
Duboka cove	40	7	6,8	52199
Martinska cove	40	5	4,8	4825
Tef cove	100	10	9,8	17904
Sveti Petar cove	50	3	2,8	11100
Vrnaža cove	50	4	3,8	97391
2. Betina port	20	4	3,8	863
3. Brodarica port	20	3	2,8	56256
4. Bilice port (construction in progress)	100	3	2,8	122104
Bilice anchorage	20	15	14,8	1704
5. Jadrija port	15	2	1,8	1385
6. Jezera port	40	1	0,8	1774
7. Kaprije port	50	2	1,8	21723
Kaprije anchorage	100	20	19,8	18128
Kaprije ferry port (construction in progress)	50	5	4,8	19955
8. Krpanj port	30	1,5	1,3	6036
9. Murter port	50	1,5	1,3	58654
10. Obonjan port	50	2	1,8	3109
11. Pirovac port	50	2	1,8	13076
12. Primošten port - old harbour	100	2	1,8	3154
Primošten anchorage	0	15	14,8	6359
Primošten ferry port	20	4	3,8	29175
13. Prvić port	20	2	1,8	5634
Prvić anchorage	40	15	14,8	11447
14. Prvić Šepurine port	20	1	0,8	42212
15. Raslina port	50	2	1,8	2631
16. Ražanj port	50	5	4,8	1166
17. Rogoznica port	50	2	1,8	11104
Rogoznica fishing port	30	5	4,8	3870
Rogoznica anchorage	50	15	14,8	24300
18. Skradin port	50	1,5	1,3	3807
19. Tisno port next to the bridge	50	4	3,8	3545
Tisno pier and new area	50	2	1,8	18639
20. Tribunj port	15	2	1,8	35591
Šovlje harbour	50	2	1,8	8997
21. Vodice small port	50	2	1,8	28724
Vodice - Stražara port	15	1	0,8	12477
22. Zblaće port	15	5	4,8	1488
23. Zaton port	15	4	3,8	2385
24. Zlarin port	50	5	4,8	10019
Zlarin anchorage	100	20	19,8	15600
Zlarin Boci (construction in progress)	0	4	3,8	7932
25. Žirje port	50	5	4,8	12084

Informations and amenities in ports' vicinity

- Krka River

The area of the Krka National Park with its lakes and waterfalls is one of the most important natural monuments in Croatia. Its seat is located in Skradin. The Krka River is formed by several tributaries which merge at the town of Knin. It flows towards the sea through a distinctly dry karstic region. Its picturesque passage through a canyon and across limestone barriers creates a unique landscape. There are several small and a few large waterfalls on the Krka River. 9 km downstream from Knin lies the 20-m-high Bilušić Waterfall, followed by the 15-m-high Brljan, the 52-m-high Manojlovac, and the 25-m-high Roski slap. The Krka riverbed then widens into Lake Visovac, which was named after an island on the wider part of the river with a Franciscan monastery known for its collection of old manuscripts. The largest and most beautiful waterfall, Skradinski buk, is 46 m high and was created at the confluence of the Krka River and the Čikola tributary. On its course towards the sea, the Krka forms Lake Prukljan, which has all the characteristics of the sea, both in terms of its water level and its tidal flow. Both fresh-water and salt-water fish can be found in its waters. The transition between the Krka River and the sea is almost imperceptible. The river is navigable for boats with a draught of up to 2 m up to Skradinski buk. Around 1 km from Skradin, the river is spanned by a bridge 5 m above the surface.

- **Primošten Port**

A town with a port and tourist center in an exceptionally beautiful natural setting protected from northerly winds. It lies on a peninsula between the Raduča and Primošten Bays. The main economic activities are agriculture, wine growing, olive groves, fishing and tourism. There are large beaches in the bays. In front of Primošten lie several off-shore islets. The slopes in the background are covered with the famous Primošten vineyards. Primošten is one of the most picturesque small towns on the Adriatic and a very famous Dalmatian tourist center. The old town core is characterized by a network of narrow streets, and there are hotels and a marina to the north and the south. There is a naturist beach on the island of Smokvica. The summer months are marked by numerous traditional entertainment and cultural events. In the 16th century, the islet settlement was connected with the mainland by a bridge. The name Primošten is derived from the Croatian word »primostiti«, which means »to bridge«. It was surrounded by a wall with towers which were removed in the 19th century. Today, Primošten is connected with the mainland by a causeway. The Church of sv. Juraj (St. George) from the 15th century was reconstructed in 1760. The local port is protected from northeasterly and northwesterly winds.

- **Skradin Port**

A settlement with a port on the right bank of the Krka River north of Šibenik. The main economic activities are agriculture, wine growing, gardening and tourism. The town is protected as a monument. The Krka National Park Office and the starting point for a tour of its attractions are located here. Organised tourism began to develop in 1960. The Illyrian settlement of Scardona once stood on the site of the present Skradin. In the Roman era it was a municipium and from the 6th century to 1830 the seat of a diocese. Skradin was destroyed by the Avars and the Slavs in 615, and plundered by the Turks in 1522. The remains of Venetian fortifications lie above the town.

- **Tribunj Port**

A large settlement west of Vodice. Its beautiful old part lies on an islet which is connected with the mainland by a stone bridge. There are beaches in the Rupa Bay and in the small bays west of the settlement. Tribunj was built in the 18th century by refugees from the neighbouring mainland settlements. Its main attractions are the Church of sv. Nikola (St. Nicholas) from 1452 and the remains of a medieval fortress. The port is exposed to the southerly wind. The bora is moderate. The port is accessible from the southeasterly direction. Small yachts can navigate between the islets of Lukovnik and Logorun. Small boats can berth on the western side of the bridge, while large boats can berth in a harbour in the southern part, where the sea is up to 3 m deep. Due to its two off-shore islands, the port is only exposed to southeasterly and westerly winds. There is a repair shop for small boats in the Sovlje Bay.

- **Vodice Port**

A settlement with a port and tourist centre in the northern part of the Šibenik Channel. The main economic activities are agriculture, fishing and tourism. There are a few picturesque beaches nearby. Vodice is particularly known for the culinary specialties that can be sampled in its numerous restaurants. The settlement was first mentioned in 1402. In the 16th century it was surrounded by a wall and defence towers. Part of the wall and a tower have been preserved. The Baroque parish church was built in 1749. The port is exposed to the bora, which is particularly strong in the winter. The jugo can also be strong and can raise the sea level. Berths are available on both sides of the knee-shaped breakwater at a depth of up to 4 m. In the summer, the beginning of the pier is used by numerous tourist ships and is best avoided. There is a fuel dock in the marina.

- **Kaprije Port**

An island in the Šibenik archipelago. Its highest point is Vela Glavica (129 m). The coast is very rugged and the interior is covered with vineyards and olive groves. There is a bathing area on the neighbouring island of Kakan. There are no cars, so the island is suitable for a peaceful vacation. During the season, the inhabitants of the neighbouring islands come to the settlement of Medoš in the north to tend to their fields. Refugees from the Turkish invasions began to settle the island in 1510.

- **Krapanj Port**

This islet in the southeastern part of the Šibenik Channel is the smallest and lowest (7 m) inhabited island on the Adriatic. A 3-m-wide strait separates it from the settlement of Brodarica the mainland. The inhabitants of the settlement of the same name engage in sponge diving and processing, which is a hundred year tradition here. Berths are available in two harbors; one is protected by a knee-shaped pier with a depth of up to 2.5 m, the other lies further north and has a depth of up to 1.5 m. When entering from the north, care must be taken to avoid a long shoal that stretches from the lighthouse to the islet. The harbour is exposed to all northerly winds.

- **Murter Port**

The island of Murter lies in the northwestern part of the Šibenik archipelago. It is separated from the mainland by the Murter Channel, which is spanned by a bridge at its narrowest part, at the settlement of Tisno. The highest point of the island is Raduč (125 m). The island has four settlements, Betina, Jezera, Murter and Tisno.

The oldest inhabitants were the Illyrians. In the Middle Ages, the island was called Srimac. There are numerous bays on the southwestern coast, including Kosirina which is a suitable anchorage for small boats, especially when the bora blows.

Betina - A well-known fishing village at the northern entrance to the Murter Channel. The settlement was established in the 1st century by refugees from the Turkish invasions. The Church of sv. Frane (St. Francis) was built in 1601 and later expanded several times. The Illyrian and later Roman settlement of Colentum once stood on the Gradina knoll. The medieval church has been preserved. Berths are available at the knee-shaped breakwater with a depth of 1.5 m. Parallel to the breakwater lies a pier which protects the inner harbour for small local boats. The depth of the sea at the pier is up to 1.8 m. Due to the strong ebb tide, sailboats should not berth here.

Ježera - A settlement with a port on a bay of the same name on the southeastern part of the island. The name Ježera (Lakes) originates from numerous ponds which appear in the karstic hollows after heavy rains. The settlement is protected by a breakwater which also protects the entire port. Behind the breakwater lies a marina with six piers. The only alternatives to the marina are a harbour on the northern coast or a knee-shaped pier with a depth of up to 3 m.

Murter town - A fishing town on the northwestern part of the island. The town has spread from the old core of Veliko Selo, which lies 500 m from the coast, to the wide Hramina Bay. Its inhabitants are the owners of most of the land on the Kornati islands. The Kornati National Park Office is located in Murter. Murter was first mentioned by its present name in 1715. In the 13th century, it was called Veliko Selo. The medieval Church of sv. Mihovil (St. Michael) was reconstructed in 1770. The hilltop Church of sv. Rok (St. Roch) was built in 1760. The Hramina Bay is always full of tourist and fishing boats. Space is hard to find even during the winter, so boats can only berth in the marina or anchor in the western part of the bay.

- **Prvić**

An island in the Šibenik archipelago with its highest point at 75m. It is separated from the mainland by the Šibenik Channel. The northeastern coast slopes gently, while the southwestern coast goes steeply towards the sea. In front of the southwesterly coast lie the islet of Lupac and the Galijola Reef. There are two settlements on the island, Prvić Luka and Prvić Šepurine. The beaches are picturesque and the sea is exceptionally clear. On the northern side of the island stands the Baroque summer villa the Draganić-Vrančić family, which contains several works of art.

Prvić Luka (port) - A settlement with a harbour. The Church and the Monastery of Our Lady of Mercy were built the 15th century, and the Franciscan monastery was built in 16th, but was reconstructed in 1884. A harbor is protected by a breakwater with a depth of up to 15 m, where a passenger ship occasionally lands. At the inner end the harbor lie a few piers which enclose an inner harbor with a depth of up to 2 m. Anchorage can be found in the middle the harbor behind the breakwater at a depth of around 4 m.

Prvić Šepurine - A picturesque settlement on the western coast of the island. The Church of sv. Jelena (St. Helen) from 1620 contains an elaborately decorated wooden altar. The harbor has a breakwater with a depth of up to 3 m and a pier with a depth of up to 2.5 m at the head, which protects the inner harbor. A passenger ship occasionally lands at the breakwater. The harbor is exposed to westerly winds.

- **Zlarin port**

An island in the Šibenik archipelago. The narrow Šibenik Channel separates it from the mainland. The highest point is Klepac (169 m). Arable land lies in a valley between two parallel ridges. There are no cars on the island. The only settlement on the island lies on the Luka Zlarin Bay and has a harbor and a sandy beach. There are several churches in the settlement, including the Parish Church of sv. Marija (St. Mary) from 1740, the Church of sv. Rok (St. Roch) from 1649, and the Church of Our Lady of Rašelj from the 15th century (reconstructed in 1714).

The harbor is protected by a large pier. Boats can berth at the outer side of the pier (not recommended in bad weather). The harbor is exposed to northwesterly winds. Berths include water and electricity hook-ups.

- **Žirje port**

An island in the western part of the Sibenik archipelago, which faces the open sea. The highest peak is Kapić (134 m). The coast is very rugged. Larger bays include Mikavica, Muna, Koromašna and Japlenišće in the northeast, and Nozdra vela, Nozdra mala, Tratinska, Kruševica, Stupica vela, Stupica mala and Kabal in the southwest.

Žirje town - The only settlement lies in the interior of the island. A road connects it with the Muna Bay, where there is a port for fishing boats. There are remains of an Early Byzantine fortress from the 6th century on the island.

Mikavica - A bay with a small pier with a depth of up to 2 m, a small enclosed harbour and an anchorage at depths between 8 and 12 m. It is exposed to northerly and northwesterly winds.

Muna - A bay with a breakwater, at the end of which lands the passenger ship, which frequently stays in the bay overnight. At the end of the bay lie a launch ramp and a small pier with a depth of 1.5 m. The bay is exposed to northwesterly winds.

Vela Stupica - There are many mooring buoys in front of the inn at the end of the bay which is exposed to southeasterly winds.

3.2. Overall description of available services for users (technical services, nautical services, waste collection, touristic services)

Port services are one of the essential mechanisms to ensure the proper execution of the different commercial activities taking place inside ports and harbors. Some of the main functions that will be covered in this paragraph include nautical and technical services, ecological aspect and touristic services.

As previously mentioned, services offered inside ports are mostly centralized, meaning that most services are being offered in the ports inside biggest cities, which is not odd as the most services require proximity of other related services.

The following paragraphs will consist of statistical information interpretation based on the data collected through dedicated FRAMESPORT questionnaires. Šibenik - Knin County consists of 43 ports of local and county significance ranging from ports in city centre, anchorage berths, buoys, berths in autocamps as well as ferry ports and small bays and coves on surrounding archipelago. Each port has an individual value which contributes the ultimate goal of providing and serving of nautical users while trying to maximize the offer and services.

3.2.1. Nautical technical services

The Port services are the provision activities needed to ensure the running of the Port, aimed at enabling the operations associated with maritime traffic to be carried out in conditions of safety, efficiency, regularity, continuity and non-discrimination.

Mooring and unmooring services - Its function is to pick up a vessel's mooring lines, take them and attach them to the elements arranged on the docks or moorings for this purpose, following the instructions of the vessel's captain, in the mooring sector designated by the Port Authority, and in the order and layout convenient for facilitating docking unmooring and undocking operations.

The unmooring service is understood as being the function whose aim is to detach the mooring lines of a vessel from the fixing elements to which it is moored, following the sequence and instructions provided by the captain and without affecting the conditions of the vessels moored next to it. Almost none of the ports and harbours within the Šibenik – Knin jurisdiction provide the service of mooring and unmooring of the incoming/departing vessels due to the sheer fact that ports are scattered all over the county and it wouldn't be economically profitable and mostly logic to ensure enough manpower to provide equal service.

Given the fact that a fair number of small harbours are located in remote places built solely of basic infrastructure needs and an economically tested thesis of more employees, it is physically not possible to provide a 24/7 service of mooring activities (100% of ports does not provide a 24/7 mooring service, but 100% of ports will manage to provide a mooring service to a berthing need in case of an emergency).

Presence of basic services in the port:

Table 7 Statistic representation of basic services in ports

Lowering and lifting of the vessel into the sea – 4.7%	Vessel storage space – 0%
Hull washing – 2.3%	Trailer for moving the vessel – 2.3%
Temporary storage space – 2.3%	Cranes (self-propelled, land) – 4.7%

Availability of boat repairing service/overhaul shipyard falls under the segment of high-end port level of equipment due to the fact that port has to ensure a large enough area for vessel manipulations with all the appropriate infrastructures and superstructure elements.

Table 8 Statistical representation of boat services/maintenance offer in ŠKC ports

Sales of technical products for vessels in shops and / or warehouses – 0%	Electrical services – 0%
Hull repair – 0%	Supervisor – 0%
Manufacture and repair of sails and awnings – 0%	Dry dock/Slipway – 0%
Sales of technical products for vessels (custom) – 0%	Electronic services – 0%
Upholstery services – 0%	Warehouse – 0%
Rope fitting and adjustment services – 0%	Plasticization of vessels / glass plastic – 0%
Marine engine service – 0%	Ship joinery – 0%

From the table above, it can be seen that the overall size and relatively small area on which the ports are built on are fairly constricting regarding the developmental needs. Weighted average corresponds to 0% meaning that the aforementioned services are not available in any port.

Percentages are defeating but they were not unexpected taking into the consideration that most of these ports are improvised and were built in a way to ensure a safe haven for vessels without spending too much of resources on anything other than basic needs. The main reason behind this table lays in a simple explanation where none of the shipyards belong to the port area (which was originally stated in the question). Port area is differently defined and only services with direct permissions (concessions) are able to conduct their business in direct port area, thus none of the listed activities can classify under port offer

Technical diver service – service providing the expert in sub-aquatic work who is not available under the statement where a diver is a part of the Port authority team, but when the emergency situation arises (slashed ropes/buoys, concrete weight at the bottom...), designated people exist and are able to intervene in any kind of situation within their domain and resolve the issue. Technically, when reflecting on the stated question, percentage-wise the answer would be 0%

Fire protection system on the berths – 4.7%

3.2.2. Ecological aspect

The greatest environmental effects of the small ports, according to the boaters, concern fuel and different types of waste, such as litter, septic tanks emissions, toxic antifouling paints and grey waters from boats. Too few places to empty septic tanks, or tanks being out of order, increases the risk of boaters emptying tanks into the sea. Due to ongoing incremental of eco-friendly movements, ports should also be able to follow trends to improve their offer and business overall. Interesting idea suggests ports could use recyclable and environmentally friendly products and maybe even provide ideas on how boaters could act more environmentally friendly.

Overall ecological impact could be decreased in couple of different ways:

- Taking better care of the waste management infrastructure (emptying containers regularly, locating them close to the ports and enabling waste sorting),
- Better maintenance of shore pump-out stations (checking and repairing them regularly, providing proper instructions on how to use them and ensuring sufficient shore pump-out stations that are safe and easy to use),
- Generally increasing boaters' environmental consciousness
- Limitation of single-use plastic items and favor the use of more sustainable materials
- Marking visitors' berths better, to make them easier for boaters to find.

Table 9 Statistical representation of ecological aspect in ŠKC ports and harbors

Presence of a port wastewater monitoring system – 2.3%	Presence of desalination equipment – 0%
Presence of a separate waste collection system in the port – 0%	Presence of air purification system in the shipyard (within the port) – 0%
Presence of a sewage treatment plant in the port – 2.3%	Presence of water purification plant inside the shipyard – 0%
Presence of ecological tanks for collecting waste oils and wastewater – 2.3%	Level of environmental education and activities promoted for users and staff – 100%
Presence of a proper battery disposal service – 0%	Level of promotion of sustainable modes of transport – 0%
Existence of Environmental Management System Certification (renewable annually) – 0%	Fuel distribution centers/Pump out stations – 4.7%

3.2.3. Touristic services

Touristic services can be defined as an overall offer to port's end users enriching the existing offer beyond basic needs. Tourist services encompass the whole array of fields in which costumers search for individual satisfaction which in turns affects the entire perception of available ports.

Welcoming tourists in their own language carries a certain dose of respect and welcoming feeling. Šibenik – Knin county throughout the history wasn't under the Italian (Venetian) influence like Istria, Primorje – Gorski Kotar and Dubrovnik – Neretva County, resulting in a slightly lower presence of Italian speaking population but nonetheless, employees working with a mostly nautical guests learned the language and most of them actively uses it.

Knowledge of Italian and English is at **100%** in ports and harbors all over the Šibenik – Knin County. Slovenian and German are following with above average percentage because of the proclivity of tourist arrivals from these countries.

Sport fields and facilities also play a huge role in enrichment of tourist offer. Cities in Šibenik – Knin County are fairly developed in terms of cultural events and infrastructural needs, but ports are mostly in secluded places, sometimes even a bit harder to reach for by land, thus, are consequently slightly “under-equipped”. By no means that alludes those ports are struggling to find its end users

but exactly opposite, people are running away from crowded places to those a bit more secluded. Similarly, to the answer mentioned few paragraphs above, when the questions are phrased in a way that it is aimed at marinas (which are not subject of this report) it is not unusual to find out that none of the ports has any kind of amenities mentioned. In the category of sea sports activities (wind surfing, sport clubs, sailing schools and diving schools) none of these activities exist within the port's areas. These kind of experience and knowledge enhancing activities often exist in a vicinity but are not a port's subject, but rather an entity for itself (most often – concessions). Other sport facilities are rather rare due to the fact that most of these ports are secluded and detached from urban centers. Only Betina port has a soccer field in a 1-kilometer range, meaning that only 2.3% of ports have a soccer field in a vicinity and other facilities such as tennis court, pool, riding ranges, golf courses and gym facilities all exist but not within a 1-kilometer mark.

Wellness facilities are an essential accessory in modern day's world with the ever-rising demand for various forms of SPA and beauty centers. Only few percent (2.3%) of Šibenik – Knin County ports have at least one of the forms (SPA center, health resort, medical center, beauty center, hair saloon or barber shop) of wellness facilities in their near vicinity.

Availability of port facilities for people with limited movement abilities is a big advantage as the social inclusion does not represent an obstacle when it comes to visiting ŠKC ports and harbors. Regarding the facilitation of accommodation to people with reduced mobility, almost none of the ports have some kinds of ramps, bridges or lifts to ease the movement of those whom it may concern.

To facilitate the movement on land, various modes vehicles for rent are available throughout ports and harbors. Quad vehicles are available in almost **0%** of ports, cars in **4.7%**, bikes also in **4.7%** of ports and motor bikes and electric scooters in **2.3%** of ports.

The following table summarizes the average distance from ports to important facilities such as police station and fire department. Presumably, this has to be one the biggest factors while choosing the port. Vicinity of these institutions provide an end-user with valuable information regarding the first steps after some kind of emergency ensures.

Proximity of other transport related facilities provide an average distance (from all of the ports -> institution/facility) to end users that might want to explore other options of travelling through Croatia while still being based in chosen port.

Table 10 Average distance (Šibenik – Knin County ports - facilities)

Train station	18.05 km
Airport	57.41 km
Bus station	17.49 km
Freeway	22.43 km
Police station / Fire department	9.56 km
Hospital / Medical service	9.63 km

As for pet-friendly facilities, it should be noted that they're not guaranteed in the harbors and ports included in this survey. On the contrary, most of the marinas (privately held or managed are not included into this survey) do so, thus underlining the opportunity to further investigate such aspects for marinas due to ever-increasing demand from end users with facilitation of accommodating their pets.

Catering facilities such as restaurants and coffee shops are a necessity within any kind of touristic hotspot. Most of the ports and harbors are in a walking distance from facilities like such, even though they do not technically belong to the port areas (concessions).

3.3. Overall information on annual traffic data (cargo/ro-ro/passengers/locals)

Annual traffic data inside this report encompasses number of dockings and number of passengers according to different categories and in comparison with previous years.

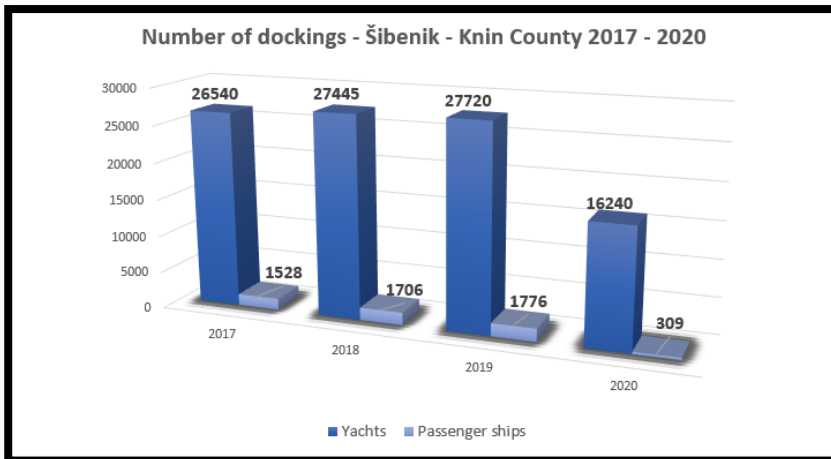
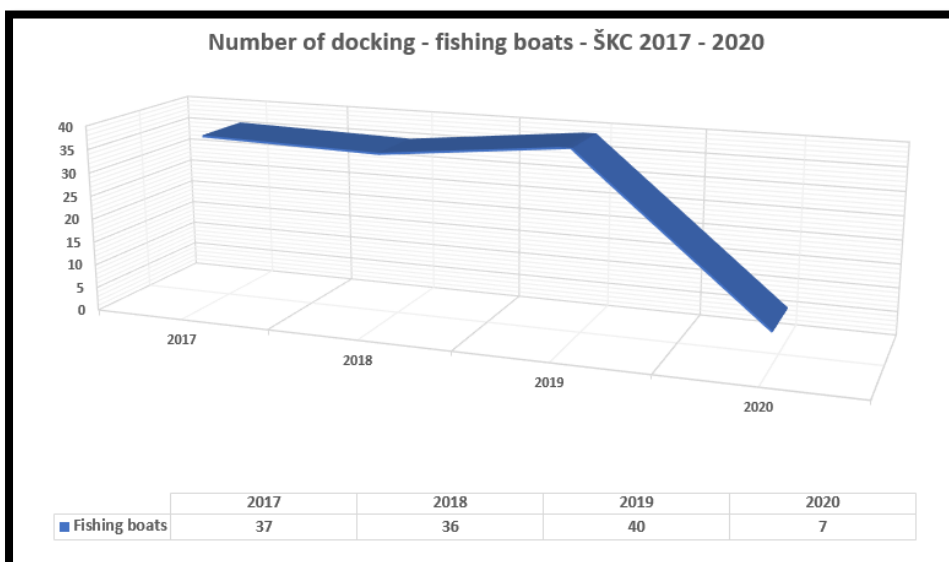


Figure 6 Number of docking - ŠKC 2017 - 2020

Number of dockings in terms of yacht as a category saw a back-to-back growth of few percentages over the years without the sign of stopping. It can be seen on a chart that a sharp 41.4% drop occurred following the restrictions during the pandemic 2020.

Even bigger chart deviation can be seen in the category of passenger ships where the number of passenger ship dockings in 2020 represented only 17.4% of dockings made in the previous year. The main reason were travelling restrictions and nescience of what the next logical step on a global level would be.

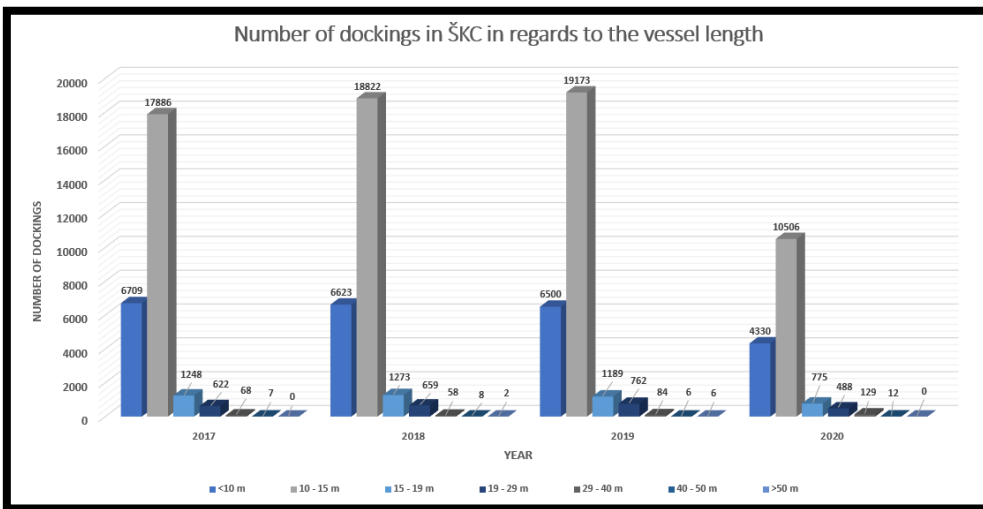
Figure 7 Dockings of fishing ships in ŠKC 2017 - 2020



The coronavirus disease 2019 (COVID-19) has brought a global socio-economic crisis to almost all sectors including the fishery. To limit the infection, governments adopted several containment measures. More specifically, in Italy, Croatia, and Slovenia,

multiple lockdown periods were imposed from March of 2020 all the way to June 2020, as well as in the Q3 and Q4 of the year during which many activities, including restaurants had to close or limit their business. All of this caused a strong reduction in seafood requests and consequently, a decrease in fishing activities. A decline of 82.5% occurred in that pandemic year leaving commercial and a lot of small-scale fishermen unable to predict where and when will their work-related activities be headed after this period

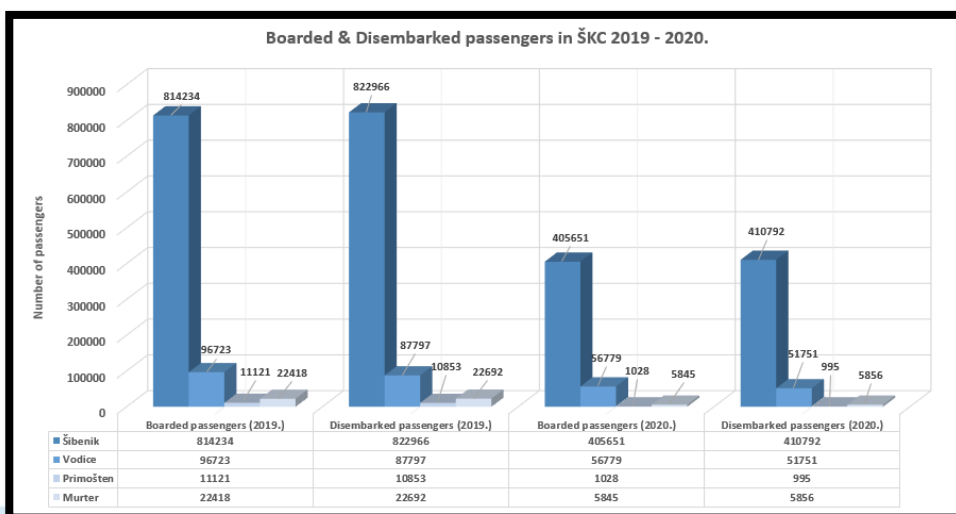
Figure 8 Number of docking in ŠKC according to vessel length categories



This category primarily represents smaller, pleasure craft vessels, but also reflects on mega-yachts. Even though 68% of vessels mentioned in this chart falls under the category 10-15 m, there was a general uptrend across all of

the categories which was abruptly ended in 2020. Interesting occurrence can be spotted with yachts from 30 – 50 m whose number grew pointing to the fact that most of the lower/middle class were more affected by the global situation than the top 1% who managed to overcome all of the border-crossing and financial obstacles. However, focusing on a macro scale across all the categories, drop of 41.5% ensued leaving a lot of damage repair to the following years.

Figure 9 Boarded and Disembarked passengers in ŠKC 2019 - 2020



The last chart represents number of boarded and disembarked passengers in Šibenik – Knin County in 2019 and 2020. 4 of the port authorities and

port offices provided the relevant documentation so it was possible to make this comparison. As it can be seen, number of boarded passengers went from 944496 in 2019 to 469303 which represents a downtrend of 50.3% in a single year, while the number of disembarked passengers was suffered a similar loss obviously. Following lines comprise a averages and their net growth/fall showed in percentages.

Šibenik -> - 50.13%

Vodice -> - 41.18%

Primošten -> - 90.79%

Murter -> - 74.06%

4. SWOT analysis on small ports phenomenon

<p>Strengths</p> <ul style="list-style-type: none"> • Natural beauty, clear sea, indented coast and numerous islands • Favorable climatic characteristics • Ecologically preserved landscape and underwater world • Strategic position • Traffic connection / accessibility • Supporting tourist infrastructure (service activities) • Hospitality • Educational structure of staff • Nautical infrastructure (nautical ports tourism) • Personal safety and safety of navigation • Possibility of expanding existing ports and harbors 	<p>Weaknesses</p> <ul style="list-style-type: none"> • Insufficient number of berths • Lack of berths for larger yachts • Content of the offer in marinas and level of service • Level of technical service in marinas • Seasonality of demand • Content of the destination offer and quality of services • Need for a more sustainable management and improvement of services for waste collection and water treatment • Inconsistency of legal regulations • Administrative barriers • Inadequate categorization of ports of nautical tourism • Lack of nautical development strategy • tourism
<p>Opportunities</p> <ul style="list-style-type: none"> • Opening new markets • Uptrends in tourism • ŠKC is becoming an increasingly popular tourist destination • Improving traffic accessibility • Adoption of a nautical development strategy tourism • Climatic conditions favorable for significant season extension • Increase in the quality of another tourist offer • Foreign investment 	<p>Threats</p> <ul style="list-style-type: none"> • Recession in the world market • Marine pollution • Reconstruction of the coast • Insufficient awareness of the need for protection of environment and biodiversity conservation • Inadequate legal and other regulations • World pandemic • Wide urbanization of natural beauty

For the purposes of analyzing the development of nautical tourism in Šibenik – Knin County, a research tool known was used called SWOT analysis. SWOT analysis, also known as situational analysis, is an intuitive method of examining and evaluating the internal (strengths and weaknesses)

and the external (opportunities and threats) of the environment or factors in the function of observing the condition and possible development of a particular phenomenon, in this case small port phenomenon.

The SWOT analysis presents a matrix of questions and answers related to factors that could affect the development and business result of ports. Such an analysis is carried out with a certain nautical tourism experts and managers, as well as coordinators and moderators. SWOT analysis is a tool that helps to identify, detect and identify key development factors, development potentials, and development constraints and as such is a key step from the analysis of the present status to think about the future, desired and possible, determining the development vision, strategic goals, measures and projects.

Competitive advantage can only be built on available potentials if these are rare and have no suitable substitutes among the competition. If the competitors are in know of that and they cannot imitate the advantage but rather have to focus on their external opportunities and neutralization of the threats. Because of the above fact, nowadays more and more attention is paid to intangible assets (knowledge and skills, technologies, patents, organization, reputation, etc.).

Nautical tourism ports still do not provide the required level of structure and the quality of the offer that boaters expect, especially compared to natural and ambient characteristics and benefits we're gifted with. Due to the lack of additional content, from the accommodation facility in the ports and sports fields to restaurants, nautical equipment shops, supermarkets, boat services, cranes, slipways, etc., the income of the ports is significantly smaller than which is possible, and its structure is unfavorable.

The biggest advantages are favorable natural features, i.e., a high degree of indentation of the coast, connectivity and complementarity of the island and coastal belt, the existing tourist infrastructure and capacities from other activities, as well as the benefits of locations for the construction of various types tourist ports and other nautical - tourist capacities. However, with all the above-mentioned advantages that nautical tourism has, there are also some shortcomings that need to be minimized in order to successfully compete in the global nautical market.

Some negative factors, respectively the shortcomings of nautical tourism and the limiting factors of its development are: seasonal character activities in nautical tourism, occupation of the sea and the coast, usurpation of the coast, sea pollution with oil and its derivatives, bacteriological pollution of

the sea by wastewater and substances, devastation of biological resources of the sea, pollution of the sea with various wastes and impurities and the destruction of fish and water resources.

5. Summary and conclusions

The aim of this regional report was to provide an overview of the current state of the north-dalmatian Port Authorities and port areas under their management thanks to the processing of data collected through the questionnaire filled by the county port authorities.

Though Šibenik – Knin County ports have one of the best predispositions for success due to favorable geolocation in the Mediterranean, as well as vicinity to neighboring states that share a similar view on the sector, even development is far out of the reach. Most of the small Adriatic ports belong to a category of “satellite ports”, meaning they serve a purpose as a temporary seclusion place, as some of the berths are improvised with homemade equipment. Some of them are illegally made and artificially prolonged so there isn’t any kind of structural cohesion between berthing piers.

It isn’t possible to make investments in all of the ports at once, thus, process of becoming sustainable and self-persevering is scheduled as a long-term goal.

As stated throughout the report, centralization seems to be the biggest obstacle that isn’t going away any time soon, as most of the content and tourist offer is concentrated in bigger cities (and ports). The natural flow of development would have to be in a form of an outflow when the levels of overcapacity hit in bigger ports. This has been proven as correct in the years before the COVID-19 pandemic. North - dalmatian ports started to achieve peak numbers in docking and passengers, and in that point of culmination, every available place that remotely resembled a berth started to attract nautical clients.

These ports are one of the greatest assets to the Croatian tourism which desperately needs to be properly addressed and valued. Following trends and socially acceptable movements are key to achieve a first step towards becoming a sustainable port. As long as the trend before 2019 continues after the solution to pandemic is found, value will continue to be extracted from Croatian tourism beauties. Nautical tourism has an unlimited potential when it comes to future upgrades as the demand keeps growing.