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Greening the Blue Economy as an Incentive to Sustainable Development of Primorje-Gorski Kotar County

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ABSTRACT

Blue development and blue economy are relatively new terms, although blue economy has been developing for centuries. Its potential on European, Croatian or regional level is huge. New researches point out that the Blue Economy impact will double in next ten years. Although present in theory since 1990ties, blue economy in last few years as a part of the answer on the global challenges, has been followed by the aspects of Green Development, Green Economy Green Growth as synonyms for desirable and necessary transition towards sustainability. The definition of Green Economy in perspective of long-term sustainability, environment protection and reduced use of natural resources is defined as well. Recognizing the importance of blue-green economy for the Primorje-Gorski Kotar County (PGKC) development, the authors describe the potentials and possibilities for development of the region, as well as analyse natural and other preconditions and point out the reached level of blue-green economy innovative sectors. The purpose of this research is to explain the importance of coastal area as a basic determinant for the blue-green economy as well as to analyze the development level of the blue-green economy in European Union, Croatia and PGKC. This paper determined the spatial, geographical, technical-technological and economical potential of PGKC, defined the regional advantages, peculiarities and limits of the blue-green economy implementation in PGKC and set the recommendations for the balanced development and maximal use of extensive regional potential.

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1 Introduction

The seas and oceans are strong drivers of the economy and have great potential for innovation and growth. In addition to the traditional exploitation of living resources (fisheries, aquaculture and the processing sector), the seas and oceans can offer important sources of economic development, and this is especially important for coastal communities. Along with the blue economy, the green economy is increasingly mentioned, as a logical continuation towards sustainability. There is a process of "greening" the blue economy which in practice means respecting the postulates of the green economy – reducing the pressure of the economic system of a particular area on its environment while contributing to solving complex global climate and environmental problems on the local (or regional) level. Croatia has not yet recognized the importance of the blue-green economy and the importance of investing in activities that are directly and indirectly related, which is particularly reflected in coastal regions.

The Primorje-Gorski Kotar County (PGKC) is developing a number of activities related to the blue-green economy, but still insuficiently. Investments in innovative sectors such as biotechnology as well as in selective forms of tourism are still unsatisfactory. Along the blue sectors, the necessity of "going green" is evident, bringing multiple benefits. For example, with increasing energy efficiency and the use of renewable energy sources in the service and manufacturing sectors, it is possible to reduce the consumption of supplied energy, and thus reduce operating costs, which is only one of many benefits of the blue and green interwining.

This paper analyzes the sectors of the blue and green economy based on data collected from primary and secondary sources. Therefore, the term and the theoretical

background of the blue-green economy and their distinctions will be desribed in this paper, following by the statistical overview and valorization of the implementation of the blue-green economy in the European Union, Croatia and PGKC. This paper is focused on interpreting the data on the state of play of blue-green economy implementation in PGKC in order to deliver the recommendations for improvement of the blue-green economy on the regional level in order to boost the maximum use of regional advantages. Difficulties in obtaining relevant data arise from differences in presentation and their overlaping, as well as the obvious lack of uniform indicators, especially in the field of green economy. Consequently, standardized data from Structural Business Statistics (SBS) compiled by Eurostat and analayzed by the European Commission, national statistics, data Croatian Financial Agency – FINA and its Info.Biz database. Data from the Data Collection Framework (DCF) for primary sectors (fisheries and aquaculture) were also analyzed. Analyzes for all other established sectors are based on Eurostat data from structural business statistics (SBS), PRODCOM, national accounts and tourism statistics. For the purposes of the analysis, current European strategic and action plans, scientific and professional papers, studies and reports were also used.

2 Theoretical determinants of the Blue-Green Economy

The concept of the blue economy is not unambiguous, it stems from the fact that the blue economy consists of both the established and emerging sectors and economic values based on natural capital and non-market goods and services. The Blue economy encompasses all sectoral and cross-sectoral economic activities related to the oceans, seas and coasts. In their research, the authors (Eikeset et al., 2018) explain the basic concepts of blue growth in the context of sustainable development of the marine environment. They especially refer to the role of stakeholders and point to the potentials and importance of blue growth. The blue economy is closely linked to blue growth, which is a long-term strategy to support the sustainable growth of the maritime and maritime sectors. According to the authors (Soma et al., 2018), the EU has launched the concept of Blue Growth as a strategy to stimulate economic growth in European seas. In addition to the basic principles of the green growth paradigm, the aim is to encourage smart, sustainable and inclusive growth of economic activities. Blue growth is not only creating business opportunities, but also creaties new jobs in sectors such as fisheries and aquaculture. Some of the priorities are:

- efficient use of resources in fisheries and encouraging the production and consumption of food from the sea;
- improve the business environment and strengthening the competitiveness of the maritime economy through institutional and infrastructural support;
- support for research, development and applied innovations in the maritime industry,
- investments in human resources development.

The term Green economy, although first used in 1989, became more present during the 2008 global economic crisis (Neusteurer, D., 2016). United Nations Environment Program (UNEP, 2011) defines the green economy as an economy that results in improved human well-being and social equality, with a significant reduction in environmental risks and further environmental degradation. According to Howard (2018), blue growth has a similar intention. It does not relate to the usual way of doing business with the goal to increase production, but looks at other social, environmental and economic aspects in a more integrated way. The same author further states that the concept of blue growth is based on national and international efforts to regulate fishing, disposal, development and other activities and, according to the author, relies on maritime law and agreements.

Blue growth means bringing everyone together (from institutions and Member States to regions and SME's) to meet existing challenges and ensure the most productive and sustainable use of what the seas and coastal areas offer. In addition to the traditional exploitation of living resources, a broad vision of the blue economy can can foster the local economies of Member States, especially for coastal communities.

The blue economy encompasses various sectors: maritime transport, port activities, shipbuilding and overhaul, fisheries and aquaculture, coastal tourism, mineral, oil and gas exploitation and emerging industries, such as ocean energy use and biotechnology. Individual sectors of the blue economy create significant indirect and induced economic effects. In doing so, the blue economy can be sustainable in a way that allows society to use values from the seas and oceans and coastal areas. However, this must be balanced with the long-term ability of the seas and oceans to withstand such activities through the application of sustainable practices.

At the same time, the definition of a green economy suggests that it is an economy that should generate increasing prosperity, while maintaining natural systems oriented towards human needs.

Historically, the trend has not been oriented towards green growth. Economic expansion has imposed demands on natural systems, both in terms of the amount of resources extracted or harvested and the amount of emissions and waste that the environment was expected to absorb and neutralize. The fact is that the above cannot be continued indefinitely. It is known that the environment has natural limits in relation to absorption, therefore it is necessary to redefine the terms growth and development that are often used as synonyms, although they denote different processes that usually occur simultaneously and run in parallel. Growth always signifies a shift in quantity, a quantitative change, while development is a new state to which one aspires, with its positive and negative meanings.

The importance of future sustainable growth is clearly demonstrated by the European Green Deal proposed by the European Commission (EC) in late 2019. The plan seeks to promote new development patterns, a development model to be applied by all European countries, which implies the transition of the entire economy towards such economic growth that will contribute to mitigating the negative effects of climate change and will not have a negative impact on the environment. The same green principles should be followed by the blue economy sectors so that the blue growth of coastal regions is not only economically but also ecologically sustainable. The United Nations Environment Program defines greening the blue economy as a model that contributes to social well-being and equality, while significantly reducing environmental risks and environmental threats and creating sustainable jobs that will contribute to the creation of lasting economic values and increased social equality (UNEP et al., 2012).

In his recent research, the author Striani (2020) provides an overview of the literature on the green- blue economy. The author points to the fact that the concept of the green economy has been given importance in past decade as a means of resolving the 2008 financial crisis. The author's considerations could be applicable also to the current crisis driven by a global health pandemic. Furthermore, the author emphasizes the need to develop green concepts as opposed to the economics of resource exploitation, and points to its limits. Moreover, Golden (2017) points out the blue and green potentials but at the same time emphasizes that blue development should not be overdimensioned or industrialized but directed towards sustainable green solutions that will benefit the community in the long run.

Today, more than half of the available fresh water is used and the highest quality soil resources are exploited. More and more pollutants and greenhouse gases are being emitted, waste created, risking to cross the critical ecological thresholds, leading to irreversible damage to ecosystems. When considering the demands placed on ecosystems, it is obvious that green growth is not just a desirable approach to economic development. This is the only way to sustain economic growth in the long run. The so-called *brown growth* that destroys natural systems cannot be justified by the obvious revenues and gains it offers. Ultimately, it will diminish progress in every sense. On the other hand, the goals of a green economy can meet the needs for food, transportation, energy, etc., in a sustainable and equitable way.

In September 2020, the European Commission presented a plan to reduce greenhouse gas emissions in the EU by at least 55% by 2030 compared to 1990 levels (COM [2020] 562 final), which represents an increase in the EU's climate ambitions, and includes the adoption of appropriate legislative proposals expected during 2021. The EU's exit from the current crisis caused by the coronavirus pandemic is intended to be supported by investments in the circular economy, clean technologies and green jobs.

3 Statistical overview of the Blue-Green Economy

In order to provide the overview on the state of play of blue-green economy, this chapter provides an overview of the indicators of the blue-green economy at the level of the EU and Croatia. The current state of play and development perspectivres are analyzed. The influence of blue-green effects on the development of society as a whole is questioned as well.

3.1 Valorization of the Blue-Green Economy in the European Union

According to the European Commission report in June 2019, the blue economy is growing constantly. With a turnover of 566 billion euros, the sector generates 174 billion euros of added value and creates jobs for almost 3.5 million people. It is projected to grow twice as fast as the rest of the economy by 2030, and for the EU that means a turnover of almost a trillion euros. The Blue Economy Report (European Commission, 2019) indicates progress in six established sectors, ie those that have traditionally contributed to the blue economy: extraction and commercialization of living marine resources, extraction of minerals, oil and gas (inanimate marine resources), maritime transport, port operations (ports, warehousing, infrastructure and suprastructure projects, port activities), shipbuilding and overhaul and coastal tourism. According to the data, the established sectors of the EU blue economy directly employed close to 5 million people and generated around 750 billion euros in turnover and 218 billion euros in gross value added in 2018 (Table 1).

Table 1 EU blue economy sectors, main indicators, 2018

Indicator	EU blue economy in 2018
Turnover	750 billion euros
Gross added value	218 billion euros
Profit	94 billion euros
Number of emplyees	5 million euros
Nett investments in material goods	14 billion euros
Net investment ratio	22%
Average annual salary	24.700 euro

Source: European Commission, 2020 https://blueindicators.ec.europa.eu/published-reports_en[1,2]

[1] Accessed on 6 October 2020.

[2] Note: Turnover is calculated as the product of turnover in each sector; can lead to double counting along the value chain. Nominal value, Direct impact only. Net investments do not include maritime transport and coastal tourism. The net investment ratio is defined as the net investment in GVA.

Innovative sectors of the blue economy, including some marine renewables i.e. ocean energy, floating solar and offshore hydrogen production, blue bioeconomy and biotechnology, marine minerals, desalination, defense and submarine cables, have significant potential. This is especially related to renewable energy sources, while the EU is the world leader with an installed capacity of 70% of global ocean energy (waves, and tides). Furthermore, the maritime defense sector generates more than 177.000 jobs, and within the blue bioeconomy sector, the turnover for the algae sector is estimated at over 350 million euros. Desalination is still a key sector for those countries that are more likely to suffer from water scarcity (e.g. Spain), not only as a consequence of climate change, even if there are important side effects (brine, energy consumption, etc.). These examples also show the interdependence of the blue economy sector and the green renewable energy sector, efficient energy management (European Commission, 2020.)

The blue economy is linked to many economic activities and its impact goes beyond the sectors mentioned above. It is embedded in the entire EU economy and is therefore heavily influenced by the circualr economy prinicple. In 2018, GDP at the EU-28 level is estimated at 15.9 trillion euros (13,500 euros without the UK) and employment at 224 million people (194 million people without the UK). The contribution of the established sectors of the blue economy to the EU-28 economy in 2018 was 1.5% in relation to GVA and 2.2% in terms of employment.

The relative size of the EU blue economy in terms of GVA in relation to the economy as a whole is around 1.5% per year since 2012, while it has increased in terms of employment from 1.8% in 2015 to more than 2, 2% in 2018. Although data for the established EU blue economies are only available until 2018, given the relative stability of their share in the overall economy, it is expected that its level in 2019 was the same.

In last decade, especially since the end of the double recession in 2013 blue economy secors faced a positive trend. However, the outbreak of the coronavirus pandemic in February 2020 poses a major challenge to the global and EU economies, with serious socio-economic consequences. Despite a rapid and comprehensive policy response at both the EU and national levels, the EU economy is expected to experience a recession. This will significantly affect different sectors of the blue economy, and the recovery will depend not only on the development of the pandemic in the country, but also on the structure of its economy and its ability to respond to adequate public policies. Public policies are often more focused on issues such as employment, i.e. the creation of blue and green jobs, mainly due to their ability to produce politically desirable quickly visible results. But, in order to achieve environmental goals such as strengthening ecosystem resilience and achieving carbon neutrality, longer-term planning is required that generates costs while the results are visible much more slowly. Some European countries have adapted better than others, and their environmental and economic performance can be quantified and compared.

The Global Green Economy Index (GGEI) is the first green economy index, launched in 2010. GGEI is used to measure performance, identify areas in need of improvement, and display it to various stakeholders to promote development (Kovačić, Kerčević, Burić, 2021). According to Gavrić and Mitrović (2019) using four basic indicators (environmental tax by economic activities, material reuse, renewable energy in gross energy consumption and trade in recyclable raw materials) it is possible to calculate the GGEI of individual countries, and in their research they made a step further, comparing the correlation between the GGEI and the Global Competitiveness Index (GCI) and concluded that acting on the principles of the green economy leads to the strengthening of economic competitiveness. Environmental protection may not be the dominant factor in global performance, but it definitively the contributing factor. Comparing EU countries combining GGEI and GCI indexes, Germany, Sweden, the Netherlands, the United Kingdom, France, Austria, Finland, Denmark and Belgium stand out as positive examples. On the other hand, the countries that are in the initial phase of green economic development, and which also show a lower level of competitiveness are Croatia, Romania, Slovenia, Lithuania, Bulgaria, Poland, Greece, the Czech Republic and Portugal. Possible reasons for the poorer index include: inadequate green policies, infrastructure deficiencies, underdeveloped financial tools, insufficient use of renewable energy sources and the potential of the circular economy (Kovačić, Kerčević, Burić, 2021).

Market production of ecological products and services has been proven to generate an increasing number of full-time jobs, and employment in the environmental economy is mainly related to waste management, production renewable energy sources and heat and energy saving measures. The term green is therefore used to describe a wide range of jobs, processes, products and services related to the field of energy, sustainability and environmental protection. Still, in terms of green jobs, uniform definition and categorization, as well as standardized numerical data at Member State level that could give a more accurate picture of the contribution of the green sector is still missing.

3.2 Valorisation of the Blue-Green Economy in Croatia

The contribution of the Croatian blue economy sector to the country's economy and overall and EU economy is increasing. The Blue Economy in Croatia employs a total of 144,165 people and generates about 3.1 billion euro in GVA. According to The EU Blue Economy Report 2020 (European Commission, 2020), the coastal tourism sector dominates and provides 75% of jobs and 80% of GVA in 2017. Most of the turnover was generated through accommodation, other consumption and transport.

Fishing, as well as marine aquaculture, also have an upward trend, with emphasis on the size of the fishing fleet, which lags significantly behind other Mediterranean countries. Marine aquaculture generated 133 million euros in 2017. All segments of fish processing and distribution also recorded a growth trend compared to 2009, which enable to provide long-term review of the growth rates. The analysed period include the time of global economic and financial crisis, which in 2009 was not as much significant as in following years, especially in tourism sector (mostly in terms of tourist visits and nights), one of the dominant economic activity in the region.

Retail sales recorded 15 million euros in turnover and 13.000 euros in GVA per employee. Fish processing and canning in 2017 had a turnover of 97 million euros. Extraction of inanimate marine resources, minerals, oil and gas is stagnating, while the handling of gravel and sand and the digging of clay and kaolite recorded a slight increase in the number of employees 1.0 in 2009 to 1.4 thousand employees in 2017. Revenue growth is also visible here, amounting to 99 million euros in 2017.

Maritime transport (sea and coastal) recorded an increase in passenger transport, which is closely related to the increase in tourist arrivals. Revenues generated in 2017 were 164 million euros, which is almost 35% more than in 2009. Maritime coastal freight transport is declining by over 30%. Inland waterway transport, although Croatia has navigable rivers, is also declining.

Traffic in Croatian ports open to public transport of special (international) importance, namely in: Rijeka, Ploče, Zadar, Šibenik, Split and Dubrovnik, although significantly behind the traffic of the most important ports in the EU, in terms of employment (there is a decline in the number of employees), shows signs of recovery. This is especially evident in the segment of cargo handling and warehousing. The turnover of goods in 2017 amounted to 8 million euros, which is a slight increase compared to the turnover of 7 million euros in 2009. There is also a decline in service activities and investment in infrastructure projects. The importance of adaptations to new technologies in shipping and technical-technological solutions, in terms of port infrastructure as well as the superstructure that can accommodate suitable ships, should be emphasized here. It is precisely those projects that need to be the drivers, given the very strong competition of the surrounding ports, especially the ports of the North Adriatic. The fact is that the geographical traffic position is not enough on its own without adequate infrastructure and significant investments.

Shipbuilding and overhaul have always been of great importance in the national economy, but today, due to various objective and subjective reasons, Croatian shipbuilding is declining. Shipbuilding recorded a significant decline in revenues, which in 2017 amounted to 295 million euros, while in 2009 as much as 755 million euros was realized. Small shipbuilding also records a negative trend in all segments, number of employees and GVA. Overhaul, repair and maintenance of ships and boats recorded a recovery, and the production of various marine equipment increased slightly, but the production of machinery and other marine equipment recorded negative trends. Overall, the blue economy contributes to the Croatian national economy 6.4% in terms of GVA and 9% in terms of jobs. GVA in Croatia based on the blue economy increased by 31% compared to 2009 due to coastal tourism and the sector of living marine resources and port transport (European Commission, 2020).

Innovative sectors such as biotechnology and the use of renewable energy sources (wind and solar energy, waves, tides) are still not sufficiently recognized. The problem is also in the unavailability of appropriate data. However, despite the abovementioned, it should be noted that there are scientific and other institutes that deal with research, which can certainly affect the innovations that should guide the further development of the blue economy in Croatia.

On the other hand, there is no completely uniform position at European nor national level on the scope of the green sector. In one of the more recent studies (Bačić et al., 2020), after analyzing the National Clasification of Activities (NKD 2007) at the lowest level of classification, i.e. at the class level, about forty activities in the field of energy and waste management, transport, buildings and infrastructure, as well as water management were selected to constitute the Green Technology, Energy and Waste Management sector. The results of the analysis show that this sector employs 5.2% of total employees in Croatia and participates with 5.7% in the total number of entrepreneurs, of which 5,667 were profitable and make up 6.2% of successful entrepreneurs. Total of 991 entrepreneurs are investors in the sector and account for 7.6% of Croatia. The number of exporters is 5.4%. The sector employs a total of 51.125 employees in 7.912 SME's. Further analysis of the indicators showed that the sector of Green Technology, Energy and Waste Management participates in the Croatian economy with 4.4% of revenues and generates a profit of 5.9%. Observing the trends, the same authors state that in the period from 2015 to 2019, the number of entrepreneurs in the sector in question increased, and thus the number of employees. Also, the number of exporters is growing, but also the number of importers.

As already pointed out, compared to other EU countries, Croatia's position towards the GGEI has not been significant so far. Croatia was in the group of countries with a low GGEI index and consequently low competitiveness. In the new EU Multiannual Financial Framework 2021-2027, Croatia was allocated more that 12 billion euros of the European Structural and Investment Funds as a strong and additional lever for economic development, and almost 10 billion euros in the framework of the Recovery and Resilience Facility as a part of the Next Generation EU Plan[3]. The allocated financial resources are twice the

[3] URL: https://vlada.gov.hr/vijesti/hrvatskoj-na-raspolaganju-22-milijarde-eura-europskih-sredstava-kao-snazna-i-dodatna-poluga-za-gospodarski-razvoj/30041, accessed on 15 April 2021

amount available in the previous period. According to the European Commission, the minimum of 37% of all investments should contirbute to green transition goal until 2026. This amount should be spent on green projects in compliance with the postulates of the circular economy, but the question is how to prove the positive impact of such investment on national GDP and employment rate, as well to prove the necessity of a such national policy goals in order to absorb the EU funds?

The authors (Denona Bogović et al, 2020) analyzed the possible effects of transition on the green economy for the Croatian economy. Economic indicators such as total number of employees, GDP and gross investment, but also environmental indicators, values of pollutant emissions in wastewater and emissions of sulfur dioxide (SO2), carbon monoxide (CO) and nitrogen dioxide (NO2) were taken into account. Also, two hypotheses were set: that the size (amount) of investments affects the growth of GDP and employment, and that the same investments affect the above environmental indicators, and the data for the period from 1996 to 2017 were considered. It was concluded that the increase in investment has a positive impact on GDP and the employment rate, but also that it has a negative impact on the amount of harmful emissions. Future investments financed by EU grants will need to be energy efficient, with low or reduced negative environmental impacts, with as few harmful emissions and negative effects on the climate as possible. In the previous Multianual Financial Framework, according to the European Commission, Croatia fully absorbed 45% of available allocated financial resources (Kovačić, Kerčević, Burić, 2021). Assuming that we will be more successful in the coming period and use 50-80% of available funds, the results of the analysis predict growth of 4.5% of GDP and 1% employment rate in a more pessimistic scenario, ie 7.1% of GDP and 1.5 % employment rate in the optimistic scenario (Denona Bogović et al, 2020).

Croatia faces the challenge of planning, developing green projects and taking advantage of the incentives offered for the most successful transition to a green economy, and for the benefit of various economic sectors and society in general. Given the available financial resources, this is a really crucial period which, if the funds are invested wisely, can significantly contribute to the blue-green development, but also, in the opposite scenario, can be a significant missed opportunity for a generational step forward.

4 Materials and methods

The methodological approach includes the presentation of the characteristics of Primorje-Gorski Kotar County (PGKC) in order to determine the natural resources, geographical position and technical and technological prerequisites for development. Individual sectors of the blue and green economy are analyzed and explained, and developmental blue-green measures are determined.

4.1 State of play analysis of the Blue-Green Economy in Primorje-Gorski Kotar County

Primorje-Gorski Kotar County (PGKC), is one of the seven Adriatic counties that covers a total area of 7.931 km^2 and 1.065 km of coastline. The coastal part of PGKC is dominated by the Kvarner Bay with the largest Croatian port, the port of Rijeka. According to the 2011 Census (Croatian Bureau of Statistics, 2011), the County has 296.195 inhabitants, while in 2018 the number of inhabitants was decreased to a total of 285.432 inhabitants. The area of PGKC is located near many EU destinations, but it is not well connected with the central parts of Croatia, as well as with neighboring western countries. Considering that this is an area that is in the function of tourism, it is the bussiest part of the Croatian coast. It is one of the most developed counties in Croatia. The potentials of PGKC have the characteristics as follows:

- natural (geographical, hydrographic and climatic conditions)
- distance / proximity to major EU centers / destinations
- population and development of the coastal area and islands
- industrial and cultural heritage
- strong maritime tradition and related maritime activities
- attractive elements of the coast as a starting point for the development of selective and other forms of tourism
- high levels of protection of the sea and coast
- technical-technological (project) teams
- scientific potential and other.

The blue economy of PGKC is one of the bearers and fundamental determinants of development. However, the level of development achieved and the economic effects do not provide adequate direct and indirect benefits. Insight into the table below indicates that the largest revenues in 2019 were generated in tourism, hotel accommodation, maritime and coastal passenger transport, as well as engineering and related technical consulting, followed by the construction of ships and floating facilities. The lowest revenues are generated by freshwater aquaculture, which is understandable considering the resources, and the production of ropes, nets and more. Fisheries and aquaculture are a very important sector for the development of PGKC, which includes 50 entrepreneurs, 2 of which are engaged in the processing and canning of fish, crustaceans and shellfish. Most entrepreneurs are related to sea fishing, as many as 42. The turnover in 2019 was 97.599.000 kuna, which is 5,6% less than in 2015. The sub-sector of mariculture, ie marine aquaculture, doubled its revenues from 2015, amounting to 254.450.000 kuna, but also the costs increased by 98,13%. Furthermore, there are significant increases in revenue in the field of goods warehouse (295,89%), ancillary activities for the extraction of oil and natural gas (158,86%) and subsector of “other accommodation” (150,21%).

Table 2 Overview of the number of entrepreneurs, revenues and expenditures in PGKC in 2015 and 2019

Activity		Number of entrepreneurs current period	Total income in thousands of kuna			Total expenditures in thousands of kunas		
		TOTAL	2015	2019	Index	2015	2019	Index
1.	Sea fishing	42	103.432	97.599	94,36	96.751	89.431	92,43
2.	Marine aquaculture	5	126.793	254.450	200,68	129.005	255.598	198,13
3.	Freshwater aquaculture	1	96	91	94,79	91	82	90,11
4.	Gravel and sand pantry activities; extraction of clay and kaolin	6	31.389	5.761	18,35	26.596	6.287	23,64
5.	Salt extraction	1	26.973	17.937	66,50	24.434	17.851	73,06
6.	Ancillary activities for the extraction of oil and natural gas	1	175	453	258,86	297	253	85,19
7.	Processing and canning of fish, crabs and shellfish	2	6.285	4.377	69,64	5.876	4.490	76,41
8.	Manufacture of made-up textile articles, except apparel	19	22.482	31.889	141,84	21.782	31.265	143,54
9.	Manufacture of cordage, rope, twine and netting	0	0	0	0	0	0	0
10.	Manufacture of metal structures and parts of structures	75	601.935	686.845	114,11	538.123	670.825	124,66
11.	Construction of ships and floating structures	48	1.629.083	688.459	42,26	1.441.049	750.272	52,06
12.	Construction of entertainment and sporting boats	10	7.181	10.507	146,32	6.889	10.402	150,99
13.	Repair and maintenance of ships and boats	59	267.923	292.062	109,01	244.469	282.209	115,44
14.	Installation of industrial machinery and equipment	21	176.114	251.912	143,04	160.045	223.712	139,78
15.	Construction of water structures	12	272.573	161.833	59,37	267.566	174.020	65,04
16.	Agents involved in the sale of machinery, industrial equipment, ships and aircraft	20	29.218	38.661	132,32	29.189	36.147	123,84
17.	Sea and coastal passenger water transport	54	909.241	1.055.953	116,14	1.019.586	1.042.528	102,25
18.	Sea and coastal freight water transport	6	75.690	87.558	115,68	76.114	88.588	116,39
19.	Goods warehouse	5	2.213	8.761	395,89	2.031	8.402	413,69
20.	Service activities incidental to water transportation	26	210.650	111.827	53,09	184.244	92.382	50,14
21.	Cargo transhipment	7	183.603	314.846	171,48	193.759	299.765	154,71
22.	Other transportation support activities	95	596.779	903.917	151,47	548.684	857.130	156,22
23.	Hotels and similar accommodation	139	1.616.457	1.873.638	115,91	1.702.403	1.987.101	116,72
24.	Resorts and similar facilities for short breaks	169	73.969	114.525	154,83	74.831	126.390	168,90
25.	Camps and camping areas	20	133.397	196.020	146,94	121.116	160.620	132,62
26.	Other accommodation	40	6.166	15.428	250,21	6.973	16.634	238,55
27.	Engineering and related technical consultancy	490	798.357	1.087.525	136,22	739.670	944.121	127,64
28.	Technical testing and analysis	52	142.064	158.811	111,79	126.377	147.031	116,34
29.	Other research and experimental development on natural sciences and engineering	19	158.683	79.910	50,36	145.104	71.358	49,18

Source: Financial Agency (Fina), 2020, data extracted from Info.BIZ database and processed by authors

The recorded expenses are the highest in the hotel industry and sea and coastal passenger water transport (and also in other transportation support activities), which can be explained by stronger tourism development. In addition to the established activities of the blue economy, we should also point out the new activities that are slowly developing and form one of the foundations for the growth of the blue economy. Desalination, wind farms, biotechnology (research-scientific and technical-technological potential), are part of the smart specialization of the County. Although there is no selective data that would better illustrate the current state of the innovative sectors, it should be emphasized that activities have been initiated for the quality establishment of new innovative sectors, with initial results visible, especially on the islands.

The islands, as the most exploited tourist areas, are increasingly turning to the blue-green economy. Low carbon development is gaining an increasing role in long-term strategic considerations. Such environmentally responsible development is based on the use of renewable energy sources, and especially positive examples are the island of Krk and island of Unije. The author Starc (Starc, 2006) states that small islands are interesting subjects of research and suitable laboratories for testing development concepts and introducing appropriate technologies. At the same time, the author emphasizes that the islands are important social, demographic and ecological communities. Thus, the project of the PGKC "Unije – self-sustainable island" began with the aim of revitalizing the island and achieving long-term demographic, environmental, energy and economic sustainability. Project activities are divided into five areas related to self-sufficiency in terms of energy, water supply and sewerage, agriculture and mariculture, transport infrastructure and tourism. Tourism is the most important industry on the islands and attracts significant capital investment. Taking on the role of leader and achieving a significant share in the global gross national product and total employment, tourism has also taken on a significant responsibility in relation to the economic, social, cultural and natural environment (Bašić, 2015).

Nautical economy and nautical tourism as a selective form of tourism is one of the desirable forms of tourism that significantly contributes to the total income from tourism. It is also one of the factors in the development of small shipbuilding as a sector of the blue economy that can significantly raise the level of competitiveness of small businesses and the whole PGKC. According to the Croatian Bureau of Statistics for 2019, PGKC has 33 nautical tourism ports, of which 9 are anchorages, 3 moorings and 7 dry marinas. Among them, six marinas categorized and marked with anchors and 5 marinas from I to III category. In relation to the total number of nautical tourism ports in Croatia (167), PGKC has a share of only 20%, although it has attractive, hydrographic and other predispositions for the development of nautical tourism. In PGKC there was revenue growth in 2019 and 123 million kuna was realized, which is an increase of almost 15% compared to 2018. The share of PGKC's revenues in Croatia's total revenues from nautical tourism is only 12.5%. There is also a significant increase in other revenues.

Looking at the sector of Green Technology, Energy and Waste Management at the regional level, according to a study (Bačić et al., 2020) PGKC is significantly positioned in the sector of Green Technology, Energy and Waste Management (GTEWM) in Croatia, in which most county indicators have more than 10% in the national share in 2019 (Table 3).

Comparing the trends in the Green Technology, Energy and Waste Management sector in PGKC, the results of the study show that the number of entrepreneurs is increasing, but the number of employees is decreasing. In 2016, there was a significant decline in the number of investors, from 184 to 123, and that number has stagnated in the last few years to reach 134 investor entrepreneurs in 2019.

Table 3 Share of the sector of Green Technology, Energy and Waste Management of PGC in the same sector of Croatia in 2019

Indicator	GTEWM sector Croatia	GTEWM sector PGKC	Share of PGKC in Croatia
Number of entrepreneurs	7.912	790	10,0%
Number of employees	51.125	5.629	11,0%
Number of investors	991	134	13,5%
Number of importers	850	111	13,1%
Number of exporters	1.100	176	16,0%
Trade balance in HRK	2.955.789.974	751.774.347	25,4%
Total income in HRK	35.078.117.281	3.055.465.943	8,7%
Total expenses in HRK	32.729.619.400	2.928.567.242	8,9%
Profit in HRK	1.830.143.980	86.677.747	4,7%
Import (including acquisition) in HRK	4.107.249.414	253.616.875	6,2%
Gross investment in new fixed assets only, in HRK	2.149.681.444	175.814.059	8,1%

Source: Euro ekspertiza j.d.o.o. i Inženjerski biro d.o.o., 2020.

The number of importers, as well as the number of exporters, is growing slightly. A comparison of individual areas of the Green Technology, Energy and Waste Management sector (energy and waste management, transport, buildings and infrastructure and water) shows that most entrepreneurs are in the area of Buildings and Infrastructure where 50% of the total number of employees in the sector per employee. The transition of the energy sector includes increasing energy efficiency, developing a quality energy market, increasing the use of renewable energy sources (RES) and increasing the quality of energy management, with the use of new (SMART) technologies and raising awareness of citizens and the economy.

As the authors of the study point out, given the combined development of maritime, tourism and the real estate market, the area of Buildings and Infrastructure is proving to be very propulsive. At the same time, maritime as a traditional branch of PGKC has a direct and indirect impact on all indicators and is a strong driver of development of the entire county (ibid.). This is important as a source of data and a starting point for further strategic reflections on the development of the region.

4.2 Results and discussion

The need to recognize and acknowledge the values of the oceans and seas, climate change, and more, whether cultural, social, or economic, is even more important today. As a result, the EU gives the highest priority to the growing climate, environmental and social challenges facing society today. The European Green Deal has set out a new growth strategy that aims to transform the economy and society into part of the road to a more sustainable future. Research and innovation are a fundamental pillar of this European response. This will be achieved, among other, through the future Horizon Europe programme and its specific mission on healthy oceans, seas, coastal and inland waters. It should contribute to the implementation of European solutions to reduce marine pollution, mitigate climate change in the oceans and seas, sustainable use and management of ocean / marine resources, development of new materials, including biodegradable substitutes for plastics, new food systems, coastal and marine spatial planning (SMEs).) and ocean management. Also, the strong political commitment to increase the green investments is strongly present in the Next Generation EU- the European Recovery Plan. The long-term potential of the blue-green economy in terms of jobs, growth and investment can only be fully realized if effective and coordinated steps are taken to bring together the environmental, economic and social aspects of marine and ocean governance. In order to retain these potentials, human activities must be managed in a way that ensures the health of the oceans and seas, where economic efficiency and productivity are protected. The Adriatic area has an increasingly important geo-strategic position, which continuously leads to an increase in maritime traffic. Economic exploitation of marine resources through fishing, mariculture, processing and storage, and tourism are important industries. At the same time, the Adriatic is a sensitive maritime area that requires proper management with the aim of sustainable development and the establishment of continuous monitoring in all countries accessing the Adriatic Sea.

All the predispositions to be a blue growth incubator are in favour of PGKC. The development opportunities of the blue economy, in fact, with all the slowness of resolving administrative barriers and lack of investment (except in tourism), are very large. Although progress is visible in the port transport and shipbuilding sector, there has not yet been a corresponding transformation of these companies, where the implementation of new technical and technological solutions would certainly enable the creation of new values. Furthermore, the investments that accompany the maritime sector in PGKC have long realization deadlines, which ultimately reduces the competitiveness of companies. That is why the economic potential of the sea and coastal area for the development of the blue economy should be the reason for the establishment of a maritime cluster. As it is known from the experience of countries and regions that have established maritime clusters, it is this association that creates stronger forms of cooperation, facilitates the transfer of information from knowledge centers and can align private sector initiatives with government policies and priorities. In the blue economy, due to the complexity of issues that require practical solutions, partnerships are needed between companies from different sectors that would not otherwise work together. According to the authors (Horvat et al, 2004), clusters contribute to the competitiveness of companies, help them enter the market and play a proactive role in their interconnection. The presence of a cluster as an organization especially helps to discover new potential ways for innovation. The experiences of neighboring regions, which have had a maritime cluster established for many years, can be a significant help in overcoming obstacles to the establishment of a maritime cluster in the region and beyond. Furthermore, some of the areas of activity that are part of the maritime cluster could give purpose to the region and have the potential to make a positive impact on the national economy.

It should be noted that PGKC has a lot of untapped potential, especially real estates that are not in function, and are located in the coastal area and at the same time due to its former function today are monuments to industries that no longer operate. It is especially important that – although these are mostly abandoned warehouses and other areas, where the population does not have access to these parts of the coast – the owners do not pay the appropriate fee (externalities) for them.

It is logical to conclude that PGKC faces a huge challenge with the purpose of better and systematic evaluation of the coastal and marine area and the ultimate and special goal, the establishment of new innovative sectors of the blue economy as a carrier of the County's development. In order to achieve this, appropriate measures are needed that will

enable reaching the goals of blue development, respecting the green principles and enabling the blue economy of PGKC to be efficient and environmentally sustainable. The measures proposed in this regard are as follows:

- improvement of the efficiency of public administration by reducing administrative barriers and procedures;
- establishment of SMEs in the sector to fill the market gaps and use the full potential;
- development of maritime spatial plans;
- encouragement and development of innovative sectors of the blue economy;
- development of biotechnology, especially in the function of using the sea and marine organisms, in a way that provides institutional, material (EU funds) and other support;
- encouragement of the development of selective forms of tourism, especially by determining the limits of sustainable reception capacity of the region / individual destination as important determinants of tourism development in correlation with the daily life of the domicile population;
- encouragement of the use of marine energy and other renewable energies;
- encouragement of the functional organization of cities on the determinant of SMART / polycentric development, in a way that brings the coast closer to the citizens;
- establishment of a maritime cluster, by first connecting large maritime companies and in the second phase joining micro and medium companies;
- raise of the awareness of all stakeholders on the wealth and economic power of the blue resource;
- reducement of the negative effects of climate change and reducing environmental pollution through responsible policies and planning in all sectors of the blue economy.

The use of renewable energy sources contributes to the low-carbon development of islands and their energy independence. In the coastal area of PGKC, fuel storage and production activities, thermal power plants and an LNG terminal activities are taking place, which requires continuous monitoring of the sea and the coastal area in order to prevent water and air pollution, ie to collect fees, the so-called externalities. Furthermore, it is very important to establish a system of maritime spatial planning in order to prevent the illegal construction and usurpation of maritime and coastal space as a whole, and to put many unused spaces into operation. This is confirmed by numerous technical and other studies (Lukić et al., 2018), researches on the dilemma of SME implementation (Kovačić et al., 2016) and theoretical features and practical application (Ehler et al., 2019), emphasizing the importance of an interdisciplinary approach to problem solving. The proposed measures can contribute to the positive blue-green effects as a consequence of the sustainable use of the blue-green potentials of Primorje-Gorski Kotar County.

5 Conclusion

Croatia is in the group of countries with the largest contribution of the blue economy to the overall national economy, with coastal tourism being the most important sector in terms of GVA and employment. Sustainable maritime spatial planning and management of the marine and coastal area, as well as the sustainable development of blue sectors of activity (among them especially tourism) is a constant challenge and subject of discussion at the national level. The crisis caused by the coronavirus pandemic has further emphasized the aforementioned issues, as well as the strong dependence of the Croatian economy on tourism revenues. And yet, since the adoption of the European Green Deal, the mainstream policy of the European Union has been – the green economy, and green products represent the sectors of the future.

It is clear that in order to overcome the crisis, Europe needs the contribution of all sectors of its economy. In this regard, the maritime and maritime sectors, the blue economy, although still not sufficiently defined and in overlap with the green economy, play an important role on the whole of Europe's path to economic recovery, especially in maritime-oriented countries. The European Union agrees that future economic development must be green, and the Green Deal is an opportunity to steer individual economies of the Union, as well as Croatia, in the direction of sustainable growth. As a country oriented towards industries and services related to the sea, green and blue growth are actually a natural and logical position, where one does not exclude the other, which is especially reflected in coastal counties, including PGKC. Orientation to the green economy and the circular economy are the backbone of the future development of PGKC, where the green does not only stand for energy efficiency and renewable energy sources, but also the focus on SMART technologies, high share of use, treatment and recycling of waste as a resource or secondary raw material, clean and sustainable transport, sustainable management of green areas, etc.

Finally, PGKC must continue to develop the potentials of the blue economy which is suffering from the recent crisis, strengthen the resilience of key sectors, ensure efficient management thus protecting marine ecosystems and the large natural capital at its disposal. And it is precisely in this respect that interlinking with the green economy is necessary, the aim of which is to increase human well-being and social equality, with a significant reduction in environmental risks and further environmental degradation. Symbolically, the sustainable growth and development of the region, which is branded as a green-blue county due to its geographical features, depends on the successful "greening" of the blue economy of Primorje-Gorski Kotar County, in order to increase resilience and ensure prosperity of the region through synergy of blue and green economy.

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