

# Political and Socio-Economic Aspects of Fisheries in Inland and Coastal Waters of the Western Balkan



Marija Smederevac-Lalić, Ivan Špelić, Samir Đug, Polona Pengal, MIMOZA ČOBANI, Danilo Mrdak, and Marina Piria

**Abstract** In the last decades in Europe, especially in the Balkan region, modernization of agriculture gave priority to economic growth without consideration of the environmental impact and sustainable development. Fisheries have traditional and essential importance of food and income in the Slovenia, Croatia, Serbia, Bosnia and Herzegovina, Montenegro, North Macedonia, and Albania (Western Balkans). The fisheries sector in Western Balkans is still not organized according to requirements of ecosystem integrity and sustainable utility. Practical application of the legislation indicates that the fishery has been developed without adequate harmonization with

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M. Smederevac-Lalić (✉)

Institute for Multidisciplinary Research, University of Belgrade, Belgrade, Serbia  
e-mail: [marijasmederevac@imsi.bg.ac.rs](mailto:marijasmederevac@imsi.bg.ac.rs)

I. Špelić

Faculty of Agriculture, Department of Fisheries, Apiculture, Wildlife Management and Special Zoology, University of Zagreb, Zagreb, Croatia

S. Đug

Faculty of Science, University of Sarajevo, Sarajevo, Bosnia and Herzegovina

P. Pengal

REVIVO, Institute for Ichthyological and Ecological Research, PE Ljubljana, Dob, Slovenia

M. Čobani

Ministry of Agriculture, Rural Development & Water Administration Albania, Tirana, Albania

D. Mrdak

Faculty of Science and Mathematics, Department of Biology, University of Montenegro, Podgorica, Montenegro

M. Piria

University of Zagreb Faculty of Agriculture, Department of Fisheries, Apiculture, Wildlife Management and Special Zoology, Zagreb, Croatia

Faculty of Biology and Environmental Protection, Department of Ecology and Vertebrate Zoology, University of Lodz, Lodz, Poland

socio-economic characteristics, enforcement resources, and adequate control measures. Policymakers continue to be reluctant to give importance to the fishery sector, when allocating fishery resources among multifunctional users of water resources. In the following text, we gave review of the fisheries policy and socio-economic aspects of fishery sector in the Western Balkan countries. Critical fisheries policy and management measures are discussed and the propositions and recommendations of environmental sustainability measures under modern anthropogenic pressures are presented.

**Keywords** Artisanal fishery · Commercial fishery · Recreational fishery · Western Balkan countries

## 1 Introduction

The industrial revolution has been given priority to economic growth without special attention to sustainable development. Fisheries, although with a long tradition did not receive any attention, which has resulted in policy and decisions concerning watershed management, hydroelectric dams, dredging and irrigation, giving the lowest priority to fisheries (Visser et al. 2021; Cowx and van Zill de Jong 2004).

Fishing has great socio-economic importance where other occupations (agriculture and industry) are not sufficiently represented. The direct value of fish, from the anthropogenic aspect, is economical, because fish represents food, while another, no less important value is that fish represents an important component of biodiversity (Smederevac-Lalić 2013).

Fisheries globally are in the process of changes due to the effects of modernization and technical innovation but are stressed by regulation and resource depletion caused by failure of fisheries governance (Bavinck et al. 2013). Globalization of resources, trade and weak control of fishing activities have dramatically changed the fisheries circumstances in the last decades (Symes et al. 2015). Combined effects of overfishing, illegal fishing, poor control, poor governance, climate change, water abstraction, pollution, agriculture, and public water supply are putting the whole fisheries sector at risk and eroding the existence of those who are relying on this activity (OECD 2020). Despite the fact that the Balkan region has most pristine rivers, the region is the target of one of the most ambitious hydropower expansion plans in the world (Weiss et al. 2018) which have significant environmental and social consequences.

Improving policy is crucial to ensure that future generations will continue to benefit from these ecosystem services (OECD 2020). Fisheries are complex and their future sustainability is at risk, given the environmental, economic, political, and social instabilities around the world. Particular attention must be paid to the social aspects of fishing communities as this helps to better understand the changes and processes that shape vulnerability, resilience, adaptation, and issues in certain

aspects of fisheries policy (Symes et al. 2015). Use of environmental and socio-economic information is among the major issues concerning management of waters (Berge and Dahl-Hansen 2005).

In the region of the Balkans, there are the last rivers in a pristine state at the European continent (Cormack 2020; EC 2020). The area is characterized by natural beauty and great biodiversity. Between 30 and 50% of the population live in rural areas (EC 2020). Fisheries are a source of food, employment, and livelihood, especially for coastal and rural communities (EC 2020). The close connection between local communities and the river as a natural resource indicates the need to regulate this relationship, in order to achieve the sustainability of the use of natural resources (Smederevac-Lalić et al. 2011b; Smederevac-Lalić 2013).

Most of the Balkan countries' population is living close to the water bodies and consequently is traditionally linked to fisheries. Therefore, this activity can be viewed through several social aspects: as a traditional activity, as a usual and expected activity but mainly as the basic economic activity of the local population on which the whole family mostly depends. Just for a small number it is just additional source of income (Smederevac-Lalić 2013). Fisheries are under increasing stress due to environmental conservation and multiple user demands. The resilience and the stability of the fishermen's livelihoods are at the risk. Droughts in recent years in the region have further emphasized the importance of ensuring water availability and resilience (EC 2020).

In the eighties of the last century, fishing in former Yugoslavia was identified as a developing sector (Spreizer and Rogelja Caf 2020). The post-socialist period brought many challenges for the fisheries sector and fishermen community in the Balkan countries. Market mechanisms and deregulation have replaced centralized government. During the transition, the fishermen also faced a new reality. The sector has been reduced and today it is only a small part of what it used to be (Teodorescu and van den Kommer 2020). Although the number of artisanal fishermen is decreasing, there has been an increase in recreational fisheries during the previous decades (Smederevac-Lalić 2013). Increasing number of recreational fishermen stresses the social importance of recreational fishery, highly appreciated throughout the world, as a socio-economic benefit for the society, a way to increase the income and development of tourism (Čaldarović 2005; Čaldarović 2006; Šprem et al. 2006). However, in the same period in Albania coastal commercial fishery increases due to migration of the population from inner to coastal areas with no visible recreational sector development (Çobani personal communication). Nonetheless, both types of fishing can contribute to economic benefits of the local and national economy (Arlinghaus et al. 2002). The disappearance of the fishing community is a result of the dilution of fishing activity to the point where it no longer dominates or represents the largest occupational group (Williams 2014). The term "fishing community" is more associated with the memory of the past than with a description of the present (Williams 2009). It is necessary to find a measure, so that fisheries policy can rebuild resilience from the perspective of tradition, economy, and sustainability. Proof of the importance of this sector and the robustness of social institutions is the survival of "small-scale" fisheries throughout Europe (Macfadyen et al. 2011, RPOA-SSF

<https://www.fao.org/gfcm/activities/fisheries/small-scale-fisheries/rpoa-ssf>). The examples given in this chapter are an overview of how the absence of an effective state hindered fishing activities in the post-socialist years in the countries of the Western Balkans. It is important to clarify that in this chapter the particularities of certain types of fishing are mentioned under different definitions, but they are observed like a synonymous with the position and problems they face conducting of the activity (Rousseau et al. 2019). Therefore, the same conditions include small-scale fishing, commercial (professional) fishing, and artisanal fishing. The terminology is explained in the following paragraphs.

## 2 Terminology

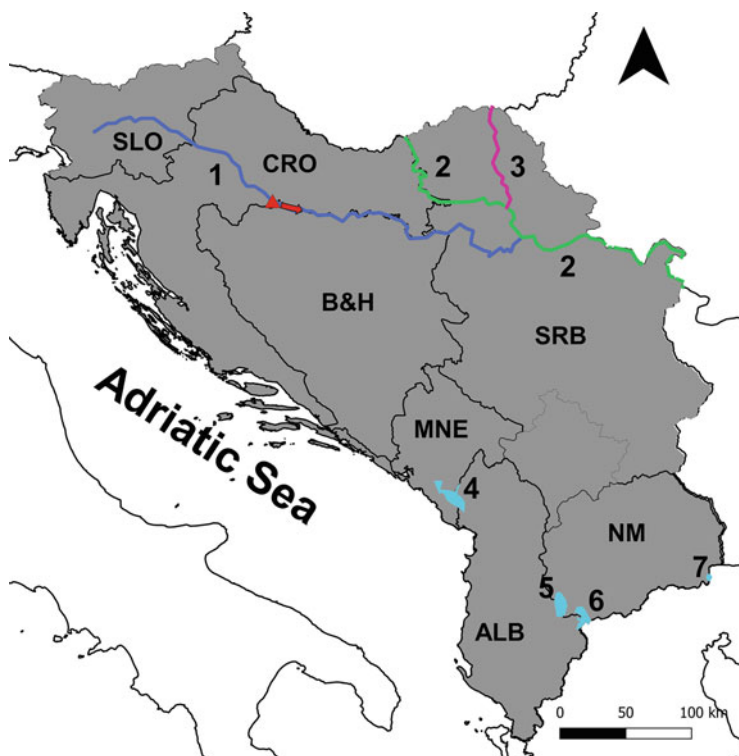
In the literature and in legal acts, confused terms are used for fishing activities. Several terms were used, such as artisanal, traditional, commercial, professional, recreational, sport, catch-and-release, selective, and scientific fishing but usually is not clearly defined meaning of each one.

Hence, in the following text, the term artisanal fishing will be referred to small-scale freshwater fishery conducted by old traditional tools usually with low technology (Begossi 2014; Rousseau et al. 2019) for subsistence, survival, and livelihood purpose. Commercial fishing will be referred to commercial marine fishery for profit, whereas the term small-scale fishing will be used for individual household marine fishery that is used for livelihood and existence. Selective fishing is related to removal of particular species and sizes of fish from the ecosystem (Breen et al. 2016). This type of fishing is often called rehabilitation fishing. Scientific fishing is used only for research purposes, covered with particular permission from the fisheries management authority of a certain country. Selective and scientific fishing will not be covered by this review.

The term recreational fishing most often implies catch-and-kill but also including leisure, catch-and-release, and sport fishing. The sport, game fishing or angling, is fishing for leisure, but sometimes include competition (Aas et al. 2002). Hence, in following text, we will use the term recreational fishing for both recreational and sport fishing. In the developing world, recreational fisheries have been also referred as an alternative livelihood strategy (Bower et al. 2014).

## 3 Study Area

The study area that was covered in this review include the following countries (in this text, Western Balkans): Slovenia, Croatia, Serbia, Bosnia and Herzegovina, Montenegro, North Macedonia (known as former Yugoslavian countries), and Albania.



**Fig. 1** Map of study area that includes eastern coast of the Adriatic Sea and freshwater bodies where artisanal fishery is allowed: (1) Sava River; (2) Danube River; (3) Tisza River; (4) Skadar Lake; (5) Ohrid Lake; (6) Prespa Lake; (7) Dojran Lake. Dark blue color represents the Sava River, green represents the Danube, and purple represents the Tisza River. Downstream of triangle in arrow direction begins artisanal fishing zone at the Sava River in Croatia

The only areas where artisanal fishing is allowed are the Sava, Danube, and Tisza Rivers and large transboundary lakes Skadar, Ohrid, Prespa, and Dojran (Fig. 1). Small-scale and commercial marine fisheries are activities related to the Adriatic Sea (Fig. 1). The recreational fishery has a wider scope and occurs almost on all water bodies (freshwater and at the Adriatic Sea) in the area that are not prohibited under specific protection measures and therefore is not shown separately on the map.

In Slovenia, artisanal freshwater fishery do not exist, but marine small-scale and commercial fishing is developed at the Adriatic Sea. The recreational fishery in Slovenia is developed at freshwater and marine waterbodies. Artisanal fishery in Croatia is conducted at the middle and lower zone of the Sava River and at the Danube River. In Bosnia and Herzegovina, practically there is no commercial fisheries activities in the traditional sense on inland waters, but exist considerably in illegal form at the Sava River (FAO 2015). In Serbia, artisanal fishery is conducted at the Tisza, Sava, and the Danube Rivers. The Skadar Lake is the only freshwater body for artisanal fishery in Montenegro which this country shares with

Albanian artisanal fishermen. Besides Skadar lake, in Albania at the Prespa and Ohrid Lakes also are conducted artisanal fishery. In North Macedonia, artisanal fishing is allowed on the three transboundary natural lakes: Ohrid, Prespa, and Dojran. Marine commercial, small-scale, and recreational fishery is conducted and well developed in Croatia, Montenegro, and Albania. In Bosnia and Herzegovina, marine fishing is restricted on small-scale and recreational fishery. Serbia and North Macedonia do not possess access to the Adriatic Sea and their fishery activity is restricted to freshwaters only.

## 4 Legal Background

All types of fishing in reviewed countries are subject to the issuance of permits by the authorized Ministry regulated by the related several Acts in force (Supplementary Table S1).

In Slovenia, the institution responsible for the fisheries policy (legislation and management) is the Fisheries Department within the Ministry of Agriculture, Forestry and Food (2022) (<https://www.gov.si/en/policies/agriculture-forestry-and-food/fisheries/>; Ministry of Agriculture, Forestry and Food Republic of Slovenia 2022). The professional basis for the preparation of the program and assessment of the situation is done by the Fisheries Research Institute of Slovenia with the help of the Fishermen's Association of Slovenia and the Institute of the Republic of Slovenia for Nature Protection. The Ministry of Environment and Spatial Planning is involved in the process of accepting the program, which gives consent to the aspect of environmental protection (Ministrstvo za kmetijstvo, gozdarstvo in prehrano) (Program upravljanja rib v celinskih vodah Slovenije za obdobje do leta 2021). In the field of freshwater fisheries in Slovenia, the policies aim to ensure sustainable management of fisheries resources in inland waterways, in particular the preservation and protection of fish stocks and the provisions of recreational fishing. Public services in the fields of freshwater and sea water fisheries expertise are provided by the Fisheries Research Institute of Slovenia. The Institute also carries out commercial activities related to sport and recreational fishing and fish farming and a range of research and expert tasks in fish biology. Fisheries supervision is provided by the Fisheries Inspection, which also supervises the implementation of fishing and farming, the operations of fishing clubs and the Fisheries Research Institute, and market in fisheries products. According to the Treaty on European Union (<https://www.gov.si/en/policies/agriculture-forestry-and-food/fisheries/>), the EU has exclusive competence to preserve marine biological resources under the Common Fisheries Policy (CFP). The main aim of the CFP is to ensure that marine fisheries and aquaculture are environmentally sustainable and managed in accordance with economic and social objectives to provide a stable food supply (<https://www.gov.si/en/policies/agriculture-forestry-and-food/fisheries/>). As an EU member, Slovenia and Croatia are bound to honor the adopted commitments. The CFP measures differ according to individual EU marine regions. The aim is achieving maximum

sustainable yield, i.e. the proportion of fish stock that can safely be removed from the stock while maintaining its potential for reproduction (<https://www.gov.si/en/policies/agriculture-forestry-and-food/fisheries/>). Another important element of CFP is fishing fleet management. Each member state is attributed a maximum level of fishing fleet capacity. New fishing vessels may only be added to the fleet after a vessel of the same capacity had been removed. The CFP also foresees the Common Market Organisation (CMO) in fisheries and aquaculture products, which aims at establishing a common EU market matching supply with demand. CMO interventions thus provide a balance between market needs and fishermen's interests and ensure a fair level playing field for all. At the international level, numerous regional organizations have been established for the management of fisheries. Slovenia and Croatia are members of the General Fisheries Commission for the Mediterranean (GFCM) (FAO 2022c; GFCM 2030).

In Croatia, fishing licenses for freshwater and marine recreational fishing are issued by the Ministry of Agriculture (2022) (<https://ribarstvo.mps.hr/default.aspx?id=2802>; Piria et al. 2022; Ministry of Agriculture Republic of Croatia 2022). The condition for freshwater recreational fishing is the payment of all costs of enforcing the fishing right, which each holder of the fishing right determines according to the provisions of the Freshwater Fisheries Act. The marine sport and recreational fishery is defined by the Marine Fisheries Act (Official gazette of Croatia 2017) as sport fishing for sport purposes and recreational fishing as fishing for recreation. Licenses for marine recreational and sport fishery can be purchased through web application. However, both fishing categories imply that license is required for performing these activities, but there are certain differences in legislation between these two categories in relation to fishing gear and equipment used, the fishing technique, and the targeted fish species (Soldo et al. 2018). Freshwater Fisheries Act defines the catch quotas for each artisanal important fish species, as well as their minimum catch sizes and the closed seasons during the spawning period for each species (Official Gazette of the Republic of Croatia 2019, No. 63). The number of licenses for artisanal fishery is fixed and they are issued by the Counties which have public authorization according to actual fisheries legislation. There are 49 licenses allowed for 7 fishing zones at the Sava River, and 50 licenses for 3 fishing zones at the Danube River (Piria et al. 2022). Artisanal fishermen are obliged to pay an annual fee for the utilization of the quota to the County on particular fishing ground and these financial funds could be used for improving the state of local freshwater fisheries. They are also obliged to collect and send to the authorized Ministry the catch data for certain fish species (Vehanen et al. 2020). To carry out freshwater recreational fishing in a specific fishing area or fishing zone, anglers purchase licenses from fishing right holders which are valid in the fishing area for which the fishing right holder has acquired management. The fishing right is given through public tenders and the contract lasts for 20 years. Holder of fishing right in Croatia is obliged to make Management plan, no later than a year after signing the contract with the Ministry and every 6 years a revision of each study must be conducted. Management plans are made by official scientific institutions. There are approximately 450 active sport-fishing associations, which are members of higher organizational units (county sport-fishing federations



or communities) (Vehanen et al. 2020). The recreational inland fisheries are far more important than the artisanal fisheries, and the landings are about 4 times larger than in commercial fisheries (FAO 2022c). There is a certain interest in artisanal fishing with old, traditional fishing tools, traditional fishing gears, equipment, and methods, as a conservation of old gear-making crafts with educational and tourism purposes. There are two main electronic applications for the collection of the freshwater catch data. One for the angler catch data (“mRibič”) and another for commercial fisherman catch data collection (“mAlas”), both in mobile and web form. This application is important to monitor catch quotas and reports fish trade and distribution of non-native fish (Piria et al. 2022). Competencies of the fisheries inspection, as well as other authorized persons for certain offenses were reviewed and harmonized with the current Law on Offenses (Official Gazette of the Republic of Croatia 2018, No 107/07, 39/13, 157/13, 110/15, 70/17, 118/18). Law emphasizes the responsible and sustainable use of natural resources—the freshwater fish stock, in ecologically, commercially, and socially justifiable ways through measures to protect, preserve, and restore resources and freshwater ecosystems, which will contribute to the sustainability and development of local rural communities through fishing tourism and supply of healthy fish to the market while ensuring its traceability. The coastal community and islands are highly dependent on the recreational, small-scale, and commercial fishing activities, while fish farming has been linked with the development of rural tourism. Croatia has a long tradition of small-scale coastal fishing, as indicated by the 55 different fishing gears officially listed as currently employed. The total amount of small-scale licenses was estimated at around 8500 in 1999 by national experts but at present it could be much higher (AdriaMed 2005). The total number of sport and recreational fishers both at sea and on rivers is estimated at some 40,000 (FAO 2022c). In addition, Croatian legislation allows for a special “subsistence fisheries at sea” category, allowing catch of marine organisms for personal consumption only, with a daily limit of 5 kg, and this activity is also subject to licensing and technical limits on gear (FAO 2022c). There is currently an estimated of 11–12,000 subsistence fisheries’ licenses issued, but a far lesser number are actually active in this fishery (FAO 2022c).

There is no particular ministry responsible for the fisheries and aquaculture sector in Bosnia and Herzegovina. Fishery is managed by the Ministry of Foreign Trade and Economic Relations, which has the role of coordination, acting as an intermediary between entities and for international relations. Responsible water resources authorities at the entity level are Ministry of Agriculture, Water Management and Forestry Federation of Bosnia and Herzegovina (FBiH), Ministry of Agriculture, Forestry and Water Management of the Republic of Srpska. As for the Brčko District, the competent authority is the Department of the Spatial Planning. However, the fisheries laws applied in the entities still are not harmonized at state level. Environmental legislation has been prepared through the EU project, “Preparation of Environmental Law and Policy in Bosnia and Herzegovina” (Regional Environmental Center 2002). The environmental laws that include water and fishery issues are: Law on the Protection of the Environment; Law on the Protection of the Waters; Law on the Protection of the Nature; Law on Waste Management; Law on Sport



Fisheries. Regulation of aquaculture/fisheries sector is not fully elaborated and not harmonized between entities. Currently, there is no sufficient and reliable data on fishing activities, as well as on the ownership structure of inland waters. Traditional artisanal freshwater fishery is concentrated on the Sava River but is not permitted in rivers and lakes. However, illegal fishing is common. Many of the fish are caught in spawning sites. Gill nets, special fish traps, and long lines with hooks are used (FAO 2022b). Fish are sold through fish shops or directly to the consumer. Recreational fishing has a significant role in the life of communities close to rivers or lakes, and it is an important branch of sport tourism and generates income for the local community. Sport Fishing Societies help to improve the conditions that are necessary for development of tourism. The direct role of fisheries sector in rural development in Bosnia and Herzegovina cannot be determined easily, since the number of employees is low in comparison to other sectors and the fish is not a primary food item in the country (FAO 2022b). Fish consumption is low in the country, and most of the catch is exported. The contribution of fish and other marine products to livestock and food export was 6.8% (FAO 2022b). There are significant efforts on the state level to improve the conditions for utilization of fish resources through the establishment of effective legislation (FAO 2022b). Most of the achievement of the sector was in the development of aquaculture facilities.

Management of the freshwater fisheries sector in Serbia is divided between following ministries: Ministry of Environmental Protection, Ministry of Agriculture, Forestry and Water Management, and Ministry of Finance. The use and protection of fishing resources in Serbia is regulated by appropriate laws: Law on protection and sustainable use of the fish resources (Official Gazette of the Republic of Serbia 2018a, No 128/2014, 95/2018) and Law on Nature (Official Gazette of the Republic of Serbia 2018b, No, 36/2009, 88/2010, 91/2010, 14/2016, 95/2018) and set of by-laws. In accordance with the Law, 17 fishing areas have been established on the territory of the Republic of Serbia (except for fishing waters within the boundaries of protected areas) (Official Gazette of the Republic of Serbia 2018a, No 128/2014, 95/2018). Within the Ministry, there is a Directorate for Inspection, which monitors the work of assigned companies and has a direct supervision of fishing activities in the field. For certain occasions supervision might be carried out by the police too. Since 2016, fishing areas have been assigned to public or private companies, fisheries associations, and fishing unions for ten-years of sustainable use, management, and protection. Fishery right holders are obliged to make Management plan that is made by official scientific institutions engaged after bidding on the tender. The sector appears to be well established through numerous laws and regulations. However, the practical application of the legislation indicates that the sector has been developed without adequate adjustment to the socio-economic characteristics of the community. Inspection and fishery ranger services have modest capacities and equipment, so the results in the protection of resources are insufficient (Smederevac-Lalić 2013). According to the Statistical Office of the Republic of Serbia (RZS 2022), the number of artisanal fishermen licenses sold in Serbia in the last 15 years varied between 1051 and 421, and recreational fishermen between 94,896 and 109,606 (RZS 2022). The amount of catches and landings can be

considerably different, but only landings data are available. Freshwater fisheries catch data accessible in the Statistical Office are mostly based on the landing reports made by the public or private companies which were assigned to manage particular water resources (Smederevac-Lalić et al. 2011c).

In Montenegro, the umbrella laws governing fisheries and aquaculture are the Law on Marine Fisheries and Mariculture (Official Gazette of Montenegro 2015, No 56/09, 40/11, 47/15) and the Law on Freshwater Fisheries and Aquaculture (Official Gazette of Montenegro 2018, No 17/18), with accompanying regulations. Montenegro has valuable but underutilized resources (Fishery sector analysis in Montenegro for purposes of preparation of the Strategy of Agriculture and Rural Development 2021–2027 and IPARD III (2021–2027) programming). The sectoral policy is implemented by the Ministry of Agriculture, Forestry, and Water Management of the Republic of Montenegro, the Directorate for Fisheries. The government policy is based on the transposition of the EU legislative framework in domestic legislation, implementation of structural measures through the national budget, and projects. The main purpose is the increase in fishing intensity making sure that overfishing and fleet overcapacity are avoided, increase in production of fish and other aquatic organisms (aquaculture), use of the offshore areas for mariculture, increase in processing capacity, improve resource management, fight against the IUU fishing, protection of autochthonous species of fish and other aquatic organisms, product branding, achieving standards in food safety criteria, establishing a better climate investment, investigation of fish and shellfish resources, and introduction of new innovative environmental protection systems and new farming systems (Fishery sector analysis in Montenegro for purposes of preparation of the Strategy of Agriculture and Rural Development 2021–2027 and IPARD III (2021–2027) programming). The Agro-budget supports the development of the marine fisheries and mariculture sector, as well as the freshwater fisheries and aquaculture sector. Fisheries policy is implemented through the Directorate for Fisheries that comprises three administrative units: 1. Unit for Resource and Fleet Management; 2. Unit for Monitoring; and the 3. Unit for Structural Measures, State Aid, EU Funds, and the Market Organisation in Fisheries and Aquaculture. The Directorate for Fisheries defines and implements a policy that ensures a sustainable use of available fishery resources and manages the fishing fleet in a way that ensures long-term and economically cost-effective fisheries in Montenegro, monitors the national legislative activity, implements the measures and management systems based on the principles of the Common Fisheries Policy of the European Union, monitors the international cooperation. The Statistical Office of Montenegro (MONSTAT 2022, <https://www.monstat.org/eng>) is responsible for the general collection, processing, and delivery of statistical data, including the statistical data in the area of fisheries, collected by the Department of Statistics in Agriculture (MONSTAT 2022). The new Law on Marine Fisheries and Mariculture (Official Gazette of Montenegro 2015, No 56/09, 40/11, 47/15) is in the process of harmonization with the EU and is partly in compliance with the basic Regulations of the EU and Common Fisheries Policy. The water quality monitoring program and biomonitoring in farming sites are also governed by the same Law on Mariculture (Official Gazette of Montenegro 2015,

No 56/09, 40/11, 47/15). To a certain extent is harmonized with the Illegal, Unreported, and Unregulated (IUU) fishing regulations. In 2020, budget was introduced in order to continue fight against illegal, unreported, and unregulated fishing, which should improve monitoring and control system in fisheries. According to the Law on Freshwater Fisheries and Aquaculture (Official Gazette of Montenegro 2018, No 17/18), waters are assigned for the purpose of sports and recreational fishing, except waters in fish farms, accumulations, lakes, or flowing waters used for or intended to be used for public water supply by spatial planning documents. Fishing areas are designated for the purpose of carrying out artisanal fishing. Artisanal fishing may be carried out only in the fishing area with or without a vessel, based on the permit. The permit is issued by the authorized ministry on the basis of a public call, exception is artisanal fishing in protected natural zones when is issued by the protected resource area managing organization. A permit for conducting artisanal fishing can be issued to a business entity or an entrepreneur to person registered in the Central Register of Business Entities of Montenegro (CRPS) for conducting freshwater fishing activities, for a period of up to 6 years. Artisanal freshwater fishing is carried out on Lake Skadar, largest freshwater basin in Southeast Europe (Pešić et al. 2018). The fishing permit is issued by the National Parks of Montenegro—Skadar Lake National Park. Fishery can be conducted in compliance with the Law on Freshwater Fisheries and Aquaculture (Official Gazette of Montenegro 2018, No 17/18) and the Order on closed fishing areas, closed seasons, and minimum sizes of fish and other aquatic organisms (Official Gazette of Montenegro 2021, No 37/20, 9/21). Permits for freshwater recreational fishing are issued for the current year, for a specific area of the water body; time and/or for night carp fishing. The permit is issued by the user or manager of the water body. Montenegro established Fisheries Information System (FIS) for marine fishery, and until the end of 2020, there has been of 268 entities (Fishery sector analysis in Montenegro for purposes of preparation of the Strategy of Agriculture and Rural Development 2021–2027 and IPARD III (2021–2027) programming) which were in accordance with the Law registered as professional small-scale fishermen. Permit is issued for each vessel separately. It is allowed to have another workforce, called the crew that participates in the fishing activity. In this regard, FIS keeps records of persons engaged on the vessel, and the number of such persons engaged from 2011 to the end of 2020 was a total of 770 persons. By adding 770 persons engaged and 268 holders of permits, the number of small-scale fishermen was 1038 (Fishery sector analysis in Montenegro for purposes of preparation of the Strategy of Agriculture and Rural Development 2021–2027 and IPARD III (2021–2027) programming). There is no organized purchase of fish, but fishermen place their catch directly on the market, through markets, restaurants, because landing places and fishing ports are still not marked. Montenegro's fleet is composed mainly of old small lengths vessels, and the most fishery activities are carried out within the territorial waters and in the coastal zone. Public Enterprise Coastal Zone Management operates in the narrow coastal zone, working on the issuance of permits, monitoring of water quality, etc. In general, the fisheries sector is underdeveloped and of a coastal character. The total catch represents a small percentage of the total

catch in the Adriatic and the Mediterranean (Fishery sector analysis in Montenegro for purposes of preparation of the Strategy of Agriculture and Rural Development 2021–2027 and IPARD III (2021–2027) programming). Permits for recreational fishing at sea are issued by sport fishing clubs that are members of the Federation. The Federation of Sea Angling of Montenegro has 23 clubs (Fishery sector analysis in Montenegro for purposes of preparation of the Strategy of Agriculture and Rural Development 2021–2027 and IPARD III (2021–2027) programming). During the six-month validity of the permit, the Federation submits to the administrative body a report on the number of licenses issued for sport and recreational fishing. Holders of licenses are obliged to keep the license with them all the time they are engaged in fishing. A license can only be used by the person to whom was issued. The form and method of distribution of permit forms is prescribed by the Ministry (MAFWM of Montenegro—Law on Marine Fisheries and Mariculture) (Official Gazette of the Republic of Montenegro 2015, No 56/09, 40/11, 47/15). The permit can be permanent and part-time. A part-time permit for sports and recreational fishing may be issued to a person who is not a citizen of Montenegro. Fishery plays a very important role in the economic development of Montenegro (FAO 2022d).

Ministry of Agriculture, Rural Development & Water Administration in Albania is the responsible state institution with the Directory of Agriculture Production and Trade Policies unit. Under this Directory is the sector of Fishery & Aquaculture Resources Policies. In Albania, the administration of the fishery and aquaculture sector is separated in two laws: the Law “On Fishing” (Official Gazette of Albania No 4/2019) as amended and the law “On Aquaculture” (Official Gazette of Albania No 103/2016). The Control Structures are organized in another Directorate within the Ministry, divided from Fishery Directorate. This structure is composed of 28 inspectors (Çobani personal communication). The Vessel Monitoring System (VMS) ([http://gfcmsitestorage.blob.core.windows.net/documents/web/VMS/2011/ppt/Albania\\_VMS.pdf](http://gfcmsitestorage.blob.core.windows.net/documents/web/VMS/2011/ppt/Albania_VMS.pdf)) is fully functional after the improving procedures, 2021 to control the fishing vessels larger than 12 meters. To support the VMS System, six system operators at the central level of the Directorate of Fisheries and Aquaculture Services were recruited, who monitor and report on the activity of fishing vessels in addition to the Fishery Monitoring Centre. Fishing is one of the main economic activities in the area of large transboundary lakes: Prespa, Ohrid, Skadar (Adhami 2015; Peveling et al. 2015; Talevski et al. 2009). Just 100 fishermen from the villages around the lake of Prespa on the Albanian side regularly fish (Grazhdani 2009). Unfortunately, their activities are disorganized and carried out on an individual basis, while half of them fish without licenses (Grazhdani 2009). Until the year 2000, artisanal traditional fisheries were disregarded; this was principally due to the small quantity of fish caught and the final destination of the production, which is almost always for consumption by the fisher and his immediate family. Furthermore, freshwater recreational fishing is included in the same category with artisanal fishery (Çobani 2016). In recent years due to the low employment that exists in Albania, commercial fishery sector at the sea started to develop (Çobani 2016). On the other hand, the measures taken by the Fishery Directorate to strengthen the application of fishing law along the coasts, especially concerning lagoons, created the necessity for

other alternatives for the communities around those areas. Those fishermen who were refused a lagoon fishing license by the fishery administration (license board) found an alternative by switching to small-scale coastal fishing. The Fisheries and Aquaculture Development Plan (<https://fliphtml5.com/cjmglljrso/basic>) is a financial instrument with the purpose of distributing the available funds to fulfill the objectives of the Fisheries and Aquaculture Administration Plan (Sonila and Kosovrasti 2013). Fishery Management Organizations (FMOs) are being promoted in some water body categories, through the Pilot Project of Fishery Development (FAO 2022a) <http://documents.worldbank.org/curated/en/240481468192881291/Albania-Pilot-Fishery-Development-Project>, and their task is to manage fisheries in general. The presence of three transboundary lakes, made necessary establishment of the law “For the protection of trans-boundary lakes” (Law No. 9103 on the protection of transboundary lakes, <http://extwprlegs1.fao.org/docs/pdf/alb60527E.pdf>) which aims to protect the environment of transboundary lakes in their natural situation, to guarantee appropriate conditions for the maintenance of the ecosystem, and to prohibit activities that would threaten and encourage useful activities while respecting the principles of sustainable development (Law No. 9103 (2003)). In 2021, in the Ohrid Lake about 1.44 million Ohrid trout (*Salmo letnica*), fingerlings were stocked, and in Prespa Lake about 501,000 carp fingerlings were stocked financed by the state budget (Çobani personal communication). In order to provide reliable statistical support to the fisheries and aquaculture sector, preparatory work on improving the data collection system has been established ALBFISH Unit supported by the FAO AdriaMed Project ([http://www.faoadriamed.org/html/adriamed\\_project.html](http://www.faoadriamed.org/html/adriamed_project.html)). This will be implemented through the redesigning of the Fishery Research Institute projects’ funding (Çobani 2016). Fisheries and aquaculture represent realistic and excellent development opportunity for Albania that can intertwine social, economic, biological, and environmental management (Prince 2021). Further development and need to study the economic and social impact of fisheries in Albania, including effects on poverty reduction and provision of high quality nutrition is necessary (FAO 2022a).

Fisheries in North Macedonia are regulated by the Law on Fishery and Aquaculture (Official Gazette of the Republic of North Macedonia 2011a, No 7/2008, 67/2010, 47/2011, 53/2011) which deals with artisanal fishing, sport fishing, and fish production (Official Gazette of the Republic of North Macedonia 2011a). The Ministry of Agriculture, Forestry and Water Management is responsible for issuing concession permits for commercial fishing companies and sport-fishing associations, as well as permits for the establishment and operation of fish ponds (Spirkovski and Bojadzieski 2013). The Ministry of Environment and Spatial Planning is also involved in matters of biodiversity conservation, because each lake has significant biological importance and commercial fish stocks, which require special management (FAO 2022e). Fishing company on each water body is awarded for the five-year concessions, and the company is expected to develop a master plan for the protection, enhancement, and exploitation of the relevant fish stock during the period of their license (Spirkovski and Bojadzieski 2013). Master plans must be submitted to the authorized Ministry before the license is issued, and the Ministry will request

the opinion of the competent scientific institutions. According to the Law on Fisheries and Aquaculture, regulations govern the method of fishing, types of fishing gear, closed season, and fishing license costs (Official Gazette of the Republic of North Macedonia 2011b, No 7/2008, 67/2010, 47/2011, 53/2011). The only active government involvement in fisheries management is collecting taxes from the commercial concession companies and the Sport Fisheries Association (SFAs), although about half of the income is returned to the fishery fund. However, despite the decreasing catch from all the lakes, instead of using the fund for improving the fish stock situation, it has been used by fishing companies. There are no official limits on the total allowable catch. In North Macedonia, there is limited potential for fisheries (FAO 2022e), as the overall water resource are comparatively limited on the three large transboundary natural lakes: Ohrid, Prespa, and Dojran. The most valuable catch comes from Lake Ohrid. Lake Ohrid is shared with Albania, Prespa with Albania and Greece, and Dojran with Greece (FAO 2022e). The socio-political changes of the last decade in Balkan countries affected negatively fishery sector. Previously, it was organized through three subsectors: artisanal, fish farming, and recreation (sport) fishing, but from 1995 this arrangement collapsed. Artisanal fishery is limited to these lakes, as well as some of the reservoirs. There are six designated landing sites for the Lake Ohrid. Lake Prespa landings are dispersed. Lake Dojran has four designated landing sites for its artisanal fishery (FAO 2022e). There are designated landing sites for the artisanal fishery on the larger reservoirs, but there are no such sites for the recreational sector. Sport fishing is allowed on the lakes on the basis of an agreement between the Sport Fisheries Association (SFA) and the concessionaire. Recreational fishing sector was strong in the 1980s, but with the fundamental changes in the socio-political environment of the 1990s, membership has dropped. Sport-Fishing Associations operate with direct permission from the Ministry. Fishing on the lakes is strictly controlled, with a limited number of days available and a limit on the equipment allowed. Control is most stringent in the trout fishery. Recreational fishing on the rivers is also on a five-year basis concession, but directly with SFA. Both commercial companies and SFA must submit a five-year plan for the protection, improvement, and responsible utilization of fish resources. Within the Ministry, there is a Directorate for Inspection, which monitors the work of companies and SFA through reports and direct supervision in the field. Certain supervision of fishing activities is carried out by the police. There were difficulties in coordinating the fishing activities on the transboundary lakes. North Macedonia has enacted legislation to protect these lakes because of their biodiversity (Official Gazette of the Republic of Macedonia No. 62/1993; 51/2011) (Law for the protection of Ohrid, Prespa and Dojran Lake; Law for declaration of Lake Prespa as natural monument) (Official Gazette of the Republic of North Macedonia 1993). No recent stock estimates are available (FAO 2022e). Catch reports are unreliable (FAO 2022e). There are no fish markets. Fish from lake catches or ponds are sold at local markets, small shops in towns or directly to hotels and restaurants. There is a high demand for trout and eels from Lake Ohrid. Urgent action is needed to prevent overfishing of endangered species and valuable indigenous species, especially Lake Ohrid trout (FAO 2022e). There is an initiative within the Lake Ohrid Conservation



Project (Spirkovski et al. 2000) due to trout population decline to conduct a joint fish stock assessment between Macedonia and Albania. On Lake Prespa, the trilateral project (Project: Integrated ecosystem management (IEM) in the transboundary Prespa Lakes Basin of FYR-Macedonia, Albania, and Greece) for the protection of the area is in the stages of implementation (FAO 2022e). Aquaculture producers have difficulties in marketing their products due to low prices compared with cheap frozen imports in the market. There were some stocking activities with exotic species although they are prohibited (FAO 2022e). In July 2018, Macedonian Minister of Agriculture, Forestry and Water Economy signed agreement with FAO Country Programming Framework that should support progressive alignment of the country's agriculture and rural development with European Union accession requirements and the Sustainable Development Goals. The agreement matches the country's needs and priorities with the expertise and experience in particular to the sustainable and inclusive growth of smallholders and family farms, improved food safety and quality, sustainable and more resilient agriculture, and strong institutional capacity. Another key priority of the program is strengthening the country's ability to manage natural resources sustainably including water resources, forestry, and fisheries (FAO <https://www.fao.org/europe/news/detail-news/en/c/1144995/>).

## 5 Political Aspects of Fishery

Freshwater artisanal fishery is conducted in Serbia, Albania, Bosnia and Herzegovina, Croatia, Montenegro, and North Macedonia but has declining trend similarly as in whole Europe (Cowx 2015). In Slovenia, this type of fishery never had considerable impact and currently no longer exists. On the contrary, in all countries, freshwater recreational fishing is increasingly developing and the number of recreational fishermen is growing (Smederevac-Lalić et al. 2011b). The marine commercial, small-scale, and recreational fishery is important for Albania, Croatia, Montenegro, and Slovenia, i.e. countries that have access to coastal part on the eastern Adriatic Sea. Considering that Bosnia and Herzegovina possesses only short marine coastline, only little impact on economy has been given by small-scale and marine recreational fishery.

The region under research is covered by a considerable number of artisanal, commercial, and small-scale fishermen and intensive recreational fishing. It is important to emphasize that generally all of them are facing the same fate and mainly the difference stands in the water resource in which the activity is carried out.

Freshwater artisanal fishery in former Yugoslav countries is marginalized as an economic activity and occupation (Smederevac-Lalić et al. 2011b; Lenhardt et al. 2020). Martinović 1978 states that “the fisherman craft (the so-called *alás*) has almost disappeared from the suburban banks of the Sava and Danube, giving way to modern industrial farming and fish processing.” The historical upheaval from a socially valued and socially necessary trade to a marginalized activity happened at the same time as the political disintegration of the former Yugoslav states and the



war events during the nineties of the last century. Since 1990, there have been significant political and economic changes in former Yugoslav countries, leading to changes in fishing artisanal practices in this region (Spreizer and Rogelja Caf 2020). This period marked changes from the previous jurisdiction of the Republic of Yugoslavia in each country's authority. It was necessary to transfer leadership from the institutions of the former Yugoslavia and to establish new national fisheries institutions in each country. At the same time, the artisanal fishery in Albania has slightly developed since the 1990s as an alternative to unemployment and low income (Çobani 2016). However, the water quality and poor fishery policies and illegal fishing in Albania over the last fifty years have negatively affected the region's biodiversity in general and its fish species in particular (Grazhdani 2009). Poor policy and management have turned important lakes into reservoirs for a local, nationally economically important irrigation system. Hence, consequences on artisanal fishery sector may be expected.

According to Teodorescu and van den Kommer (2020), special attention has to be given to three emerging policy domains: economic restructuring, environmental planning, and EU policy implementation. These areas will provide a reason for an understanding of how post-socialist policies have failed to address and even ignored growing problems in fisheries sector. Inland fisheries have never been part of any high-profile global fisheries assessment (Teodorescu and van den Kommer 2020). The policy makers are largely unfamiliar with freshwater ecosystems, with fish resources, as well as the ecosystem services generated by inland fisheries (Cooke et al. 2016). This ignorance is particularly notable nowadays when emphasis is given to food–water–energy connection where important role of inland fish and fisheries is omitted despite important part in nutrition and livelihoods in low-income and food deficit countries (Cooke et al. 2016).

Artisanal fishermen in Balkan countries are not organized into cooperatives, associations, committees, or boards, through which they could have a much greater influence and participation in society and fisheries policy (Smederevac-Lalić 2013). Moreover, they are not a compact group that has common goals and it is difficult for them to take same positions among themselves and to represent common interests. The need to establish fishing cooperative exists among fishermen, but fishermen do not have the power to change decisions and represent interests in the management system (Pita et al. 2020).

Commercial and artisanal fishing is a significant source of income for many people in the Western Balkan countries (Mikuš et al. 2018; Matić-Skoko et al. 2017). This is a job that demands hard work and brings little income. Only a few of the commercial fishermen managed to form a market niche by way of which they can more successfully solve one of the key problems in their business—sale. They open their own fish shops and/or sell fish to restaurants. Also, many of them are aware of the need for association and initiative in business, by which they would replace the previous command concept of business that they remember, with a new one, based on higher input of individual entrepreneurship (Smederevac-Lalić 2013; Lenhardt et al. 2020). Measures defined by the state should give more incentive to

such business concepts. Together with the definition and implementation of appropriate rules, this should lead to sustainable development of the industry.

Although the marine fishing sector in some countries (i.e., Slovenia) is small and has an insignificant influence on the national economy (Spreizer and Rogelja Caf 2020), it is still considered to have a strong social impact in terms of directly creating employment and give importance for maritime identity and tourism (Lopes et al. 2015). However, fisheries policies aim to ensure adequate working conditions and safety of fishermen, enhance the development of coastal fishing areas, and seek synergies between fisheries and tourism, cultural heritage and tradition (Miret-Pastor et al. 2021).

Countries of the Balkan that passed through the procedure of joining the EU had to find an adequate response to changes according to the EU policy. They had to make strategic decisions based on the analysis of benefits and losses and to implement the fisheries strategy. Firstly, strengthening of the administration capacity to propose and implement good decisions based on the data (Smederevac-Lalić et al. 2011b). The baseline conditions should be known by measuring the indicators, which should then be improved. Also, it is necessary to ensure their continuous monitoring.

In Slovenia, but also in Croatia, process of adaptation to the EU policy in the fishery sector resulted in negative perception of this policy that significantly and adversely influenced the behavior and emotional response of fishers, which, in turn, also influenced their resilience (Spreizer and Rogelja Caf 2020). In general, fishermen feel alienated from the decision-making process and their confidence in the policy-making is low. Example of that was the question of calling non-commercial fishing “small-scale for personal needs” or subsistence fishing, which according to current regulations should have been registered in the commercial category. Through this process, about 7500 fishermen in Slovenia have either joined the recreational fishing category or become inactive (Matić-Skoko et al. 2017). This happened because fishermen realized that EU policy makers do not recognize particular characteristics. The transition process lasted 2 years and had a very negative public perception (Spreizer and Rogelja Caf 2020). These transformations on water have implications for those who are allowed access to the resource (Boucquey 2017). Furthermore, Slovenian fishermen highlighted that social goals were almost completely neglected (Spreizer and Rogelja Caf 2020). Their opinion was that resource and habitat protection policies are introduced without consideration of socio-economic factors, particularly those that are in competition with small-scale fisheries (like the establishment of new Marine Protected Areas). Therefore, management authorities must find a way to meaningfully involve fishermen more in decision-making processes, reduce conflicts, so that political perception becomes positive and resilience of the fishermen community improved. The experience of the ministry in Slovenia during the EU accession process is that it was difficult to gain an understanding of the specifics of Slovenian fisheries within the EU. Recently, even the Slovenian state was brought before the European Court of Justice, because the sector did not develop an electronic log (fishing log system) (Spreizer and Rogelja Caf 2020).

Understanding resource user groups is crucial given their potential influence on policy choices and the real political and economic consequences of different access to resources (Adger et al. 2005). Artisanal fishermen use their own narratives to express importance of the fish in the social and economic context (Boucquey 2017). While artisanal fishermen cannot even unite through groups such as federations or associations, recreational fishing groups are increasingly visible in the political arena (Boucquey 2017). Understanding the roots and complexities of these moral arguments between two main categories of fishermen helps illuminate the conflicts that exist from local to international levels.

Real social and economic value of fisheries in terms of their contribution to livelihoods, recreation, and food security is still not well measured in Europe due to lack of appropriate data collection systems (Cowx and van Zill de Jong 2004). This is the reason why policy makers are still reluctant to give this sector the importance it deserves when making decisions affecting fish resources (Cowx and van Zill de Jong 2004). Since water resources are shared among competing users, the lack of reliable data, and thus the underestimation of fisheries, results in policy decisions that have historically favored the construction of dams to produce hydroelectric power, dredging to produce or transport sand, and flood control protection measures. The underestimation of inland fisheries due to the lack of accurate statistics contributes to the underestimation of these resources in political decisions regarding freshwater resources (Visser et al. 2021). Thus, there is a clear need for accurate statistics and sustainable data collection methodologies for fisheries managers which will serve the dual benefits of ensuring sustainable management of fisheries resources and equitable valuation of aquatic species when making decisions on the use and management of freshwater resources (Vehanen et al. 2020).

Although in most of European countries conflicts between commercial, artisanal, and recreational fishermen no longer exist (Arlinghaus et al. 2002), in the Balkans this problem reduces the potential for sustaining and developing fishery in the future. The recreational inland fisheries are far more important than the artisanal fisheries, and the landings are about 4 times larger than in artisanal fisheries. Besides, various forms of illegal fishing (poaching) are also present on a significant scale (Smederevac-Lalić et al. 2011a).

For economic fishery restructuring policies, we need to go back to the first period after 1989 and state what major changes took place. This period, also called “transition,” marked a major metamorphosis of fisheries in the Balkan countries and included the privatization of state-owned companies, the closure of unprofitable fish processing industry, and the emergence of private sector fishing operations. Austerity measures implemented after 1989 led to a lack of control of fishing activities and rapid deterioration of vital infrastructure (Teodorescu and van den Kommer 2020). According to Teodorescu and van den Kommer (2020), also small-scale fisheries in Romania experienced failing of post-socialist economic and environmental policies and ignorance of the problems in the fisheries sector. As a result of misguided policies and environmental decline, resources were mismanaged. This period is characterized by a lack of interest in the development of new economic opportunities for fishermen and, more generally, an underestimation of the local importance of fisheries (Teodorescu and van den Kommer 2020).

With no EU common freshwater fisheries policy, every European country can arrange its fisheries policies according to its geomorphological, biological, ecological, ichthyological, but also socio-economic circumstances and conditions (EU Water Framework Directive 2000/60/EC). In addition, the success of any national strategy depends on the effective inclusion in other policies (agriculture, forestry, regional development, energy, transport, and fishing). The Balkan countries that are still not part of the EU, are encouraged to align their policies with the EU's 2030 Biodiversity Strategy and to support the EU's position in the international negotiations on the post-2020 global biodiversity framework (EC 2020).

The Balkan region is part of the EU Action Plan for the implementation of the Green Deal, defined as the Green Agenda for the Western Balkans (EU Commission Green Agenda). In October 2020, "Guidelines for the implementation of the Green Agenda for the Western Balkans" was published (EC 2020). The main focus related to agriculture where the fisheries sector belongs is the "greening" of existing programs, public administration reform, smart specialization, research and development, education, institutions' capacity development, and the market chain improvement. In most of the countries, agriculture, forestry, and fisheries contribute around 20% of the Gross Domestic Product (GDP), while 40% in the case of Albania (EC 2020). The EU is aware that the Balkan region is rich in habitats and species, including endemic species, and as such should make efforts to protect biodiversity and the ecosystem. The main challenges are the lack of political commitment to improve the implementation of biodiversity policy, the lack of financial resources, and the impact of economic activities, such as agriculture, forestry, and fishing (EC 2020). A comprehensive policy framework exists, but implementation lags. The European Green Deal proposed the establishment of a just transition mechanism and fund to support societies in the transition process (EC 2020). The mechanism could focus on the regions and cities most affected by the transition. Two EU macro-regional strategies with a strong innovation component are being implemented in the Western Balkans: European Union Strategy for the Danube Region (EUSDR) (EUSDR European Union Strategy for the Danube Region [https://ec.europa.eu/regional\\_policy/en/policy/cooperation/macro-regional-strategies/danube/](https://ec.europa.eu/regional_policy/en/policy/cooperation/macro-regional-strategies/danube/)) and European Union Strategy for the Adriatic-Ionian Macro Regional Strategy (EUSAIR) (EUSAIR European Union Strategy for the Adriatic-Ionian Macro Regional Strategy EU Strategy for the Adriatic and Ionian Region—Regional Policy—European Commission) and should continue to support innovation and cross-border cooperation (EUSAIR n.d.; EUSDR n.d.).

## 6 Socio-Economic Aspects

### 6.1 *Historical Background*

The first signs of fishing activity on the territory of Western Balkans can be found since the Neolithic period (Ćurčić 1910; Smederevac-Lalić 2013). Also, since



**Fig. 2** Fishing activity on the Sava River before Second World War (Petrović 1998)

ancient times, the Adriatic Sea has been used as food provider for people who have settled in these regions. In Dalmatian municipalities, particularly in Zadar in the tenth century, with a donation of fishing-grounds around the island of Molat, and in Telašćica of the island of Dugi Otok to the Benedictine monastery of St. Krševan in Zadar dated circa 995 in which, for the first time, Croatians are mentioned as involved in fishing along the coast (FAO AdriaMed Project ([http://www.faoadriamed.org/html/adriamed\\_project.html](http://www.faoadriamed.org/html/adriamed_project.html)) (FAO-AdriaMed Project 2022). As evidenced by numerous historical records, fishing has been a traditional activity for centuries (Petrović 1998). Archeological findings show that fishing was one of the main activities in the area of the Sava and Danube Rivers (Fig. 2). Fish was a symbol of life and one of the conditions of existence at the beginning of human civilization (Živaljević 2017). Inland fishery in Serbia represents “living-by-the-rivers” lifestyle as common and traditional activity of local inhabitants (Lopes et al. 2015). The main part of the area is comprised of a largely rural population and most households in the villages in the vicinity of the large rivers such as Danube, Sava, and Tisza depend on fishing because fishing is an integral part of their livelihood (Smederevac-Lalić et al. 2011a). Importantly, the former state of freshwater ecosystems differed hydrographically and hydrologically from present situation, primarily due to the draining of wetlands, the regulation of flows, and the construction and formation of artificial water systems such as dams. However, this did not diminish fishing importance, but it did have an impact on the characteristics of the fishing resource and fish stock (Smederevac-Lalić 2013).

The first regulation on fishing activity in the area was adopted in 1859, and the first Law on fisheries in 1898 (Petrović 1998; Smederevac-Lalić 2013). The

fishermen's guild existed and at the beginning of the twentieth century. Within the Law on Freshwater Fisheries (Petrović 1998; Smederevac-Lalić 2013), there was a special article related to the protection and improvement of fisheries. There were fishing associations whose tasks were rational utilization, and improvement of fishing, aquaculture, processing, organization of sale and transport of fish, and general improvement of economic interests. The government supported these associations. Local administrations were obliged to collect statistical data and send them to the competent ministry. The law prescribed a fishery fund intended to be used for the improvement, organization, regulation, and fisheries research. After the Second World War, fishing on the large rivers Danube, Sava, and Tisza became an increasingly important economic branch (Smederevac-Lalić 2013). The abundance of fish was reduced by the regulation of the Danube, and later by the increasing development of industry along the banks of the Sava and Danube (Smederevac-Lalić 2013). Fish catch records are maintained since 1948, while the data on exact species composition was introduced in 1951 (Smederevac-Lalić 2013).

However, fishing has remained until present time the professional occupation of a part of the population, the basis of their diet, livelihood and the subject of trade (Smederevac-Lalić 2013).

## 6.2 *Present Socio-Economic Status*

Artisanal fishery in the Western Balkans has a long tradition and today it represents ethnological, traditional, sociological, cultural, and economical heritage (Lynch et al. 2016; FAO 2019; Pascual-Fernandez et al. 2020; RPOA-SSF (n.d.); RPOA-SSF <https://www.fao.org/gfcm/activities/fisheries/small-scale-fisheries/rpoa-ssf>). Inland fisheries have low economic value and a small impact on the economy (Smederevac-Lalić et al. 2011b; Lynch et al. 2016; Matic-Skoko and Stagličić 2020). Although there is demand for fresh fish, competition for space and conflicts with recreational fishermen reduces the potential for sustaining and developing artisanal fishery in the future (Gómez et al. 2006).

The most common indicators that illustrate the socio-economic importance of fishing are the catch and the number of fishermen (FAO 2019; GFCM 2030 <https://www.fao.org/gfcm/2seas1vision/GFCM2030Strategy>; GFCM n.d.). The decreasing trend of artisanal and small-scale fishermen can be linked with the legislation and corresponding regulations and obligations arising from it.

Artisanal fishermen are territorially unevenly distributed, and thus are not subject to the uniform rules of different users of the area, which makes it difficult for them to unite for their rights. Fishing is marginalized as an economic activity and occupation (Smederevac-Lalić et al. 2011b; FAO 2019). In this sense, aquaculture is far more represented as competition on the market.

Fishing is mostly done by people who have lost their jobs or are not qualified to do other occupations or have inherited and learned from family members (Chuenpagdee et al. 2013; Smederevac-Lalić 2013). Those who do not have another

source of income or do not have the possibility to live in a different way remain in this business. Fishermen provide food for all levels of society. However, there are more poor citizens who are unable to buy other types of meat, so second quality fish is an option. Nowadays artisanal fishing in many countries is not considered by the government as an economically significant activity (Smederevac-Lalić 2013; Matić-Skoko and Stagličić 2020; Rakowski et al. 2020; FAO 2022b). The fish market has been disordered and unorganized for a couple of decades. Since there is no organized purchase of fish from fishermen, the sale of freshwater fish is most often carried out by fish farms (aquaculture facilities), private fish shops, restaurants, and resellers who buy fish from fishermen. More and more fish and fish products, and the low prices of imported fish compete with domestic freshwater fish. The market is small, and there are just a few companies involved in the processing of fish and its products (Smederevac-Lalić et al. 2015).

There is practically no official data on fishing resources, their richness, accurate fish stock assessments, condition, economic and recreational use, although the legal regulations manage the conditions of use and regular monitoring of resources (Visser et al. 2021; Vehanen et al. 2020). The absence of an organized fish purchase system and insufficient management of the fishery sector have resulted in poor data reliability. There is a lack of data on the historic catch per unit effort (CPUE) (Jarić et al. 2015). Knowledge about the present and historic fishery pressures based on the number of fishermen, their fishing effort, and catch quantities, is a prerequisite for the efficient management of fishery resources, which is commonly realized by keeping regular management statistics (Coates 2002; Smederevac-Lalić et al. 2011c; Jarić et al. 2015).

Based on the statistics (Visser et al. 2021), the number of recreational fishermen has been growing for years. While recreational fishing in European countries has only the character of a free time activity, directly reflecting standard of living, in Balkan countries it has a different character. For the majority it is an additional source of income or a supplement to the family's diet (Smederevac et al. 2006). Often exposed to political and governance changes, fisheries management institutions still lack adequate mechanisms to cope against corruption and poaching. Estimation of actual fishing pressure of both artisanal, small-scale and recreational fisheries is difficult. Recreational fishermen, unlike artisanal ones, with such a large number of fishermen, are extremely difficult to control. However, recreational fishing has a very significant impact on fishing resources and should not be neglected (Smederevac-Lalić 2013).

The socio-economic status of fishermen is an important factor affecting the sustainability of fishery (Cowx 2015; Boucquoy 2017). It is important to note the constant and increasingly pronounced conflict between recreational fishermen and artisanal fishermen (Cooke and Cowx 2006; Boucquoy 2017). Underlying that conflict lays a complicated set of reasons that can best be defined as the different economic and social positions of the two categories of resource users. The position of artisanal fishermen is clearer, because they catch fish on a professional basis and this is their primary economic activity (Fig. 3). However, their position does not depend only on the degree of success in catching (Supplementary Video S1), but



**Fig. 3** Artisanal fisherman on the Danube River (photo: Smederevac-Lalić)



also on a series of legal measures that they must comply with, which is not the case with recreational fishermen to such an extent (Čaldarović 2005). Better conditions for the resource use (Rockland 1983) are given to recreational fishing, in the sense of a lower license price, less limitation of the territory where they can fish, minor restrictions on catches, tools, etc. Recreational fishers are also seen as “stewardship leaders” with a strong political voice, and they can have a strong influence over decision-makers (Bower et al. 2014). There are different reasons and motivation for recreational fishing: some return the catch to the water, others consume it, and there are also those who sell the catch. The motives for engaging in recreational fishing, and therefore the final result of the activity, are not always in accordance with the idea of recreation and relaxation. According to Cowx (1996), Eastern Europe recreational fishing is much more than simply a leisure activity and there is an increasing dependence on this activity as a source of food, as the transition from the communist regime proceeds. The motivation for those engaged in fishing, in general, depends on the social and economic position (Čaldarović 2005). Therefore, artisanal and recreational fishermen reflect two structurally and functionally different social positions in the society.

Results of the survey (Smederevac-Lalić et al. 2011b; Smederevac-Lalić 2013) conducted with the artisanal fishermen in Serbia, indicated that fishermen consider fishing has no future. The most significant problems according to the opinion of fishermen were lack of an organized system of fish purchase, poaching, high fishing licenses costs, poor regulations, and pollution (Smederevac-Lalić 2013). A number of artisanal fishermen experienced a trend of a constant decline since 1994, as the sector failed to find its proper place in the transition process and nowadays represents a marginalized branch of the industry. The freshwater fishery is an insufficiently regulated area that depends on personal commitment and individual responsibility (Smederevac-Lalić et al. 2011b, Smederevac-Lalić 2013).

The marine fishing sector has rarely been influenced by political issues. In the early 1990s, during the transitional period, socio-economic reasons led to a large number of people engaged in fishing. In the last decade, there has been no increase in the number of new small-scale fishers in Croatia (Matić-Skoko and Stagličić 2020). Despite small-scale fisheries not being very economically significant, they do have great social importance. Besides food supply, supplement to the household budget, this activity make a substantial contribution to employment among the rural population on islands and along the coast. Fisheries also provide an added value to tourism services, have significant cultural value and as such are part of the identity of the island community (Matić-Skoko and Stagličić 2020). Existence of the small-scale fisheries in the future is questionable due to potential conflicts with oil and gas industry, with the maritime transport sector and with the wind energy sector, with Marine Protected Areas (MPAs), which are expected to increase in size in the coming years (Matić-Skoko and Stagličić 2020).

Fishing communities exist in coastal villages all along the Adriatic coast (FAO 2022c). Coastal areas and particularly the islands are characterized by numerous fishing communities, where the majority of the population is employed in fisheries. In some areas, fishers are organized in cooperatives, trying to secure the best possible outcome for their activities (Matić-Skoko and Stagličić 2020). With the development of tourism, traditional fishing communities are difficult to identify, and generally there is still a rather low level of larger fisher organizations, such as cooperatives or other types of joint management. In order to fish, it is necessary to have a fishing license or fishing permit obtained from local offices or travel agents. Licenses are issued for recreational angling, underwater spear-gun fishing, hand trolling, long lining, and tuna fishing. Fishing in Croatia is strictly forbidden in the area of the National Parks (FAO 2022c). Also, Montenegro recently formed Marine Protected Area (MPA) where in particular time of the year fishing is banned (Fishery sector analysis in Montenegro for purposes of preparation of the Strategy of Agriculture and Rural Development 2021–2027 and IPARD III (2021–2027) programming). About 300 registered fishermen are engaged in freshwater artisanal fishing in Montenegro (Fishery sector analysis in Montenegro for purposes of preparation of the Strategy of Agriculture and Rural Development 2021–2027 and IPARD III (2021–2027) programming). They fish with quite outdated fishing vessels and tools. Freshwater artisanal fishermen use traditional fishing boats at the Skadar Lake, the so-called čun, maximum power engine of 10 hp, in accordance with the

Law on Navigation Safety (Official Gazette of the Republic of Montenegro 2014, No 62/2013 and 06/2014).

They argue for these restrictions, because they believe that 10 hp engines do not guarantee safety in bad weather conditions and request the change in the context of using higher power engines. There are no special moorings for fishing boats, docks, or other supporting infrastructure (warehouses, cold stores, ice machines, etc.) on the Skadar Lake in Montenegro. Fishermen sell their catch directly on the market (markets, restaurants), and to fish processing factories. Since 1987, statistics on fisheries have not been kept although there is strict law obligation for each fisherman to have log book with data regarding their catch (FAO 2022d).

For the majority of artisanal fishermen on the Skadar Lake in Montenegro, fishing is not their primary occupation, but rather an additional or supplementary occupation through which they earn a significant income (Fishery sector analysis in Montenegro for purposes of preparation of the Strategy of Agriculture and Rural Development 2021–2027 and IPARD III (2021–2027) programming). During the survey among commercial fishermen from Skadar Lake on the share of individual costs, no precise data were obtained to estimate costs and possible earnings. For most commercial fishermen on Skadar Lake, fishing is not the main occupation, but an additional or supplementary occupation with which they make a certain profit, and a certain number of respondents answered that they do not make a profit, i.e. do not sell the catch but use it exclusively for their own needs (Fishery sector analysis in Montenegro for purposes of preparation of the Strategy of Agriculture and Rural Development 2021–2027 and IPARD III (2021–2027) programming). When it comes to artisanal fishermen, the problems are: small and old fleet, poor equipment, as well as the lack and high price of raw materials and equipment for fishing, lack of specific places for moorings. An additional problem on the Skadar Lake is illegal fishing, so it is necessary to strengthen control and inspection because the current number of employees cannot ensure constant control. There is a need for the construction of facilities for the processing of traditional fishery products, among which the most important are smoked and marinated carp and smoked bleak, for which this region is famous (Fishery sector analysis in Montenegro for purposes of preparation of the Strategy of Agriculture and Rural Development 2021–2027 and IPARD III (2021–2027) programming).

Albania has the highest population growth rates in Europe and fishery and aquaculture can contribute in the poverty alleviation. Demographic movements led to an increase of population in coastal areas; consequently pressure on marine fishing grew rapidly (Bon et al. 2018). Fish farming is considered to be the most efficient measure to ensure that fish resources are not overexploited (FAO 2022a). Artisanal and commercial fishing in Albania has been a very important occupation since the time of the Illyrians (Çobani 2016). Coastal residents were mainly engaged in fishing and this activity has become one of the most important sources of food. The artisanal and commercial fishery has developed since the 1990s as an alternative to unemployment and low income in coastal areas (Çobani 2016). The data collection and reporting are obligatory for artisanal and commercial fishermen (Çobani personal communication). A recent field survey (Çobani 2016) of commercial, small-scale,

and artisanal fisheries in Albania gave the insight into the importance of this sector in terms of species and quantities caught, socio-economic aspects, and relations with other categories of fisheries and management activities. About 85% of the fishing category is made up of illegal, unreported, and unregulated fishing (Çobani 2016). Recently, the fisheries inspection has begun to consider artisanal fishing more important. In order to get to know the situation and start the basic monitoring of this category of fishing, interviews were conducted with artisanal fishermen (Çobani 2016). It is not a primary economic activity in general in Albania, because fishermen are mostly employed in agriculture and other occasional activities (FAO 2022a). According to survey data (Çobani 2016) almost all fishermen have been engaged in this activity for more than 10 years, in some cases even 20 years, following the family tradition. Lagoon (commercial) fishermen exploit both the lagoon and the marine coastal zones by combining the lagoon's seasonal catch using traps with trammel net fishing along the coast. They comply with regulations regarding the stocking of their lagoons as it is considered fundamental to their activity. This category of fishermen proved to be appropriately licensed. Among the main reported constraints and problems affecting the small-scale fisheries are the lack of good quality fishing nets and the inability to directly access to the equipment (Çobani 2016). Fishing equipment imported from abroad does not offer a suitable range of quality and price (Çobani 2016). Illegal inshore trawling that causes damage or loss of small-scale fishing gear is also recognized as a problem. The sale of the catch to restaurants or fishing companies has been reported to be negatively affected due to small quantities sold. This category of fishermen is very poor. They are characterized by good expertise in maintenance of boats, making nets, and knowledge of the sea for forecasting and planning of fishing activities (Çobani 2016). Artisanal fishers know the fish behavior well and their biological seasonality, therefore this traditional local knowledge would need to be framed and valued by scientific programs and to be considered by policy makers in a way that this fishing category could be an integral part of management plans. Also, artisanal traditional fisheries may contribute to determine illegal fishing by fishing boats operating in shallow water near the coast (Çobani 2016).

Ecological and socio-economic changes in Balkan countries, increase of recreational fisheries, and the disappearance of traditional low-technology commercial fisheries led to a loss of the traditional ecological knowledge held by small-scale fishers (Matić-Skoko and Stagličić 2020). According to Cooke et al. (2016), inland fisheries have traditionally been forgotten compared to marine fisheries, but still there is a hope that in the future political will and public desire will properly assess and manage inland fisheries in an integrated water resources management. The active involvement of fishermen preserves and incorporates unavailable traditional and local knowledge into the decision-making process, and lends legitimacy to the rules governing fisheries and results in strategies that are respected and voluntarily followed (Dimech et al. 2009). Embedding different areas of social science in activities should rebuild resilience and adaptability within the fisheries sector and fishing community.

Experiences of other countries, opinions and knowledge of fishermen could be used as a good basis for sustainable planning, monitoring, and management of fish resources and fisheries sector (Smederevac-Lalić et al. 2011b; Smederevac-Lalić 2013).

## 7 Management

The main problems of fisheries worldwide are overfishing, unemployment and poverty, food insecurity and social injustice (Chuenpagdee et al. 2013). These problems can be felt in all countries and governments, so the approach must be holistic and to take into account principles, institutions, and conditions, analyzing the nature of fisheries management problems and challenges concerning the governance of fisheries, exploring where these problems lie and finding potential solutions (Chuenpagdee et al. 2013). Governance is an important concept in environmental policy and social science with increasing application to socio-ecological systems such as fisheries. Management analysis of fisheries has created innovative ways to implement the ideal of sustainability. However, despite progress, there are limitations in existing governance concepts (Song et al. 2018). This change is driven by the opinion that the state governance model is becoming increasingly inadequate in mobilizing effective and legitimate responses to the complexity of socio-ecological problems.

In general, there is still a lack of communication and trust among scientists, fishers, and fisheries managers. This should be the focus of any management process that could facilitate the desired outcome of the sustainable management of fisheries. The feeling of inequality leads to hopelessness and anger and a loss of confidence in future work. Perceptions of a lack of fairness in the distribution of costs and benefits of resources can have an impact on the way policies are perceived and implemented (Cochrane 2000). For example, recently Pešić et al. (2018) stressed that conflict over the sustainable use of limited aquatic resources has been recognized in the public as a consequence of the lack of an established set of equitable sharing principles among the contending parties (Pešić et al. 2020). This is particularly important for small-scale fisheries with non-transferable skills (Cochrane 2000). Management strategies based on fishermen's knowledge can provide invaluable practical information. The newly reformed Common Fisheries Policy (CFP) recognizes that securing the future small-scale fisheries is essential (CFP) (<https://www.europarl.europa.eu/factsheets/en/sheet/114/the-common-fisheries-policy-origins-and-development>) (The common fisheries policy (CFP) n.d.). Nevertheless, small-scale fishing has taken its rightful place in the wider picture of tourism, sustainability discourse, and neoliberal economy. They also had to deal with new challenges and opportunities at different levels, such as flow of the "projects." "Everything nowadays becomes a project," preferably sustainable, and it has become quite difficult to work outside of the project even if you are a fisherman. In this race for projects, fishermen come last, even though they

are the ones on which the image of sustainable fisheries is based. They have to compete with aquaculture, with people who know how to apply for projects, or they have to get involved in the tourism industry to survive. Not everyone is ready or has the financial ability to make these changes (Spreizer and Rogelja Caf 2020).

Surveys of socio-economic characteristics of fisheries may help the national fisheries management authority by providing a better understanding of the situation in this sector. It can contribute to its management and the establishment of a more regular monitoring scheme (Çobani 2016).

There is a need for integrated water resources management where strategies should create incentives for resource-user communities to invest in the long-term conservation of habitats and fish stocks. Integrated management of water resources is necessary because it includes biophysical and socio-economic elements (Cooke et al. 2016). Limited availability of fish resources will require communication, proactive management strategies, and cooperation across sectors to ensure the sustainability and resilience of the socio-ecological system. In that context, management should be organized establishing an adaptive management strategy that includes avenues for stakeholder participation (Bower et al. 2014).

A considerable complication for the management and often a politically sensitive issue is when the water and fish stocks are shared by several countries. Sustainable management requires agreement among countries on unique management goals and measures, as well as a compatibility and regular exchange of data. This particular concern about fisheries management of shared water bodies has been expressed by several governments in the Balkan region (White et al. 2018). Governments are usually more motivated to monitor marine fisheries and aquaculture than freshwater because of the higher potential for tax revenue (Coates 2002).

## 8 Conclusions

By comparing the present situation in the Western Balkan countries, the situation in fishery sector seems similar. Fundamental changes in the socio-political environment on the territory covering most of the Balkan countries in the 1990s crucially affected regular life, economy, and consequently fisheries sector. The major common impression after the analysis of the data about fishery from Balkan countries is that fishing is in a prolonged process of transition from command economy under socialism to market economy. This period in fishing, as well as in the whole economy, is characterized by the absence of effective implementation of regulation, strengthening of illegal and informal activities and weak control. The only significant difference is pressure on resource, affected by the number of artisanal, commercial, small-scale, and recreational fishermen.

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