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KA2 – Cooperation for innovation and the exchange of good practices – **Capacity Building in the field of Higher Education**

Capacity building for Blue Growth and curriculum development of Marine Fishery in Albania – ALMARS

Ref. 598550-EPP-1-2018-1-HR-EPPKA2-CBHE-JP

SHORT DESCRIPTION OF THE PROJECT

Project aims to enhance marine fishery industry in Albania through several tasks: 1) development of new professional master degree in marine fishery that will meet market needs, 2) enhancement of collaboration among Blue Growth stakeholders by developing networking platform, and 3) improvement of maritime training centers which provide professional trainings to seafarers operating on fishing vessels. The new curriculum in marine fishery will be developed through collaboration of scientific experts and marine industry stakeholders. Curriculum will provide students with theoretical knowledge and practical skills that are required by the labor market needs, which will have a positive impact on the employability of students and matching of the labor market demand.

Furthermore, the new curriculum will offer more practice-oriented opportunities, contributing to university-enterprise cooperation, opening door to new research opportunities and knowledge exchange among industry stakeholders and academics. The creation of the networking platform that will unite all stakeholders active in marine fishery field, education institutions, graduated students, private companies and organizations, will further contribute to that since it will provide the stakeholders with opportunities for new partnerships, exchange



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know-how, access to up-to-date market information, qualified staff and/or employment opportunities.

Improving the maritime training center for professional seafarers operating on fishing vessels allows us to penetrate and shape the marine fishery industry from another angle which is the field of exploitation and fishing. Currently, training centers are not in accordance with IMO standards and the requirements of EU legislation. Developing new courses for professional seafarers would have a positive impact on environment protection, decrease in safety hazards, at the same time improving fishing and exploitation efficiency and international collaboration opportunities.

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Partners

ALB ADRIATICO 2013 (AL)

ALBAMAR (AL)

INTERNATIONAL ORGANISATION FOR THE DEVELOPMENT OF FISHERIES AND AQUACULTURE IN EUROPE (DK)

MINISTRIA E BUJQESISE DHE ZHVILLIMIT RURAL (AL)

UNIVERSITA POLITECNICA DELLE MARCHE (IT)

UNIVERSITETI ALEKSANDER MOISIU DURRES (AL)

UNIVERSITETI BUJQESOR I TIRANES (AL)

UNIVERSITETIT TE VLORES (AL)



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Associate Partner: UNIADRION (IT)

Working Package 1: Analysis of current status of fishing industry in Albania

Assumptions

- Interest of target groups for the results of the analysis,
- Cooperation of stakeholders active in the marine fishery field for providing the data

Risks

- Accuracy and quality of the collected data

Description

Goal of this work package is to give a detailed overview of the marine fishery field in Albania, including education opportunities and their capacities (infrastructure and teaching), human resources in the fishery administration institutions (Ministry of Agriculture, Fishery Inspectorate, etc.) and their education, needed trainings for building the capacities in public fishery sector, stakeholder active in fishing industry and aquaculture, fishery products processing industry, fish trading and marketing enterprises, such as manufacturers, distributors, and professional seafarers.

Implementation of this work package will include two activities: report on the existing educational resources in Albania and report on the fishing industry in Albania.

Tasks



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Preparation of 2 reports:

1.1. Analysis of the existing educational resources in marine fishery field at universities in Albania

1.2. Analysis of the fishing industry in Albania

WP1 refers to the analysis of the current status of educational resources in the marine fishery field and the structure and number of stakeholders in the fishing industry. Most work will be done by Agricultural University of Tirana (AUT) and Ministry of Agriculture and Rural Development (DSHPA) who will provide data on stakeholders and market specific data, also Eurofish who is running surveys on fishing industry analysis on EU level as well as locally in Albania. There is a total of 226 days planned within this WP, and subcontracting costs of printing material for analysis. The other involved partners are represented by the private companies (AlbAdriatico 2013 and ALBAMAR) and other involved Universities (Universita Politecnica delle Marche, Universiteti Aleksander Moisiu Durres and Universiteti i Vlores).

Description of Reports

1.1. Analysis of the existing educational resources in marine fishery field at universities in Albania

Analysis will give an overview of the existing education programs related to the marine fishery field available at universities in Albania. It will also give us detailed insight in the existing resources at partner universities: AUT, UV and UAMD, more specifically: details on courses related to the marine field, teaching staff, equipment and other resources currently available and related to the marine fishing field.



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Each university will provide data on its resources along researching technical secondary schools and training courses organised by different institutions (fishery, environment, food safety, etc).

1.2. Analysis of the fishing industry in Albania

The report will give an overview of the structure, capacity and number of stakeholders active in the fishing industry in Albania. The activity will include panel discussions and interviewing stakeholders in order to obtain information on collaboration activities, possible shortcomings in the industry, and their needs with regards to networking, developing human resources, regional development and transboundary cooperation, natural and economic resources.



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1.1. Analysis of the existing educational resources in marine fishery field at universities in Albania

Universiteti i Vlores (University of Vlora “Ismail Qemali”)

University of Vlora (UV), established in 1994, is a public higher education institution located in southern Albania. Its academic program is based on the Bologna Accord. Currently, the university provides Bachelor's, Master's degrees, and doctoral program. UV gives a special emphasis in promoting and encouraging the international dimension of studies, learning and scientific research. It is the most important Albanian maritime higher education institution. It has contributed to the preparation of Navigators for fishing vessels and Specialists for the related sector. Currently, UV is accredited and the maritime education departments are fully upgraded to the international standards of maritime education in accordance with the STCW Convention. Thanks to a series of projects with European partners such as NTNU Norway, University of Montenegro, University of Barcelona, University of Split, CMU, University of Slovenia etc. is equipped with laboratories and simulators in accordance with actual standards for maritime education. UV holds Agreements with more than 30 Higher Education Institutions of EU countries and also with Universities in China and the Middle East. UV is also ranked among first Albanian Higher Education Institutions in terms of student mobility.

UV is the only Albanian institution that has endorsed and undersigned The European Charter for Researchers and The Code of Conduct for the Recruitment of Researchers in October 2016. UV has been/is partner in several EU projects (U3M Developing third mission activities in Albanian Universities –TEMPUS) and Erasmus Mundus Green-Tech –WB – innovative technologies 2014-2018. UV has already developed its own “Internationalization Strategy”. Main goal is internationalization, opening of the University in cooperation with European higher education institutions and participation in European research activities and projects



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Historical aspects of Maritime Education in Vlora region

In 2003, at the High Technology School "Hysen Cela" in Durres, after the request of the "Fishery Association", as a demand of the labor market in this sector, was opened a 3-year fishing branch, which continued until 2009. In 2014 this branch was reopened with 2 + 1 + 1 system and 31 students were enrolled.

In 1979, at the Vlora Marine Academy, take place the first graduation of navigators, specialized for fishing vessels and for the management of fishing activity in Albania.

In 2010, the branch of "Navigation and Marine Fishing" was opened at University of Vlora. The branch was a continuation program of the Maritime Academy's for the preparation of profiled navigators for fishing vessels. The students graduated could be employed not only as navigators but as fishing specialists also. The profiling, of students, took place in the third year of study with the introduction of subjects that covered techniques and methods of fishing, national and international fisheries legislation and regulation, knowledge of marine species their growing and cultivation techniques.

Nowadays, at University of Vlora there is a branch of Biology department where a part of its program is focusing on marine species, including the treatment of their growth and cultivation methods.

Training and Certification of seafarers of Shipping Vessels

The training and certification of seafarers of Shipping Vessels is performed by several training centers.

There are currently three Training and Certification Centers in Albania:

- University of Vlora
- Durres - TST



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- Vlora - VMTC Training Centers.

The Maritime Training Center at the Department of Navigation at the University of Vlora offers Training and Certification of Students who had completed the studies in the Navigation and Naval Engineering Departments. Training and Certification includes: Basic Training, Safety Training for All Seafarers, Proficiency in using safety Boats, Watchkeeping in the ship (bridge and engine room). Up to now, there are trained a number of students who have completed the studies at Navigation and Naval Engineering at the University of Vlora and University of Durres.

The other two Training Centers TST - Durres and VMTC – Vlore, offer training of seafarers in both sectors, at all levels of training according to the STCW-95 Convention and the Manila 2010 amendments. Both centers are equipped with didactic materials, laboratories, simulators and polygons, for carrying out the training in accordance with the requirements of the Convention. Both centers have been and continue to be training seafarers crew members of shipping.

The Maritime Training Centers, mentioned above, have all the necessary resources for training of seafarers of fishing vessels. Despite the fact that the conditions, for training of seafarers in fishing vessels are real this training can not be done, because Albania, as well as many other countries in Europe and beyond have not ratified the STCW-F (Standards of Training, Certification and Watchkeeping for Fishing Vessels Personnel) Convention. There is a small number of EU Member Countries which have ratified this Convention (9 states: Belgium, Denmark, Latvia, Lithuania, Netherlands, Poland, Portugal, Romania and Spain). On the other hand, the report highlights the great importance of ratifying the Convention since the Training and Certification of Fishermens is directly related to the safety of life and the level of life of about 150,000 people working on board of fishing vessels and their families. The Report highlights the large number of accidents involving fishing vessels, noting that in 60% of accidents the cause is human error.

In conclusion, it is highly recommended to do improvements by staying focused in:



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- Improving the maritime education at the high schools and universities,
- Reopening the branch of Navigation and Maritime Fishing at the University of Vlora or a 2 years study program for Navigation and Maritime Fishing.
- Revise the Biology Degree Programs and include them in more of the International References and Legislation in relation to the growth, cultivation, and preservation of marine living things. Also exchanges and organization of joint lectures and seminars between the branches of Navigation and Biology, related to fishing.
- Lobbying at Local Government in Coastal Cities to sensitize the importance of training of fishing vessel personnel, with the aim of obliging the Albanian Government to ratify as soon as possible the STCW-F Convention to open the training and certification route of this part of the seafarers in our country.

Marine Biology profile of the Department of Biology

Biology Department, is currently involved in the research of marine biology through various collaborations between our University and the Department of Biology, Faculty of Natural Sciences, University of Tirana. Currently, the department has three marine biologists, which carry out research in marine zoology and ecology. Their research is focused on the medium-littoral and infra-littoral habitats, their biodiversity, the structure of the communities and the health status of the ecosystem. During the last five years, the research activities have been carried out in the Vlora Bay, and also in the Marine Protected area of Sazan-Karaburuni. Currently, the biology department counts the collaboration of three marine biologists, who direct a large number of research projects and student theses. Our research field has so far been concentrated mainly in zoology and marine ecology. Mainly this department staff members worked on the macro-zoo benthos of the middle coast and infra-littoral habitats. The main methods we apply are morphological identification, the use of bioindicator species and ecological and biometric indicators of the population of different species of benthic macroinvertebrates.



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Our research group will also have the opportunity to apply a series of restoration methods for the rocky inter-coastal habitats thanks to the financing of the AFRIMED project. Furthermore, thanks to the project, our staff was prepared for the morphological identification of Mediterranean algae, in particular the *Cystoseira* genus and the *Cystoseira* forest restoration methods.

During these years, we have also been able to prepare a number of students in the field of marine biology and zoology with whom we continue to collaborate by involving them in sampling campaigns or in personal staff research projects.



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Universiteti Bujqesor i Tiranes (Agricultural University of Tirana)

Agricultural University of Tirana (AUT), founded in 1951, is the unique centre for undergraduate and graduate studies, scientific research, training and extension in the area of agriculture, food and environment. AUT is among the largest sector academic institutions in Albania - it includes 310 academic staff. Currently, the number of enrolled students is about 15,000.

AUT offers research and education at various levels: Bachelor, Master and PhD in various fields like animal production; horticulture; aquaculture and fisheries; environmental sciences; integrated rural development; marketing; finance etc – which are the main focus fields for the development in Albania as well as for the western Balkans.

AUT offers a wide range of services through its numerous offices and other support units including the Office for Studies and Students, University Library, Experimental and Didactic Economy, Aquaculture and Didactic Economy Lab in Tapiza, the Plant Protection Lab, Institute for Plant Genetic Resources, the Food Research Centre, the Wood Processing Workshop, University's Veterinary Clinic and Botanical Garden.

AUT is increasingly considered as a leading academic and research institution including rural development in Western Balkans – training scholars and experts from the region, eg. Kosovo, Macedonia and Montenegro as well as collaborating with other neighboring countries, thanks to the immense support provided by EU, German government or USAID funded projects.

AUT has signed many bilateral agreements with partner institutions involved also in Erasmus+ Programmes (KA 1). As the number of students and graduates has increased, one of the priorities is building stronger bridges with the labor market.



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Faculty of Agriculture and Environment

Besides teaching, one of the important dimensions of scientific research is consistent with the philosophy and mission of the Faculty of Agriculture and Environment (FAE), in accordance with the interests of the Agricultural University of Tirana, academic staff and students, and in accordance with human and financial capacities.

In Albania, agriculture is currently one of the main branches of the economy and it is considered also one of the key sectors for the livelihood of the population. With all the "internal migration", i. e. the movement of people into the major cities and towns, still a significant part of the population lives in rural areas. This means that for a good part of the agricultural activity and livestock population constitutes the essential source of income life insurance.

Agricultural University of Tirana (AUT) has a long tradition of outstanding value inherently recognized within and outside the country. Faculty of Agriculture and Environment is considered as the place where are formed thousands of specialists that have enabled significant transformations of the agricultural sector for decades. Recognition of degrees in other developed countries has made it possible for specialization and scientific qualification (MSc and Ph.D) of the academic staff of the Faculty in Western European countries or their employment in scientific institutions. Interdisciplinary studies have contributed to efficient and stable team building and provided substantially by improving laboratory infrastructure and the provision of financial support; all these factors have contributed to growing significantly and qualitatively the level of research in the faculty.

FAE has an admirable intellectual potential, which stands at the forefront of research in the Agricultural University of Tirana and beyond. The academic staff members have shown to be personalities and prominent figures within and outside the country in the field of agriculture, livestock, environment, ecology, aquaculture and horticulture.



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The FAE Development Strategies (short, medium and long term) on scientific research is thought to achieve differentiation in study programs master and doctoral level in order to better training of young researchers. Also, one of the main goals of FAE is represented by the training of young professors/lecturers and researchers, in the framework of cooperation with foreign counterpart institutions, to develop doctoral studies, post-doctoral in these institutions.

FAE is conceived as a scientific research center, in partnership with third parties, institutions, international organizations and other actors of the Albanian society. In fulfillment of the dimension of scientific research, all the related activity lies in improving the standards of the University scientific journal, organizing scientific conferences and supporting the staff members on publishing scientific publications.

The Faculty of Agriculture and Environment is structured in 19 Groups of Research and Education, which belong to six departments. These groups are responsible for the coordination of scientific research and the related work within and outside the department. FAE encourages the creation and operation of other research groups, structured around lecturers with high qualification titles and ranking within the department, collaboration between departments and other faculties within the country or collaborations with counterpart departments foreign universities. These activities should have a topic of particular interest to the fields of study, research and development projects. Within the framework of these projects integrate the works of students thesis and other projects with third parties partners. Research groups coordinate and demonstrate their work in compliance with the national and international conference themes. The university and the faculty have always been an active part of the technical discussions and the specific problems solutions in the field of research, while supporting the development of the agriculture sector.

The study programs, scientific research, international collaborations and services



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University study programs are organized in two successive levels; first level and second level of the study. According to the levels of study, the student acquires First Level Degree (*Bachelor*) and/ or Diploma Level II University (Master of Science and Master Professional). Requirements and goals for each level programs are developed in accordance with Law no. 9741, dated 21/05/07 "On Higher Education and Research in Republic of Albania".

FAE offers programs of study on Professional Master and Master of Science. The students' thesis and the relative practical work, as the first cycle, as well as the second cycle of studies, are included as an important part of FAE scientific policies and all students graduate topics. The majority, over 90% of curricula predict the development of courses, which increases independent work, teamwork and the relationship between theoretical and practical topics related to the production activities.

Based on the fact that FAE is the only institution in our country that prepares specialists in the field of Agriculture and Environment, it is the only institution which is dealing with problems of various degrees faced by the Agriculture related sectors in Albania. The students of the second cycle (formerly the School of Postgraduate Studies) under the new name under the law of Higher Education - Master, FAE has always had a very good tradition regarding the quality of scientific work in the framework of the thesis the Masters.

All students who complete the studies in one of the programs of study offered by the FAE are generally enrolled in further scientific qualifications. Programs of instruction in these programs are organized into modules with special recognition given to research. It is an integral part of the scientific activity of Professor/supervisor, to work together with the students in order to finalize these studies in the form of an article written or just a Master student thesis.

On 16. 02. 2009 in the FAE, it was created the Doctoral School with 41 PhD. In this PhD school since its opening (2009-2019) to date, counted more than 450 registered PhD students. The Study Program of the Third Cycle "Ph.D." at the Faculty of Agriculture and Environment was opened



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based on the decision of the Senate no. 1 and the Decision of the Council of Ministers no. 696, dated 18. 06. 2009

The Scientific research work has been carried out in all base units (research and education groups – GMK) in all the laboratories of FAE based on their relevance criteria, in each department.

Each department has at least two or more laboratories that serve and work in teaching and research. It is worth mentioning that due to the FBM projects won in recent years, it has become a possible replacement to a considerable extent of equipment and measuring instruments in these laboratories and it has been possible to establish new laboratories with new equipment in recent years. In recent years, with national and international institutions support it has been possible to establish new laboratories, like the Laboratory of Biotechnology and Biochemistry, Laboratory of Environmental Science, Laboratory of Genetics and Biotechnology and Laboratory of Chemistry and Physiology of Nutrition animals. It is important to mention the work done by the Department of Crop Production for the full operation of the two Laboratories: the Laboratory of Seed Testing and the Laboratory of Plant Biotechnology, which are already working at full capacity.

One of the main aims of the performed scientific research by the FAE staff members is linked to the provide contributions on knowledge enrichment and improvement of the content of the learning process by giving further contribution on increasing its quality, as well as performing a continued raising academic standards in FAE. All academic staff members are engaged in the process of integrating the results of their scientific research into the teaching process, by including not only lectures, but also seminars, where many of these results are included in their scientific publications either in the form of scientific monographs. Often, for this purpose are organized seminars and scientific symposia across departments, with broad participation of academic staff and students. In all these activities of the academic staff members update their knowledge with young students, which is generally originating from their research work in



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accordance with expertise areas. Although, generally the student is considered as the recipient of information on the subject, he is entitled to ask questions and hold discussions on the addressed problems. In many modules, the lecturers tend to interact with the students during the lessons and seminars. At the end of each academic year, specific analysis on teaching and research activities are performed in the department and faculty level, as well as all related publishing activities analyses. These analyses are discussed in detail in the departments' meetings. Part of quality assessment has been open communications with students about the problems that they have encountered in the teaching process and beyond. In order to guarantee the anonymity of student opinion, the surveys are conducted with students of different programs at the departments of FAE.

The Faculty of Agriculture and Environment have developed research analysis in the years before the adoption of the Law on Higher Education of 2007, which clearly defines the obligation of regular and continuous research analyses in the basic unit-level departments and faculty level. These tests as conducted in departments under the supervision of the Dean/vice deans and the Faculty Council; the latter after detailed discussions of its members adopt the open ballot scientific analysis. Each department has collected information on the research of each member of the academic staff for the years in which it has been implemented the self-assessment questionnaire. There is an increased quality of work done in this regard by all staff members FAE in all major areas of research.

The main directions of work done include:

- Human resources, organizational structures and their effectiveness in scientific research function.
- Scientific research support infrastructure.
- Sources of funding for scientific activity.
- Performance of scientific research.
- Participation in national and international conferences



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- Publication of scientific articles in national and international journals
- Preparation of textbooks and various guides for laboratory work
- Master of Science and PhD Thesis
- Organizing and participating in national and international workshops
- Participation in national and international research projects
- Studies and different expertise to support the development of agriculture sector policies in Albania.

During the course of these analyses, it was possible to notice numerous difficulties encountered by the academic staff of FAE. These difficulties consist mainly of:

- Highly significant facts showing insufficient cooperation with companies and business in our country.
- Lack of funds, which will further support the development of the scientific research; requirement of special funds for financial support of academic staff members for publications in scientific journals, short-term training and participation in international conferences abroad – it constitutes a major deficiency in this respect.
- It is one of the key influencing factors of finding ways to ensure financial independence of the department as a key link and more important to increase the effectiveness and quality of scientific research in the future.
- Finding ways to repair opportunities and laboratory equipment (heating, ventilation), which hinders analysis at normal temperature conditions, the availability of chemicals, standards. Another source of funding for research can be private sector in agriculture and animal husbandry. Naturally, this cooperation there must have mutual interests, so research should give answers to current problems that farmers today. Here arises again the need for a better coordination of work between the public and private sector.



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- A scientific work coordination between teaching and research groups for more comprehensive interdisciplinary research. It could be further elucidated by organizing seminars, consultations and scientific symposia with the participation of specialists of the public and private sector.

In the Faculty of Agriculture and Environment, the scientific activities have been continuously growing as a result of a serious commitment of the academic staff members and the development good relationships with universities and scientific institutions within and outside the country, as part of a series of joint projects. The main goal is that research could be characterized by a long-term sustainable development. It is time that the research should respond to today's realities and demands of the Albanian society and the economy, by effectively utilizing infrastructure and human resources at the level of the faculty and by closely cooperating with other institutions within and outside the country. The positive trends for specific research in specific directions, actually is pointing toward efficient lab equipment, as a product of the most positive initiatives to be supported and applauded.

The Faculty of Agriculture and Environment has consistently offered and provided, through its staff of qualified academic consultancy services for third parties, including in private business, as well as various state institutions. The academic staff members of the Faculty are among the most skilled specialists and more prominent in various areas of agriculture sector; they often become part of various projects and studies, conducted by not for profit organizations (NGOs), National and International Agencies, associations, and private and foreign businesses.

Furthermore, the academic staff members of the FAE offer professional knowledge, which makes possible their participation in advisory boards, evaluation commissions and technical committees. The Faculty of Agriculture and Environment collaborates with private companies



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on technology transfer, training, realization of projects of other services in order to consider the business research and development necessary for self-development.

FAE has quality assurance policies, but these are not formal policies and procedures associated with formal achievements. FAE is working to develop its policies in terms of:

- Linkage between teaching and research
- Strategy for quality and standards
- Organization of quality assurance system
- Responsibilities of the faculty, departments and individuals for quality assurance
- Students involvement in quality assurance
- Modality of implementation, monitoring and review of policy

Implementation, monitoring and periodic review of the program of study

Drafting and approval of programs of study is a FAE continuous process of developing programs of study done on the basis of several standard formats required by the Ministry of Education and Sport (MES) and the Accreditation Agency. For the design of *curriculum* that are part of the program of study is conceived an official format, where the emphasis is placed in detailed presentation of issues related to the course subject, as well as the relevant literature, mandatory and additional literature which carefully selected after extensive consultation with experts in the relevant field. It should be emphasized that the concept of *curriculum* should be sufficiently formative in accordance with the objective responses, that are indicated in coherence with other material in horizontal and vertical direction, laboratory conditions and available IT infrastructure; furthermore it is faced with similar programs universities counterpart European Union countries, neighboring countries, or even the USA.

FAE policies and procedures are set out in the process of drafting and adoption of the draft program of study. At the core of these policies is collegiality in the design of the program of study (group work, discussion in the department) as well as in decision-making (the program is



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approved by the faculty and the academic senate). Final approval of the opening of the program of study done by the Council of Ministers, after passing through the filter of evaluation Agency for Higher Education Accreditation.

The Faculty of Agriculture and Environment has met all management structures, such as terms of managing authorities, as well as governing bodies conform to the requirements of the Law no. 9741, "On Higher Education in the Republic of Albania", dated 21.05.2007, as amended.

In FAE, it is conducted regularly an internal control for the quality of teaching in two aspects: The first aspect is tracking all stages of drafting, review, and approval of the project - different study programs, taking measures opinions of lecturers and their approval becomes in collegial form. This form ensures the quality of drafting of the study program; The second direction is the quality of implementation of the program of study. In this regard, it is created the possibility of checks controls, which are more oriented towards the participation of teachers in learning how to monitor the quality of teaching to different professors especially young professors. In this regard, it is generally believed that the FAE must improve its obligation to strengthen the internal control quality of teaching.

In the Faculty of Agriculture and Environment, a particular attention is paid to control exam season and the diplomas/thesis discussion sessions. The regular controls at departments by the dean's office representatives are considered as routine exercises to respect the schedule of exams, exam rule, the requirements of Regulation Curriculum for conducting the exam and completing the exam papers.

In cases of violation of rules related to the process of teaching and during exams or discussion of diplomas/thesis, the Dean takes measures to solve the problems. The administrative measures for academic staff member who has made the relevant violation, are provided with admonition and warning to be fired, till the extreme measure of firing the employee.



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The implementation for the first time in the academic year 2013-2014 of the online Esse3 system for improving the information process toward the student test letting them know the scores electronically is a significant achievement.

Department of Aquaculture and Fisheries

The Department of Aquaculture and Fisheries (DAP) was established by the Decision no. 20 of 15/07/2013 of the Rector and the approval of the UBT Academic Senate. The "Agrarian Engineer" Degree with the profile "Aquaculture and Fishing Management" has been offered since the academic year 2001-2002 by the Department of Animal Production, initially as an Integrated Second Degree Diploma, and then as a First Cycle Degree (Bachelor) and the Second Cycle (Master of Science) Studies.

During the years of delivery of this diploma, the number of graduates in the field of aquaculture and fishing has increased. Increasing interest in following this direction has been driven mainly by the rapid development of the fisheries sector and especially the aquaculture sector, which is the fastest-growing agribusiness sector in Albania. However, the rapid development of the sector and its need for qualified specialists has been added to the legal obligation (Article 33, Law No. 103/2016 of 20/10/2016 "On Aquaculture") for employment in aquaculture farms skilled workers in the field of aquaculture. In Albania, at least so far, the only unit that qualifies specialists in the field of aquaculture and fisheries, is represented by the Department of Aquaculture and Fisheries, at the Faculty of Agriculture and Environment.

The developed study programs at the Department of Aquaculture and Fisheries provide a combination of knowledge on aquaculture and fisheries, which are unique in Albanian Universities. These programs provide graduates with in-depth knowledge through a multidisciplinary approach focusing on advanced technologies for the provision of fishery products, quality and food safety, sustainable use of water resources, and the management of aquaculture and fishery enterprises.



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The Department of Aquaculture and Fisheries mission is represented by 1) the creation of aquaculture and fishing specialists capable of responding to the present and future needs of the aquaculture and fisheries industry, their supporting industries, and state, public or private agencies focusing on water resource management, 2) the research in the field of advanced technologies for aquatic organisms cultivation and finding the best ways to ensure effective and sustainable fishing, and 3) advisory services in the field of aquaculture and fisheries.

The vision of the Department of Aquaculture and Fisheries is to contribute, through academic education, professional training, research and advisory services, to sustainable development and in line with international standards of the aquaculture and fisheries sector.

The Department of Aquaculture and Fisheries aims to achieve the following objectives:

1. Continuous improvement of study curricula and the opening of new programs in line with the development trends of the aquaculture and fisheries sector and labor market requirements.
2. Creation of a stimulating and innovative environment in order to improve the quality of teaching, learning and research activity according to the time requirements and international standards.
3. Strengthen relations with national and international academic and research institutions.
4. DAF transformation into a national study center on marine studies and sustainable use of marine resources as two of the key components of the Blue Growth Strategy of the European Commission.

The Department of Aquaculture and Fisheries consists of three main units:

Department at the AUT university campus, where most of the theoretical and practical courses take place. In addition to the auditors, this unit includes the Aquaculture Laboratory and the Aquarium and Hydrobiology Laboratory, which are primarily in the function of teaching but also of research activity.



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Aquaculture and Fishery Laboratory - Durrës, was established in Durres due to the proximity of the sea and the vessels, which facilitate the processing and analyzing of the water samples and fish organisms. Laboratories of this unit welcome students to conduct teaching practices, diploma thesis, as well as academic and research staff members for research activity.

Didactic and Research Aquaculture Center – Tapizë is located in Fushë-Kruja. This unit serves for the development of teaching practices of students studying aquaculture and fishing related courses, as well as performing scientific and practical research activities in the field of directed reproduction of domestic water fish species and their genetic improvement. In this unit, it is experimented with the reproduction and cultivation of carp decorative fish species. This center produces annually about one hundred thousand of fish fingerlings of the carp family, mainly carp, Koi carp and gold fish, which are required by aquaculture farmers for cultivation and by state or private entities that administer natural and artificial reservoirs.

The Department of Aquaculture and Fisheries cooperates with research groups at AUT and other Albanian and foreign universities, with which it shares similar research areas. The Department also has cooperative relations with the Directorate of Fisheries and Aquaculture Services, Local Fisheries and Aquaculture Inspectorates, Fishery Management Organizations, Marine Aquaculture Organizations, and many aquaculture farmers and fishery processing enterprises.

Study Programs at Bachelor and Master Level on Aquaculture and Fisheries

The teaching activities are structured in 2 semesters and details about each learning modules is reported in the tables for the first and the second level of studies, respectively.

The curricula of the Bachelor level on Aquaculture and Fisheries is reported as follows:

FIRST-LEVEL STUDY PROGRAMME (Bachelor) in “Agrarian Engineering”, Profile “Aquaculture and Fisheries Management”



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1st Year, 1st Semester

Nr	Courses	Hours/ Week	Total hours			ECTS Total	Lecturers
			Total	Lect.	Sem.		
1	Mathematics	4	60	30	30	6	Arben Bocari, Prof As
2	Inorganic Chemistry	3	45	30	15	4	Edlira Shahinasi, MSc
3	Physics and Metereology	4	60	30	30	6	Spiro Grazhdani, Prof Alma Ahmeti, Prof As.
4	Biology and Microbiology	6	90	45	45	7	Spase Shumka, Prof Sonila Cocoli, Dr.
5	General Botantics	3	45	30	15	4	Stela Ruci, Dr.
6	Foreign Language	2	30	0	30	2	Arian Shumeli, Prof As.
	TOTALI	22	330	165	165	29	

1st Year, 2nd Semester

Nr	Courses	Hours/ Week	Total hours			ECTS	Lecturers
			Total	Lect.	Sem.		
1	Botanical Sistematics	3	45	30	15	4	Alma Imeraj, Prof As.
2	Organic Chemistry	3	45	30	15	4	Artiona Laze, Dr.
3	Applied Informatics	3	45	15	30	4	Eneida Topulli
4	Basis of Economy	3	45	30	15	4	F. Bombaj, MSc.
5	Basis of Plant Production	3	45	30	15	5	Ilir Kristo, Prof Agim Canko, Prof
6	Basis of Animal Production	3	45	30	15	5	Lumturi Papa, Prof Alma Llambiri, Dr.
7	Sociology	2	30	15	15	3	Denis Cela, MSc



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8	Foreign Language	2	30	0	30	2	Arian Shumeli, Prof As.
	TOTAL	22	330	180	150	31	

2nd Year, 1st Semester

Nr	Courses	Hours/ Week	Total hours			ECTS	Lecturers
			Total	Lect.	Sem.		
1	Comparative Anatomy	5	75	45	30	6	Gerald Muca, MSc.
2	Genetics	5	75	45	30	6	Anila Hoda, Prof Lorena Hysi, Dr.
3	Introduction to Aquatic Microbiology	5	75	45	30	6	Pranvera Cabeli, Prof Elvira Beli, Prof As. Sonila Cocoli, Dr.
4	Animal Physiology and Biochemistry	5	75	45	30	6	Lefler Klimi, Prof Enkelejda Ozuni, Dr.
5	General Zoology and Sistematics	4	60	30	30	5	Elvis Kamberi, MSc.
	TOTAL	24	360	210	150	29	

2nd Year, 2nd Semester

Nr	Courses	Hours/ Week	Total hours			ECTS	Lecturers
			Total	Lect.	Sem.		
1	Ecology	4	60	30	30	5	Romina Koto, Dr.



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2	Fish Feeding and Fish Feeds	5	75	45	30	6	Enkelejda Sallaku, Prof Etleva Delia, Prof
3	Genetic Improvements in Aquaculture	5	75	45	30	6	Lumturi Papa, Prof
4	Mechanics in Aquaculture	4	60	30	30	5	Edmond Demollari, MSc.
5	Introduction to Aquaculture	4	60	30	30	5	Elvira Beli, Prof As.
6	Water and Earth Sciences	3	45	30	15	4	Ilir Kristo, Prof
							Elvis Kamberi, MSc.
TOTAL		25	375	210	165	31	

3rd Year. 1st Semester

Nr	Courses	Hours/	Total hours			ECTS	Lecturers
			Total	Lect.	Sem.		
1	Kultivimi i Molusqeve dhe Karkalecave te Detit	4	60	30	30	5	Elvira Beli, Prof As.
2	Iktiologji	4	60	30	30	5	Valbona Kolaneci, Prof As.
3	Higjiena dhe Parandalimi	4	60	30	30	5	Edmond Hala, Prof As



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	i Semundjeve te Peshqve						
4	Inxhinieria e Akuakultures	4	60	30	30	5	Rigers Bakiu, Prof As
5	Hyrje ne Teorine e Peshkirnit	4	60	30	30	5	Elvis Kamberi, MSc
6	Riprodhimi i Peshqve dhe Prodhimi Larval	4	60	30	30	5	Edmond Hala, Prof As.
	TOTAL	24	360	180	180	30	

3rd Year, 2nd Semester

Nr	Courses	Hours/ Week	Total hours			ECTS	Lecturers
			Total	Lect.	Sem.		
1	Fisheries Management	4	60	30	30	5	R Kristo, Dr. E.Kamberi, MSc.
2	Professional Fisheries	3	45	30	15	4	Enkelejda Buda, Dr. Marsida Bllaca, Dr.
3	Water Ecotoxicology	3	45	30	15	4	Rigers Bakiu, Prof As.
4	Elective Course 1	3	45	30	15	4	



5	Elective Course 2	2	30	15	15	3	
6	Professional Practice					5	
7	Final Exam					5	
	TOTAL	16	225	135	90	30	

The curricula of the Master (Professional Master and Master of Science) level on Aquaculture is reported as follows:

1. SECOND-LEVEL STUDY PROGRAMME (Professional Master) in “Agrarian Engineering”, Profile “Production Technologies in Aquaculture”

1st Year, 1st Semester

Nr	Courses	Hours/ Week	Total hours			ECTS	Lecturers
			Total	Lect.	Sem.		
1	Aquaculture Engineering Techniques	3	45	30	15	5	Rigers Bakiu, Prof.assoc. Marsida Bllaca, Dr.
2	Hatcheries and Fish Larvae Growing System	3	45	30	15	5	Edmond Hala, Prof.assoc. Marsida Bllaca, Dr.
3	Aquaculture On-Growing Systems	3	45	30	15	5	Rigers Bakiu, Prof.assoc. Elvira Beli, Prof.assoc.
4	Fish Management Health	3	45	30	15	5	Edmond Hala, Prof.assoc. Enkelejda Buda, Dr.



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5	Fishery Products Processing Technologies	3	45	30	15	5	Prof.As.Elvira Beli Jerina Kolutari, Prof.assoc.
6	Biological Aquaculture	3	45	30	15	5	V. Kolaneci, Prof.assoc. S. Shallari, Prof.
TOTAL (1st Sem)		18	270	180	90	30	

1st Year, 2nd Semester

Nr	Courses	Hours/ Week	Total hours			ECTS	Lecturers
			Total	Lect.	Sem.		
1	Aquaculture Management	4	60	30	30	6	Maksim Meço, Prof.assoc. Ilir Tomorri, Dr.
2	Elective Course 1	2	30	15	15	4	
3	Elective Course 2	2	30	15	15	4	
	Professional Practice					8	
	Thesis and Exams					8	
TOTAL (2nd Sem)		8	120	60	60	30	
TOTAL		26	390	240	150	60	

Elective Courses

Nr	Courses	Hours/	Total hours	ECTS	Lecturers
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		Week	Total	Lect.	Sem.		
1	Feeding Technologies and Food Safety in Aquaculture	2	30	15	15	4	E.Sallaku, Prof. E.Delia, Prof.
2	Aquariology	2	30	15	15	4	E. Hala, Prof.assoc.
3	Water Quality Management in Intensive Aquaculture	2	30	15	15	4	Uran Abazi, Prof.
4	Extension in Aquaculture	2	30	15	15	4	Ylli Biçoku, Prof.
5	Marketing of Aquaculture Products	2	30	15	15	4	Dorina Grazhdani, Prof.assoc.

2. SECOND-LEVEL STUDY PROGRAMME (Master of Science) in “Agrarian Engineering”, Profile “Aquaculture”

1st Year, 1st Semester

Nr	Courses	Hours/ Week	Total hours			ECTS	Lecturers
			Total	Lect.	Sem.		
1	Analytical and Instrumental Chemistry	4	60	30	30	6	Ariola Devolli, Dr. E. Shahinasi, MSc.
2	Scientific Research and Modeling	4	60	30	30	6	Sulejman Sulçe, Prof
3	Biotechnology in Aquaculture	4	60	30	30	6	Anila Hoda, Prof. Lorena Hysi, Dr.
4	Genetic Improvement in Aquaculture	4	60	30	30	6	Lumturi Papa, Prof.



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5	Economy and Administration of Aquaculture and Fisheries Enterprises	3	45	30	15	5	Ilir Tomorri, Dr.
TOTAL		19	285	150	135	29	

1st Year, 2nd Semester

Nr	Courses	Hours/ Week	Total hours			ECTS	Lecturers
			Total	Lect.	Sem.		
1	Techniques of New Species Production in Aquaculture	4	60	30	30	6	Edmond Hala, Prof.assoc.
2	Fishery Products Processing Technologies	4	60	30	30	6	Elvira Beli, Prof.assoc.
3	Aquariology	4	60	30	30	6	Edmond Hala, Prof.assoc.
4	Toxicology	4	60	30	30	6	Rigers Bakiu, Prof.assoc.
5	Fish Nutrition Physiology and Food Safety in Aquaculture	5	75	45	30	7	M. Tafaj, Prof., E. Sallaku, Prof., E. Delia, Prof.
TOTAL		21	315	165	150	31	

2nd Year, 1st Semester

Nr	Courses	Hours/ Week	Total hours			ECTS	Lecturers
			Total	Lect.	Sem.		



1	Applied Ichthyology and Fish Stock Assessment	4	60	30	30	6	Valbona Kolaneci, Prof.assoc.
2	Theory and Practice of Fishing Gear Design	4	60	30	30	6	A.Demiri, Dr.
3	Mariculture Production Techniques	4	60	30	30	6	Rigers Bakiu, Prof.assoc.
4	Elective Course	4	60	30	30	6	
5	Elective Course	4	60	30	30	6	
	TOTAL (Sem)	20	300	150	150	30	
6	Thesis of Master of Science					30	
	TOTAL	20	300	150	150	60	

Elective Courses

Nr	Courses	Hours/Week	Total hours			ECTS	Lecturers
			Total	Lect.	Sem.		
1	Induced Reproduction of Cultured Fishes	4	60	30	30	6	M. Bllaca, Dr. E. Hala, Prof.assoc.
2	Fish Health Management	4	60	30	30	6	Dr. Enkelejda Buda E. Hala, Prof.assoc.
3	Organic Aquaculture	4	60	30	30	6	V. Kolaneci, Prof.assoc. E.Kamberi, MSc.
4	Practical Feeding Technologies in Aquaculture	4	60	30	30	6	Enkelejda Sallaku, Prof Etleva Delia, Prof.



5	Biostimulators in Nutrition of Cultivated Fish	4	60	30	30	6	Etleva Delia, Prof.
6	Advances in the Biotechnology Methods Application	4	60	30	30	6	Anila Hoda, Prof. Lorena Hysi, Dr.

Staff members dedicated to research and knowledge providing

The academic staff members of the Department of Aquaculture and Fisheries is represented by 7 lecturers; 5 associated professors, 2 with PhD and 1 with Master of Science. In the table below you can find more information about them.

NO	TITLE	NAME	SURNAME	PROFILE
1	ASSOC. PROF. DR.	RIGERS	BAKIU	LECTURER OF AQUATIC TOXICOLOGY AND MARINE AQUACULTURE
2	ASSOC. PROF. DR.	EDMOND	HALA	LECTURER OF AQUAROLOGY, REPRODUCTION AND FISH HEALTH
3	ASSOC. PROF. DR.	ELVIRA	BELI	LECTURER OF AQUATIC MICROBIOLOGY
4	ASSOC. PROF. DR.	JERINA	KOLITARI	LECTURER OF FISHERIES METHODS
5	ASSOC. PROF. DR.	VALBONA	KOLANECI	LECTURER OF ICTIOLOGY AND MARINE BIOLOGY
6	DR.	ROLAND	KRISTO	PART TIME LECTURER. AT PRESENT DEPUTY MINISTER AT MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT
7	DR.	ARJAN	DEMIRI	PART TIME LECTURER. AT PRESENT DIRECTOR OF



				DIRECTORATE OF AQUACULTURE AND FISHERIES SERVICES, AT MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT
8	DR.	MARSIDA	BLLACA	LECTURER OF PROFESSIONAL FISHERIES
9	DR.	ENKELEDA	BUDA	LECTURER OF PROFESSIONAL FISHERIES AND HEALTH MANAGEMENT, SPECIALIZED IN MARINE BIOLOGY AND WATERS BIODIVERSITY
10	MSC	ELVIS	KAMBERI	LECTURER OF ZOOLOGY AND FISHERIES MANAGEMENT

Most of the registered students in the first and second level of studies performed at the Department of Aquaculture and Fisheries are represented by persons with a poor general knowledge background, where most of them don't have knowledge on foreign languages. Generally, the interest in the courses is the law and it is supported by the fact of high migration rate of people from Albania toward the Western Europe Countries and the United States of America. The continuous review of the curricula and the establishment of new Master courses could attract more good students and increase the level of interest for most of them.

Regarding the research and didactic infrastructures, The Department of Aquaculture and Fisheries is represented by the Laboratory of Aquaculture and Fisheries (LAP), located in Durres, and didactic unit of Tapiza. During 2014, LAP has participated in a number of projects funded by the public institutions and foreign donors. It is worth mentioning the scientific research laboratory within international projects funded FAO Adriamed and MEDITS (EC). In both of these funding, LAP is the institution of reference and covers data processing for small pelagic and demersal fish.



Within the cooperation with the institutions and agencies of foreign countries, a good example of laboratory establishment in DAE is represented by one of the laboratories of LAP, which was funded by the Turkish International Cooperation and Development Agency (TIKA). This laboratory is equipped with devices and instruments required for doing scientific research related to monitoring and analysis of water ecosystems – from the microflora to the fisheries stock assessment analyses.

Furthermore, the Department of Aquaculture and Fisheries is sharing the same building with the Department of Animal Production and the name of this building is the Building of Zootechnical Courses (Godina e Zooteknia in Albanian language). In the tables below you can find more information about this building and the other units of the Department of Aquaculture and Fisheries.

Name of the Building	Year of construction	Total Surface in m ²	Ground Floor Surface - m ²	First Floor Surface - m ²	Second Floor Surface - m ²	Estimated Value of the Building (leke)	Address of the Building	Function of the Building
Building of Zootechnical Courses (Godina e Zooteknia)	1968	2332.5	777.5	777.5	777.5	48,922,650.00	kampusi	lessons
God. Lab. Kerkimi peshkut	1963	460	191	191	78	13,758,181.00	Durres	research
Ekonomia e Rritjes Peshkut Tapize	1986	308	308			5,261,602.00	Tapize	research
Total		12294.1	7043.1	3175.5	2075.5	316231177		

Building	number	Surface - m ²	number	Surface - m ²	ies	m ²	number	m ²	numb
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Building of Zootechnical Courses (Godina e Zooteknia)	12	779.2	8	348.0 5	6	262	3	498. 6	1
God. Lab. Kerkimi peshkut	6	205					2	106	1
Ekonomia e Rritjes Peshkut Tapize							1	81	
Total	64	2171.4 2	30	1274. 6	17	193 4	22	228 4	3

Universiteti “Aleksander Moisiu” Durrës (Aleksandër Moisiu University of Durrës)

Aleksandër Moisiu University in Durrës was established by the Council of Ministers Decision No. 801 dated on 20.12.2005 and is one of 11 public universities in Albania. When the University opened its doors in the 2006-2007 academic year, one thousand of students from across the country started their studies. Today Aleksandër Moisiu University has about nineteen thousand students (19 000) and 6 main units: Faculty of Business, Faculty of Education, Faculty of Information Technology, Faculty of Political Juridical Sciences, Faculty of Professional Studies and Faculty of Integrated Studies with Practice (FASTIP).

This institution is based on the best western academic experiences. The students are in the center of attention in all activities and services provided. The Aleksandër Moisiu University brought a new mentality in the whole Albanian higher education system through a new method of program organization, university life, scientific research activities, links with the local



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community and academic world. It is designed as a university with innovation in teaching and learning.

The beginning of studies about the maritime sector in Albania started in 1961 with the “Naval Academy” (Maritime University) Vlore up to the year 1998. It was the foundation of the Albanian maritime education.

The Faculty of Professional Studies was opened by the Decision of the Council of Ministers of the Republic of Albania, no. 801, dt. 20.12.2006, as one of the main units of the University "Aleksander Moisiu" (UAMD). It was initially known as a Senior Professional School. Since 2010 has changed its status to the "Faculty of Professional Studies".

Throughout its activity, the FPS aims to consistently achieve the highest contemporary academic standards, and to support the educational aspirations and achievements of anyone who seeks out of higher education.

As a vocational education provider, this faculty aims to create a modern and quality system of vocational education in the country. Such a system will contribute to the creation and continuous development of the professional skills and citizenship of young people, through the provision of professional qualifications, not only in accordance with the requirements of the country's economic and social development but also wider.

To this end, high professional education is one of the priorities of higher education development in the country. Also, in the context of the integration of the country into the European Union, vocational education is defined as one of the key elements of development policies for a rapid and full integration of the country into the major European family.

Historical aspects and needs of the sector



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After this academy was closed, there was no other institution offering maritime higher education in Albania Apart of the secondary fishing school in Durres and a training fishing course in Durres. This situation continued until the Department of Nautical Sciences in Vlora University “Ismail Qemali” was established in October 1998. This Department reestablished (after the closure of Naval Academy) the "Navigation" program, and the first students started their 4-year education in the academic year 1998-1999. The "Navigation" and "Marine Fishing" profile was opened for the first time in the academic year 2002-2003. So students of the Department of Nautical Sciences graduated for the first time as navigators in the academic year 2001-2002 and navigators and marine fishing in the academic year 2005 -2006.

Since 2013 at the University Aleksander Moisiu Durres (UAMD) was established study program “Navigation and Maritime Management” on the Faculty of Professional Studies. The purpose of the "Navigation and Maritime Management" Study Program is to qualify individuals with a combined training of the nautical and economic sciences, responding to the conditions of the market economy. Among other things, this program enables the formation of students in such a way that it conforms to the international standards established by the International Maritime Organization (IMO).

The fishing sector is one of the fast-growing sectors during the last year. After a period of several years with negative growth, 2018 noted a significant increase. Marine fishing grew from 4609 Tons from 2017 to 5537 Tons in 2018 (28,5% growth). This due to the subvention policies that the Albanian government has followed recently and the growing demand that the fish process industry has had recently. This growth of the sector was associated with a gap in the human resources. During the last years, except for the secondary fishing school established in Durres in 2003, there were no other training institutions to meet the needs of the sector for qualified personnel. At present there are more than 100 foreign fishermen embarked on board Albanian flag fishing vessels mainly from Egypt, Morocco, India etc.



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The sector itself recently has underlined the need for training centers in order to train new fishermen and have skilled labor force. This demand of the sector has not been adequately considered by the government or education institutions and Universities.

Study Program on Navigation and Maritime Management

One of the main study programs is the program on "Navigation and maritime management. This program is considered as most required from the labor market.

Continuous changes in the labor market, coupled with the globalization process, require skilled specialists in all areas of management. Bsc Study Program. "Navigation and Maritime Management" relies on a need that dictates the rushing economic and social development of our country, constantly introducing new demands for specialists of various professions, especially in the field of seamanship, and fisheries given the fact that Albania is a coastal country, with a commercial, fishing and tourist fleet as well as with a developed port sector. This program is designed to deliver students with the necessary professional skills so that they can be successful in the job market at home and abroad, both in the private and public sectors. At the same time the Bsc Research Program. "Navigation and Maritime Management" creates a variety of career opportunities in the professional and academic field.

The purpose of the "Navigation and Maritime Management" Study Program is to qualify individuals with a combined training and knowledge of the nautical and economic sciences, responding to the conditions of the market economy. Among other things, this Program enables the formation of students in such a way as to conform to international standards set by the International Maritime Organization (IMO). Current training programs are in line with STCW 78/95 (International Convention on Standards of Training Certification and Watchkeeping for Seafarers) Convention. Thus, this Diploma of bachelor's degree is comprehensible and convertible to the Maritime Academies of other developed countries, as students who will



complete their studies in the "Navigation and Maritime Management" study program must also be accepted in the international labor market.

In addition, students acquire knowledge of economic theory and develop skills in quantitative analysis, exchange knowledge about the tools needed to analyze and solve workplace problems.

The curricula of the Navigation and Maritime management is as follows:

No.	Course	Pre-required Course	Semester	Credits/ ECTS
1	Mathematics I (Modul 1)		I	8
2	Physics I (Modul 2)		I	8
3	Maritime Hydrometereology		I	5
4	Applied Chemistry		I	5
5	English language		I	4
	Information technology and communication			
6	Mathematics II (Modul 1)	Mathematics I	II	8
7	Physics II (Modul 2)	Physics I	II	8
8	Navigational cartography		II	8
9	Ship’s engines and aggregates		II	6
	Systems and mechanisms of the ship			
No.	Course	Pre-required Course	Semester	Credits/ ECTS
10	Maritime Security		III	8



11	Navigational bases and coastal navigation		III	8
12	The economics of maritime transport		III	7
13	Ship's Construction		III	7
14	Electronic navigation ECDIS	Navigational bases and Coastal navigation	IV	8
15	Ship's Stability		IV	7
16	Navigational electronics devices		IV	7
17	Practice on ship recognition (Modul 3)		IV	8
No.	Course	Pre-required Course	Sem	Credits/ECTS
18	Ship's direction and maneuvering		V	8
19	Maritime Astronomy		V	8
20	Theory and techniques of maritime transport		V	7
21	Ship's emergencies operations		V	7
22	Emergency operations on ship		VI	8
23	Maritime English		VI	7
24	Navigational practice (Modul 3)	Practice on ship recognition	VI	8
25	Defense Degrees		VI	7



Staff members dedicated to research and knowledge providing

The teaching staff of the Faculty of Professional Studies is very professional and with a wide professional carrier. Especially the teaching staff dedicated to the Navigation and Maritime Management study program have a long seagoing background and some experiences in the fishing sector. The following table provides a few information about the key teaching staff of this study program

NO	TITLE	NAME	SURNAME	PROFILE
1	ASSOC. PROF. DR.	OSMAN	METALLA	NAVIGATOR, FORMER CAPT., MERCHANT AND FISHING VESSELS. MANAGEMENT EXPERIENCE IN THE PORT SECTOR. MARITIME EXPERT
2	DR.	DRAKULI	LUMI	TRANSPORT ENGINEER
3	DR.	ELI	VYSHKA	TRANSPORT ENGINEER
4	MSC. CAPT.	SHPETIM	PUPA	CAPT. MORE THAN 20 YEARS OF SEAGOING EXPERIENCE
5	MSC. CPT	HYSNI	ARUÇI	PART TIME PROFESSOR. FORMER FISHING CAPT., AND EXPERT. AT PRESENT DIRECTOR OF MARITIME SECURITY AT GMD
6	MSC. CAPT.	HAMDİ	DOMİ	PART TIME PROFESSOR. FORMER CAPT., AND EXPERT. AT PRESENT DIRECTOR OF REGISTRATION DEPARTMENT AT GMD
7	MSC. CAPT.	MUHARREM	TRUPE	PART TIME PROFESSOR. FORMER CAPT., AND EXPERT. AT PRESENT INSPECTOR OF PSC AT GMD
8	DR.	MILİDİN	BAKALLI	PROFESSOR OF BIOCHEMISTRY
9	DR.	ERİOLA	KEÇİ	PROFESSOR OF BIOLOGY. SPECIALIZED IN MARINE BIOLOGY AND WATERS BIODIVERSITY



10	DR.	LAURA	GJYLI	PROFESSOR OF BIOLOGY. SPECIALIZED IN MARINE BIOLOGY
11	DR.	ANISA	LITI	PROFESSOR OF MICROBIOLOGY

Laboratory of Biochemistry and Laboratory of Navigation

In order to provide students, the possibility to do professional practices, the Faculty of Professional Studies has several laboratories. In this report, we will focus on the laboratory of biology and Navigational laboratory.

Biochemistry laboratory, which includes biology, microbiology, biochemistry and chemistry, serves for laboratory work for Maritime Management students and Medical Science students. Currently in the laboratory are applied classical methods of analysis.

During the academic year 2019-2020 is expected to be funded by the Ministry of Education Sports and Youth two laboratories, Microbiology and Chemistry laboratory. These laboratories will serve to fulfill curricula items and implementation of modern methods in the environmental field. Laboratories will serve academic staff and excellent students in scientific research for chemical, fecal indicator and nutrient content in underground, surface and sweater.

Navigation laboratory serves as the main training center for the students of the Navigation and Maritime Management study program. This Lab consists of a number of navigation equipment in order to demonstrate and exercise their theoretical knowledge. Some of the equipment we have in this lab are given in the following table:

No	Equipments	Quantity
1	Radar	1
2	VHF	1



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3	EPIRB	1
4	Gyro compass	1
5	Bridge navigational panel	1
6	Life jackets	4
7	Life rings	4
8	Signaling rockets	Set
9	Ship model (replica with scale 1:200)	1
10	Others (complete of chart working sets – compasses, rulers, triangles etc.)	

This lab is used as a chart class as well where chart navigation exercises are carried out. The university is planning to equip this laboratory with a bridge simulator (full bridge) as well as ECDIS simulator.

In order to complete the navigational practices, the Faculty of Professional Studies has signed a number of agreements with different maritime companies including fishing vessels. According to these agreements our students are allowed to be embarked as cadets in these vessels and practice/exercise different navigational skills.

Other Available Resources related to Maritime Education

Apart of the University, there are other maritime education institutions which are offering maritime education. One of the high schools offering professional studies is the school “Hysen Çela in Durres. This school has a number of study programs such as Food Technology, Hotel and Restaurant Management, Economy-Business and there is another study program “Navigation and Fishing”, a program added to the geographical position of the city of Durres, which promises a lot for the future of youngsters who will follow exactly this branch that was opened based on labor market requirements for the



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fish industry, with the growing demand for our city restaurants for this fresh product and the increasing number of tourists.

The students from this study program are the most preferred ones for the acceptance at the “Aleksander Moisiu” University. To increase their chances to be enrolled at the University, there are preferential criteria set forth for the students that are graduates of this study program. This is a good resource for the fishing fleet to get skilled young employees.

Training Courses offered by Private Providers

Even though the study programs of Navigation in the University and the High school offer knowledge for the maritime sector, navigation skills and the use of navigation equipment, still it is necessary for the students to be equipped with STCW 78/95 training courses. Albania is part of the STCW78/95 and STCW-F Convention, therefore all seafarers on board merchant and fishing vessels (as per convention requirement) must be trained. For this purpose, there are a number of training courses offering the basic STCW courses as well as other required courses.

In 2010, the TSTS Group was inaugurated. In co-operation with European partners, this company is engaged in providing consultancy related to safety standards in the workplace, risk assessment for different enterprises and prevention of incidents by type of activity being carried out. This Maritime Training Center offers all STCW training courses for seafarers. The TSTS Group Marine Training Center has been certified by the International Classification Society "RINA - Genova" with the ISO standards: 9001: 2015.



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1.2. Analysis of the fishing industry in Albania

Introduction

Blue Growth is the long term strategy to support sustainable growth in the marine and maritime sectors as a whole. Seas and oceans are drivers for the European economy and have great potential for innovation and growth. It is the maritime contribution to achieving the goals of the Europe 2020 strategy for smart, sustainable and inclusive growth. The 'blue' economy represents roughly 5.4 million jobs and generates a gross added value of almost €500 billion a year. There are many different views of what the blue economy is; definitions vary widely. Deciding what the blue economy includes is a challenge in itself, given the difficulty of estimating the extent of coastal and ocean activities, and their direct and indirect impacts. A delineation of the blue economy largely depends on the sectors included and the extent to which indirect upstream and downstream effects can be identified and measured. Hence, deciding what sectors and activities to include when analyzing the current state and size of the blue economy, is an important first step, in this report.

In this report (in the same way like 2018 Annual Economic Report on Blue Economy), blue economy includes economic activities that are as follows:

- Marine-based, including those undertaken in the ocean, sea and coastal areas, such as capture fisheries and aquaculture, offshore oil and gas, offshore wind energy, ocean



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energy, desalination, shipping and marine transport, and marine and coastal tourism; and

- Marine-related activities, which use products and/or produce products and services for the ocean and marine-based activities; for example, seafood processing, marine biotechnology, shipbuilding and repair, port activities, communication, equipment, maritime insurance and maritime surveillance.
- The blue economy also includes those parts of the public sector with direct coastal and ocean responsibilities (national defense, the coast guard, marine environment protection, etc) as well as marine education and research.
- The ocean also has economic value that is not easy to quantify in general, in terms of habitats for marine life, carbon sequestration, coastal protection, waste recycling and storing, and processes that influence climate and biodiversity.

Albania, officially the Republic of Albania, is a country in Southeastern Europe. Albania spans 28,748 square kilometers and had a total population of almost 3 million people as of 2016. Albania is a unitary parliamentary constitutional republic with the capital in Tirana, the country's largest city and main economic and commercial center, followed by Durrës and Vlorë. It is located in the south-western part of the Balkan Peninsula, bordered by Montenegro to the northwest, Kosovo to the northeast, the Republic of Macedonia to the east, and Greece to the south and southeast. The country has a coastline on the northern shore of the Mediterranean Sea, the Adriatic Sea to the west and the Ionian Sea to the southwest where the Albanian Riviera begins. Albania is less than 72 km from Italy, across the Strait of Otranto which connects the Adriatic Sea to the Ionian Sea.

Albania is a democratic and developing country with an upper-middle income economy. The service sector dominates the country's economy, followed by the industrial and agriculture sector. After the fall of communism in Albania, free-market reforms have opened the country to foreign investment, especially in the development of energy and transportation infrastructure.



Albania is a member of the United Nations, NATO, WTO, World Bank, the Council of Europe, the OSCE and the Organisation of Islamic Cooperation. It is also an official candidate for membership in the European Union. Albania is one of the founding members of the Energy Community, Organization of the Black Sea Economic Cooperation and the Union for the Mediterranean.

Almost 70% of the country that is mountainous is rugged and often inaccessible from the outside. The climate on the coast is typically Mediterranean with mild, wet winters and warm, sunny, and rather dry summers. Inland conditions vary depending on elevation, but the higher areas above 1,524 meters in northern Albania, such as the Albanian Alps, the southernmost part of the Dinaric Alps, are rather cold and frequently snowy in winter; here cold conditions with snow may linger into spring. Besides the capital of Tirana, which has more than 700.000 inhabitants, the principal cities are Durrës, Fier, Korçë, Elbasan, Shkodër, Gjirokastër, Vlorë, Sarandë and Berat.

Albania is home to one of the three largest and deepest tectonic lakes in Southern Europe and it has also a total of 13 islands. The majority of them are small in size with only two being larger than a square kilometer such as Sazan and Kunë. With its coastline facing the Adriatic and Ionian seas, its highlands backed upon the elevated Balkan landmass, and the entire country lying at a latitude subject to a variety of weather patterns during the winter and summer seasons, Albania has a high number of climatic regions relative to its landmass. The coastal lowlands have typically Mediterranean climate; the highlands have a Mediterranean continental climate. In both the lowlands and the interior, the weather varies markedly from north to south.

Although a small country, Albania is distinguished for its rich biological diversity. The variation of geomorphology, climate and terrain create favorable conditions for a number of endemic and sub-endemic species with 27 endemic and 160 subendemic vascular plants present in the country. The total number of plants is over 3250 species, approximately 30% of the entire flora species found in Europe. Phytogeographically, Albania belongs to the Boreal Kingdom, the



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Mediterranean Region and the Illyrian province of the Circumboreal Region. Coastal regions and lowlands have typical Mediterranean macchia vegetation, whereas oak forests and vegetation are found on higher elevations. Vast forests of black pine, beech and fir are found on higher mountains and alpine grasslands grow at elevations above 1,800 meters.

According to the World Wide Fund for Nature and Digital Map of European Ecological Regions by the European Environment Agency, there are around 760 vertebrate species found so far in Albania. Among these, there are over 350 bird species, 330 freshwater and marine fish and 80 mammal species. There are some 91 globally threatened species found within the country, among which the Dalmatian pelican, pygmy cormorant, and the European sea sturgeon. Rocky coastal regions in the south provide good habitats for the endangered Mediterranean monk seal.

Marine and coastal ecosystems in Albania are rich in their typology of habitats, plant community and animal/wild life species. They represent an important share of natural heritage not just for the country, but for the whole Mediterranean region. Coastal plants mainly include evergreen shrubs and partially deciduous shrubs; while along the Adriatic coast, mainly in Divjaka (Lushnje), and Pishë Poro (Vlora) there are mainly forests with stone pines (*Mediterranean pines*). In the coastal wetlands and sand dunes we can find halophyte, psamophyte species and other organisms of brackish water and freshwater species

There is increasing information, though still limited information in the country about the sea/marine fauna and habitats. Among the groups of non-vertebrae for which there is more information are: the Echinodermata (53 species), crustacea (147 species) and molluscs (385 species). The data about sponges and other groups such as: Cnidaria, Bryozoa, Annelids and Ascidians (sea squirts) are poor and have only been collected recently. Some Benthic groups are almost not covered at all. According to the most recent list of marine ichthyofauna there are more than 260 species and sub-species of Pisces, including 28 species of sharks, of which some are globally threatened and are part of the IUCN Red List of Threatened Species (2015).



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Based on the social and economic point of view and according to the EU Commission Report (2016), the agriculture, forestry and fisheries remain the main job providers, with 41.3 % in 2015 (against 42.7 % in 2014). Anyway, there are a lot of problems to be solved in the fisheries sector, which affect the life of the elasmobranchs in the Albanian waters. As it was mentioned previously Albania is an EU candidate and it is obliged to do some reforms in order to reach the standards for implementing the EU common fisheries policy, which lays down rules for management of fisheries, protects living resources of the sea and limits the environmental impact of fisheries; this includes setting catch quotas, managing fleet capacity, rules for markets and aquaculture as well as support for fisheries and coastal communities.

In Albania, preparations in this field are at an early stage and there was no progress in the past year (EU Commission Report, 2016). It is important to mention that the Recommendations of the EU Commission are that in the coming year, Albania should, in particular, align legislation and procedures with EU rules on fisheries markets; implement the sector strategy; and strengthen its institutional and administrative capacity to ensure appropriate management of fish resources and enforcement of regulations.

Actually, resource and fleet management continue to suffer from a lack of clearly defined tasks and responsibilities, institutional coordination and capacity. Inspection and control capacity is insufficient, where the Department for Fisheries Services and Aquaculture lacks sufficient qualified staff to control and eliminate illegal fishing practices; the number of inspectors has dropped from 24 in 2013 to 18 in 2015.

It is also very important to mention that there is an increasing trend to enlarge the Albanian fishing fleet by including more trawlers and purse seiners in it. In composition of the Mediterranean national fishing fleets by métier for the year 2008, (Sacchi, 2011) Albania resulted to contribute for 0.33% on the Mediterranean fishing fleet and it was represented by 180 trawlers and dredgers, 22 purse seiners for small pelagic and 67 artisanal (small scale) boats. Actually, according to the last report of FAO (2018), the Albania fishing fleet contributes for



0.66% on the Mediterranean fishing fleet, where it is represented by 179 trawlers and 36 purse seiners and pelagic trawlers. The most updated data from INSTAT 2016 reports that approximately 858 operators are working in the fisheries sector. Access to marine resources within the national waters is governed by a licensing system. It distinguishes between different categories depending on the fishing activities and methods (Law n. 10001 of 6 October 2008; Regulation n. 538 of 26.5.2009) such as: bottom, small or large pelagic, bivalve mollusk fishery, hydraulic dredges, selective and coastal fishery, etc.

Commercial fishing is carried out by a professional fishery trader or by a fishery artisan (Article 29). Professional fishing is performed by ships longer than 12 m and with motor power equal or greater than 56 kW (75 horsepower) (Article 4, parag. 62).

A professional marine fishing permit lasts five years and is issued individually to fishing vessels by the National Licensing Center, upon approval of the Directorate of Fishery in the Ministry of Environment, Forestry and Water Administration. A tax is due on the basis of the engine power and the type of activity undertaken (Law n. 8977). For foreign vessels authorized to fish within Albanian waters, the fee is twice that of Albanian vessels. Fishing vessels authorized by the Ministry of Agriculture and Food (Fishery Directorate), which will trawl for scientific purposes, are exempt from paying fees.

Transfer of fishing permits are allowed in the following cases: another navigating craft of the same technical characteristics when the first fishing vessel is out of activity for fishing purposes, and certified it with the necessary documentation (Regulation n. 3 on fishing and aquaculture licensing); any property subject or legal representative of a fishing vessel or an aquaculture center equipped by a license/permit and where the subject aims to continue its activity performance according to the existing permit.

Fishing outside the territorial waters of the Republic of Albania is done by special authorization of the Minister (Article 34 of Law on Fisheries n. 64/2012). A special authorization can be granted only to a vessel that complies with seaworthiness and safety requirements. In addition,



prior to granting a special authorization to a vessel which was previously registered in a foreign country, the competent authority must give due consideration to the vessel past behavior in order to determine whether it has breached the law of that country and/or undermined international conservation and management measures on the high seas. In case the vessel is reported as a frequent violator of fisheries laws and regulations of third countries and/or of international conservation and management measures on the high seas, it shall be denied the granting of a special authorization, except where the owner or the master of the vessel has no connection with the previous owner or master of the vessel (Article 65.4 of Regulations n. 1 of 29 March 2005).

The collaboration already existing is poised to become stronger following a bilateral agreement signed between FAO and the Ministry of Agriculture and Rural Development of the Republic of Albania aimed at strengthening cooperation and technical assistance activities in fisheries and aquaculture over the next years.

In the frame of the launched Mid-term strategy (2017-2020) by GFCM towards sustainable fisheries in the Mediterranean and the Black Sea, in the agreement between GFCM and Albanian government, the main cooperation areas identified in the agreement address the following priority areas:

- the development of a national fisheries data collection system
- the establishment of effective Port State Measures for the fight against illegal, (IUU) fishing, and
- support to the development of a national strategic plan for sustainable aquaculture.

Albania joined the General Fisheries Commission for the Mediterranean (GFCM) as member of several contracting parties on 10 April 1991. Recognizing the importance and peculiarities of fisheries in the Mediterranean and the Black Sea, and the need for strong regional cooperation, the GFCM was established to promote the development, conservation, rational management and best utilization of living marine resources in the region. Among its various responsibilities,



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the GFCM regularly reviews the state of fisheries, including the economic and social aspects of the fishing industry, as a basis for the formulation of scientific and management advice conducive to sustainable and responsible fisheries. This report is based on the second issue of the GFCM biennial series The State of Mediterranean and Black Sea Fisheries (SoMFi – FAO, 2018) and the first report – published in 2016 following a request by GFCM contracting parties, which proved to be a reference for experts, scientists, policy-makers and stakeholders both from within and outside the region, seeking up-to-date and reliable information on the status of Mediterranean and Black Sea marine resources.



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Fisheries Characteristics

Fishing Fleet

The officially reported fishing fleet operating in the Mediterranean in 2017 comprised around 86 500 vessels, 6 200 units less than the 2014 value reported in SoMFi 2016 (FAO, 2018). The fishing fleet is unevenly distributed in the GFCM area of application, with the eastern Mediterranean accounting for the largest share of vessels (30.6 percent), followed by the central Mediterranean (26.4 percent) and the western Mediterranean (17.3 percent) and the Adriatic Sea (12.3 percent). Turkey, Italy, Egypt and Tunisia are, in decreasing order of importance, the countries with the highest fishing capacity in gross tonnage (GT), accounting for 60 percent of the total.

Polyvalent vessels constitute the dominant vessel group, representing 77.8 percent of all vessels in the Mediterranean Sea. Other vessel groups of regional relevance in terms of numbers are trawlers over 6 m length overall (LOA) in the Mediterranean Sea (8.6 percent). The available information also highlights that the fishing fleet of Turkey, the largest in the GFCM area of application, is one of the youngest in the region (22 years old, on average), and that Albania's, one of the smallest fleets, is the oldest (43 years old, on average).

Despite the increased quantity of data submissions by CPCs to the GFCM in recent years, this total number of vessels should be considered an underestimate of the real size of the fleet, given the lack of data on some parts of the fleet, especially small-scale fleets, from some Mediterranean and Black Sea riparian states or non-state actors. Around 63 percent of the total reported number is represented by four countries only: Turkey (17.8 percent), Greece (17.3 percent), Tunisia (15.1 percent) and Italy (13 percent).



TABLE 1 – Number of operating fishing vessels per GFCM contracting party, cooperating non-contracting party, non-contracting party or relevant non-state actor in the Mediterranean and the Black Sea

Country	Operating vessels		Capacity (GT)	Landing (tonnes)	Engine power	Reference year
	Number	Percentage of the total (%)				
Albania*	571	0.66	6 955	6 282	79 642	2017
Algeria*	3 437	3.98	62 653	89 200	507 614	2017
Bulgaria*	1 295	1.50	4 958	8 513	41 160	2017
Croatia*	6 042	6.99	34 509	68 815	262 142	2017
Cyprus*	786	0.91	3 462	1 775	36 782	2017
Egypt*	3 087	3.57	121 953	53 964	340 526	2016
France*	1 489	1.72	15 927	18 706	144 476	2017
Georgia*	54	0.06	10 795	57 650	63 226	2016
Greece*	14 987	17.33	71 085	49 308	427 418	2017
Israel***	400	0.46	N/A	1 544	N/A	2015
Italy*	11 255	13.02	143 535	179 409	918 885	2017
Japan**	0		-	-	-	2017



Country	Operating vessels		Capacity (GT)	Landing (tonnes)	Engine power	Reference year
	Number	Percentage of the total (%)				
Lebanon*	2 193	2.54	6 663	3 536	58 666	2017
Libya****	2 957	3.42	35 150	30 002	231 128	2016
Malta*	792	0.92	5 500	2 149	61 937	2017
Monaco	na		-	-	-	
Montenegro*	153	0.18	889	932	8 404	2017
Morocco*	2 981	3.45	20 922	24 925	107 112	2017
Palestine*	608	0.70	N/A	3 838	22 482	2016
Portugal*	2	0.01	391	116 207	915	2017
Romania*	135	0.16	1 377	9 553	6 104	2017
Russian Federation***	33	0.04	N/A	95 692	N/A	2013
Slovenia*	79	0.09	339	128	4 787	2017
Spain*	2 397	2.77	61 538	79 263	318 801	2017
Syrian Arab Republic*	1 950	2.26	N/A	1 900	N/A	2017
Tunisia*	13 124	15.18	104 535	108 419	596 060	2017
Turkey*	15 406	17.82	174 700	322 173	1 197 548	2017
Ukraine*	247	0.29	N/A	44 506	N/A	2017
Total	86 460	100	887 836	1 378 390	5 435 815	

Source of data:

* GFCM Task 1 and DCRF.

** GFCM vessel records (fleet register and authorized vessel list).

*** Other GFCM sources (e.g. questionnaires) or combination of previous sources.

na = not applicable (no fishing vessels).

N/A = data not available (data either not reported or not transmitted to the GFCM).

Japan = although Japan has 199 fishing vessels authorized to fish in the Mediterranean Sea, none of them operates in the area.

**** The reported values for the Libyan fleet (number of vessels, capacity and engine power) were estimated taking into account the most recent data (fleet register) as officially transmitted by Libya to the GFCM and applying a conversion ratio of small-scale fisheries in similar national fleets.

Albanian fishing fleet represents the 0.66% of the total fishing fleet present in the Mediterranean basin, which is represented by 571 operating vessels, with a capacity of 6955 GT and a landing of 6282 tonnes. The total engine power is 79642 horse power (hp).



Fishing capacity

According to the most up-to-date information reported to the GFCM, the fishing capacity of operating fishing vessels in the Mediterranean and the Black Sea accounted for around 888 000 GT and 5 450 000 kilowatts (kW), as shown in Figure 1. Although these data were not available for some countries or non-state actors, it is possible to affirm that four countries only represent around 60 percent of the total fishing capacity (in GT) in the GFCM area of application: Turkey (19.7 percent), Italy (16.2 percent), Egypt (13.7 percent) and Tunisia (11.8 percent). Other national fleets of substantial capacity (more than 50 000 GT) are those of Greece, Algeria and Spain.

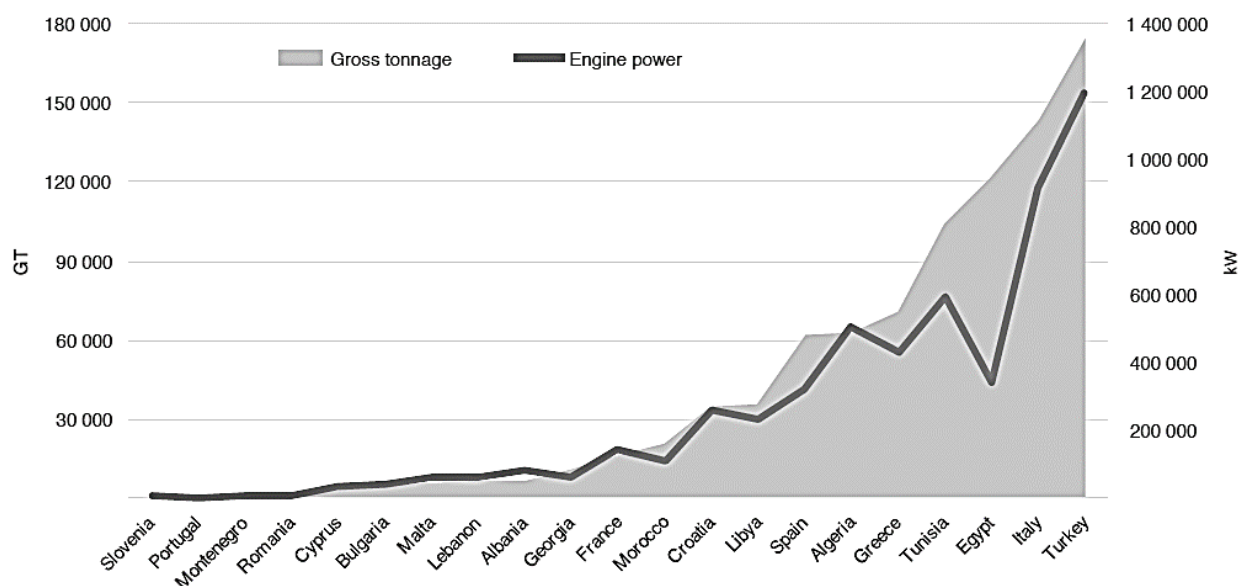


FIGURE 1 – Fishing capacity (GT and engine power) of GFCM contracting parties, cooperating non-contracting parties and non-contracting parties operating in the Mediterranean and the Black Sea



As you can see by the graphic of Figure 1, the fishing capacity is comparable to the fishing capacity of Georgia and Lebanon, where most of the fishing vessels are operating in the Adriatic Sea.

The largest share of operating vessels is present in the eastern and central Mediterranean subregions, with 30.6 and 26.4 percent respectively (Figure 2) and the Adriatic Sea represents just 12.3% of the share.

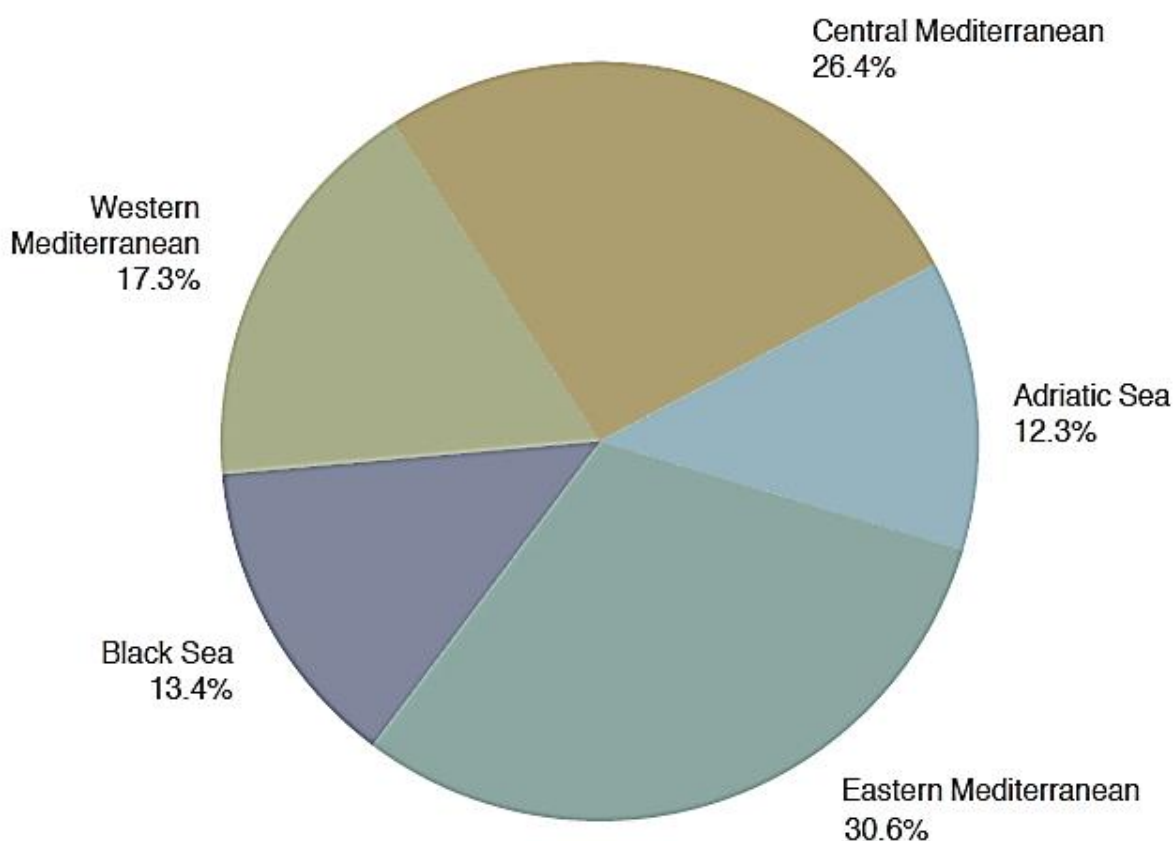


FIGURE 2 – Percentage of operating fishing vessels by GFCM subregion



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In accordance with relevant GFCM recommendations related to the management of fisheries at the subregional level, the GFCM gathers information on fishing vessels authorized to operate in geographically defined areas and targeting specific species (FAO, 2018). Regarding the small pelagics in the Adriatic Sea (Albania, Croatia, Italy, Montenegro and Slovenia) exist a GFCM Recommendation GFCM/37/2013/1, where 1 461 vessels (around 55 000 GT) are operating. Fishing vessels are single and pair trawlers, purse seiners and surrounding nets without purse line, authorized to fish for small pelagic stocks and either registered at harbors located in GSAs 17 and 18 or registered at harbors located in other GSAs, but operating in GSA 17 and/or 18. Croatia and Italy account for around 47 percent of the fleet (95 percent of the fleet altogether).

Age of the fishing fleet

The average construction year of fishing vessels in each state or relevant non-state actor, as recorded in the GFCM vessel records (fleet register and authorized vessel list) database, is reported in Table 2. Although information on the year of construction is not always available for all the countries, it emerges that, on average, Romania has the youngest fleet (12 years old), followed by Portugal (19 years old), Algeria (19 years old) and Turkey (22 years old). By contrast, the oldest fishing vessels are in Albania (43 years old), Slovenia (39 years old), Croatia (38 years old) and Greece (37 years old). The aging of the fleet in the latter countries may be a matter of concern for safety, while the substitution of aging vessels can also represent a problem for the increase in fishing capacity if no rules are in place to regulate the entry of new vessels in the fishery (FAO, 2018).



TABLE 2 – Average year of construction and age of fishing vessels in the GFCM vessel records (fleet register and authorized vessel list) database

Country	Average		Data coverage (%)*
	Year of construction	Age	
Albania	1975	43	89
Algeria	1999	19	99
Bulgaria	1996	22	100
Croatia	1982	36	99
Cyprus	1991	27	100
Egypt	N/A	-	-
France	1984	34	100
Georgia	N/A	-	-
Greece	1981	37	100
Israel	N/A	-	-
Italy	1984	34	100



Country	Average		Data coverage (%) [*]
	Year of construction	Age	
Japan	1996	22	100
Lebanon	1988	30	42
Libya	1997	21	7
Malta	1988	30	100
Monaco	Na	-	-
Montenegro	1981	37	14
Morocco	1994	24	91
Palestine	N/A	-	-
Portugal	1999	19	100
Romania	2006	12	100
Russian Federation	N/A	-	-
Slovenia	1979	39	100
Spain	1985	33	100
Syrian Arab Republic	N/A	-	-
Tunisia	1990	28	24
Turkey	1996	22	99
Ukraine	1983	35	97
Average	1989	29	82

^{*} Coverage indicates the percentage of data records with information on the construction year of the fishing vessel.

na = not applicable (no fishing vessels).

N/A = data not available (either data not reported or data not transmitted to the GFCM).

According to the available information (FAO, 2018), a comparison between the total number of fishing vessels by country (Table 1) and the average of age (Table 2) highlights two opposite cases:

Turkey, the largest fleet in the GFCM area of application (17.8 percent of the total), is one of the youngest of the region (22 years old, on average), whereas the oldest fishing vessels



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belong to Albania, which is one of the smallest fleets, though the data coverage related to Albania reported statistics is 89% (FAO, 2018).

In the period 2017-2018, the total number of fleet segments, given by the combination of vessel groups with length classes, which was communicated by CPCs to the GFCM, accounted for a total of 51. The analysis of this information revealed a heterogeneous situation among countries, where a comparative analysis is not always straightforward: in fact, different CPCs have aggregated their data and then communicated them to the GFCM by combining same vessel groups with different length classes; consequently, the length range of some fleets segments overlap (e.g. “Purse seiners between 12–24 m” and “Purse seiners above 12 m”).

A vessel is assigned to a group on the basis of the dominant gear used in terms of percentage of time: more than 50 percent of the time at sea using the same fishing gear during the year.

- “Polyvalent vessels” are defined as all the vessels using more than one gear, with a combination of passive and active gear, none of which exceed more than 50 percent of the time at sea during the year.
- A vessel is considered “active” when it executes at least one fishing operation during the reference year in the GFCM area of application.



TABLE 3 – Groups of fleet segments used for the analysis of fleet composition

Group of fleet segments	Fleet segments
Polyvalent vessels (all lengths)	<ul style="list-style-type: none">– Small-scale vessels without engine using passive gear (0–6, 0–12, 6–12)– Small-scale vessels with engine using passive gear (> 0, 0–6, 0–12, 0–24, 6–12, 12–24, > 24)– Polyvalent vessels (0–6, 0–12, 6–12, > 12, 12–24, > 24)
Trawlers (> 6 m LOA)	<ul style="list-style-type: none">– Trawlers (> 6, 6–12, 6–24, > 12, 12–24, > 24)– Beam trawlers (> 6, 6–12, 6–24, > 12, 12–24, > 24)
Purse seiners and pelagic trawlers (> 6 m LOA)	<ul style="list-style-type: none">– Purse seiners (> 6, 6–12, 6–24, > 12, 12–24, > 24)– Pelagic trawlers (> 6, > 12, 12–24, > 24)
Other fleet segments (all lengths)	<ul style="list-style-type: none">– Longliners (all)– Tuna seiners (all)– Dredgers (all)

Although this heterogeneity prevents an in-depth comparison of all the fleet segments at the national level, by aggregating the information on larger groups available in all data submissions (Table 3) it is possible to note that, according to the available information,⁴ around 80 percent of the total fishing vessels operating in the GFCM area of application (Mediterranean and Black Sea) belong to the fleet segments “Polyvalent vessels – all lengths”,⁵ followed by “Trawlers above 6 m” (7.9 percent) and “Purse seiners and pelagic trawlers above 6 m” (4.8 percent). The “Other fleet segment” groups 16 different fleet segments accounting, individually, for around 7.6 percent of the total. This category also includes “Longliners 6–12 m” (2.9 percent), “Longliners 0–6 m” (1.8 percent), “Longliners 0–6 m” (1.6 percent) and “Dredges 12–24 m” (0.9 percent)



TABLE 4 – Number of operating fishing vessels, by group of fleet segments and by GFCM contracting party, cooperating non-contracting party, non-contracting party or relevant non-state actor in the Mediterranean and the Black Sea

Country	Group of fleet segments					Total
	Polyvalent vessels (all lengths)	Trawlers (> 6 m LOA)	Purse seiners and pelagic trawlers (> 6 m LOA)	Other fleet segments (all lengths)	Unallocated	
MEDITERRANEAN SEA						
Albania*	343	179	36	6		564
Algeria*	1 765	467	1 056	5		3 293
Croatia*	5 432	380	188	42		6 042
Cyprus*	772	12		2		786
Egypt*	628	1 043	249	1 167		3 087
France*	1 045	79	18	97		1 239
Greece*	10 724	246	238	3 779		14 987
Israel***					400	400
Italy*	7 794	2 243	309	870		11 216
Japan**						0
Lebanon*	2 106		87			2 193
Libya****	2 793	62	95	7		2 957
Malta*	715	11	6	60		792



Country	Group of fleet segments					Total
	Polyvalent vessels (all lengths)	Trawlers (> 6 m LOA)	Purse seiners and pelagic trawlers (> 6 m LOA)	Other fleet segments (all lengths)	Unallocated	
Montenegro*	120	16	13	4		153
Morocco*	2 665	92	238	1		2 996
Palestine *					608	608
Portugal*	2					2
Slovenia*	64	8	1	3		76
Spain*	1 210	667	278	239		2 394
Syrian Arab Republic*					1 950	1 950
Tunisia*	12 123	467	507	27		13 124
Turkey*	5 574	211	104			5 889
Total	55 895	6 183	3 423	6 309	2 958	74 748
%	74.8	8.3	4.6	8.4	4.0	

Source of data:

* GFCM Task 1 and DCRF.

** GFCM vessel records (fleet register and authorized vessel list).

*** Other GFCM sources (e.g. questionnaires) or combination of previous sources.

na = not applicable (no fishing vessels).

N/A = data not available (data either not reported or not transmitted to the GFCM).

**** The reported values for the Libyan fleet (number of vessels, capacity and engine power) have been estimated by taking into account the most recent data (fleet register) officially transmitted by Libya to the GFCM and applying a conversion ratio for small-scale fisheries in similar national fleets.

The available data clearly show that, out of six countries, four are represented by the Mediterranean Sea (Lebanon, Turkey, Tunisia and Cyprus). In Albania, there are 564 fishing vessels, where are included 343 polyvalent vessels, 179 trawlers and 36 purse seiners and pelagic trawlers (FAO, 2018). It means that the small-scale vessels with and without engine (using passive gears) represent 61 of all the operating vessels in Albania.



Capture fisheries production

Total landings in the Mediterranean and the Black Sea increased irregularly from about one million tonnes in 1970 to almost two million tonnes in 1982. They remained relatively stable during most of the 1980s before declining abruptly in 1989 and 1990, largely due to the collapse of pelagic fisheries in the Black Sea. In the Mediterranean, landings continued to increase until 1994, reaching 1 087 000 tonnes, and subsequently declined irregularly to 850 000 in 2016, with production apparently leveling out in the last three years. In Albania, it remained stable at 8500 tonnes, before the collapse in 1990 (FAO, 2018).

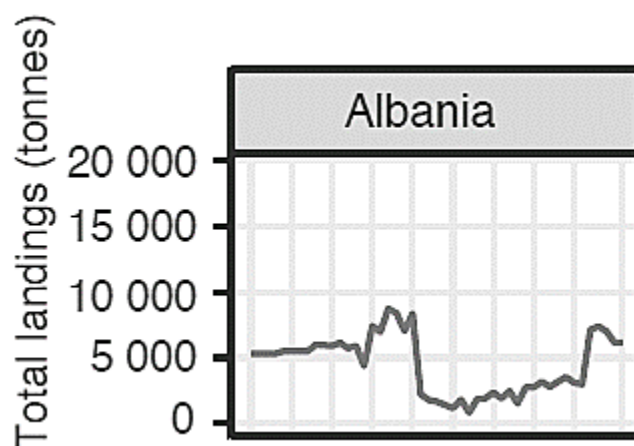


Figure 3 – Trends in landings by country (catching up to 20 000 tonnes), 1970–2016

The combined landings for the Mediterranean and the Black Sea averaged between 2014–2016 amount to 1 220 000 tonnes (827 000 in the Mediterranean and 396 000 in the Black Sea).

As it is shown in Table 5, the landing has been nearly at the same level between 2014–2016, with an average value of 6500, where the biggest contributor still remains the marine fisheries. In Figure 4, it is shown a comparison in terms of production between Marine Fishing and Freshwater/Inland Fishing. It also reported the total catch provided by both categories of



fishing. As it is shown in Figure 4, after 2009, the major contributor in Fisheries is represented by Marine Fishing in comparison to Freshwater Fishing.

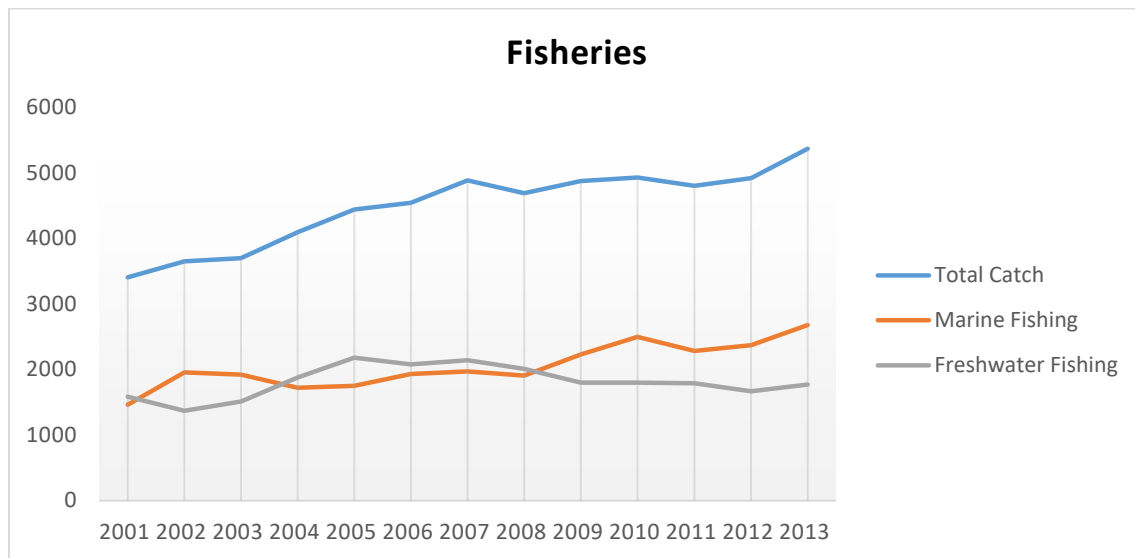


Figure 4. A comparison between Marine Fishing and Freshwater Fishing (INSTAT, 2015)

Marine fish catches have increased from 1,373 tonnes in 2001 to 2,374 tonnes in 2012. Demersal species make up 35-40% of the catches. Most of the Albanian fleet is small scale fishing vessels that have landings of about 500 tonnes (2012). On the Adriatic coast, the most used gears are trammel nets, gillnets, and entangling nets, while on the Ionian Sea coast long lines and gillnets are the primary gears. The fishing fleet is distributed mainly in the regions of Durrresi (38%), Vlora (35%), Saranda (14%), and Shengjini (12%) (Jimenez, 2015).



TABLE 5 – Landings by country, 2014–2016

Country	Landings 2014 (tonnes)	Landings 2015 (tonnes)	Landings 2016 (tonnes)	Average 2014-2016 (tonnes)	% variation 2014-2015	% variation 2015-2016
Albania	7 061	6 232	6 204	6 500	-11.7	-0.45
Algeria	97 828	95 946	95 000	96 258	-1.9	-1.0
Bosnia and Herzegovina	5	5	5	5	–	–
Bulgaria	8 546	8 546	8 562	8 617	2.3	-2.1
Croatia	78 946	72 258	71 895	74 366	-8.5	-0.5
Cyprus	1 257	1 475	1 484	1 405	17.3	0.6
Egypt	62 747	57 603	53 965	58 105	-8.2	-6.3
France	15 063	12 742	14 337	14 047	-15.4	12.5
Georgia	12 050	12 050	12 050	12 050	0	0
Greece	58 505	63 763	74 733	65 667	9.0	17.2
Israel	1 475	1 544	1 207	1 409	4.7	-21.8
Italy	178 867	189 205	188 793	185 262	5.8	-0.2
Lebanon	2 978	3 618	4 271	3 622	21.5	18.0
Libya	25 004	26 002	30 002	27 003	4.0	15.4
Malta	2 404	2 438	2 418	2 420	1.4	-08

Across the GFCM area of application, the ranking of capture fisheries production in 2014–2016 continues to be dominated by Turkey (321 800 tonnes and 26 percent of total landings versus 31 percent previously reported), followed by Italy (185 300 tonnes and 16 percent, similar to the percentage previously reported). Algeria (96 300 tonnes and 8 percent) and Greece (65 700 tonnes and 5 percent) also maintain the same percentages in landing contribution. (FAO, 2018)

In the Mediterranean, Italy is the main producer (22 percent). The other countries that contribute to at least 5 percent of total captures are Tunisia (14 percent), Algeria (12 percent), Spain (9 percent), Croatia (9 percent), Greece (8 percent), Turkey (8 percent) and Egypt (7 percent).



Catches are dominated by small pelagics (herrings, sardines, anchovies), representing nearly 49 percent of the catches (versus 51 percent reported in SoMFi 2016), mainly European anchovy and sardine (22 and 16 percent respectively, compared to 26 and 12 percent reported in SoMFi 2016).

Among areas and using the 2014–2016 average, the western Mediterranean continues to dominate the capture fisheries production in the Mediterranean (265 100 tonnes and 22 percent of the total landings in the GFCM area of application, compared to 24 percent reported in SoMFi 2016), followed by the Adriatic Sea and the central and eastern Mediterranean (193 500, 184 500 and 180 800 tonnes respectively, representing 16, 15 and 15 percent of the total). The average production in the Black Sea over the last three years has reached 396 000 tonnes, accounting for 32 percent, similar to the percentage reported in SoMFi 2016 (FAO, 2018).

In Albania, the Marine Commercial Fisheries production is at least 3 times higher than the Marine Artisanal and Coastal Lagoon Fisheries. However, after 2006, it is shown an increasing trend of Marine Artisanal Fisheries production. (Figure 5).

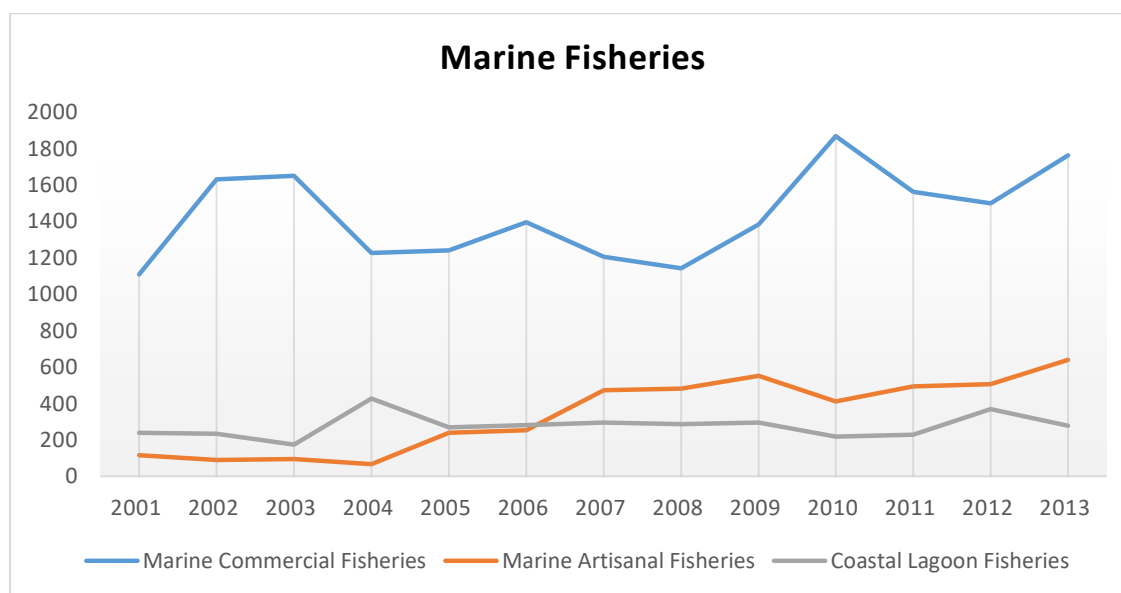




Figure 5. A comparison between Marine Commercial Fisheries, Marine Artisanal Fisheries and Coastal Lagoon Fisheries Production (INSTAT, 2015)

Socio-economic characteristics

Marine capture fisheries in the Mediterranean and Black Sea produce an estimated annual revenue of USD 2.8 billion and directly employ just under a quarter of a million people (248 000) onboard fishing vessels. In comparison with the information reported in SoMFi 2016, total revenue has decreased by USD 300 million (around 10 percent) and total employment has increased by 26 000 people (around 10 percent). Revenue calculations, based on official data on value at first sale, represent only a small part of the total economic impact of fisheries, which is estimated to be at least 2.6 times larger (approximately USD 7.3 billion). Furthermore, the changes in revenue and employment reported here may indicate an improvement in the data collection rather than a real change in the sector.

Of the main vessel groups, trawlers and purse seiners together represent 64 percent of total revenue; however, they provide only 34 percent of employment in fisheries. In contrast, the situation of the polyvalent vessel group is reversed: it represents 26 percent of total revenue, but provides employment to 59 percent of all fishers in the region. Preliminary data show that remuneration within the vessel groups that provide the most employment opportunities (primarily the polyvalent vessel group) is approximately 50 percent less than that of other groups, such as trawlers and purse seiners.

The trade of fish products continues to be important for the region. Most Mediterranean and Black Sea riparian states are net importers of fish products and only eight countries are net exporters (Morocco, the Russian Federation, Turkey, Tunisia, Croatia, Malta, Albania and Greece).

The fisheries sector in Albania is relatively small, however, it is important from a socio-economic point of view as it is a significant source of jobs in coastal and remote areas (EuroFish Website, 2015). Fish processing is an important component of the Albanian meat processing



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industry. This has been one of the fastest growing sub-sectors of the food processing industry and it is oriented toward exports. Canned fish production has been increasing from 2000 to 2010. The highest level of production was reached in 2009, with 3000 t (Karen Lindquist, 2013).

There are 59 companies in the field of aquaculture, fisheries and processing. Only three of them are major processing companies (Rozafa shpk, Korali shpk and Eurofish) and these mainly process marine fish. The rest are small size processors, which also process freshwater fish and mollusks. The main processing activity is preservation and canning. The main companies are located near the main ports, such as Durres, Shengjin and Vlora (Karen Lindquist, 2013), but recently Rozafa shpk built one of the biggest processing plant in Balkans, which is located in Elbasan.

Economic performance

It is estimated, however, that the wider economic impact of fisheries in the Mediterranean and the Black Sea, including the direct, indirect and induced economic effect of the fisheries sector, may be as much as 2.6 times the value at first sale (FAO, 2016), or approximately USD 7.3 billion. More complete data on total revenue are foreseen in the coming years as CPCs improve their data submissions in line with DCRF requirements.

Figure 6 presents a breakdown of landing value by CPC. In line with the analysis presented in SoMFi 2016, the value of landings in Italy continues to be notable, accounting for approximately 30 percent of total revenue in the region. Turkey, Egypt, Spain, Tunisia, Greece and Algeria, in addition to Italy, remain the countries producing the highest revenue from fisheries in the GFCM area of application.

As it can be seen in Figure 6, the Albanian landing value is about 23 million USD and seems to be comparable to Lebanon's landing value and 2 times lower than the landing value of Croatia.

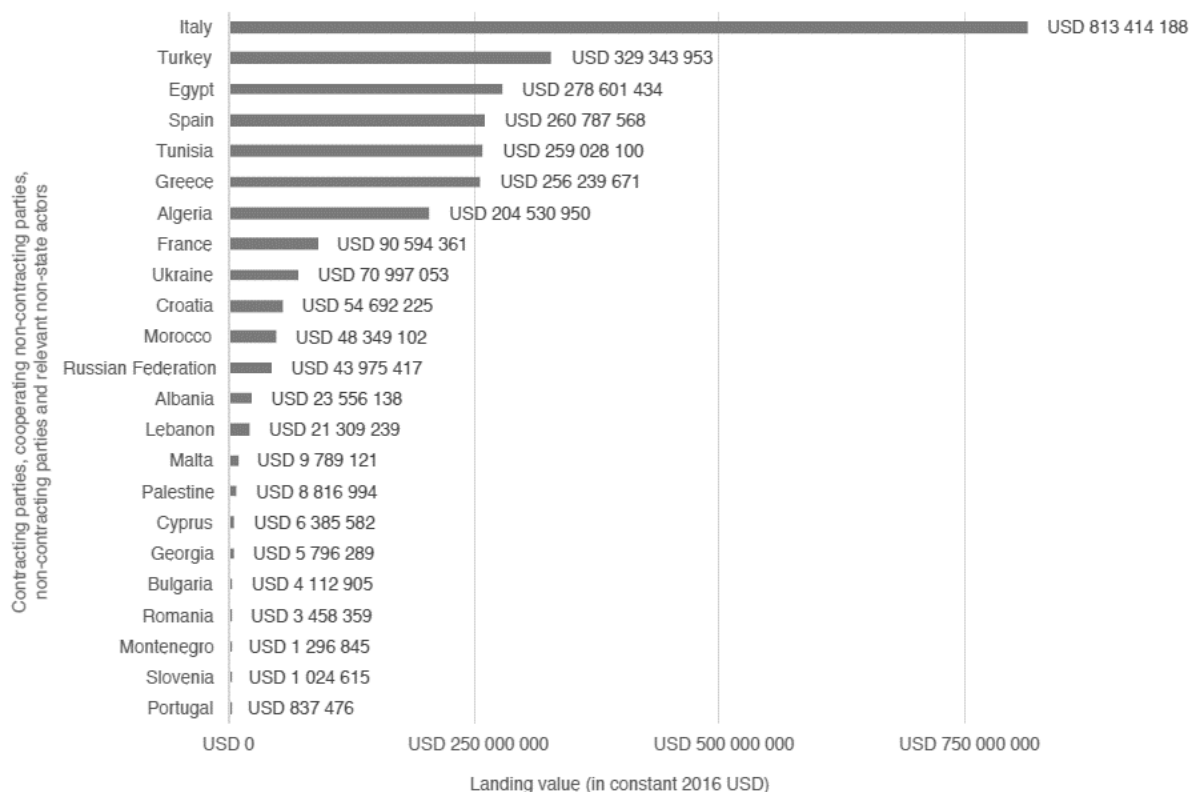


Figure 6 – Landing value at first sale by CPCs and relevant non-state actors

A preliminary analysis was carried out on official data transmitted to the GFCM and, after a quality control, data submissions from ten CPCs were included in this analysis (Albania, Bulgaria, Cyprus, Greece, Croatia, Italy, Lebanon, Malta, Romania and Slovenia) (FAO, 2018).

An analysis of landing values for main commercial species for the ten CPCs noted above was carried out and the top 20 most important species by value from these groups are presented in Figure 7.



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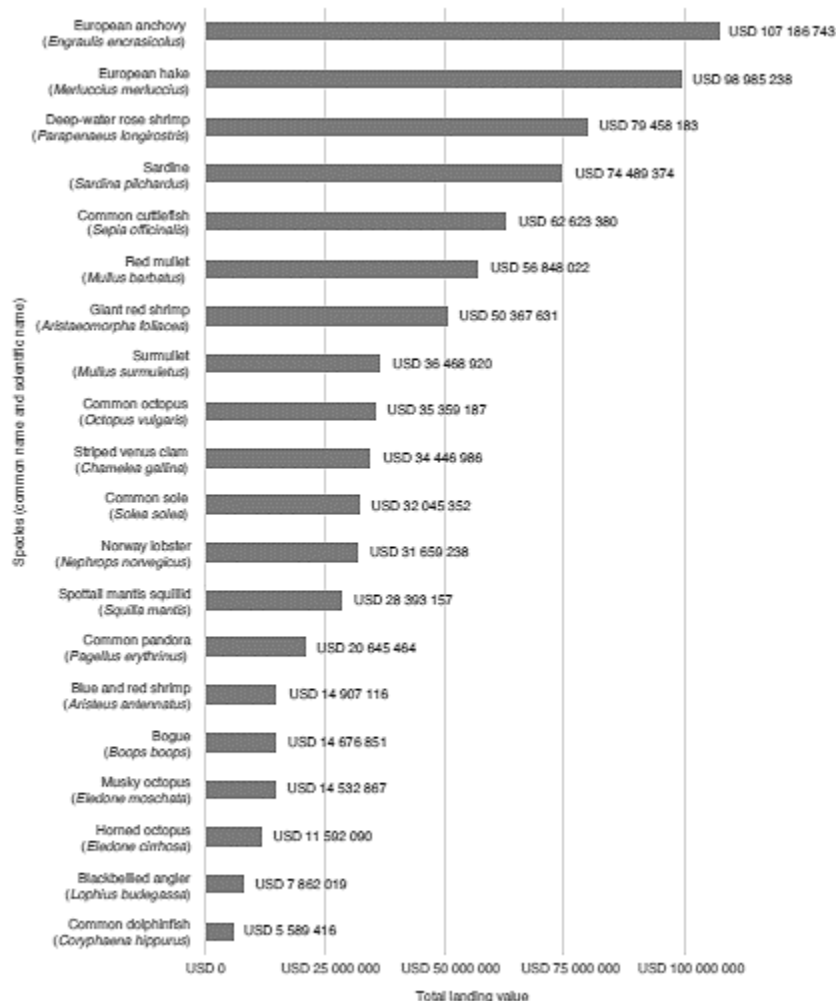


Figure 7 – Total value of landings for main commercial species

Over 60 percent of landing value comes from just seven species: European anchovy (*Engraulis encrasicolus* – 12 percent of total landing value), European hake (*Merluccius merluccius* – 12 percent of total landing value), deep-water rose shrimp (*Parapenaeus longirostris* – 9 percent of total landing value), sardine (*Sardina pilchardus* – 9 percent of total landing value), common cuttlefish (*Sepia officinalis* – 7 percent of total landing value), red mullet (*Mullus barbatus* – 7 percent of total landing value) and giant red shrimp (*Aristaeomorpha foliacea* – 6 percent of total



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landing value). When comparing these values with the volume of landings per species (see Table 9, Chapter 2), it is clear that demersal species have a larger contribution in value than in volume; this is the case in particular for European hake (12.1 percent of value but only 1.7 percent of volume), deep-water rose shrimp (9.1 percent of value but only 1.5 percent of volume) and red mullet (6.9 percent of value but only 1.3 percent of volume). On the other hand, the opposite is the case for sardine (which accounts for 15.5 percent of volume but only 9.1 percent of value), and to a lesser extent for European anchovy (the species with the overall highest value and volume, however, which accounts for 22.1 percent of volume but only 13.1 percent of value).



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According to official data submissions to the GFCM, total employment onboard fishing vessels in the GFCM area of application is just under a quarter of a million people (248 000), with the Mediterranean accounting for approximately 227 250 jobs. These figures do not include pre- and post-harvest labor, gleaning activity or other in-kind labor, such as support from family members, which by some estimates may account for as much as half of total employment in the fisheries sector (Sauzade and Rousset, 2013).

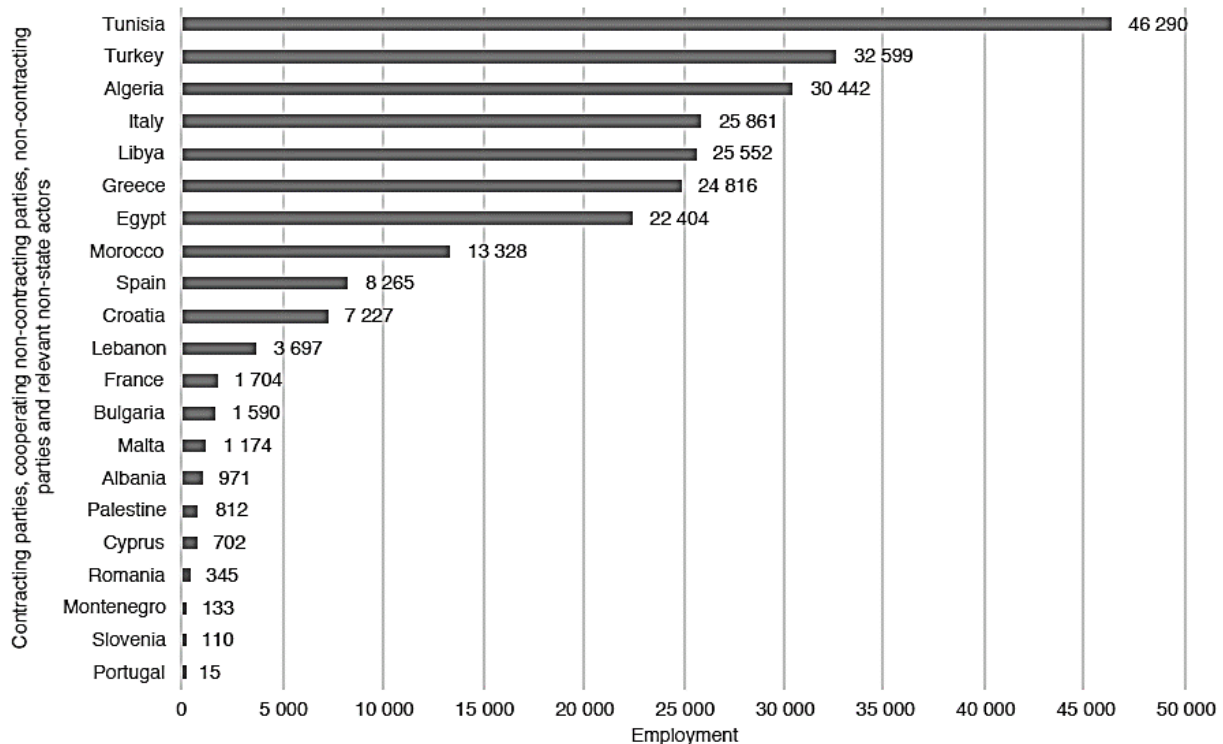
With respect to the SoMFi 2016, total employment has increased by approximately 10 percent (about 26 000 people). As many CPCs have been making efforts to improve their socio-economic data collection in recent years, this increase in employment, however, stems in part from an increase in the number of CPCs reporting employment data, as well as improved accuracy by certain CPCs of the data reported.

Figure 8 presents employment data by CPCs and relevant non-state actors. Four countries represent over 55 percent of all employment onboard fishing vessels in the GFCM area of application: Tunisia (19 percent of total employment), Turkey (13 percent of total employment), Algeria (12 percent of total employment) and Italy (10 percent of total employment).



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Employment data are unavailable for Georgia, the Russian Federation and Ukraine.

Reference years: 2017 (Albania); 2016 (Bulgaria, Cyprus, France, Greece, Croatia, Italy, Lebanon, Malta, Montenegro, Portugal, Romania and Slovenia); 2015 (Egypt, Morocco and Spain); 2014 (Algeria, Libya and Turkey); 2013 (Tunisia); 2012 (Palestine). Data were not reported for Bosnia and Herzegovina, Israel, Georgia, the Republic of Moldova, Spain, the Syrian Arab Republic and Ukraine.

Spanish data has been calculated by averaging employment per vessel per fleet segment (data source: STECF, 2017) and applying this average to official fleet data submitted to the GFCM.

Figure 8 – Total employment onboard fishing vessels

It is important to note that though the landing value of Albania is comparable to Lebanon's landing value, the employment is 5 times lower in comparison to Lebanon and 7 times lower than Croatia. Anyway, the employment trend in fisheries and aquaculture is positive as it is shown in Figure 9.



Time	1980	1990	2000	2010	2012	2013	2014
Employment in Marine Fisheries (ind.)	280	4010	1000	1600	1920	1920	2250

Source: FAO Fishery and Aquaculture Statistics (2016)

Figure 9 Employment in marine fisheries and aquaculture.

Remuneration

As an indicator of productivity, the average production in terms of value at first sale for each fisher is presented, offering an indication of the efficiency of production. According to official data submissions to the GFCM, across the GFCM area of application, the average fisher produces approximately USD 14 000 in annual catch value. This indicator is presented below by CPC and by subregion (Figures 10 and 11, respectively). The landing values and employment data presented earlier were used for this calculation.

Although useful as an indicator of productivity, landing value per employee provides a distorted view of remuneration per fisher as it does not consider part time employment and it does not account for costs. A better indicator is remuneration by full time equivalent (FTE).

Full-time equivalent employment, which equals the number of full-time equivalent jobs, is defined as total hours worked divided by the average annual number of hours worked in full-time jobs (the commonly used international threshold is 2 000 hours per year). Through the new data submission requirements, CPCs now have the option of submitting FTE data, in addition to personnel costs. Although initial submissions are limited, a preliminary analysis of nine CPCs (Bulgaria, Croatia, Cyprus, Greece, Lebanon, Malta, Montenegro, Romania and Slovenia) has been carried out. On average, remuneration per FTE for these nine countries is USD 6 870 per FTE fisher, however, wide variation is seen across the different vessel groups (see Figure 46), with “Purse seiners and pelagic trawlers (above 6 m LOA)” and “Trawlers (above 6 m



LOA)” providing the highest remuneration and “Polyvalent vessels (all lengths)” providing the lowest. A number of countries (like Albania) are improving their socio-economic data collection in order to submit these data, and it is foreseen that more complete and accurate calculations of this indicator will be available in coming years. Due to the low number of employed in the fisheries sectors, the average annual landing value per employee (24 260 USD) is comparable to the relative value corresponding to Italy (31 453 USD).

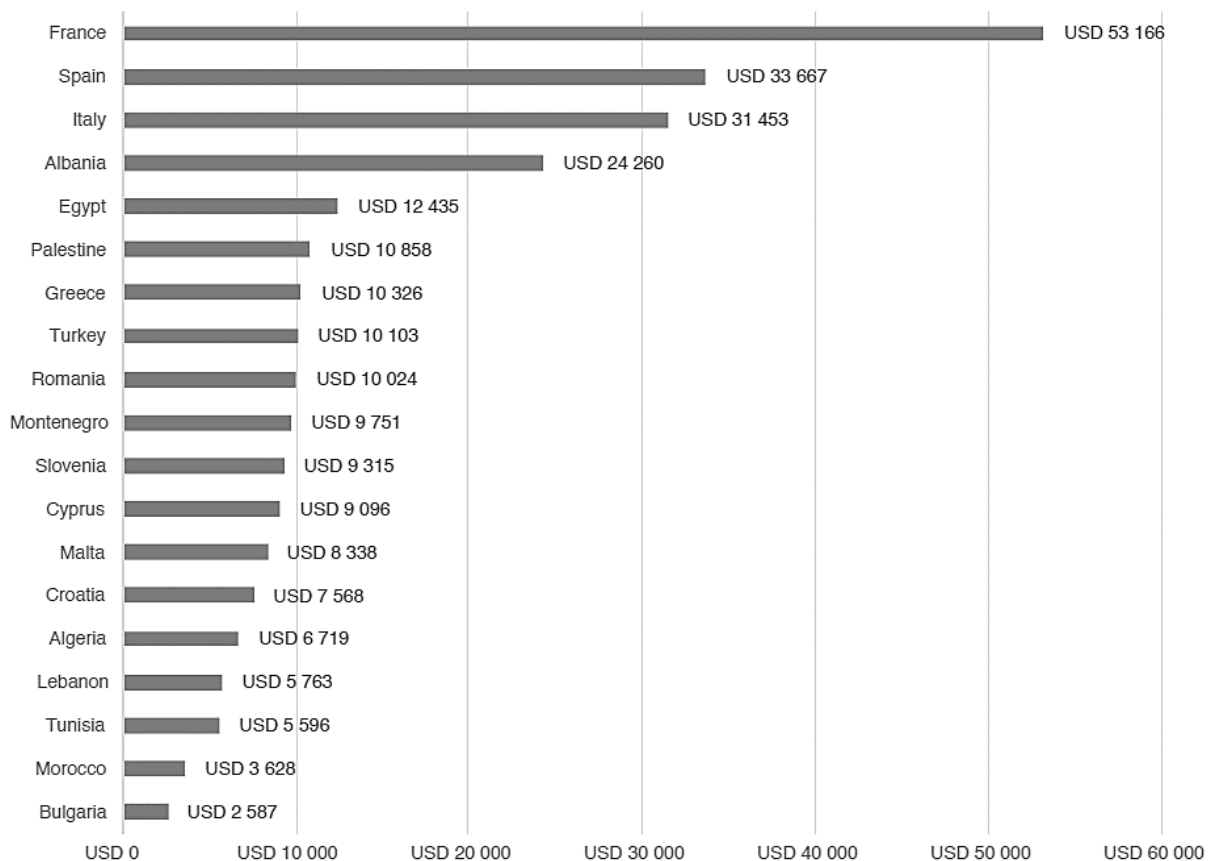


Figure 10 – Average annual landing value per employee



This is related to the highest average landing per employee registered in the Adriatic, where most of the Albanian fleet fishing vessels go perform the fishing activities.

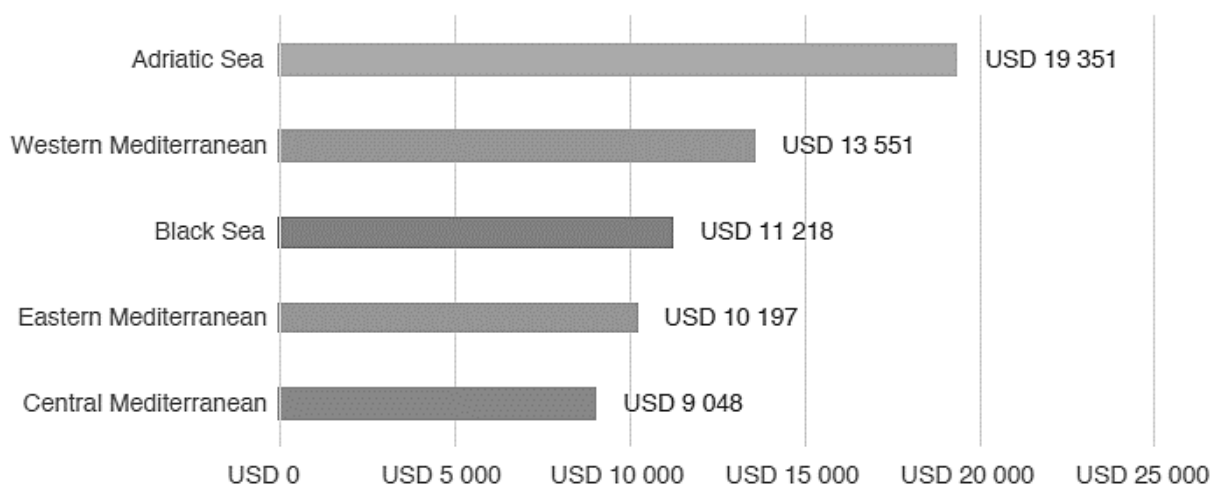


Figure 11 – Average landing value per employee by subregion

Trade

Fish trade is an increasingly important activity in the Mediterranean area. In particular, the trade relationships between the EU and non-EU CPCs are particularly important, often with high-value fish products being exported to the EU (Malvarosa and De Young, 2010). Trade data presented in this section are based on data from the FAO Fishery Commodities Global Production and Trade database for reference year 2016.

The standardized trade balance (STB) is a useful indicator for understanding if a country is a net importer or exporter of fishery products. It is calculated as a percent ratio between the simple balance (exports minus imports) and the total volume of trade (exports plus imports). An STB of negative one indicates 100 percent net imports and an STB of one indicates 100 percent net exports; a STB of zero indicates a perfect balance between imports and exports. In the GFCM area of application, CPCs are generally net importers (Figure 12). In particular, Montenegro,



Lebanon and the Syrian Arab Republic depend almost entirely on imports of fishery products, while Morocco has an important net export ratio. As it is shown in Figure 12, Albania is exporting more fish than importing it, based on the STB value (0.0796) and its trade balance is almost identical to Greece (STB = 0.0793).

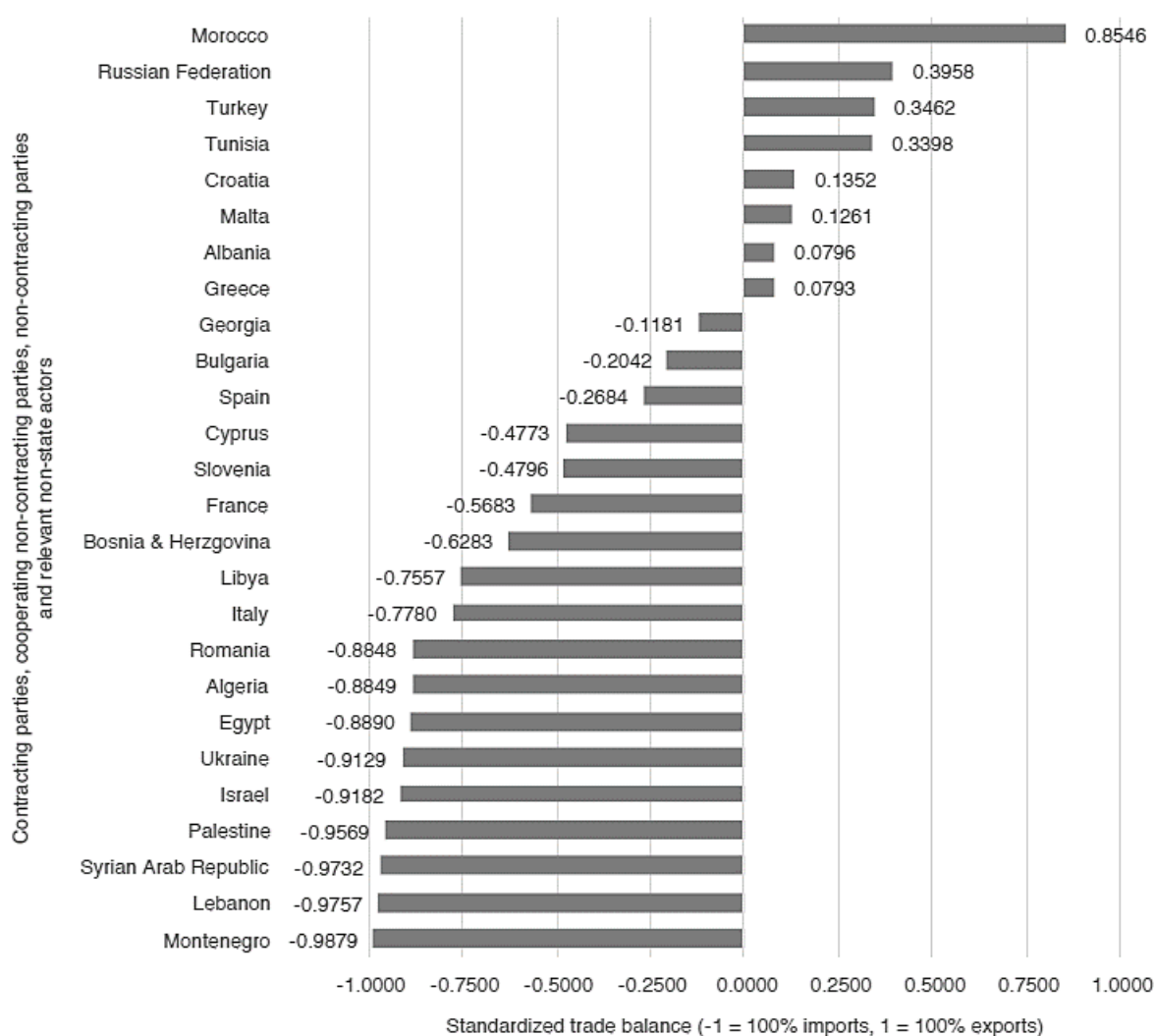


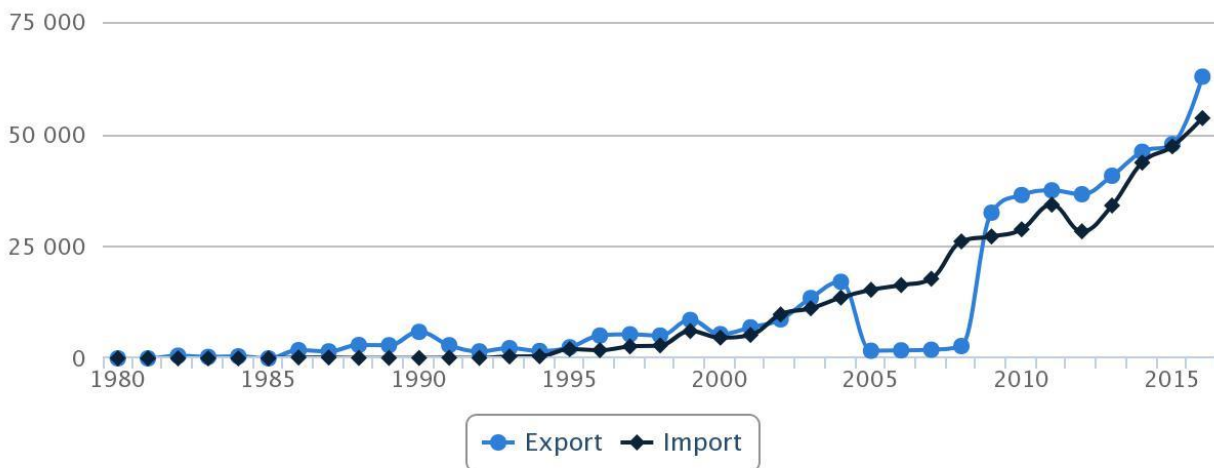
Figure 12 – Standardized trade balance



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Total imports and exports of fish and fishery products for the Republic of Albania (USD 1000)
Source: FAO FishStat



Source: FAO Fishery and Aquaculture Statistics (2016)-(USD 1000)

In addition to trade balance, it is also important to understand the value of fishery trade in the region. The total value of traded fish products (imports plus exports) is provided for CPCs and relevant non-state actors in Figure 13. The total value of traded fish product from CPCs and relevant non-state actors is USD 40.5 billion, over 16 times the regional landing value at first sale. It is important to highlight that although these figures provide a snapshot of the value of traded fish products in the GFCM area of application, the available data are aggregated by country within the FAO Fishery commodities global production and trade database and they do not consist solely of fish products originating from capture fisheries in the GFCM area of application. As such, these data also include the value of traded fish products from aquaculture, from other FAO major fishing areas (especially in the case of Egypt, France, Morocco, the Russian Federation and Spain, which border multiple FAO fishing areas) as well as re-exports.



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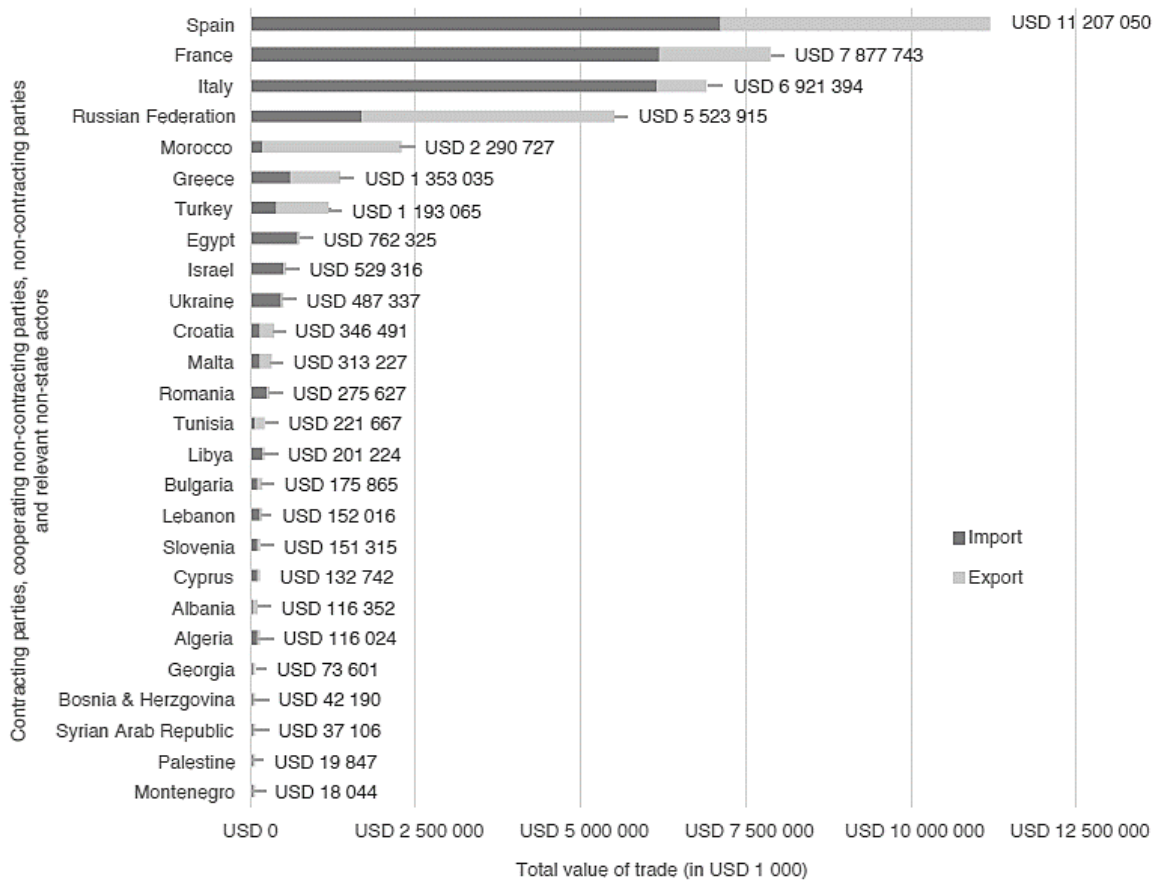


Figure 13 – Total value of traded fish product (imports and exports)

Though Albania is exporting a lot of fish, the total value of trade is comparable to Algeria and Cyprus. Thus, it means that a wise and sustainable strategy should be grown in the Albanian reality based on the Mediterranean development of the fishing sectors.

For example one of the biggest concerns is related to the high percentage of the bycatch in Albanian fisheries (personal observation).



The term “bycatch” is widely used to refer to the part of the catch unintentionally captured during a fishing operation, in addition to target species. It consists of other commercial species (that may be secondary targets or may become target species if the market develops) and non-commercial species (returned to the sea or landed, in case of a discard ban) as well as incidental catches of vulnerable species, which may include species of commercial value or not, formally declared as “vulnerable” or “species at risk” as a result of natural or, more commonly, anthropogenic pressure, including fishing pressure (Figure 14).

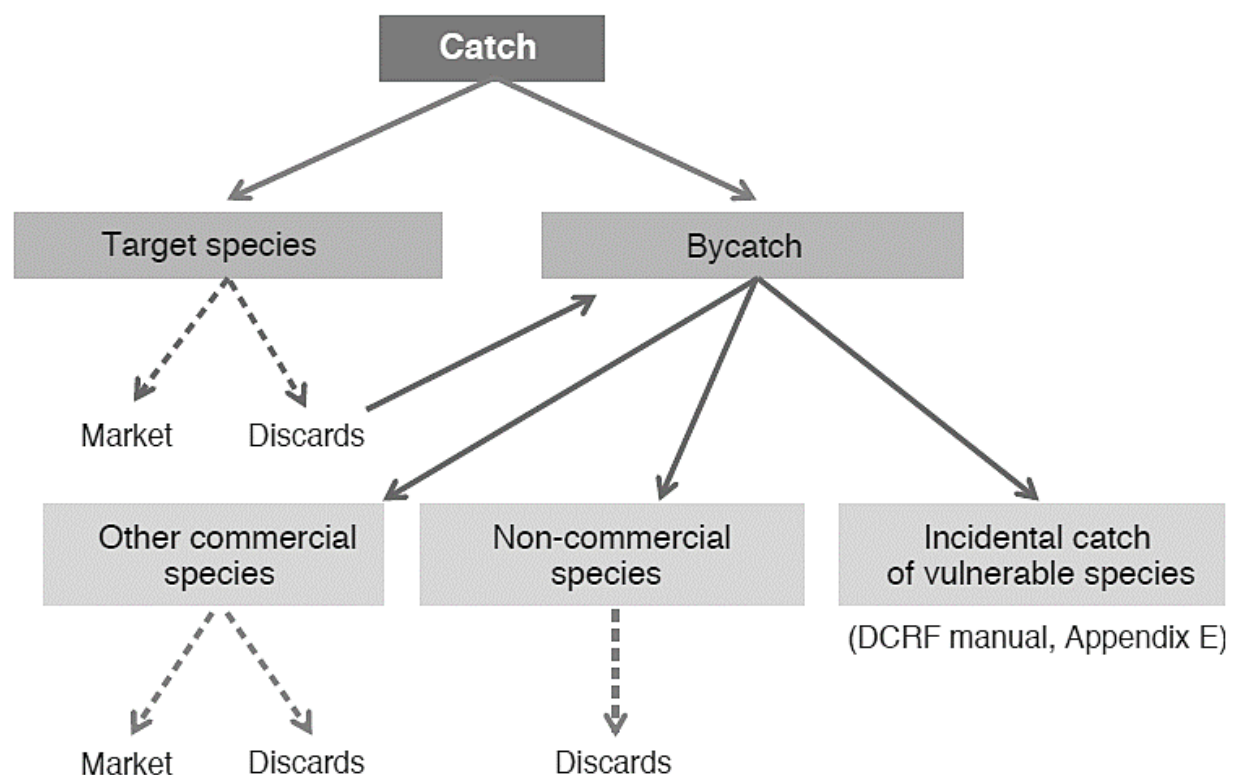


Figure 14 – Different components of the catch as defined by the GFCM Data Collection Reference Framework (GFCM, 2018)

The effects of fisheries on the environment have been abundantly described and reviewed (Kelleher, 2005). Fisheries impact not only target resources (e.g. fish, crustaceans and



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cephalopods), but also many other species that are relevant to the functioning of the overall ecosystem (Jackson et al., 2001; Kelleher, 2005), both directly (e.g. discards, vulnerable species, benthic species etc.) and indirectly (e.g. species occupying higher trophic levels that rely on target catch).

In 2016, recognizing the need to address this issue and to have better information, the GFCM brought back to the forefront monitoring programs for discards and incidental catch of vulnerable species in the Mediterranean and the Black Sea. Assessing the impacts of bycatch on different fisheries activities was included as a priority in the mid-term strategy under Target 4 “Minimize and mitigate unwanted interactions between fisheries and marine ecosystems and environment” (Output 4.1 “Reduced bycatch rates in Mediterranean and Black Sea fisheries”)

In general, bycatch studies (both on discards and on incidental catch of vulnerable species) do not address all fishing gear and countries, and most of these studies cover relatively short temporal and small spatial scales. This gap of knowledge highlights the need to expand bycatch surveys and to standardize practices in order to enable comparison among fisheries and the testing of potential methods and tools to mitigate bycatch. Actions aimed at gathering more robust data or better evidence are therefore crucial and analyses at the subregional level are of primary importance. Sharing existing information, standardizing approaches, establishing or expanding well-designed monitoring schemes and cooperation among countries is essential to develop a holistic approach of bycatch and thus contribute to enhancing fisheries management in the region.

In this view, the GFCM has developed two methodologies for the monitoring of discards and incidental catches of vulnerable species to be used as guidelines for relevant data collection activities (FAO, 2018). The objective of these two documents is to provide a harmonized methodological framework for data collection that is applicable to the context of different countries and enables the comparison of data at the regional and subregional levels.



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Why is discarding a problem?

Discards have negative consequences on the environment and the ecosystems (Hall, 1996). Ethically, they constitute a waste of natural resources. From an ecological standpoint, they negatively affect the marine ecosystems, provoking changes in the overall structure of trophic webs and habitats, which in turn puts at risk the sustainability of current fisheries (Bellido et al., 2011). Discards trigger changes in the food chain ecology: they generate increased levels of food through dead fish or fish that may not survive after release, altering the relative prey-predator abundance (Garthe and Scherp, 2003) and causing additional interactions between species (e.g. scavenging organisms on the sea floor, and feeding populations of sea birds, marine mammals, and sharks) (Votier et al., 2004). Particularly, in deep-sea environments where food is scarce, the input of organic matter from discards increases the diversity of benthic communities in localized areas (Jennings and Kaiser, 1998). In contrast, species with low discard mortality may increase in terms of abundance in areas of extensive fishing and alter relationships in the ecosystem (Rogers and Ellis, 2000).

The majority of specimens caught and discarded either dead or dying are usually small and sexually immature (Davis, 2002). This implies a reduction in future spawning stock biomass and reduced the potential for the stock to rebuild, which is currently one of the key parameters in fisheries management. Discarding results in the loss of valuable scientific information by complicating the stock assessment process since the real fishing mortality applied to fish stocks is not quantified (Diamond and Beukers-Stewart, 2011). Finally, discarding small specimens also lead to a reduction in future harvesting opportunities, thereby diminishing the growth potential of stocks as well as potential yields from the fishery, with obvious economic consequences. From a manager's perspective, the problem consists in simultaneously meeting socio-economic and biological objectives and developing suitable performance indicators to measure progress towards these objectives (Catchpole et al., 2013); from a fishers' perspective, discarding is an extra cost both in labor and money (Pascoe, 1997).



Sea turtles (around 80 percent) and elasmobranchs (around 16 percent) represent the highest share of reported incidental catches of vulnerable species among the total specimens caught.

Seabirds and marine mammals, by contrast, are apparently the groups with the lowest amount of reported bycaught specimens (around 4 percent of the total) (Figure 15).

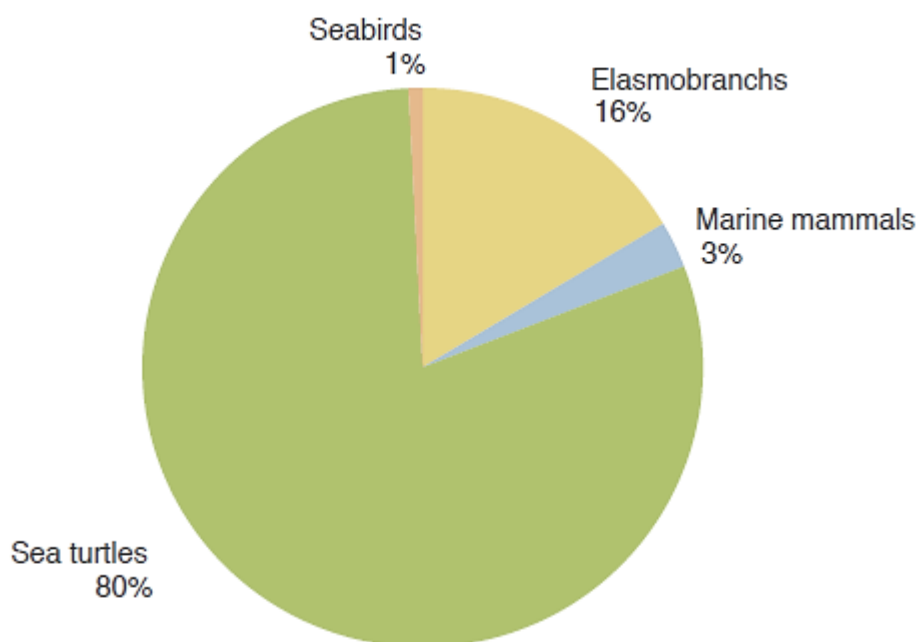


Figure 15 – Number of specimens (in percentage), by group of vulnerable species, reported as bycatch in scientific publications (preliminary analysis)

Most of the reported catch, for all groups of vulnerable species, is concentrated in the western Mediterranean (covered by 50 percent of available literature).

Concerning the information by vessel group, longliners are responsible for most of the incidental catches of vulnerable species in all subregions; sea turtles, elasmobranchs and



seabirds account for most of the incidental captures for this vessel group. The incidental catches of these groups of species are reported especially in the western and central basins where the fishing activity is more intense and where the monitoring measures are more constant and effective.

Trawlers (pelagic and demersal) are the vessel group for which most information is reported regarding the incidental catch of marine mammals (both in the central Mediterranean and the Adriatic Sea) and elasmobranchs (in the Adriatic Sea).

The volume of fishery discards amounts to around 230 000 tonnes per year in the Mediterranean (around 18 percent of total catch). In the Mediterranean, bottom trawlers are responsible for the bulk of discards (generally more than 40 percent), whereas discard rates for pelagic trawlers and purse seiners are generally lower (mostly less than 15 percent and between 2 and 15 percent of total catch, respectively).

Information on discards for small-scale fisheries is relatively scarce, but available data report a discard ratio lower than 10 percent for all different types of gear (i.e. trammel, gillnets and small longliners). Demersal longliners produce minimal discards (less than 15 percent), whereas pelagic longliners still may produce high values of both discards (more than 15 percent) and incidental catch of vulnerable species.

Generally, in all subregions, the most commonly discarded groups of species are benthic invertebrates (e.g. gastropods, porifers, cnidarians, echinoderms), elasmobranch species with no commercial value, but also non-commercial individuals of target fish, crustaceans and cephalopods species.

Annual absolute values of incidental catches of vulnerable species are not available, therefore this report collects information on the relative importance of different types of fishing gear and the main species affected. Sharks, rays and skates, which occur in the shallow coastal shelves of the Mediterranean, are mainly affected by bottom trawlers targeting demersal fish and



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invertebrate species. Longlines (both pelagic and demersal) have a significant impact on sharks, sea turtles and seabirds. Static nets also incidentally catch a conspicuous number of sea turtles.

Data from literature indicate that sea turtles (around 80 percent) and elasmobranchs (around 16 percent) show the highest percentages of reported incidental catch among the vulnerable groups. Seabirds and marine mammals, on the contrary, are apparently the groups with the lowest number of incidental catch events (around 4 percent of the total).

Small scale fisheries



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Small-scale fisheries are deeply rooted in the fabric of Mediterranean and Black Sea fishing communities. Their significant role in this region is well known, despite, in some cases, limited available data for this sector. Since millennia, the small-scale fishing sector has supported livelihoods within coastal communities. The role it plays in sustaining economic activity and ensuring food security within vulnerable coastal communities is not to be overlooked, particularly in the current context of ever-increasing rural to urban migration.

Furthermore, SSF plays a key role in maintaining local traditions and culture, creating added value for other sectors, such as the restaurant and tourism industries. Albeit different, recreational fisheries are another fishing subsector for which data are typically limited in the Mediterranean and the Black Sea. However, preliminary information points to a non-negligible impact of this sector, both in biological and economic terms.

The definition of SSF has been regularly debated in various fora at the global and regional level. Indeed, the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines) recognize the great diversity of SSF and acknowledge that there is no single, agreed definition of the subsector, nor would such a definition be desirable for such a diverse and dynamic subsector. The SSF Guidelines, therefore, state that the identification and application of the term “small-scale” should be carried out at the regional, subregional or national level, taking into account local contexts. In particular, such an exercise should be carried out in a participatory fashion to ensure that all voices, including those of marginalized groups, are heard (FAO, 2015).

The definition of SSF in the Mediterranean and the Black Sea has also been debated within the context of the GFCM. At present, the terms “artisanal fisheries” and “small-scale fisheries” are often used interchangeably to refer broadly to a multi-faceted fisheries segment practiced along coastal areas in the Mediterranean and the Black Sea, and indeed worldwide. Definitions vary between countries in the GFCM area of application. Small-scale fisheries are generally characterized by a large number of boats of low tonnage (between 1 and 4 tonnes), which are



highly diversified and use low-impact fishing gear to target a wide variety of species. Fishers exploit areas that are usually close to the coast where they live and shelter their boats. Small-scale fisheries usually require low capital investment, in contrast to industrial fishing, but they are an important source of income and make a significant contribution to food security, especially in coastal communities. (FAO, 2016).

Artisanal or small-scale fisheries (SSF) in the Mediterranean and the Black Sea play a significant social and economic role: they represent 84 percent of the fishing fleet (70 000 vessels), 26 percent of total revenue (USD 633 million) and 60 percent of total employment (150 000 people). The SSF fleet has decreased by approximately 4 000 vessels (5 percent), whereas employment and annual revenue in SSF has increased by approximately 15 000 persons (9 percent) and USD 45.3 million (7 percent) compared with data reported in SoMFi 2016.

Despite anecdotal evidence suggesting that marine recreational fisheries constitute significant fishing activity in the Mediterranean and the Black Sea, data collection for this sector is currently limited and fragmentary, and varies between countries. In the following section is going to be presented one of the few case studies reported about SSF in Albania.

The compilation of timely and complete data on SSF has been historically limited, because CPCs face a number of challenges in improving data collection for this subsector. In certain countries, there is still a need for complete and up-to-date fleet registers for the small-scale subsector. Furthermore, in many cases, SSF may lack dedicated infrastructure, and catches are landed at numerous remote landings sites along the coast, including informal sites such as beaches, hindering regular data collection and record keeping. The multi-gear and seasonal nature of SSF also contributes to a complex data collection scenario.

Nevertheless, the submission of data on SSF by CPCs has been improving in recent years, and data submission in line with the DCRF has facilitated improved analysis. A future challenge is the paucity of data on gleaning and post-harvest activities, which are not currently requested by



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the GFCM but which constitute an important share of SSF activity, as well as a principal contribution by women.

Small-scale fisheries fleet

The small-scale fleet in the GFCM area of application represents 84 percent of the total regional fishing fleet – 83 percent of vessels in the Mediterranean. The total small-scale fleet in the region is approximately 70 300 vessels¹ (approximately 59 800 vessels in the Mediterranean. A breakdown of the percentage of SSF vessels per national fleets is presented in Figure 16.



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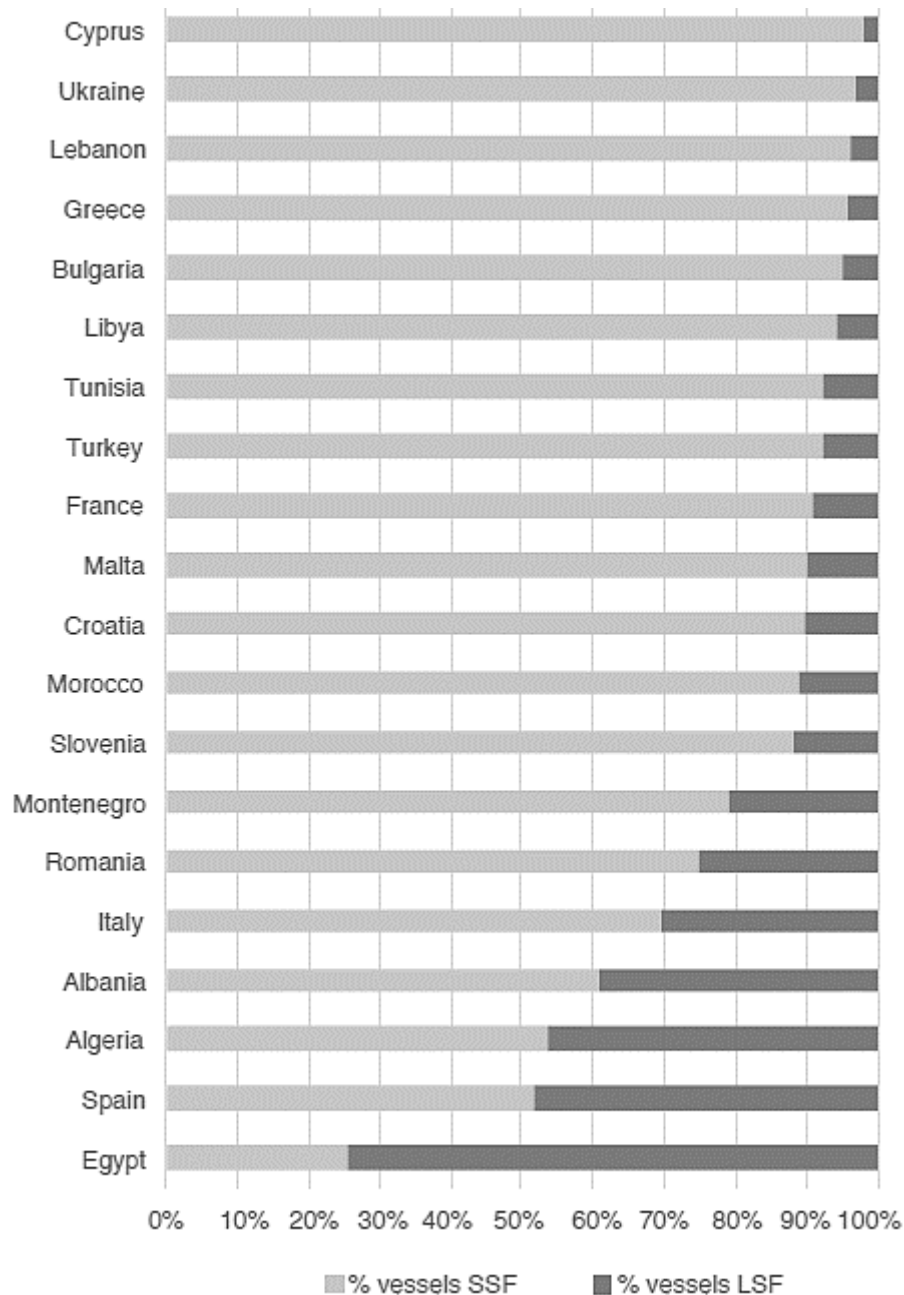


Figure 16 – Percentage of vessels from small-scale fisheries by contracting party and cooperating non-contracting party



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In over half of the CPCs analysed, the small-scale fleet makes up over 90 percent of the total national fleet, accounting for the largest portion of national fleets in Cyprus, Ukraine, Lebanon, Greece, Bulgaria, Libya, Tunisia, Turkey, France and Malta (FAO, 2018).

In the Adriatic Sea and the western Mediterranean, the small-scale segment accounts for only 75 and 73 percent of the total fleet, respectively. Albania is not included in the countries with the highest proportion of the small-scale fleet (62%) and in the Adriatic Sea its small-scale fleet proportion is lower than the average percentage (73%).

Small-scale fisheries value

Small-scale fisheries account for approximately 26 percent of total revenue in the GFCM area of application, or 24 percent of total revenue in the Mediterranean and 49 percent of total revenue in the Black Sea. This revenue amounts to approximately USD 633 million (USD 519 million in the Mediterranean and USD 114 million in the Black Sea).

A breakdown of the percentage of revenue from SSF by CPC is presented in Figure 17. These figures, however, only consider revenue from the first sale of capture fishery products and do not include revenue from other uses of the vessel, such as fishing tourism, which has been shown to have considerable economic potential for SSF (Piasecki et al., 2016). Indeed, estimates suggest that the wider economic impact of SSF may be as much as 2.6 times the reported landing value (Dyck and Sumaila, 2010).



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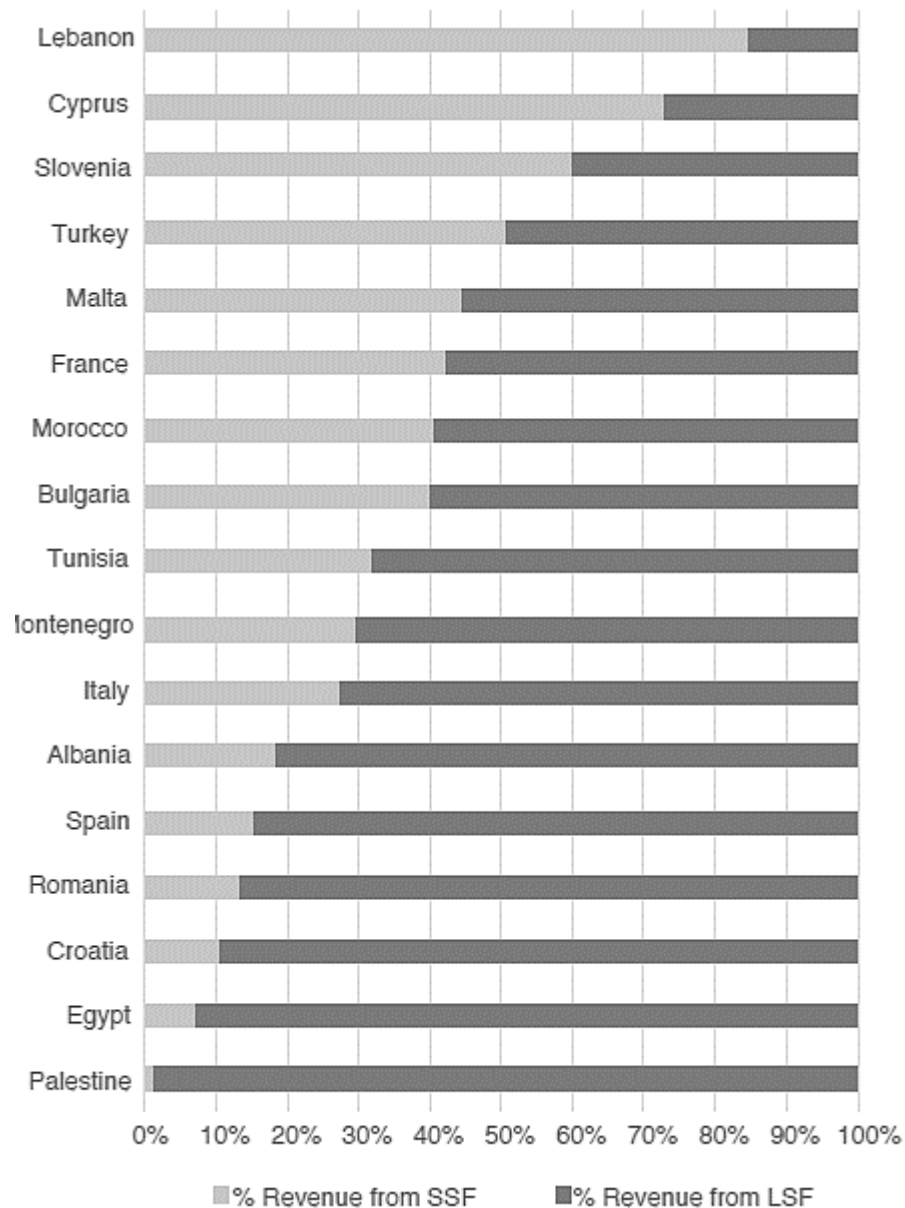


Figure 17 – Percentage of capture fishery production revenue from small-scale fisheries by contracting party and cooperating non-contracting party and relevant non-state actor



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As it is shown in the Figure 17, in Albania the percentage of capture fishery revenue (18%) is comparable to that corresponding to Spain.



Aquaculture

The area surrounding Albania has relatively abundant fresh water resources. Seven main rivers run from east to west in Albania. The hydrographic basin of Albania has a total area of 43,305 km² from which only 28,748 km² are situated within the state territory of Albania. The rest, which belongs to the catchments of the rivers Drini and Vjosa, is situated in Greece, FYROM and Yugoslavia. Albania is crossed by several rivers, in general East - West direction: Drini, Mati, Ishmi, Erzeni, Shkumbini, Semani, Vjosa are the most important ones. The mean annual discharge of all rivers of Albania is about 1300 m³/s, which corresponds to a specific discharge of 29 l/s.km², one of the highest in Europe. Surface water include also the natural lakes of Ohrid, Prespa and Shkodra, a multitude of minor lakes, and reservoirs built along the main rivers: at Fierza, Komani and Vau Deja along Drini river, Ulza and Shkopeti on the Mati river, and Banja on the Devolli river. Several lagoons are situated along the sea coast, the main ones being the Karavasta, Narta and Butrinti. The total coastline of Albania is about 476 km long. The coast between Velipoje and Shengjin in the north is characterized by curative sand beaches, and a few lagoons near Lezhe perfect for bird-watching. Between Durres and Vlore in Central Albania, the coast is characterized by long stretches of sandy beaches and several lagoons. Along the Albanian Riviera in the south, the coast is mostly rocky, with the presence of several islands like Sazan and Zvernec. All these waters resources and characteristics provide the possibilities for the development of aquaculture in Albania.

Fish farmers use different cultivation techniques, intensive, semi intensive, and extensive to grow primarily trout, molluscs, and carp. These species are grown in water-reservoirs, artificial and natural lakes and coastal lagoons. In 2012, total aquaculture production was 2,010 tonnes of which mollusc production was 760 tonnes (Eurofish Website, 2015).

Marine cage culture activities are concentrated in the Ionian Sea, where the operators farm gilthead sea bream (*Sparus aurata*) and European sea bass (*Dicentrarchus labrax*). Mollusc (*Mytilus galloprovincialis*) cultivation is concentrated in the Butrinti lagoon with some activity



also in the open sea at Shengjini Bay (around 100 ha with floating lines) (Eurofish Website, 2015).

Trout farming is concentrated in the southeast of Albania, where about 60 companies have their facilities. Most of them try to hold down costs by allowing the fish to reproduce naturally. Cultivation of the endemic fish koran (*Salmo letnica*) is restricted to the area near lake Ohrid. A few hatcheries are involved in the cultivation of common carp (*Cyprinus carpio*), Chinese carps such as grass carp (*Ctenopharyngodon idellus*), bighead carp (*Hypophthalmichthys nobilis*) and silver carp (*Hypophthalmichthys molitrix*) for restocking purposes (Eurofish Website, 2015).

In the graphic of Figure 18, it is shown the comparison between the production trends of Fish and Mussel Aquaculture, respectively. As it shown, there is a decreased production trend of mussel culture after 2009 and an increasing production trend after 2010.

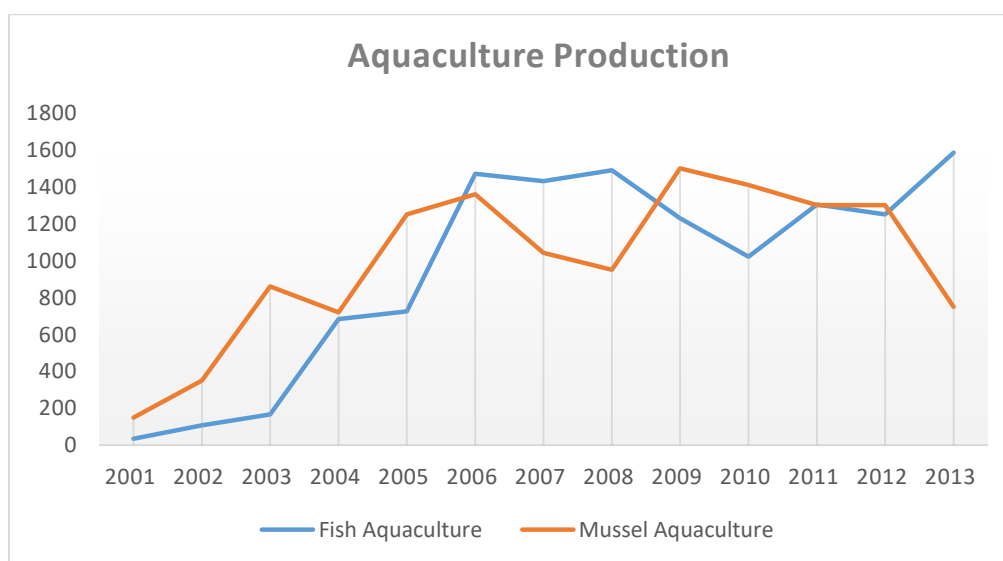


Figure 18 - A comparison between Fish Aquaculture and Mussel Aquaculture production (INSTAT, 2015)

Floating cage farming of marine finfish started in 2002, involving Gilthead seabream and European seabass, and now is intensively practiced by using floating cages. In comparison to



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2002 situation, actually there are present 16 floating cages farms in the territory of Albania, which are specialized in growing gilthead seabream and European seabass. It is important to note that no hatchery exists in the Albanian territory and most of the fingerlings is coming in this on-growing farms from the hatcheries located in Greece, while the fish feed is imported from Italy, France and Germany. Mainly the sea cage farms are located in the Bay of Vlore (close to Karaburun peninsula), Saranda (in Ksamil) and Himara (Porto Palermo), where identical growing technologies used in Greece and Turkey are installed in these areas. Anyway, there is an Italian company which is installing off-shore cages near to Karaburun peninsula (Rigers Bakiu; unpublished data)

Bivalve culture has been developed since the beginning of the 1960s in the coastal lagoon of Butrinti where fixed structures are being used for the production of Mediterranean mussel (*Mytilus galloprovincialis*). Due to the excellent environmental conditions in this lagoon, about 80 fixed concrete units were constructed here during the 1970s. Since this time production has grown steadily, reaching a maximum of 5,000 tonnes/year by the 1990s (FAO website, 2015).

In later years, mussel breeding was practically stopped, for reasons relating to internal organization but also, above all, because of the ban on exports of all live fisheries products imposed for sanitary reasons by the European Union in October 1994. About 75 percent of the fixed structures are now into operation, mainly for the local market, with the hope that exports to countries of the European Union will be opened up again. Until now about 60 fixed concrete units are in production, with an output of 676 tonnes. The bivalve mollusk cultivation is an important culture also in the open sea by floating units. In Shengjini Bay is operating one subject extending his facilities into 100 ha under cultivation of Mediterranean mussel (FAO website, 2015).

- Most of the production is exported toward EU countries, like Italy, France, Poland and Germany directly by the farming companies or wholesalers. For example, Alb-Adriatico 2013 has finished the construction of a brand new packing house in the first quarter of 2017, following the regulations and demands of hygiene and sanitation of the EU. This



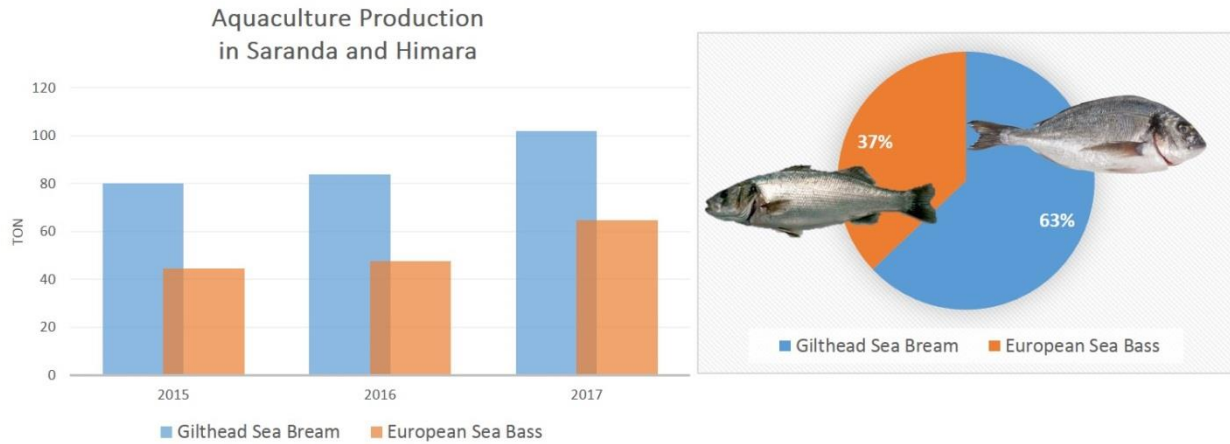
refrigerating warehouse for packing and storing the fish products was built under the norms and standards of EU, the materials and machinery installed in the packing house are all of the latest technologies available in the market today, and all were produced in EU countries such as Germany and Italy. It represents one of EU exporting Albanian companies and the 350-400g fish of gilthead seabream and European seabass was certified for export with license number CE 54, AQ and PP.

- Mare Adriatik sh.p.k is an Albanian company founded in 2001, situated in the area of Shelqet in Shkodra district, in the northern part of Albania. From the beginning, the company aimed at the continuous improvement of product quality in order to match the demanding EU standards. The company has acquired the License of European Community 30/AL CEE to be allowed to export its products into these markets. It has also acquired the Certificate ISO 9001:2000 and HACCP. Actually, the Mare Adriatik aquaculture site (Rigers Bakiu personal observation, 2015) is visited regularly by inspectors from Tirana, who monitor and certify the water quality. The mussel production started in 2009 and Mr Babani (the founder and General Director) is expecting a production volume of 250 to 300 tonnes each year. Unlike in the Butrinti Lagoon, where the mussels are produced using concrete structures, Mr Babani has invested in ropes and flotation devices. Currently, he has five headropes (EuroFish Magazine 4/2012), each about 800 m in length, that float on the surface of the water with the help of flotation devices.

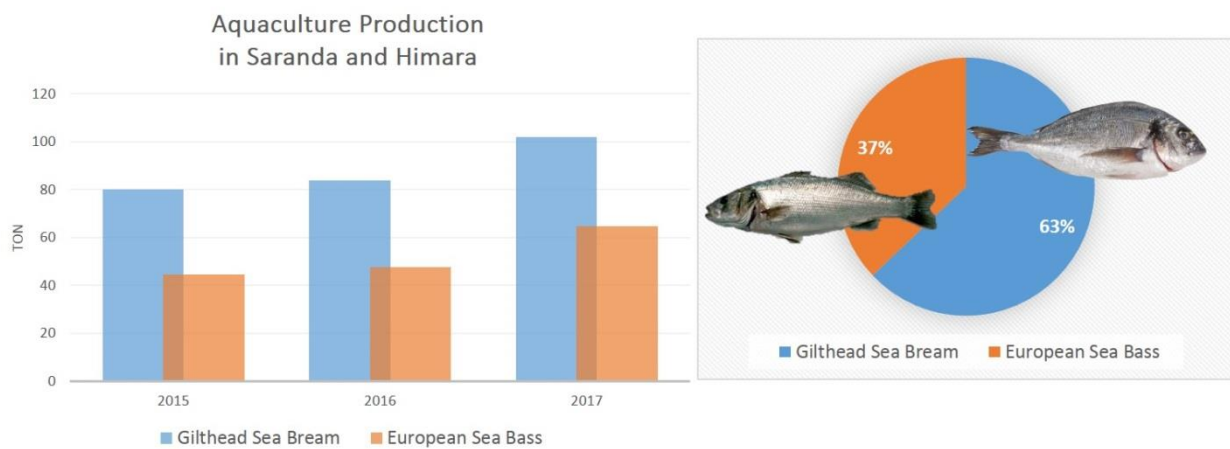


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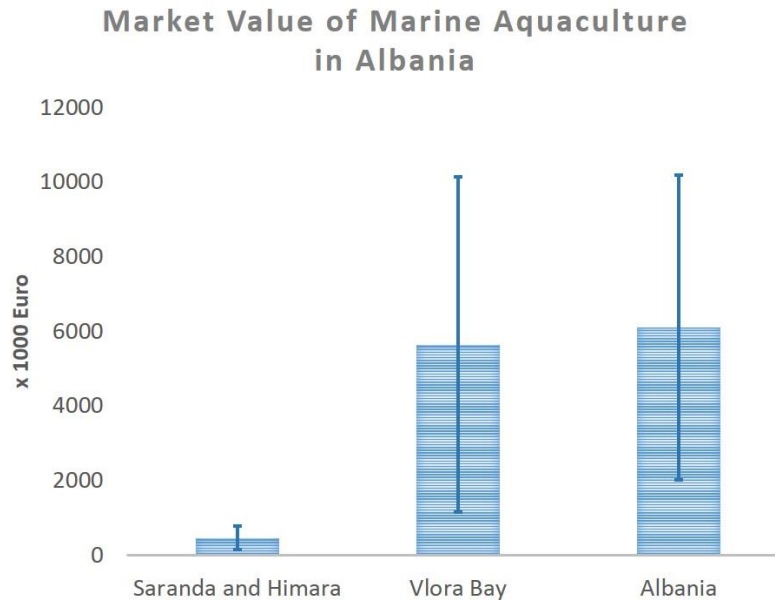
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Source: unpublished data from Rigers Bakiu (based on data provided by the Ministry of Agriculture and Rural Development)



Source: unpublished data from Rigers Bakiu (based on data provided by the Ministry of Agriculture and Rural Development)



Source: unpublished data from Rigers Bakiu (based on data provided by the Ministry of Agriculture and Rural Development)

Time	2000	2010	2012	2013	2014
Employment in Aquaculture (ind.)	140	400	400	400	400

Source: FAO Fishery and Aquaculture Statistics (2016)

Blue Growth/Blue Economy regions in Albania

Fisheries production for each Blue Growth/Blue Economy regions, 2014-2017

Time	Fisheries	Albania	Durres	Lezhe	Vlore/Sarande
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2014	Marine	2.78	778	729	1.273
	Coastal	700	119	79	276
	Lagoons	286	-	58	122
	Aquaculture	800	-	33	631
	Mussel growing	1.5	-	-	1.5
2015	Marine	2.396	671	628	1.097
	Coastal	291	49	33	115
	Lagoons	261	-	53	111
	Aquaculture	936	-	39	738
	Mussel growing	295	-	-	295
2016	Marine	2.83	792	742	1.296
	Coastal	580	99	65	229
	Lagoons	364	-	74	155
	Aquaculture	604	-	25	476
	Mussel growing	302	-	-	302

Quantities are reported in tonne.

Source: Ministry of Agriculture and Rural Development-2017

Shengjin-Lezhë

The northernmost port at Shengjin is in the Lezhë area, which is represented by a small outdated fishing fleet of around 50 boats, of which almost 15 work regularly. Other activities characterize the area of Shengjin, like local fish processing, some tourism activity and as yet unrealized aspirations to attract coastal yachting. The port administration, employing some 150 long-standing workers, intent to expand through port dredging (from 6-8m to 8.5-9 m depth), infrastructure improvements and better strategic road connections east to Kosovo and north to Montenegro.

In the last year, with the privatization of the fishing fleet and the newly developed requirements in the fish market, the structure of fishing methods has also changed. Up until the end of the nineties, the pelagic method was used to catch about 75 % of fish that went into the canning industry. After the nineties when the fish processing industry saw major transformations and



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the demand for export and local consumption has qualitatively changed, the bottom method has gained weight. However, other methods are not excluded either such as coastal fishing, lagoon fishing, sports fishing and tourist fishing.

More recently in the Shengjin Bay to the north entrepreneurs have begun to grow mussels on ropes (Eurofish magazine 4/2012). Privatization of the fishing sector starting with the catching, processing and selling create opportunities for free enterprise in projects related to aquaculture. These projects are connected with the real natural opportunities available to the population in the Bay of Drin and their long time experience in this sector. The project under implementation takes place in the water environment under the jurisdiction of the port in an area of 100 m² which cultivates 3-5 tons of mussels every year destined for the local market (Local Environment Action Plan 2006). The other project still is covering an area of 100 ha of water surface which is used to install the technology for the cultivation of mussels in accordance with modern standards and yield high productivity and provide jobs for 30 workers.

Durrës

Albania's largest port, Durrës serves Tirana and regions beyond. It offers facilities for bulk shipment, container and general cargo, and ferry passenger transit, including tourist arrivals for nearby coastal resort areas. An expanded fishing dock is under construction, to accommodate 40 commercial boats. All but this and the general cargo terminal have been outsourced to private contractors, and along with passenger numbers and bulk throughput, general cargo has been declining. There is some naval visitation e.g. from the nearby Italian fleet. Container traffic is growing as road linkages improve. Durrës is the starting point for road-rail pan-European Transport Corridor VIII to Sofia and Varna in Bulgaria, and is developing greater depth, infrastructure including inter-modal transfer facilities and other capacity to capitalize on its central location in the country. However, its port and land transfer operations seriously conflict with surrounding poorly-controlled urban development. In 1998, prior to privatization, the port employed 1,500 workers and now has 400.



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Vlora

Albania's second port, Vlora hosts two general cargo quays at 8 meters depth and a ferry terminal that is closest to Italy (Brindisi 70 km). Cargo movement is declining and the port authority is awaiting decision on further plans to separate or otherwise reduce cargo capacity. It will concentrate on passenger handling to serve tourism, business, migration and family reunion movements. Expansion from one to five ferry berths is anticipated; most ferry operators are Italian. There is now a separate bulk oil facility and some capacity for solids bulk handling. A fishing port (Triport) is also separate, to the north, berthing 30-40 commercial boats. The homeport itself employs about 300, including border police. The region's only private marina, with recreational housing, is nearby to the south: it struggles to stay viable due to onerous coastal yachting restrictions and market memories of the 2005 moratorium on pleasure boats, now removed. However, Vlore is also known for the cage farming of sea bass and seabream near Karaburun Peninsula.

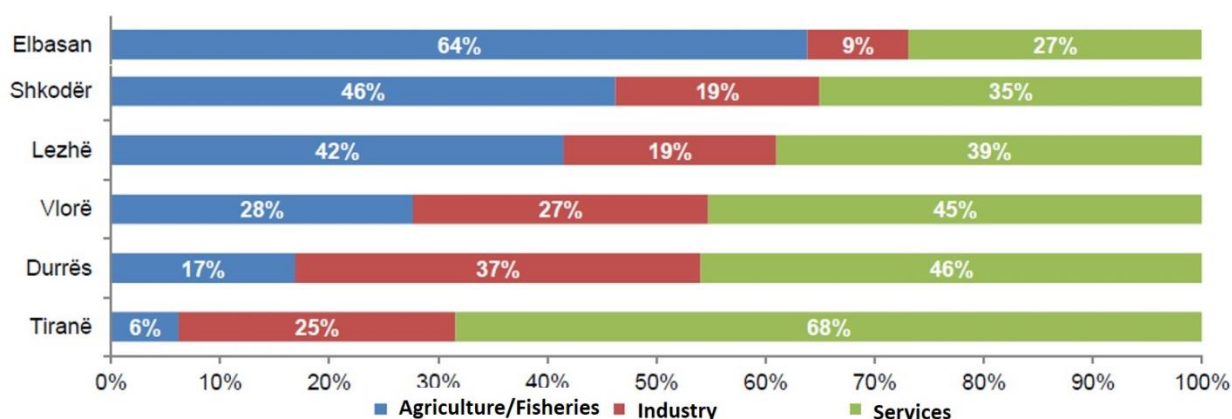
Saranda

Saranda hosts a tourism port (9.5m depth) for ferries and cruise ships, benefiting from a new 180m-long liner berth, a pleasant waterfront environment, major heritage destinations, and proximity to Corfu and the rest of Greece. Urban encroachment around the port has driven the relocation of goods handling 3 km away to the Bay of Limion. Rugged terrain favors sea over road transport, and the region plans seek to improve domestic coastal shipping and logistics, as well and further international maritime linkages. As it was mentioned previously, aquaculture activity is most represented by mussel culture, which is concentrated at Butrinti Lake, south of Saranda. However, the fishermen of Saranda were organized in an Organization for Management of Fisheries, just recently (last summer) and there is an improvement of the fisheries sector, which is the main provider of fresh fish to the local markets and restaurant. Based on the Survey about Employment (2017), the specializations/professions, which are best paid are represented by the government administrative officers and the relative executive



directors; the graduated specialists and the qualified techniques, while the specializations/professions less paid are represented by the qualified workers in agriculture, forestry and fisheries; workers of the elementary professions and handicraft workers.

**Blue growth/economy regions employment structure
based on the economy sectors (2017)**



Source: Survey about Employment-2017

The total full-time employment in the fisheries and aquaculture is estimated at 4215 persons (Fisheries Sector Assessment Report, January 2017) with a significant number of women employed by the processing industry. On the other hand, there is no accurate data on indirect employment of women that besides household or farm work are mostly engaged in the ancillary services like fishing net repair and maintenance, inland aquaculture and fish processing.

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