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Applying and Promoting the Marina Sustainable Development Concept: The Case of Marina Bar, Montenegro

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Abstract: In response to the growing need for sustainable marine tourism, this paper proposes the Marina Sustainable Development Concept (MSDC), as a means to develop approaches and strategies that support sustainable planning and management of recreational ports and marinas in countries with extensive coastlines, such as Montenegro. It is important to note that applying such a MSDC has not always been an easy task due to the fact that managers in this field have not been particularly familiar with its importance. Since Montenegro is an official candidate for EU and Montenegrin marinas are reporting good throughput trends over the last few years, it is highly topical and timely to apply the MSDC in order to highlight the current situation in terms of existing capacities in environmental standard implementation, thus comprehending the level of sustainable practices in the country. The MSDC described here, includes targets and goals pertinent to the implementation of directives and best practices which confirm that a marina has all the capacities and conditions to operate in an environmentally friendly manner. It is proposed that in order to offer services in the era of sustainability, marinas must adopt a MSDC based on identifying and managing environmental issues. Also, this paper addresses challenges facing MSDC implementation and assesses the potential of MSDC based strategies being implemented in Marina Bar (Montenegro), through a scientific international project entitled "Applying and Promoting the Concept of Sustainable Development to AD Marina Bar" originating in 2014.

Key words: applying and promoting; marina sustainable development concept; Marina Bar
JEL codes: O2, Q51, Q56, R41

1. Introduction

Nautical tourism represents one of the most important activities for recreational ports, thus making it imperative to address ways and strategies for marinas to provide clean and sustainable services. The Mediterranean represents one of the most famous tourist destinations in the world incorporating many different types of tourist services, including marine tourism. As far as marine tourism is concerned, the demand for commercial marinas has been shown to be increasing, thus expanding the opportunities for investment in the tourism sector (Tselentis et al., 2014; Lee & Yoo, 2014; Raffaele, 2014; Massiani & Rosato, 2008). These studies

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have also shown that investing in a sustainable yachting industry can have a positive influence on the national economy, as this industry contributes to the creation of new jobs.

Recently the development of nautical ports has become increasingly important for Montenegro due to the very competitive geographical position within an area which already has a thriving maritime industry located in Italy, Greece and Croatia (ADMB, 2014; Dragović et al., 2014a, b; SMP, 2014). The country disposes with 300 km of coastline and already new marinas have been developed during the past few years (Dragović et al., 2014a, b; Tselentis et al., 2015). Marina Bar is a publicly owned marina and there are definitely areas for improvement, especially applying the Marina Sustainable Development Concept (MSDC), paying special attention to the possibility of achieving a certified environmental management system based on high standards in water quality, pollution prevention and safety and security. In addition, nautical tourism represents one of the most important activities in the city of Bar and its promotion is highly recommended, especially since the city and the state have become aware that developing the marina is closely related to sustainable operations maintaining the region's natural beauty (ASCE, 2012; CDBW, 2005; Dragović et al., 2014a; Dragović et al., 2014c; Tobiasson & Kollmeyer, 2000). Already Marina Bar has concluded several studies on issues such as plans for new locations and developing a new terminal for yachts and boats, which are still under consideration.

The entire MSDC is innovative, since for the first time, provides for the responsible stakeholders to jointly perform a systematic analysis aiming at the protection of the environment in the marina. Also this innovative approach will be the basis for an expert's platform which will serve the future systematic and sustainable development of the marina, incorporating the knowledge and experience gained from the implementation of environmental certifications, such as the Blue flag, ISO standards and Gold Anchor Scheme. At present much work has already provided a register of all the environmental aspects resulting from the marina's activities, using a logical, objective (rather than subjective) methodology to rank such aspects into order of significant impacts upon the environment.

It is believed that the MSDC proposed and implemented in Marina Bar, will be able to address many other challenges facing the complex port system of Montenegro on its path to environmentally friendly operation and sustainable services, since most face common problems in integrating already existing facilities, materials, human resources and equipment, into a new set of procedures driven by a novel sustainable management culture. This has been shown to increased commercial viability through aspiring to client (tourist) increased demand for sustainably managed coastal regions and marinas, providing leisure activities, recreation and pleasure in a natural and culturally and socially rich destination (SMP, 2014). In addition, during the implementation of MSDC, a very significant output will be provided in relation to applying and promoting the concept of sustainable development in recreational ports throughout the Mediterranean.

2. Marina Bar Development

Marina Bar was the first marina in Montenegro established along with the biggest port in the country, Port of Bar. It is important to report the basic information about the marina area, its infrastructure and operational characteristics, as it is one of the largest marinas in the country with 592 commercial berths, a total land area of approximately 4.5 ha and a water area, including each basin and the marina entrance, of around 9.5 ha. As mentioned previously, the marina is in the process of achieving criteria for MSDC (ADMB, 2014).

This study recognizes that Marina Bar as a very attractive place for yachting and has achieved nautical

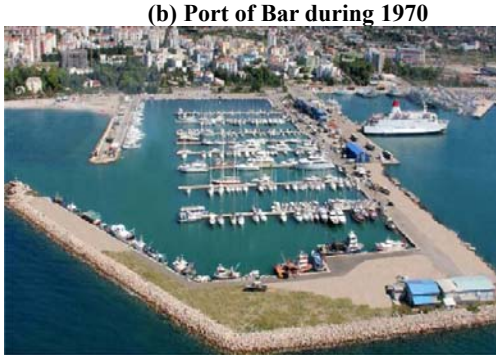
tourism port status through continuous development since the 1980s. It is a commercial small port divided into eight docks with the total quay length of 3600 m (ADMB, 2014). It is interesting to note that even though the marina occupies a large area, its capacity during the year is basically at the maximum level providing services not only for new customers, but also for the community, by including small boats and fishing boats. The aim is not to make Marina Bar a popular marina, but to satisfy the needs of the local population and new customers.

Figure 1 represents the development phase of Marina Bar integrated into the biggest port in the state, Port of Bar. The site of Port of Bar during 1930 is shown in Figure 1a. It is apparent from Figure 1b that the development of the marina adjacent to the Port of Bar during 1970s has not started yet, while the layout of all elements and contents of marina is apparent in 1994 (Figure 1c). In Figure 1d the current conditions of Marina Bar with the proximity to the city of Bar, are shown.

(a) Port of Bar during 1930

(b) Port of Bar during 1970

(c) Marina Bar during 1994



(d) Marina Bar during 2014

Figure 1 The Development of Marina Bar from 1930 to 2014 (ADMB, 2014)

There are plans to enlarge the capacity of marina, but for the purposes of this study, it is important to focus on the development, application and promotion of environmental standards regarding the following issues: the erosion process of the public beach near the marina which negatively affects the draft in the marina entrance, one of the biggest problems facing the application of the MSDC; upgrading already existing security and safety services; introducing waste management procedures and sewage water collection and disposal on docks, energy and water consumption reduction, alternative energy sources, etc. It is believed that by applying and promoting environmental practices and activities through the MSDC, the above will be recognized and successfully implemented.

3. Marina Sustainable Development Concept — MSDC

To define the MSDC, some main objectives have to be evaluated and analyzed, while at the same time striving for the Blue Flag, ISO 14001, ISO 9001 and Gold Anchor Scheme certifications. The main point is to

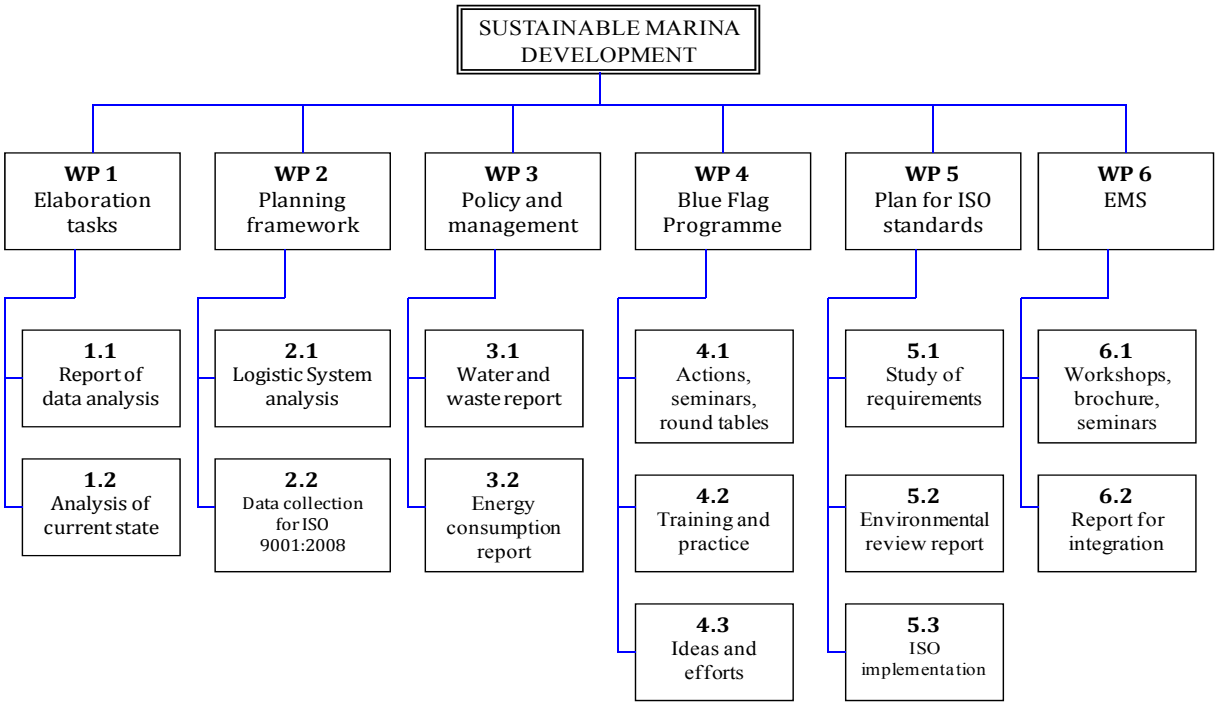
reduce the costs and have an environmentally protected area. This MSDC primarily involves the environmental management tools and methodologies, combined with the training and advisory support services that provide individual marina authorities with the option of developing and implementing their own, site-specific, environmental programme in the time-scale of their choosing and with the voluntary option of professional review and certification (Dragović et al., 2014c; SMP, 2014).

The main activities of the MSDC along with the implementation of project activities are divided into 12 work packages: WP 1-Elaboration of project tasks through international cooperation; WP 2-Marina Bar planning framework; WP 3-Development of the environmental policy and environmental management system for Marina Bar; WP 4-Applying the Blue Flag programme to Marina Bar; WP 5-Strategic development plan for ISO standards to Marina Bar; WP 6-Establishment of marina environmental management system; WP 7-Application of novel techniques in Marina Bar services; WP 8-Marina Bar sustainability: A life cycle assessment of Zero emission marina equipment; WP 9-Improvement of safety and services in Marina Bar; WP 10-Certification of Marina Bar with regard to ISO standards; WP 11-Award to Marina Bar with regard to Blue Flag and Gold Anchor Scheme; WP 12-Final proposal for Marina Bar facility solutions (SMP, 2014).

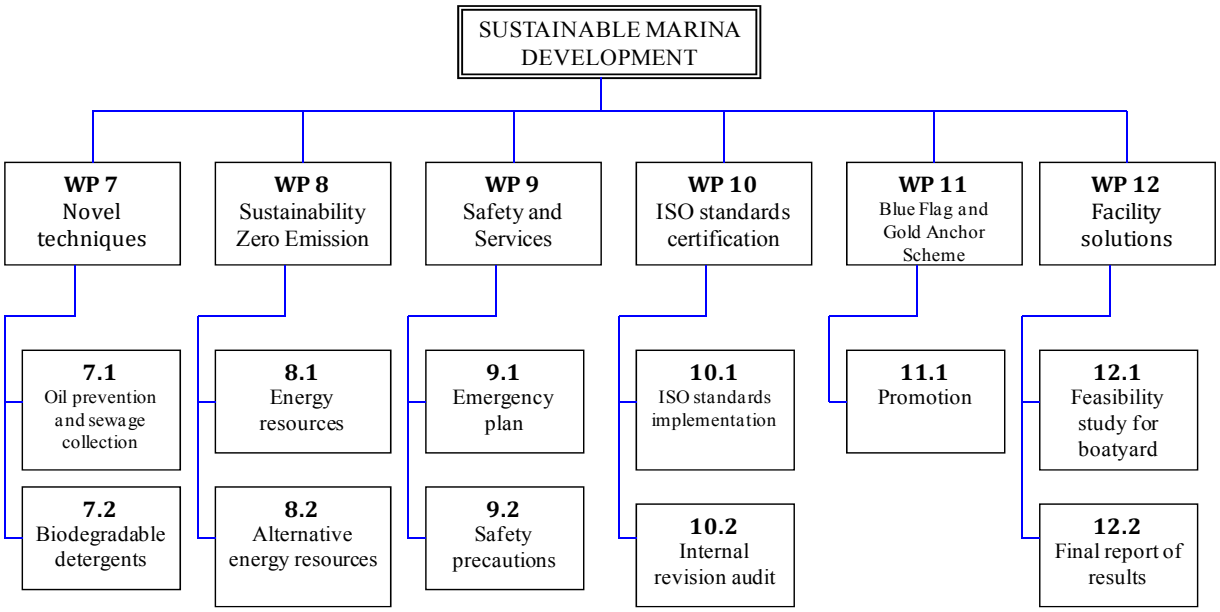
Firstly, the recognition of the main characteristics and indicators of marina capacities, are determined. Only with this, the investigation study will be put into context by using data analysis which covers parameters for marina capacity, technical recommendations for actions, statistical data of marina callings, marina traffic intensity and so on. After the formed framework of activities in marina area, the MSDC concept can be introduced. The economic benefits are also evaluated, by including planning and development of the environmental policy and environmental management system and identifying critical elements in attaining the sustainability concept. A structural approach to the Blue Flag programme is next target point focusing on its implementation cycle and its main objectives and principles. Social, economic and environmental benefits from the Blue Flag programme are to be specified (FEEI, 2013; Heron & Juju, 2012; MonteCEP, 2013). Along with this, ISO certification is initiated, by firstly studying the requirements for the implementation of ISO 9001 and ISO 14001 through a complete environmental review. It is believed that the implementation of the MSDC will lead to an integrated management system, which is definitely the ultimate goal for the marina.

Secondly, if the above mentioned tasks are implemented, then a detailed framework for sustainable marina development and the establishment of a marina environmental management system can be realized. This includes the main concepts important to a sustainable marina, i.e., sustainable marina management action, environmental management training and integration of environmental management systems with other management systems. This provides a good base for the coming activities, through the application of novel techniques in marina services and a life cycle assessment for a Zero Emission marina, the latter being based on the identification of characteristics and indicators that highlight the impacts of vessel exhaust emissions in an environmentally protected coastal area of the marina. In addition, the concept of zero emissions' marina is referred to a marina powered mainly from renewable energies in order to fulfill its power requirements and to reduce the air emissions mainly using this concept for the emerging cold ironing regulation. This is followed by the achievement of a safe marina which has to be evaluated through the prevention of incidental situations. Finally, with the implementation of all these goals, the marina can introduce some new facility solutions for high level decision-makers in order to assist them to better understand the importance of the marina in relation to marina equipment and social contexts, as well as an instrument to facilitate the integration of marina planning into sustainable development planning and management (Dragović et al., 2014a; Dragović et al., 2014b; Dragović et al., 2014c; SMP, 2014).

4. Implementation of MSDC



(a) Work package structure (WP 1-WP 6)



(b) Work Package Structure (WP 7-WP 12)

Figure 2 Work Package Structure (WP 1-WP 12) (Dragović et al., 2014; SMP, 2014)

The structure of the MSDC as described by the implementation tasks listed in the work packages is described below (Dragović et al., 2014a; Dragović et al., 2014b; Dragović et al., 2014c; SMP, 2014) and presented in Figure 2. More precisely, the overall strategy for sustainability enables the determination of standards for water quality and management, standards for environmental management, environmental education and safety, analysis of

energy consumption alongside docks and berths, promoting health and safety issues in regards to environmental-friendly strategy etc. Adaptation of an official policy for implementing quality management system in Marina Bar is of prime interest. The results are related to the integration of an environmental management system which will directly affect the development plan for sustainable marina management action. Determining the level of all the impacts in relation to environmental loads in marina (in the form of energy, water, materials, waste, etc.) is a major step for implementing a sustainable development model for the marina.

The implementation of some work packages in the project and generally in the MSDC model are presented in Figures 3 and 4 and Tables 1 and 2. The transfer of know-how and the exchange of best practices with surrounding areas are of utmost importance (Figure 3).

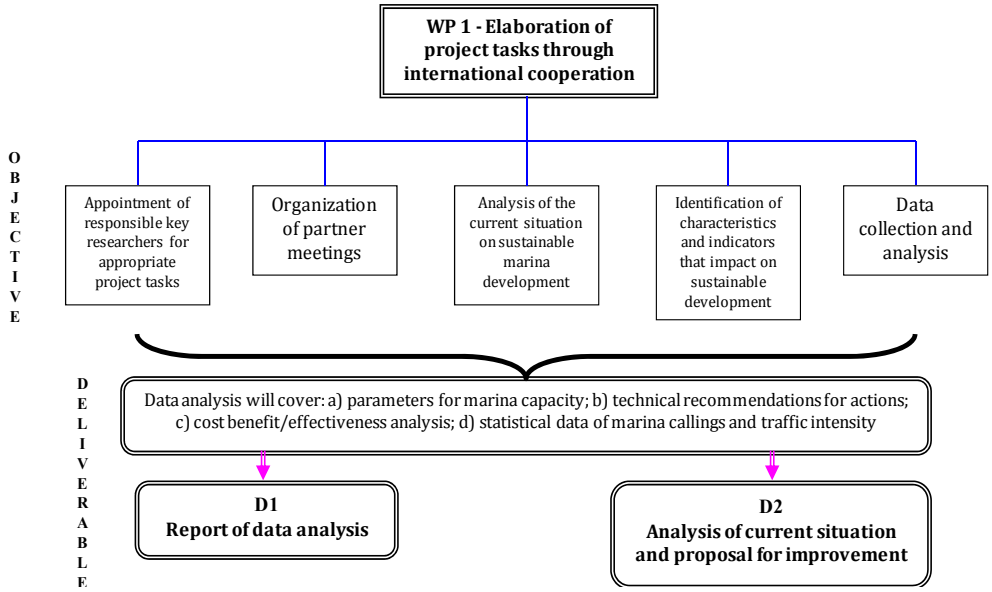


Figure 3 Implementation of Work Package 1 (WP 1) (Dragović et al., 2014c; SMP, 2014)

Data collection is an important aspect of this MSDC phase. Data analysis has to be based on the collected data, generally covering the following issues: parameters necessary for determining marina capacity; technical recommendations for actions in line with the best EU practices; cost benefit/effectiveness analysis with organizational and management recommendations; statistical data of marina callings and statistics of traffic intensity.

Table 1 Implementation of Work Package 2 (WP 2) (Dragović et al., 2014c; SMP, 2014)

	Objectives	Deliverables
WP 2 - Marina Bar planning framework	Preliminary work on applying the MSDC	Logistic System Analysis
	Logistic System Analysis	
	Integrated marina planning	
	Ecological footprint as measure progress towards MSDC	
	Management through Environmental Assessment	Preliminary data collection for ISO 9001
	Preparation for ISO	

In relation to WP 2 presented in Table 1, the main systematic planning process is based on selecting a suitable capacity for the marina and services provided while applying site planning, landscaping and engineering design standards to address the development. This approach has proved successful for the development of marina

capacity. Sustainable commercial viability largely depends on a well-defined national strategy for sustainable development at both the national and local levels. Sustainable marina development requires the strengthening of human resources, and institutional capacities amongst all sectors involved and at several levels. The objectives of this work package are, based on the logistic system analysis and integrated marina planning method, to recognize the importance of environmental protection for the long-term development of the marina market. Like MSDC, integrated marina planning implies a comprehensive and integrated approach which recognizes that all development sectors and supporting facilities and services are interrelated with each other and with the natural environment and society of the area. Besides this, the management body must also pay attention to the ecological foot-printing and environmental impact assessment.

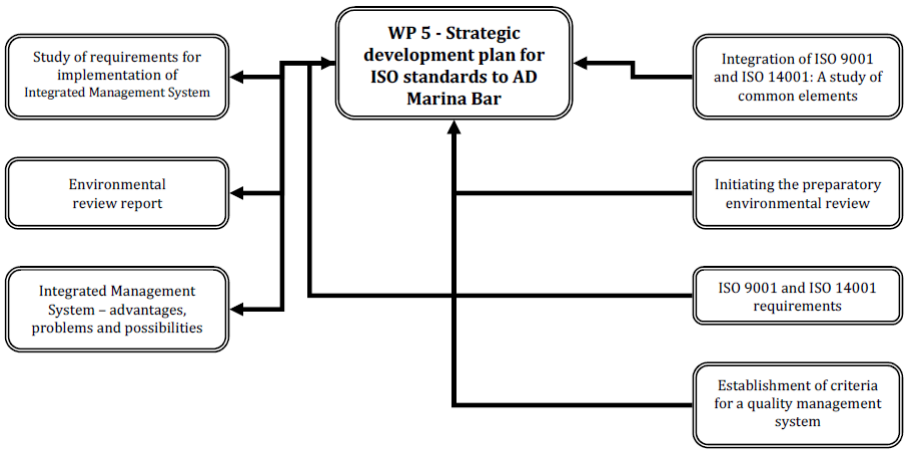


Figure 4 Implementation of Work Package 5 (WP 5) (Dragović et al., 2014c; SMP, 2014)

ISO certification represents one of the most important objectives for the MSDC (Figure 4). Using ISO 9001 helps ensure that customers get consistent, good quality products and services, which in turn brings many business benefits. On the other hand, ISO 14001 addresses the environmental management system and sets out the criteria of its implementation. It does not state requirements for environmental participation, but maps out a framework that can be followed to set up an effective environmental management system. Benefits are mostly recognized in a reduction in waste management cost, as well as distribution costs, savings in energy and material consumption, improved corporate image among regulators, customers and the public etc.

Table 2 Implementation of Work Package 9 (WP 9) (Dragović et al., 2014c; SMP, 2014)

WP 9 - Improvement of Safety and Services in Marina Bar						
Objectives	Establishing adequate and clearly signposted lifesaving, first-aid and fire-fighting equipment	Development of Emergency Plans in case of pollution, fire or other accidents	Design and application of posters on safety precautions	Development of electricity and water outlet installations	Design and implementation of wheelchair access and accessibility features	Design and implementation of a clearly posted map indicating the location of different facilities in the marina
Deliverables	Development of detail emergency plan in marina		Development of design and application of poster of safety precautions and safety in marina		Promotion of MSDC at the local and regional level	

Safety and services in marina are determined as specified in Table 2. A safer marina may also help to reduce insurance premiums, a commercial benefit to the marine company, through the formulation of better operating procedures and effective emergency plans.

5. Excepted Results of MSDC

The MSDC includes achieving steps for implementation and improvement of performance in Marina Bar, presented schematically in Figure 5. In this section, expected results are correlated with the milestones as the outputs of the same model. The integrated MSDC together with environmental and ecological standard certification, is expected to be achieved during the last term of the project.

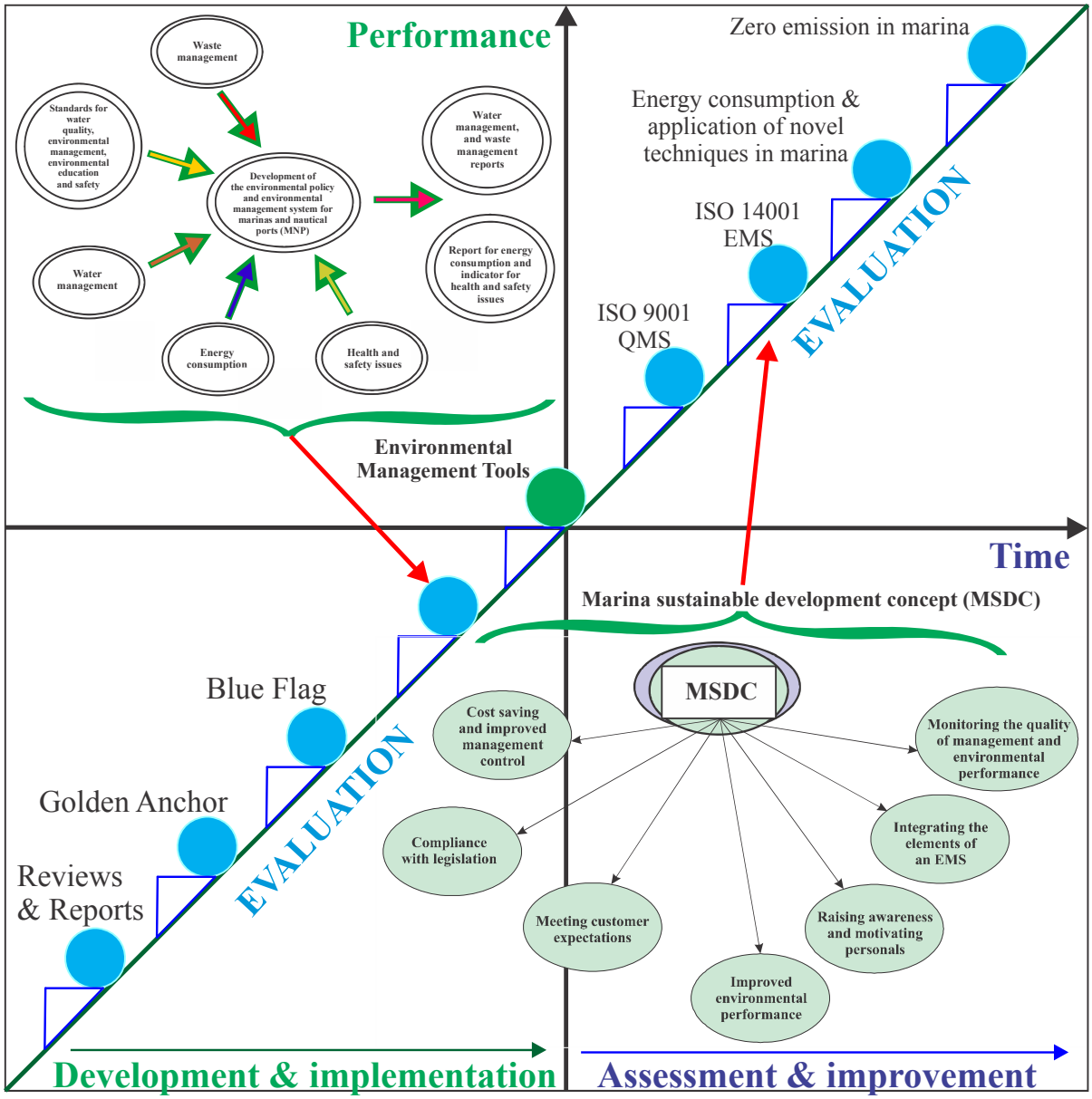


Figure 5 Achieving Steps of the Marina Sustainable Development Concept-MSDC

(Adapted from ESPO, 2014; Tselentis et al., 2015)

As a first step of implementation of environmental management system, it is necessary to recognize significant environmental aspects in relation to marina activities as potential points for improvement, from the management point of view. For marinas that are in the process of introducing a quality management system, it has been shown

that facilitating the development and implementation of environmental management system, is a good base to build on. Since the activities of marinas are closely connected and impact the environment, good management practices of their activities, especially with regard to the environmental standards are considered important aspects in the overall management of the governing bodies.

Therefore, the introduction of an environmental management system for marinas which already have in place a quality management system represents an upgrade of the existing management system, thus significantly contributing to the further improvement of the management of the organization through the application of standards such as ISO 14001. The procedural steps in the case of Marina Bar for implementing MSDC are shown in Figure 5 (Tselentis et al., 2015). It is proposed to be initiated by striving for the Marina Blue Flag certification the intention being to achieve the standards for attaining this award through the Bleu Flag program. Marina Bar is currently in the process of working on an integrated quality system which provides simultaneous application to both ISO 9001 and ISO 14001. In addition, the marina is constantly improving its environmental performance and preparations for the Gold Anchor Certification Scheme (Heron & Juju, 2012).

In Figure 6, milestones and expected results of the model are shown and correlated with the Marina Blue Flag programme implementation, ISO standard promotion and the application of Gold Anchor Scheme. The mentioned figure also shows the large-scale dimension of the sustainable development model to Marina Bar as well as the expected results and milestones. It is also correlated to the promotion of good environmental planning according to national strategy of sustainable development plans in the country (SMP, 2014). The proposed MSDC will also work on direct multiplication and dissemination of best practices and lessons learned to other relevant stakeholders, through publicity and awareness activities. These activities are seen as a very important learning and advocacy tool for recognition and action towards improvement of status and state of the target group, affected by this proposed MSDC marina (Dragović et al., 2014a; Dragović et al., 2014b; Dragović et al., 2014c; SMP, 2014).

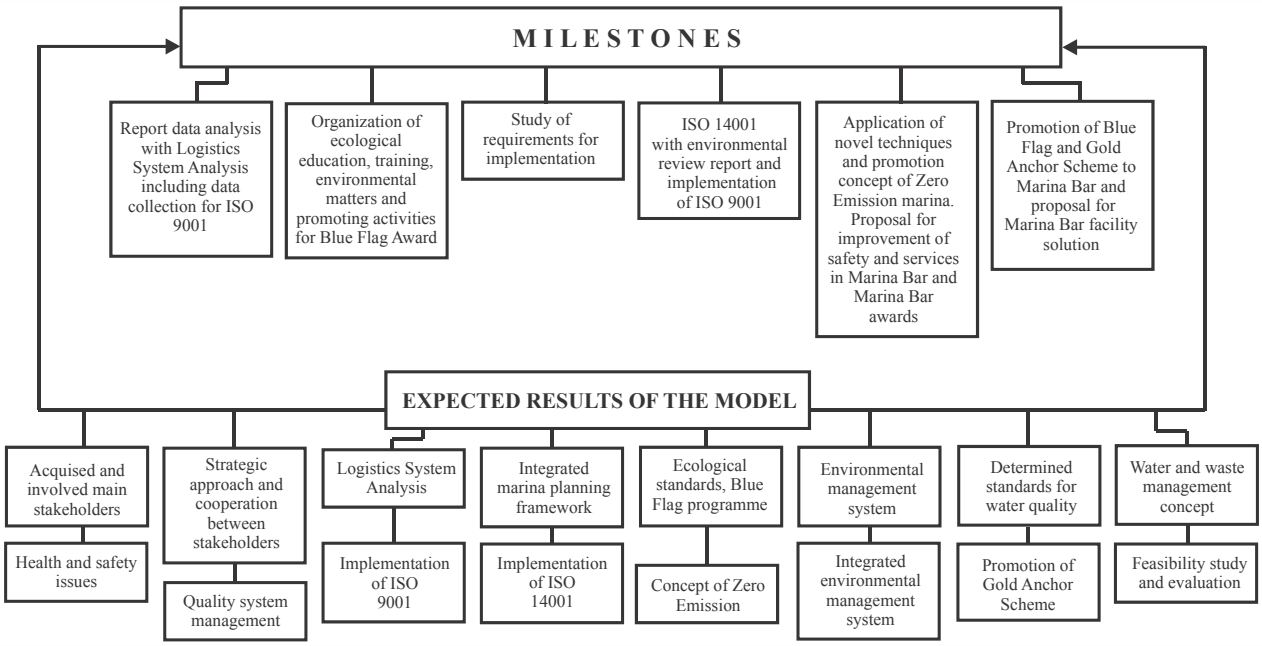


Figure 6 Milestones and Expected Results of the MSDC

This MSDC has a strong structural impact expressed by the initiatives for strengthening and developing the

organization. From the results already obtained from the model, implemented activities result in further initiatives for compliance to all legal requirements as far as marina services are concerned. Each activity aiming at environmental protection and lowering of marina impacts on the environment and the local community, is a step toward environmental sustainability.

5.1 Excepted Impacts — Outputs

The expected impacts through the outputs are specified in Table 3 describing how the MSDC contributes towards the expected results listed in the work packages with regard to applying and promoting the concept of sustainable development of Marina Bar. However, the continual improvement and investment in the marina definitely affects the promotion of good services by taking advantage of location and the creation of a good management body, within international standards. Also, the project of international awards, such as Blue Flag, Gold Anchor Scheme, ISO 9001 and ISO 14001, is already proving to be a very effective marketing tool, as other marinas internationally have experienced, having adopted these international standards (Heron & Juju, 2012). It is believed that only with international quality standards, can Marina Bar be present on the map of this competitive Mediterranean nautical region.

Table 3 Expected Impacts — Results and Outputs from Work Packages (SMP, 2014)

Work packages	Expected impact-Outputs	Expected impact-Results
WP 1	Analysis of current situation in Marina Bar. Data collection analysis. Work Plan of activities.	Accepted strategic approach and cooperation between stakeholders.
WP 2	Initial analysis and capacity assessment of the Marina Bar. The review of marina capacities. Organizing a marina user's promotion campaign.	Analyses of marina environment protection, marina capacities and legal framework.
WP 3	EMS implementation. Detail plan for water management, waste, energy consumption and health and safety issues.	Determined standards for water quality, environmental education and safety, water management and waste management concept.
WP 4	Promoting and adapting all details with the Blue Flag criteria for marinas. Provide the availability for all information related to local eco system and environmental phenomenon.	Organization of ecological and educational actions, training in environmental matters and best practice methods for marina personnel.
WP 5	Preparation of all activities for obtaining ISO 9001 and ISO 14001.	Developed strategy for ISO 9001 and 14001.
WP 6	Evaluation of current marina capacities in environmental management system.	Developed plan for sustainable marina management action and realization of seminars, workshops and promotions.
WP 7	Application of novel techniques.	Determined management for implementing novel techniques.
WP 8	Apply the life cycle assessment methodology and zero emission technology.	Proposal for the use of alternative energy resource such as photovoltaic and wind energy.
WP 9	Establish prevention plan as paramount statement for safety.	Conduct: signposted lifesaving, first-aid and fire-fighting equipment etc.
WP 10	Promotion of the getting certificate focusing on Blue Flag award. Definition of the base line scenario to maintain achieved objectives especially in respect to environmental management system.	Investigated reasons and extension of any discrepancies. Certifications of Marina Bar with regard to ISO standards.
WP 11	Concentrate on getting Gold Anchor Scheme. Review report focused on achieved results.	Promotion of getting accreditation to provide sustainable development concept in marina.
WP 12	Proposal for facility solutions and new boatyard equipment and new berth equipment. Developed strategy to improve storage equipment and storage services in marina.	Evolution of realized work packages and reporting the obtained results. Feasibility study of Marina Bar.

Synergy with the local community leading to tourism growth in the area, is one of the most important issues to which the EU advocates and its implementation directly generates increasing utilization of eco-friendly services in

marina with low impacts on environment. Sustainable tourism development in Montenegro in a next few years, according to the EU recommendations and directives, will developed in parallel to the efficient use of transport means, energy conservation and environmental protection. Although, the environment has its own expectations, rights and responsibilities with regard to sustainable marina development, they all need to follow the same sustainability pattern and address social, economic and environmental issues in respect to regulatory, economic and planning tools.

6. Conclusions

This paper recognizes the importance of introducing MSDC in any recreational port. This MSDC is expected to be well conceived and efficiently organized, since it refers to long-term development and conditions of the marina. In this paper it is pointed out that the implementation of the MSDC can be the basis for achieving worldwide recognized certifications, such as the Marina Blue Flag award, ISO 14001 and 9001 certification and Gold Anchor Award Scheme. The MSDC is complex and difficult to achieve, but represents a challenge for Marina Bar to become more sustainable. It is recognized as well, that it is not only in the hands of the marina but also the community to show interest and cooperate in achieving such results, supporting the strive for an environmentally protected marina and a new tourist destination. The paper defined the MSDC and described in detail all the steps for specifying and achieving this concept. Expected results from the case study of Marina Bar are described and the analysis of the output results explained. Milestones are presented and explained in detail indicating that the concept described herewith, is well structured and defined. Also, the implementation of zero emissions to marina is possible after the completion of the developed model, for a marina which possesses the afore mentioned certifications and awards, since these accreditations ensure that the sustainable development concept and motivation continuously improve the services to consumers leading to a safer and more attractive marina.

One of the goals of the concept, presented in this paper, is to ensure continuous improvement after the completion of its implementation, in various fields including the implementation of joint action plans addressing both commercial viability, as well as the responsibilities of partners concerning model maintenance and its upgrade. All the national responsible authorities have shown high motivation to implement all the actions which are part of MSDF; thus sustainability at the institutional level seems to be guaranteed. The authors finally stress that the MSDC can only be considered sustainable when it continues to deliver benefits to the target groups involved, for an extended period after its implementation. In this respect it is always important to develop effective dissemination plans, as well as tools to continuously assess the efficacy of future measures and actions targeting the sustainable development of Marina Bar.

Acknowledgment

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