Green Port / Eco Port Project - Applications and Procedures in Turkey

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Abstract. As being the heartlands of international trade, sea ports are the junction points of land and sea routes. The growth of global trade has led to the development of number and capacity as well as the service quality of ports. The policies and procedures applied during construction, operation and development of ports under development with environmental considerations scope has evolved in accordance with the needs of global trends. Although maritime transportation provides the most ecofriendly transportation method, the reduction of potential environmental threats and continuous improvement of ports and their vicinity is paramount from environmental concerns with regards to the international environmental standards. In the context of the study, national and international legal regulations governing the control of the environmental impacts of the activity groups causing pollution in Turkey based sea ports were viewed. In addition, the models applied during the measurement and documentation of environmental impacts were investigated. The most important aspects in terms of the effectiveness of the environmental management models are legal regulations. However, the standards applied at the ports without any legal obligation, such as EcoPorts applications, ISO 14001 standard, and the EMAS (Eco-Management and Audit Scheme) were sought in the scope of the study. The boundaries of the study were determined as the EU based Environmental Management Systems and the Green Port/Eco Port Project which is being administered by the Turkish Ministry of Transport, Maritime and Communication. "Marport", which is Turkey's first certified Green Port / Eco Port is designated as the experimental study site. In addition, the provisions in the ports of ESPO member countries are approached in order to compare the effectiveness and applicability of Green Port / Eco Port Project.

1. Introduction
The increase in maritime originated trade activity and the need for competition in the global market, force all the possibilities to systematically and continuously optimize the port operations and reduce the costs associated with them [1]. In this extend the term of “Green Port” has emerged as the result of a research on sustainability in maritime industry [2]. The basis of Green Port approach is constituted by port management with high environmental performance. In this context, many important topics such as, waste generation, water quality, air pollution, energy consumption, noise pollution, shipborne pollution, occupational health and safety is being tackled in order to provide a sustainable port operation. Today, environmental sustainability has become a decisive factor in ensuring the success of businesses and are demanded by
corporations and individuals. [3]. Many proactive and political environmental instruments have been developed in Europe since the early 1990s. Among these instruments, the EMS (Environmental Management System), which has a more flexible structure stands at the forefront [4]. Green port applications in EU member countries are carried out within the scope of the EcoPorts project, which is carried out by ESPO (European Sea Ports Organization) and exclusively applied to ports. ESPO was founded in 1993 as the continuation of the Port Working Group of the European Commission [5], which was established in 1974 and is based in Brussels / Belgium. By implementing The Environmental Code of Practice in 1994 the EcoPorts project in 1997, ESPO took the most important steps regarding the environmental management and sustainability of ports. Since 2011, the EcoPorts project has been fully integrated into the ESPO structure. ESPO is structured by 23 EU countries and Norway as member states, Israel and Iceland, as observer states [6].

Unlike EcoPorts project, ISO 14001 and EMAS (Eco Management and Audit Scheme) which are internationally recognized standards for EMS are not specific to ports, but can be applied to any type of organization, regardless of size and activity. ISO 14001 was initially published in 1996 and in 2015 the latest version of the standard came into force. EMAS was initiated with the regulation 1836/1993 of the European Council in 1993 and in 2009 final version was published [7].

Green Port concept in Turkey is based on the establishment of a sustainable environmental policy at the ports and the application of this policy to all operations of the port facilities on the grounds of adoption by all business owners and stakeholders voluntarily. As an environmental policy, Green Port concept can be explained within 7 headlines which are; preservation of natural life, air policy, water policy, land and sediment policy, education policy, sustainability policy and energy policy [8]. Green port concept in Turkey was carried into effect with the "Green Port / Eco Port" project which was launched with the protocol signed between the Ministry of Transport, Communications and Maritime Affairs, General Directorate of Maritime Trade (DTGM) and Turkish Standards Institution (TSE) on 16.12.2014. The Green Port / Eco Port project, which stands out as the only standard that is currently being applied exclusively to the ports in Turkey, is materialized due to the fact that many port facilities serve in a narrow area near the city centers and the pollution caused by ships and port operations adversely affect the city life. The expected output from the project has been determined as reduction and neutralization of current and potential environmental threats by developing more eco sensitive port facilities [9].

2. Green Port Implementations in EU and Current Situation in Turkey

Green port applications in EU countries are implemented through the EcoPorts project, which is being carried out by ESPO (European Sea Ports Organization) since 2011. ESPO is composed of 23 EU countries and Norway as permanent members, Israel and Iceland as observer members. Currently, 93 ports are being monitored by ESPO under EcoPorts project. Within these ports, the only Turkish port certified with an EcoPorts tool is ASYAPORT that has PERS (Ports Environmental Review System) certificate. In addition to this, MARPORT is also listed as having ISO 14001:2015 (Environmental Management) certificate. The distribution of ports regarding international standard certificates are shown at Table 1 [10].

| Ports   | SDM | PERS | ISO 14001 | EMAS | ISO, PERS | ISO, EMAS | ISO, EMAS PERS |
|---------|-----|------|-----------|------|-----------|-----------|----------------|
| EU Ports| 29  | 17   | 33        | 1    | 4         | 2         | 3              |
| Non-EU Ports | 0   | 1    | 3         | 0    | 1         | 0         | 0              |
| Total   | 29  | 18   | 36        | 1    | 5         | 2         | 3              |
The first port certified by the Ministry of Maritime Affairs and Communications within the scope of Green Port / Eco Port project is MARPORT operating in Beylikdüzü / Istanbul.

3. Methodology: Environmental management systems and tools

3.1. EcoPorts Tools Provided by ESPO
Since 2011, the EcoPorts project has been operated within the structure of ESPO and it is applicable to ports in Europe and neighboring countries. The tools of the project are SDM (Self Diagnosis Method) and PERS (Port Environmental Review System) [11].

3.1.1. SDM: This tool is the first step to gain access to EcoPorts coverage. SDM tool is being conducted by ESPO EcoPorts for European and neighbouring countries and by ECOSLC (ECO Sustainable Logistic Chain Foundation) for other countries. Completing the SDM Checklist by providing information regarding the applicant port’s environmental status voluntarily and transparently is the only necessity to earn EcoPorts port status. After having the status, the applicant port’s name is displayed at EcoPorts project website. Besides an analytical review which is carried out by experts, can be requested by the applicant port. The result of an analytical review reflects the following subjects.

- The assessment of the checklist submitted by the applicant port in accordance with the European Performance Standards.
- Gap Analysis is performed between the international environmental management standards (ISO 14001 and PERS) and the measured environmental performance of the applicant port.
- The current environmental performance of the applicant port is defined by SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis.
- Expert opinions and recommendations regarding the status of the environmental management program of the applicant port and potential development areas.

The period of validity of the report is 2 years and the EcoPorts port status can be maintained unless the applicant port resubmits the SDM checklist within the mandatory period. In addition, receiving the EcoPorts port status provides access to PERS which is the only port-specific environmental management system [12].

3.1.2. PERS: This is the only international environmental management system dedicated exclusively to seaports. The application process is carried out by EcoPorts and ECOSLC just like SDM.

Table 2. SDM report (Partial example) [5]
For the execution of this tool, the applicant port should form an environmental policy and a document that reflects how this policy will be implemented. The second step of PERS is the validation of this document by Lloyd's Register as an independent auditing institution. After validation, the applicant port is entitled to receive the “ECOPORTS PERS CERTIFIED” status which is valid for 2 years [13]. ASYAPORT is the only PERS certified Turkish port which operates in Tekirdağ.

3.2. ESPO Recognized EMS

3.2.1. EMAS: The EU Eco-Management and Audit Scheme is a management instrument developed by the European Commission that evaluates, feedbacks and improves the environmental performance of the applicant in all aspects of operations, including port operations. Enterprises applying to this mechanism voluntarily improve their environmental performance through EMAS, adapt to international environmental legislation and increase their transparency by exhibiting their environmental efforts in open sources.

EMAS is an audit process completed in 10 steps and projected to be repeated every 2 years. The application commences with the contact with the competent body. Competent bodies are local and authorized institutions that provide technical support and advice on the way to EMAS. The only accredited institution for EMAS in Turkey is TURKAK (Turkish Accreditation Agency) in Ankara.

![Figure 1. EMAS process](image)

The next steps are;

a) By conducting an environmental preliminary assessment, environmental problems arising from the activities of the enterprise are effectively assessed.

b) Environmental policies and programs are planned.

c) Environmental management system is implemented.

d) The system is inspected by internal audit mechanisms.

e) Applications are made to improve environmental performance.

f) The Environmental Report is published in order to share the achievements through studies with the stakeholders.

g) The environmental management system is verified and validated by environmental verifiers.

h) After having verified, the applicant compiles an application file and if all formal criteria have been fulfilled, the Competent Body registers the organization and the name of the organization will be enlisted in the European EMAS register.
Finally, the entity will begin to use the official EMAS logo and the Environmental Report will be published on the EMAS web page. [14].

3.2.2 ISO 14001: ISO 14001 is an international standard designed by ISO (International Organization for Standardization), which sets out the requirements for an effective EMS. ISO 14001 is a standard that contributes to the achievement of organizational goals, especially when certification is integrated with ISO 9001. The preparation of the ISO 14000 Environmental Management System Standard is based primarily on the decisions taken at the world summit in Rio de Janeiro in June 1992 and the principles contained in the Rio Convention. In 1993, a technical committee was established by ISO to represent international environmental management standards, consisting of representatives from 50 countries. As a result of the studies done by the technical committee, ISO 14001 EMS standard was initially published in September 1996 and it was revised in 2005 and finalized in 2015. Currently, the ISO 14001:2005 version prevails. As of the end of 2015, there are a total of 318377 ISO 14001 certificated institutions, establishments and enterprises in the world which 2868 of them are operating in Turkey.

ISO is an organization that sets standards as an institution and does not offer a certification process within its organic structure. For this reason, enterprises that will implement the ISO 14001 standard need to apply to independent organizations for certification. In Turkey, this process is carried out by organizations accredited by TÜRKAK.

The certification process briefly includes the following steps.
- Review of the existing quality management system.
- Purchase of ISO 14001: 2015.
- ISO 14001 training.
- Execution of an independent and accredited third party certification process.
- Certification of the applicant.

The ISO 14001 standard is an integral part of the EMAS since 2001 and enterprises with ISO 14001 certification can also access the EMAS certification after a straightforward process.

3.3. Green Port Implementations and Procedures in Turkey

Green port implementations are fulfilled via Green Port / Eco Port project in Turkey. The scope of the project can be defined as; Turkey based sea ports which already have TS EN ISO 9001 "Quality Management System", TS EN ISO 14001 "Environmental Management System" and OHSAS 18001 "Occupational Health and Safety Management System" certificates and meet Sectoral Criteria Conformity document requirements. Any sea port that meets those requirements can voluntarily apply to the Ministry of Transport, Maritime Affairs and Communications in order to be certified as a Green Port [9]. The aims of the project are as follows.
- Establishing an integrated quality management system at port facilities,
- Improvement and maintenance of sea water quality around the port facilities,
- Reduction of environmental pollution derived from ship or port operations,
- Providing energy saving and keeping energy efficiency at the highest level in port operations,
- Reduction of greenhouse gases and harmful emissions derived from operations within port boundaries,
- Development and implementation of renewable energy projects,
- Reduce the amount of waste generated from port operations by providing waste recycling,
- To take necessary measures and ensure continuity in occupational health and safety in port operations.
The applicants are evaluated by the "Green Port / Eco Port Project Evaluation Commission" which is established within the body of DTGM. Ports that have been evaluated as successful are given the right to use special logo of the project and Green Port / Eco Port certificate. Besides successful ports are published in DTGM website. The harbour facilities, which are named as green ports are audited every two years in terms of certification requirements. In this process, the certificates of the ports that are found to be deficient in their competence can be suspended or cancelled.

Figure 2. Green Port / Eco Port Project Certificate

The applicant port is required to compile an application folder with the following content:

- Detailed description of the facility (site plan, waste disposal areas specified)
- An example of the international documentation systems that the port facility has,
- Environment Management System (EMS) Handbook (CD),
- Waste Management Plan (AYP) (CD)
- Integrated Management System (CD) (including port workflow processes),
- Explanatory information on the operation of the integrated management system,
- Emergency Response Plan (AMP), (CD)
- Legal compliance monitoring chart,
- Detailed information on the environmental responsibility,
- Information on the content of the wastes generated in the port facility, efforts and precautions taken. (Domestic Waste, Packaging Waste, Waste Battery and Accumulator, Waste oil, Hazardous Wastes, Electronic Waste, Medical Waste, Excavation Waste, Wastewater, Tires that have completed life span, Waste from ships etc.)
- Information on the studies carried out and planned for the prevention of pollution caused by the handling equipment in the port facility,
- Information on the work undertaken and planned for the prevention of shipborne emissions,
- Copies of any kind of exemption, permission and licenses taken from the Ministry of Environment and Urbanism,
- Sample of Waste Oil Declaration Form and Waste Oil Analysis Report,
- Sample of national waste transportation form used for each waste within the port facility,
- Waste transport contract samples. Copy of the licenses that are taken from Ministry of Environment and Urbanization by authorized waste transportation company.
- Disposal information. Copies of authorization documents which are authorized by Ministry of Environment and Urbanization, contract copies,
• Information on collection of waste from ships. A sample of the transfer form of wastes to be filled for wastes taken from vessels,
• If there are vehicles that are not within the boundaries of the port facility, documents indicating that the emission measurements of such vehicles have been carried out and samples of conformity documents,
• The list and contents of the courses received from the competent authorities of all personnel, including all waste types that may occur in the port facility,
• An example of a waste management contract falling within the scope of the Hazardous Waste Control Regulation,
• An example of a compulsory liability policy for hazardous substances and hazardous waste,
• An example of a medical waste contract and follow-up forms
• An example of contract for the purchase of bilge and sludge waste,
• An example of water pollution control permits and analysis,
• Wastewater Treatment Plant project approval example,
• Example of Waste Management Table,
• Under the scope of the IMDG Code, information about the work and the regulations made (person responsible, training, certificate etc.)
• List of EIA (Environmental Impact Assessment) permits and examples of documents,
• An example of the assessment of noise pollution within the scope of the EHAM (Environmental Hazard Assessment and Management) Regulation
• The example of the Environmental Officer Service contract,
• To provide relevant information regarding the memberships to any NGO working in the field of environment or particularly "Marine Pollution Prevention"
• To provide relevant information regarding any social responsibility projects in the subject of sea and environment
• Penalties, sanctions, warnings, etc. within the scope of environmental pollution that is fined by any authorized organization. To provide information about the efforts on eliminating the deficiencies causing environmental pollution.

4. Results and discussion
The international environmental management systems other than Green Port / Eco Port project, such as SDM, PERS, ISO 14001 and EMAS are in succession of each other. Amongst those standards, a hierarchy and a simple to complex order can be seen. In this case, any port authority that voluntarily fill SDM checklist accomplishes the first step to join PERS as well. In an equivalent manner, having validated by Lloyd’s Register for PERS certificate represents not only the appropriateness and sustainability of the environmental management system but also an important step to reach the ISO 14001 and EMAS, which are located at the top of EMS hierarchy [9]. In the Green Port / Eco Port project, the process is based on the prerequisite of obtaining ISO 9001, ISO 14001 and OHSAS 18001 certifications. Therefore, the project is not a continuation or prerequisite for any other national or international process, and brings no new procedure for any EMSs.

From the value of the certificates perspective:
• The necessity of having a valid ISO 14001 certificate in access to the Green Port / Eco Port Project certification assessed as a compelling issue while in practice a positive feature that can make a significant contribution to environmental management system.
• It is evaluated that Green Port / Eco Port Project has more complex content than SDM and PERS and that it has an equal status with EMAS as both standards have ISO 14001 in common.
According to ESPO instruments, EMAS and ISO 14001 are widely recognized, international and sophisticated standards. However, the Green Port/Eco Port project is currently limited to Turkish ports. This means it is unlikely to see a significant increase in the short term.

The Green Port/Eco Port project is a unique initiative launched by Turkey. It is not possible to obtain a SDM, PERS or EMAS certificate by a port that is entitled to obtain a Green Port/Eco Port certificate in Turkey with this certificate.

5. Conclusion
It is concluded that if any Green Port/Eco Port certified port is willing to be certified by SDM and PERS qualifications, it can be provided in a short time due to the firm ground of the Green Port/Eco Port project.

On the other hand, ESPO qualification can be provided in a reasonable period of time, starting from the point where a port with Green Port/Eco Port certificate has already achieved ISO 14001 qualification.

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