The Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden

(PERSGA)

EIA and EMS Guidelines for Fishery/Aquaculture Projects in the Red Sea and Gulf of Aden

PERSGA Technical Series No. 9

May 2004

PERSGA - is an intergovernmental organisation dedicated to the conservation of the coastal and marine environments and the wise use of natural resources in the region.

The Regional Convention for the Conservation of the Red Sea and Gulf of Aden Environment (Jeddah Convention) 1982 provides the legal foundation for PERSGA. The Secretariat of the Organization was formally established in Jeddah following the Cairo Declaration of September 1995. The PERSGA member states are Djibouti, Egypt, Jordan, Saudi Arabia, Somalia, Sudan, and Yemen.

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Executive Summary

This document provides proposals for establishing **Environmental Impact Assessment** (**EIA**) regulations, procedures and guidelines and **Environmental Management Systems** (**EMS**) for fishery/aquaculture projects. The study was carried-out for the Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA).

This study includes three major aspects of fishery projects. These are:

- Aquaculture projects
- Fishing project practices
- Processing and packing industries of aquaculture and fished products.

As each country has its own environmental and legal framework, attempts have been made to ensure the work in the study is a mixture of the more general and the specific. This ensures that each country can modify the regulations, guidelines and procedures recommended without losing scientific merit and structure.

The study comes in two parts and is as follows:

- EIA regulations, procedures and guidelines
- EMS guidelines and procedures.

The study follows from a recommendation made at a workshop sponsored by FAO, PERSGA-(SAP), ROPME, USAID (Egypt), and the WorldFish Center held in Hurghada, Arab Republic of Egypt, 15-17 September 2002. The "Environmentally Friendly Aquaculture and Fisheries Practices" workshop recommendations requested establishing EIA and EMS guidelines.

The Strategic Action Programme (SAP) is executed by PERSGA and funded by the World Bank, United Nations Development Programme (UNDP), the United Nations Environment Programme (UNEP) and other donor organisations. It was prepared following an extensive analysis of regional environmental issues and has been endorsed by the PERSGA Council of Ministers. The SAP provides a cooperatively developed framework for the long-term conservation and management of the coastal and marine resources of the Region[1]. The programme of activities is being carried out through six complementary components: reduction of navigation risks and maritime pollution, the promotion of integrated coastal zone management, sustainable use of living marine resources, conservation of habitats and biodiversity, the establishment of marine protected areas, and the enhancement of public awareness and participation. This study is in line with the PERSGA-SAP programme and its objectives.

[1] Region (capital R) refers to the area described in Article II 'Geographical Coverage' of the Regional Convention for the Conservation of the Red Sea and Gulf of Aden Environment 1982.

Abbreviations and Acronyms

APRP	Agriculture Policy Reform Project
CV	Curriculum vitae
EIA	Environmental Impact Assessment
EMS	Environmental Management System
FAO	Food and Agriculture Organization
GEF	Global Environment Facility
HAB	Harmful Algal Bloom
HACCP	Hazard Control at Critical Control Points
HSE	Health and Safety Executive
ISO	International Standards Organization
MSDS	Material Safety Data Sheet
PCE	Pollution Control Equipment
PEIA	Preliminary Environmental Impact Assessment
PERSGA	Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden
PPE	Personal Protective Equipment
RDI	Reform Design and Implementation
ROPME	Regional Organization for the Protection of the Marine Environment
RSGA	Red Sea and Gulf of Aden
SAP	Strategic Action Programme for the Red Sea and Gulf of Aden
SDS	Safety Data Sheet
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
USAID	United States Agency for International Development

Introduction

The Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA) is an intergovernmental body that is dedicated to the conservation of the coastal and marine environments in the PERSGA region. It takes its legal foundation from the "Jeddah Convention" signed in the Kingdom of Saudi Arabia in 1982. The following countries are currently members of PERSGA:

- Arab Republic of Egypt
- Arab Republic of Sudan
- Republic of Djibouti
- Hashemite Kingdom of Jordan
- Kingdom of Saudi Arabia
- Republic of Yemen
- Somalia

The following sections deal with three important issues relating to fishery/aquaculture projects:

- **EIA** regulations
- **EIA** procedures
- **EIA** guidelines

The scope of the consultancy service

PERSGA is executing the Strategic Action Programme (SAP) funded by the World Bank, United Nations Development Programme (UNDP), the United Nations Environment Programme (UNEP) and other donor organisations.

The SAP was prepared following an extensive analysis of regional environmental issues and has been endorsed by the PERSGA Council of Ministers. The SAP provides a cooperatively developed framework for the long-term conservation and management of the coastal and marine resources of the Region. A programme of activities is being carried out through six complementary components: reduction of navigation risks and maritime pollution, sustainable use of living marine resources, conservation of habitats and biodiversity, the establishment of marine protected areas, the promotion of integrated coastal zone management, and the enhancement of public awareness and participation.

A workshop titled "*Environmentally Friendly Aquaculture and Fisheries Practices"* was held in Hurghada, Arab Republic of Egypt from 15-17 September 2002. It was sponsored by the Sustainable Use and Management of Living Marine Resources (LMR) component of the SAP (PERSGA) in conjunction with the Regional Organization for the Protection of the Marine Environment (ROPME), the United Nations Food and Agriculture Organization (FAO), The WorldFish Center for Africa and West Asia, and the Agriculture Policy Reform Project USAID/Egypt Reform Design and Implementation Unit (RDI). The workshop proceedings were printed by FAO (EL GAMAL et al. 2002).

The workshop was very successful and its presentations were delivered by key consultants from the Region and abroad. One of the main recommendations from the workshop stated the need for sound Environmental Impact Assessment practices and the need to introduce EMSs.

PERSGA therefore requested the development of Environmental Impact Assessment (EIA) regulations, procedures and guidelines and Environmental Management Systems (EMS) guidelines, for the PERSGA region. The work started August 2003 and was completed in

September of the same year. PERSGA requested that the work be carried out in accordance with the recommendations from the Hurghada workshop that included:

- A review of related environmental regulations and procedures in the Red Sea and Gulf of Aden (RSGA) region.
- Preparation of clauses for Environmental Impact Assessment regulations, for the RSGA region, in relation to marine fishery/aquaculture activities and projects.
- Preparation of EIA procedures and guidelines for mariculture activities and projects.
- Introduction of the EMS concept and the need for its implementation to governments, commercial organisations and establishments interested in mariculture activities.
- Submission of a final report with an executive summary, an introduction, legal requirements and regulations, and EIA and EMS study findings and recommendations.

EIA regulations, procedures and guidelines for the PERSGA region

In the first section of this report the authors have prepared specific EIA regulations, and generic EIA procedures and guidelines for fishery/aquaculture projects. The proposed regulations consist of nine clauses. The regulations can be used in an independent form in countries that do not have EIA regulations or in countries that have EIA regulations but do not have the specific clauses that apply to fishery/aquaculture projects. The regulations, procedures and guidelines need to be incorporated into the existing environmental administration and legal framework of PERSGA countries. It shall be the responsibility of the Environmental authorities in the PERSGA region to subject aquaculture and other fisheries projects to Environmental Impact Assessment Studies (EIA).

It is recommended that the following regulations, procedures and guidelines are implemented in order to establish EIAs for aquaculture and similar fisheries projects in the PERSGA region.

EMS Guidelines for fishery/aquaculture projects

The second section of this report includes a theoretical background to the EMS concept its value to companies and to the environment, and describes the steps involved in setting up an EMS for accreditation.

Environmental Impact Assessment

1.1 EIA Regulations for Fishery Projects in the PERSGA Region

CLAUSE ONE

The terms below shall have the following meanings in these EIA regulations:

Environmental Impact Assessment Study (EIA):

- An environmental management tool that is used to identify, predict and assess the impacts of development activities of concern before their implementation.

Fishery Project:

- Aquaculture of marine organisms in fresh or marine or brackish water, or any similar acceptable aquatic media.
- The fishing practices and processes.
- Aquaculture products processing plants and packing plants.

Environmental Authority:

- A government authority with the power to enforce legislation and ensure compliance.

Client:

- A government, private or joint venture establishment interested in carrying out development projects in a sustainable manner.

Consultant:

- A person or a firm that has the ability to perform EIA studies in a competitive manner to an approved standard.

Letter of Approval:

- A formal letter given by the environmental authority to the client declaring its approval of its fishery project EIA study and its readiness for implementation. It is a conditional declaration.

Conditional Acceptance:

- The right of the environmental authority to set conditions and their acceptance by the client in order to obtain a "Letter of Approval".

Preliminary Environmental Impact Assessment Study (PEIA):

- An initial EIA study done in less detail than a standard EIA study.

ISO 14001 and EMS:

- An international standard that contains clauses for an Environmental Management System. It requires certification by a competent authority.

HACCP:

- Hazard Control at Critical Control Points is an international standard for food safety ensuring that food products are safe until they reach the consumer.

CLAUSE TWO

It shall be the responsibility of the client to conduct Environmental Impact Assessment (EIA) studies for its fishery projects. The EIA study needs to consider the impacts of the project during site preparation, construction, operation and decommissioning.

CLAUSE THREE

It shall be the responsibility of environmental authorities to review EIA studies for fishery projects and to accept, request modifications or reject them. Under all circumstances, it shall be the responsibility of Environmental Authorities to reply to the client within a maximum period of 60 working days declaring its decision.

CLAUSE FOUR

It shall be the responsibility of environmental authorities to grant approval for fishery projects only after reviewing the client's EIA studies. The approval shall be in a form of a Letter of Approval. This letter shall contain the following information:

- The name of the project
- The name and address of the client
- The name and address of the consultant who carried out the EIA study
- The project's exact location through GPS coordinates
- Brief description of the project
- List of the negative and positive impacts
- The environmental authority's recommendations
- A signed declaration by the client guaranteeing the implementation of the Environmental authority recommendation within a specific period of time.

CLAUSE FIVE

If the environmental authority rejects the EIA study it must inform the client, in writing, of its reasons within seven working days. The client can file a petition, within a further seven working days, requesting the alteration of the environmental authority's decision to that of Conditional acceptance. The client may appoint an independent person or body to review its EIA study. The client shall modify the EIA study, based on the conditions then set by the environmental authority, in a manner that is acceptable to the client and resubmit the study for final review.

CLAUSE SIX

It shall be the responsibility of the environmental authority to authorise consultants to conduct EIA studies for fishery projects. The authorisation shall be based on the following criteria:

- The provision of certificates and *curriculum vitae* proving that the consultant can provide recognised expertise in the field of EIA.
- That the consultant has carried out no less than seven approved EIA studies.

In addition, it shall be the responsibility of the environmental authority to maintain an up-to-date registry of EIA consultants. The registry shall contain information as follows:

- Level "A" EIA Specialist. The main criterion for registration at this level is the provision of proof of not less than 15 years of EIA experience.
- Level "B" EIA Specialist. The main criterion for registration at this level is the provision of proof of not less than 10 years of EIA experience.
- Level "C" EIA Specialist. The main criterion for registration at this level is the provision of proof of not less than 5 years of EIA experience.

CLAUSE SEVEN

It shall be the responsibility of the client to ensure that the consultant conducting the EIA study shall cover, as a basic requirement and in relevance to the type of the fishery project, the following aspects:

- A detailed description of the project
- An aquaculture organism suitable for culturing, consumption and export
- The sustainability of the aquaculture, fishing methods and practices that will be used
- The sustainability of the ecosystems in the fishing area
- The sustainable practices that ensure good water quality
- Any pollution and pollutants and their control measures
- The use of growth hormones, antibiotics and feeding materials and associated risks
- The risk of diseases, harmful algal bloom (HAB), bio-invasions and population explosion
- Any waste (solid, liquid and semi-liquid) and any related reception facility requirements
- Odour
- Noise
- House-keeping and hygienic practices.

Investigations shall relate to the short-, medium- and long-term impacts, and whether those impacts are of a direct, indirect, adverse, positive or accumulative nature.

CLAUSE EIGHT

Fishery projects using certified organic aquaculture methods, being certified and accredited by an approved competent authority and holding valid ISO 14001 accredited certification shall be asked to submit a Preliminary EIA (PEIA) study for their fishery project. In addition, any fishery projects holding valid ISO 14001 accredited certification can also be asked to submit a PEIA. Under all conditions, the client must provide proof to the environmental authority of his intention to use organic aquaculture and/or ISO 14001 and HACCP accredited certification in order that the client may be allowed to submit only a PEIA study.

CLAUSE NINE

Violators of this regulation shall be penalised in accordance with the environmental authority's laws and regulations.

CLAUSE TEN

The environmental authority is required to review and if necessary revise this regulation after five years of its enactment. The revision is to consider the addition of new aspects that may be required in clause seven without the weakening of those already in force.

1.2 EIA Procedures for Fishery Projects in the PERSGA Region

Environmental authorities in the PERSGA region shall establish Environmental Impact Assessment Departments whose main duties are:

- To establish contact with clients interested in starting fishery projects
- To inform clients about the existence of EIA regulations, procedures and guidelines
- To ensure that EIA studies are conducted in a professional manner
- To establish a registry of EIA professionals
- To establish a registry for consultants who can carry out EIA studies

- To review EIA studies and declare, in writing, their acceptance, requests for modification or rejection of these studies
- To ensure that EIA studies and recommendations are followed up and implemented
- To ensure that environmental violators are first warned about the consequences of violating the law and then penalised if the violation takes place or is repeated.

To be able to enforce the law, EIA departments need to have:

- Sufficient staff to run all administrative and scientific affairs associated with EIA
- Staff who are well trained in EIA
- Staff who are updated with new issues related to EIA
- Staff who have communication skills and are efficient in reviewing EIA studies
- The ability to minimize routine administrative work associated with EIA
- The backing of legal advisers and departments in their environmental organisations
- The support of public relations departments in their environmental organisations, in order to promote its objectives and regulations, their field of activity and to make clients and the public aware of the importance of EIA.

A client interested in initiating a fishery project shall contact the relevant EIA department through the environmental authority and declare his interest through a written request. The client's request shall contain basic information about the project and the name and contact address of the consultant who will conduct the EIA study for the project.

The environmental authority shall reply to the client, in writing, within seven working days, requesting the conduct of the EIA study for the project and its compliance with certain requirements. The EIA regulations, procedures and guidelines shall be enclosed with the letter. The environmental authority shall have the right to inform the client of any environmental aspects, in addition to those in clause seven, which need to be considered.

Once the EIA study is completed, the client shall submit it to the concerned environmental authority and subsequently to the EIA department. The submission needs to meet the following criteria:

- A covering letter stating the successful completion of the EIA study
- A request for review of the EIA study and a reply within 60 working days
- Two copies of the EIA study.

The environmental authority shall inform the client, in writing, on receipt of the EIA study, that it has received the EIA study and it shall reply within 60 working days declaring its decision.

The EIA department shall refer the EIA study to an employee, hereafter called the reviewer. The reviewer shall have experience in the subject of the EIA study and will review the EIA study in an unbiased and scientific manner ensuring the following:

- As a basic requirement that the EIA study meets the aspects stated in clause seven of the EIA regulations
- That there is a balance in the content of the EIA study
- That the EIA study has scientific merit
- That air, water, soil or any other test items are sampled and analysed in accordance with scientific protocols
- That impacts are investigated during the whole project life cycle, to include site preparation, construction and installation, operation and decommissioning

- That if there are gaps that exist in the EIA study, that these be clearly identified and reported
- That the impact of the project will not affect the environment and ecosystem in a way that can not be largely corrected
- That the recommended corrective measures are adequate, practical and can be implemented
- That monitoring practices are stated clearly.

The reviewer shall present his final decision in writing and will declare one of the following decisions:

- Acceptance of the EIA study and recommendation for provision of the Letter of Approval to the client. The letter shall state the requirement to implement the recommendations, and the commitment, on the part of the client, to provide evidence to the environmental authority that the recommendations shall be implemented.
- Conditional acceptance of the EIA study, indicating that the Letter of Approval may be provided to the client once the consultant has implemented the modifications requested by the environmental authority.
- Rejection of the EIA study.

Under all circumstances, the concerned environmental authority shall inform the client, in writing, of its decision within 60 working days of receipt of the EIA study.

If the environmental authority rejects the EIA study, then client can file a petition within seven working days of receipt of the rejection. The environmental authority shall clearly indicate the reasons for rejection, the flaws in the EIA study and what changes would be required before it alters its decision to one of either acceptance or conditional acceptance.

The EIA department, in co-ordination with related departments in the concerned environmental authority, must carry out follow-up visits to the project site to ensure that the recommendations are in place. It shall record, report and take the necessary action against any violations.

The environmental authority must retain the right to reject any proposal even if it accepts the client's EIA, if it believes that the negative impacts on the environment outweigh the positive impacts of the proposed development.

The EIA department shall establish a special unit called a "Public and Clients Complaints Unit". The responsibility of this unit shall be to ensure that the public and the environment are not adversely impacted by the projects that are approved after the EIA. In addition, it shall have the responsibility to receive complaints from the public and clients and reply to these within seven working days. Complaints should be recorded on a form available from the unit. The form shall be simple in nature and shall contain the following:

- The full details and contact information of the person filing the complaint
- The date and time of filing the complaint
- Detailed information about the nature of the complaint
- Any additional information that supports the complaint, e.g. data, information and images
- A signed declaration that the complaint is original.

The unit will accept a complaint by phone but the form will need to be completed and signed before any action can be taken.

1.3 EIA Guidelines for Fishery Projects in the PERSGA Region

The EIA guidelines are available as forms for ease of use. These forms are the following:

- *Form One*: General guidelines.
- *Form Two*: Project guidelines.
- *Form Three*: Environmental Implications Guidelines

The contents of these forms are generic in nature and can be modified by the concerned environmental authorities and EIA departments. The required contents of the forms are indicated in the following pages.

Form 1: General Guidelines (Client and Consultant)

Client:

- Company name:
- Representative name:
- Statement of Capability:
- Client address:
- Tel.:
- Fax:
- E-mail:
- Background of the client (field of activity, experience, owners, partners and subsidiary links).

Consultant:

- Consultant company name:
- Representative name:
- Statement of Capability:
- Names of consultants working on the project and their CVs:
- Address:
- Tel.:
- Fax:
- E-mail:

Form 2: Fishery Project Guidelines

Project activity:

- Proposed project name or title:
- Are there similar projects elsewhere?
- Exact site of proposed project: (Maps and drawings to be attached)
- Alternative sites for proposed project: (Maps and drawings to be attached)
- Dimensions required for the construction of the project site including areas required for future expansion. The information should show the total area of the site including a breakdown of space allowed for processing, manufacture, storage, administration, car parking or any other space required by the project (maps and drawings to be attached).
- Description of any activities and associated processes
- Description of site criteria and conditions
- Copies of certificates of approval from governmental bodies, other than environmental authorities, in relation to their acceptance for implementing the project
- If excavation or dredging activities are to be undertaken, indication of the extent and method of excavation or dredging, contamination level and disposal methods for excavated or dredged material
- Types of vessels to be used, their features and on-board environmental measures to prevent pollution
- Number of berths and names of vessels using the berths
- Maximum water depth and maximum water depth required for berthing the vessels

- Detailed information about the ecosystem in which the project is to be implemented
- Processes involved and production capacities.

Form 3: Project Environmental Implications Guidelines

Environmental implications:

Environment and ecosystem; this includes the following:

- Site grading status in accordance with relevant laws and regulations for fishery projects
- Site environmental sensitivity (land, coastal, seabed or offshore) to fishery project and related activities
- Site ecology (fauna and flora diversity, abundance and distribution and ecological risks associated with the fishery project)
- Site geology and features of significance that might be impacted by the project implementation
- Excavation and dredging activities and their impacts
- Possibility of soil erosion caused by habitat modification
- Climate and weather conditions at the proposed site
- Changes in nutrient cycles and patterns
- Waste management and disposal of by-products generated by the fishery project. This includes the following types of waste:
    - Solid
    - Liquid
    - Semi-solid
    - Construction
    - Hazardous
- Expected noise levels in decibels during all phases of the project;
- Air-borne emissions and pollutants (sources, maximum allowable, daily averages and their control measures)
- Aqueous discharges to sewers, water bodies and courses (types, by-products, quantities, quality, daily average and maximum discharges, time and period of discharge and hazards)
- Implications and control of pollution in marine facilities (accidental spillage of hazardous materials, vessel wastes including bilge water and sewage discharges)
- Raw materials use and characteristics (ensuring non-toxicity, appropriateness and avoiding damage to the ecosystem)
- Implications on human habitats (including resettlement, employment, influx and movement of labour)
- Water demand, use and conservation measures (average and peak use, including the use of recycled water)
- Electricity consumption and conservation measures (average and peak use and possible use of solar panels)
- Implications associated with machinery and tools (appropriate use of pressurized and non-pressurized equipment, pipelines, fishing equipment and nets)
- Implications of the use of cleaning agents and their environmental friendliness (biodegradation and SDS status)
- Fire, security and medical aid in the event of accident or emergency (possible emergency scenarios, safety and evacuation procedures, use of personal protective equipment (PPE), fire extinguishers, fire control and fighting systems, security measures)
- Requirements for future expansion.

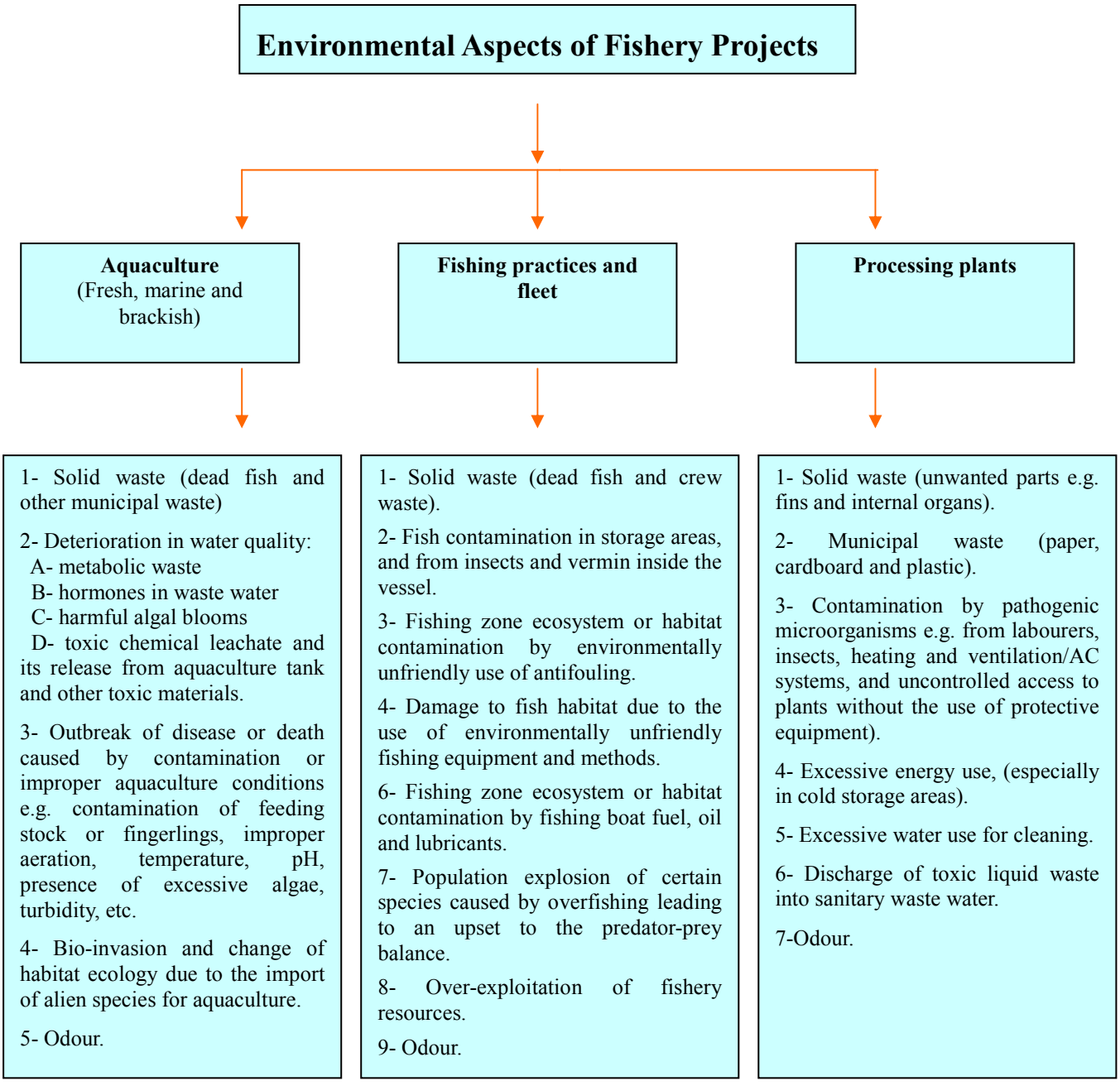

Figure 1.1 Environmental aspects associated with fishery projects

Environmental Management Systems Guidelines for Fishery Projects in the PERSGA Region

2.1 General

Fishery project developers have an ethical and legal duty to act sustainably in order to protect the environment and its biotic and abiotic components from the impacts associated with the implementation of such projects. This is very important in order to protect natural fishery resources and to increase fishing and aquaculture yields in a sustainable manner. The reality is that fishery projects can play an important role in the economy and can yield valuable monetary return from local, regional and international sales. However, its activities and operations can inadvertently cause harm to the environment and its components, including human health, if environmental aspects and impacts are not considered and properly assessed during the decision-making process. In the second part of this study, an Environmental Management System (EMS) is suggested and recommended for use in improving the environmental performance of fishery projects. EMS, like EIA, is a systematic environmental management tool. However, it needs to be conducted after project implementation. EMS, unlike EIA, cannot be conducted if no project exists. Much of the work in this section is based on KHURAIBET and AL-ATTAR (2002), the ISO 14001 Standard, and STAPLETON and COONEY (1996) 'EMS for Small and Medium-sized Organizations'.

2.2 The EMS Concept

After the Rio de Janeiro Summit, an increasing concern developed for the importance of introducing Environmental Management Systems into organisations and projects of all kinds, especially the ones that might have adverse environmental impacts. To assist establishments and organisations to achieve and to demonstrate sound environmental performances by controlling the impact of their activities on the environment, the international standard ISO 14000 was introduced. Both the public and private sectors are constantly seeking ways to improve environmental conditions and reduce pollution. They can do this by adopting an EMS. The ISO 14000 family of standards enables businesses to adopt specific procedures and technical specifications which they can use consistently in order to achieve environmental protection. It also ensures that materials used, processes adopted, products produced and services provided are all environmentally sustainable. The ISO 14000 management system of standards provides a framework for environmental management for both public and private sectors in order to reduce the adverse impacts associated with their activities (Figure 2.1).

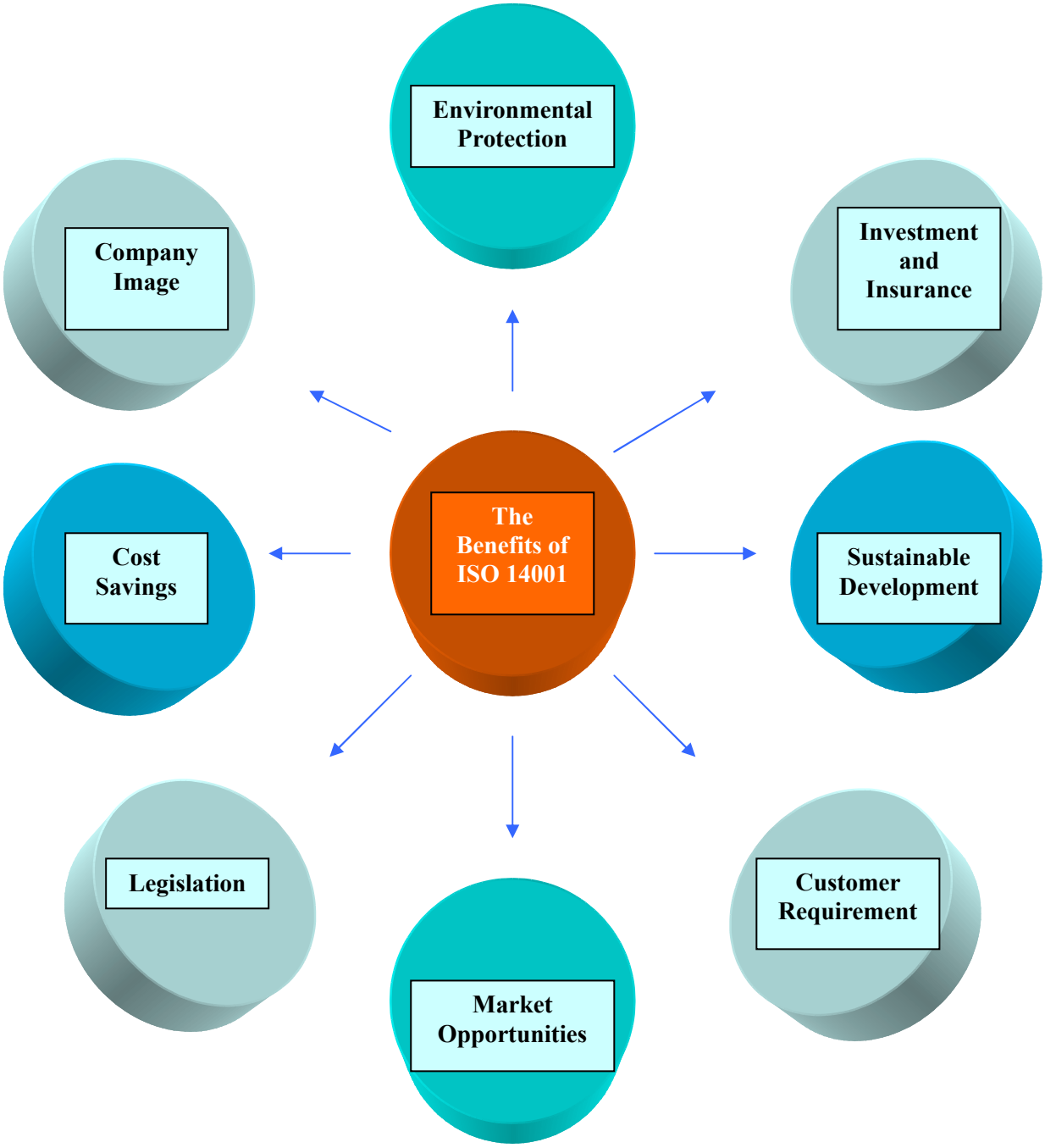

Figure 2.1 The benefits of adopting the ISO 14001; after AL-ATTAR (1999) and KHURAIBET and AL-ATTAR (2002)

The International Standards Organization (ISO) sets certain standards for businesses to achieve a sustainable environmental performance. These standards are known as the ISO 14000 Environmental Management Systems. Such systems are important because they are essential in the control and management of those adverse impacts associated with services, products and the activities of public and private sectors. Such systems are being introduced as a result of strict environmental legislation worldwide to reduce waste and pollution. These standards are applicable to all types of organisations and projects worldwide regardless of their type and size.

To achieve control over the adverse impacts associated with public and private sector activities and to enhance environmental performance, companies are required to adopt, implement and maintain certain environmental standards. This should be carried out within a structured environmental management system and be part of the overall management activity designed to achieve sustainable environmental and economic objectives. The overall aim of the ISO 14000 Environmental Management Systems is to support environmental protection and pollution prevention measures in balance with the socio-economic needs of organisations, projects and society.

2.3 The Benefits of Adopting the ISO 14001 Standard

A company or activity certified as compliant with the ISO 14001 Environmental Management Systems standard will have demonstrated that it has made substantial efforts to prevent pollution and to minimize the adverse impact of its activities. The benefits of adopting the ISO 14001 standard are the following:

- The reduction of the costs associated with dealing with adverse environmental impacts and waste management.
- The reduction and elimination of conflicts with environmental legislation and authorities where the organisation is operating.
- The enhancement of the market opportunity and the social and environmental image of the organisation.
- The integration of the EMS standards with other management systems already existing within an organisation or project in order to ensure that the organisation's overall performance is within acceptable international standards.
- An assessment of the effectiveness of the organisation's or project's environmental objectives, policies and procedures so as to achieve conformance with the EMS and to demonstrate that conformance to other organisations and the public.
- The organisation or project is provided with the elements of an effective environmental management system designed to achieve their economic objectives without harm to the environment and human health. The latter is not directly required by the standards, however it should be taken into consideration.

An organisation/project without the ISO 14001 standard	An organisation/project with the ISO 14001 standard
No environmental management model or system exists. Things are done according to management's perception. This could lead to mismanagement of environmental issues and violations of laws and regulations.	A management model exists and is followed. There are written procedures, instructions, forms and records that need to be followed and recorded.
Things are not done systematically. Each member of the organisation or project does not know clearly what his exact environmental role is; who is doing and preventing what, when, how, why and where.	Things are done systematically. Each member of the organisation or project knows clearly and exactly his role, who is doing what, when, how, why and where. Environmental awareness and compliance starts from top management to the lower levels.
Financial and human resources are not efficiently utilized. Therefore, the organisation or project is not built on a strong efficient environmental foundation.	Financial and human resources are efficiently utilized. Therefore, the organisation is built on a strong environmental foundation and is efficient in carrying out corrective actions.
Environmental auditing is absent and is not carried-out. There are clear indications and signs of non-compliance with environmental regulations, procedures and instructions.	Environmental auditing is carried-out to ensure that there is clear compliance with the standard, environmental laws and regulations.
Conflicts do exist with environmental legislation and authorities.	Adverse impacts associated with an organisation's activity are considered in order to reduce pollution. Compliance with regulations is a major component of the ISO 14001 standard. Therefore, no conflicts exist between an organisation and an Environmental authority.

Table 2.1 illustrates the difference between an organisation/project that implements or does not implement the ISO 14001 standard.

2.4 Factors That Can Lead to the Success of ISO 14001

To achieve compliance with ISO 14001 certain factors must exist. These include the following:

- Commitment by management, from the top down, to adopt the ISO 14001 standard.
- All management must ensure that procedures are set in place to maintain and improve operational conditions and amend unsustainable actions.
- Accreditation must be obtained from an approved and accredited external body.
- Continuous compliance with the stringent standards of ISO 14001.
- Implementation of the best available green technology and the use of environmental protection methods that are best suited and economically feasible.

2.5 EMS and Fishery/Aquaculture Projects

Fishery projects have a significant ecological footprint, with consequent implications for the well-being of the environment and of present and future generations. While many organisations take on environmental initiatives such as pollution prevention measures, these efforts often fail over longer periods of time due to the lack of organisation and a systematic environmental management framework.

An Environmental Management System (EMS) represents a systematic approach to the conduct of an activity to improve environmental performance. It promotes the concept of continual improvement. This can be carried out by challenging establishments to identify their environmental impacts, determine which are the most important and set performance-based targets to continually minimize their impact.

This part of the study provides guidelines for pollution prevention and control through an EMS approach to fishery projects and their related activities including fishing, harvesting, aquaculture, transportation, export and import. This generic document can be tailored to more specific activities to ensure that the management system produced takes more account of local environmental factors.

Establishments running fishery projects have a duty of care to protect the fishery resources and the environment. This duty includes the following:

- The protection of the ecosystem
- The securing of the future of fishery resources
- The integration of ecological considerations into all decision-making
- The compliance with local and international environmental laws and regulations.

The Elements of EMS

An EMS is a continual cycle of planning, implementation, review and improvement of the processes and actions that an organisation undertakes to meet its environmental responsibilities. An EMS comprises the following major components:

- Policy determination
- Planning, identifying environmental aspects and establishing goals
- Implementation, including training and operational controls
- Monitoring and corrective action and
- Review, including progress reviews and making necessary changes to the EMS.

Figure 2.2 illustrates the main components of an EMS.

3.1 Policy

An environmental policy is top management's declaration of its commitment to the environment and environmental protection. The policy is the basis of the EMS and shows the organisation's concern for the environment as a whole. Since it serves as the framework for setting environmental objectives, the policy should be reflected in the plans and actions of the organisation. Everyone in the organisation should understand the policy and what is expected of him/her in order to achieve the anticipated objectives (STAPLETON and COONEY 1996).

The policy reflects three key commitments. Although improvement cannot be expected in all areas at once, the policy should aim to improve environmental management and performance continually. The three commitments are:

- Continual improvement
- Pollution prevention
- Compliance with relevant laws and regulations.

The final policy should relate to the services provided by the organisation and all other supporting activities. A preliminary review is advised where an analysis of the environmental aspects of all fisheries projects, activities, products and services is carried out. This will make the commitment to promote sustainability and minimize environmental impacts to be based on facts and to attain reasonable targets.

The policy should also be understandable by all employees and should be reasonable, flexible and attainable. An example of a policy statement follows:

"To provide quality aquaculture products for the community whilst sustaining the marine resource and protecting the environment for present and future generations".

The following are examples of objectives which can be included in an environmental policy related to fishery projects:

- To ensure fisheries resources and the ecosystems are utilized in a sustainable manner
- To ensure that all project activities and practices are conducted according to standards
- To ensure that all the project activities abide by all international and local environmental laws and regulations related to fishery projects, industries and activities
- To ensure that communities, stakeholders and regulators have access to information

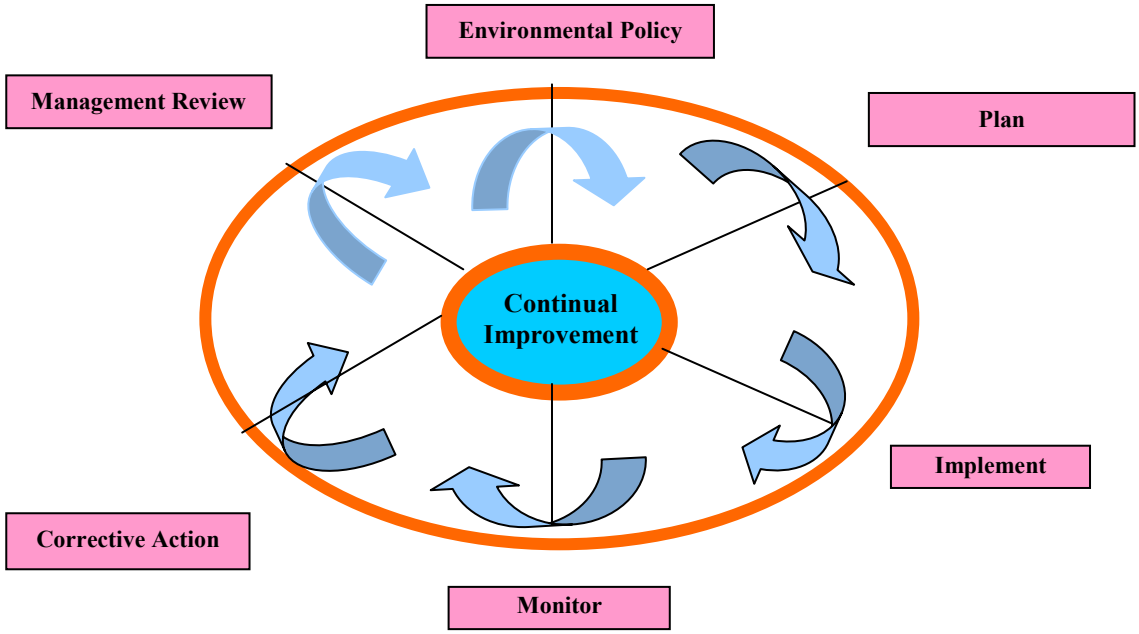

Figure 3.1 Components of Environmental Management Systems

related to environmental aspects of the activities undertaken

- To ensure that all environmental impacts are minimised.

Commitments to achieve such objectives include:

- To effectively manage the impacts of fishery projects by assessing their environmental impacts and proposing measures by which such impacts can be minimized
- To integrate the concept of sustainable development into project activities to include the environmental and social along with the economic factors affecting the project
- To develop and implement an environmental action plan to be implemented in all operations within the fishery project
- To effectively monitor and review the environmental action plan to ensure its correct implementation
- To minimise pollution and waste within the project
- To raise the awareness of management, employees, contractors and the community to their potential role in protecting the environment
- To comply with local, regional and international environmental laws.

3.2 Planning

Defining goals:
The first step in EMS planning is to set the goals which will be the basis of the EMS. The goals include: improvement of environmental performance, compliance with regulations, prevention of pollution and promotion of involvement throughout the organisation. These goals need to be documented.

Scope of work
The organisation should determine the project scope and the location at which it will be implemented. Some organisations may decide to apply their EMS on one site and expand at a later date to include other locations or facilities.

Securing management approval and involvement
One of the most critical steps in the planning process is to gain top management approval and a real commitment to support EMS development and implementation. Therefore, management needs to understand the benefits of an EMS and ensure that the goals of the EMS are clear and consistent with other organisational goals. Management's commitment should be communicated across the whole organisation.

Selecting personnel and persons in charge
The choice of a team leader, in charge of the development and implementation of the EMS, is essential. The team leader should have the necessary authority, an understanding of the organisation, management skills, the time and administrative and financial support. A team made up of representatives from different sections and departments should assist in identifying and assessing the environmental aspects of their own work places. This also includes fishery project contractors, subcontractors, suppliers and other external parties.

Conducting a preliminary review
Preliminary review of current compliance with existing laws and regulations is essential as it provides information on the legal standing of the project. It also provides information on existing environmental programmes and a comparison of these against the criteria defined in the EMS standards (ISO 14001). The organisation's structure, procedures, policies, environmental impacts and training programmes should also be evaluated to determine which parts require additional work. Gap analysis and self-assessment tools are beneficial at this point. Based on the results of the preliminary review, a project plan and budget can be prepared. The plan should describe in detail what key actions are needed, who will be responsible, what resources are required, and when the work will be completed. The plan needs to be flexible to allow for future alterations.

Identifying environmental aspects
Fishery projects and industries need to identify their environmental issues in order to plan for and control their impacts. It is also important to know what the existing pollution prevention measures are. Such aspects need to be under the control of the project itself. This includes the work of the contractors both in and outside the boundaries of the project area if the service is provided for the project. Other factors that are beyond the influence of the project such as weather conditions, other adjacent projects or establishments are not its responsibility.

Environmental aspects are defined as issues of concern such as waste, spills, emissions and releases. Environmental impacts are defined as the effect of certain aspects, such as pollution, on the environment. The significance of such impacts should be determined. Significant aspects should be considered when establishing environmental objectives and defining operational controls.

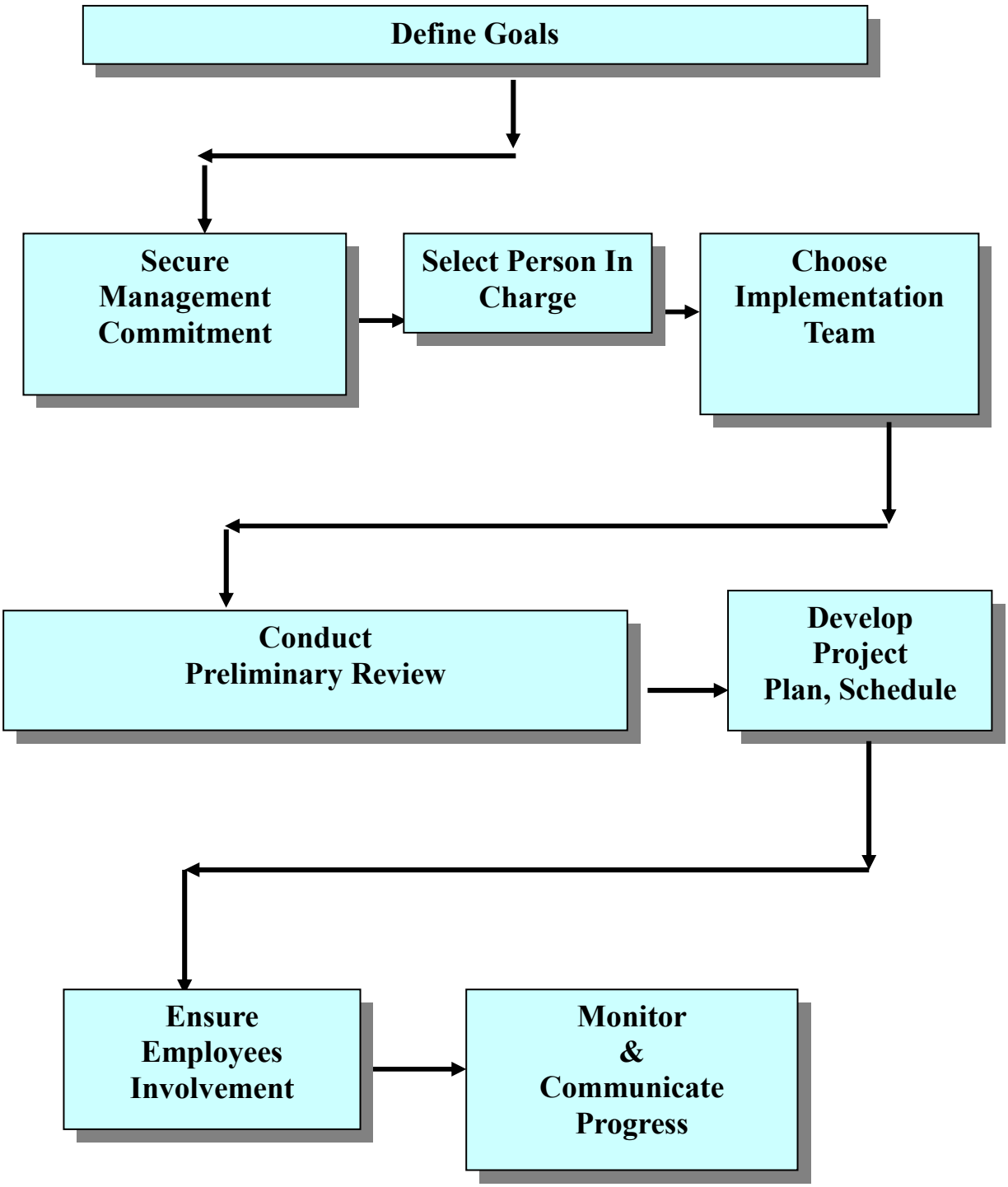

Figure 3.2 The process of developing an EMS for a fishery/aquaculture project

In general, potential environmental aspect categories include:

- Ecosystem disturbance
- Raw material and resource use, e.g. water, energy, etc.
- Contamination of land
- Solid and hazardous wastes including hazardous material storage and handling
- Water discharges, e.g. spills, sewage, industrial discharges to water bodies
- Local issues, e.g. noise, odour, dust, traffic, etc.
- Air emissions
- Energy use.

- **Environmental policy:** Develop a statement of your organisation's commitment to the environment. Use this policy as a framework for planning and action.
- **Environmental aspects:** Identify environmental attributes of your products, activities and services. Determine those that could have significant impacts on the environment.
- **Legal and other requirements:** Identify and ensure access to relevant laws and regulations, as well as other requirements to which your organisation adheres.
- **Objectives and targets:** Establish environmental goals for your organisation, in line with your policy, environmental impacts, the views of interested parties, and other factors.
- **Environmental management programme:** Plan actions necessary to achieve your objectives and targets.
- **Structure and responsibility:** Establish roles and responsibilities for environmental management and provide appropriate resources.
- **Training, awareness and competence:** Ensure that your employees are trained and capable of carrying out their environmental responsibilities.
- **Communication:** Establish processes for internal and external communications on environmental management issues.
- **EMS documentation:** Maintain information on your EMS with related documents.
- **Document control:** Ensure effective management of procedures and other system documents.
- **Operational control:** Identify, plan and manage your operations and activities in line with your policy, objectives and targets.
- **Emergency preparedness and response:** Identify potential emergencies and develop procedures for preventing and responding to them.
- **Monitoring and measurement:** Monitor key activities and track performance. Conduct periodic assessments of compliance with legal requirements.
- **Non-conformance and corrective and preventive action:** Identify and correct problems and prevent their recurrence.
- **Records:** Maintain and manage records of EMS performance.
- **EMS audit**: Periodically verify that your EMS is operating as intended.
- **Management review:** Periodically review your EMS with an eye to continual improvement.

Table 3.1 The key elements of an EMS; after STAPLETON and COONEY (1996)

Environmental aspects and impacts of fishery projects

Fishery projects and aquaculture are essential industries that provide food for many communities especially in low income countries. However, their environmental impacts still require control and mitigation. Table 3.2 provides a summary of the major environmental aspects and impacts of fishery projects.

Setting the legal framework for the EMS

In order to comply with laws and regulations an organisation must first know which apply to it and how they affect it. Compliance with legal requirements is the basis of environmental policy. Non-compliance with such laws possibly damages the environment, causes revenue loss and impacts on the organisation's public image.

An effective EMS should include processes for the identification and communication of applicable legal and other obligations. New or revised legal obligations might require modification to the project's EMS elements. The EMS should include a procedure for identifying, accessing and analyzing applicable legal and other requirements. There are many methods of obtaining information about applicable laws or regulations. These include the websites of international organisations, direct contacts with regulators, trade unions and groups, official documents and publications.

Objectives

The following should be considered when defining the objectives of the EMS:

- Objectives help organisations to reach their goals. These can be applied at the organisational level or to individual units, departments or projects (Table 3.3).

In setting objectives the following should be considered:

- Environmental policy
- Significant environmental aspects
- The views of stakeholders
- The legal requirements
- Financial, administrative and technical resources
- The objectives should reflect what the organisation does, how well it is performing and what it wants to achieve
- The setting of objectives should involve people from all relevant operations; these people should be able to establish, plan for, and achieve these goals.
- Communicating objectives to employees is vital.
- Linking the objectives to real environmental improvements gives people something tangible to work towards
- Objectives should be consistent with the overall goal and the key commitments established in the environmental policy
- Objectives should be flexible, realistic and simple; progress in achieving objectives should be communicated across the organisation
- Individual progress in achieving objectives should be communicated throughout the organisation; regular reports on this progress should be considered at staff meetings
- A limited number of objectives should be set at the start of the project and then increased over time.
- A method for measuring progress should be determined.

Aspect	Impact	Effect
Creation of ponds as artificial habitats	Physical change to the habitat (seepage of salt water: salinization, acidification and sulphuration of soil and waterways)	Damage to coastal ecosystems and fauna affecting food web and affecting socio-economic well-being
Waste food and waste from organisms	Settlement on seabed, increased microbial activity, sulphate reduction, increased biological oxygen demand, increased turbidity	Changes in bacterial populations, change in water quality leading to ecological problems such as fish kills, reduced hatching and decline in fish growth rates
Food quality and quantity	Loss from fish cages	Unnecessary destruction of mammals, and birds; environmental deterioration
Captive breeding and rearing	Reduced levels of genetic composition	Reduced fitness of wild population after release into the environment
Egg collection	Damage to similar size larvae and plankton	Imbalance in the food web
Damage to coastal wetlands	Coastal erosion	Decline in coastal fisheries and destruction of any nearby coral reef
Large scale bivalve farms	Filtration of phytoplankton and zooplankton	Alteration of local food web
Medications, antibiotics, growth hormones and vaccines	Emergence of resistant bacteria and alteration of the bacterial flora in the environment	Seafood quality and health, and human health
Chemical usage such as environmentally unfriendly anti-fouling	Water pollution	Toxic effects on fish stock and human health
Escape of alien species (bio-invasions)	Uncertainty of ecological effects: some serious ecological damage	Effects on food web and food chain
Aquaculture conditions	Stress: undermining change in resistance making fish more prone to disease	Economic loss and effect on health of ecosystem
Noise	Increase in noise level	Health and psychological effects
Sewage	Water pollution	Health effects on humans and fish, economic effects and social effects
Oil, fuel and lubricants passing into the environment from fishing vessels and aquaculture farms	Water pollution	Toxic effects on human and fishery resources

Table 3.2 Aspects, impacts and effects of fishery/aquaculture projects

Aspect	Impact	Effect
Energy consumption	Air and thermal pollution from power stations	Greenhouse effect and effects upon marine ecosystems caused by increase in water temperature and particulates settlement; also economic effects
Nuisance to leisure activities	Visual and social impacts for shore and water users	Social and psychological effects
Management of retained and non-retained species from fishing vessels	Over-exploitation of target species and depletion of other species accidentally caught	Effects on food webs, reduction in fish catch, affecting food supply, consequential economic and social problems
Municipal waste collection & disposal from project area	Soil pollution, visual impacts, odour and noise	Health and psychological effects and ecological damage

Table 3.2 continued

Objectives	Goals
To reduce the amount of waste generated by the project	A reduction in the amount of waste generated by the project site by 15% before 2004
To reduce energy and water usage	A reduction in electricity and water use by 15% in 2005
To reduce usage of hazardous chemicals	The elimination of toxic antifoulant use by 2005
To improve employee awareness of environmental issues	Monthly awareness training courses; the training of all employees by end of the year
To improve compliance with wastewater discharge permit limits	Zero permit limit violations by the end of 2005
To reduce the catch of non-retained species	A decrease in the catch of non-retained species by 20% by 2005
To introduce organic aquaculture methods to meet export, environmental and public demands.	Introduction by 2006
To introduce organic feed	The introduction of certified organic feed by the end of 2005
To install pollution control measures in fishing vessels	The introduction of sewage containers in 60% of the fishing vessels by 2004 and the rest in 2005; installing waste collection containers in all vessels by 2003

Table 3.3 Examples of objectives and goals

Objective / Target #1: ----------					
Action Items	Priority	Responsibilities	Schedule	Resources Needed	Comments

Table 3.4 Sample form for Environmental Management Programme

The Environmental Management Programme

When fully developed, the environmental management programme will:

- Identify specific action steps
- Set defined schedules
- Allocate staff and financial resources
- Establish individual and group responsibilities
- Identify the training needs of the staff involved
- Establish a monitoring and reporting system to ensure that individual and departmental obligations are being met and,
- Establish emergency preparedness and response plans.

As a first step in developing environmental management programmes Implementation Teams should review the list of significant aspects and the workflow diagrams that identify where in the organisation these aspects occur and how they should be monitored. Implementation Teams should meet with the appropriate department personnel and confirm the significant environmental issues.

Departments should review their applicable legal and other requirements, and examine existing operational procedures and work instructions, making necessary adjustments to reduce possible environmental effects. They should verify that appropriate operational controls are identified and check that employees are fully informed of their obligations in their job descriptions. Department managers should note which employees require additional competency or awareness training and which job descriptions need amending.

The program should be modified when:

- Objectives are modified or added
- Relevant legal requirements are introduced or changed
- Substantial progress in achieving objectives has or has not been made
- Changes to products, services, processes, and facilities or when other issues arise.

Structure and responsibility

For an EMS to be effective, roles and responsibilities must be clearly defined and communicated. The commitment of all employees is needed for an EMS to be successful. Top management plays a key role by providing the resources needed to implement the EMS. An effective management system needs a management

representative who must ensure the following:

- That the EMS is established and implemented
- That reports on its performance over time are kept as a permanent record
- That the opinions of all workers are important to modification of the EMS. The management representative can also serve as the project Team Leader.

The organisational structure for environmental management should be planned. A flow chart of the existing organisational structure may help to identify suitable personnel to be responsible for the implementation of the EMS. The EMS approach holds all personnel, even those outside the organisation's environmental functions, accountable for the environmental issues associated with their jobs. Implementation Teams should work closely with each department to clearly identify and communicate employee roles and responsibilities. Other workers, regardless of their job or status in the organisation, should be encouraged to help to protect the environment; see Table 3.4.

The EMS management representative and the Implementation Team should clearly define and communicate their own roles and responsibilities and the roles and responsibilities of departmental staff with respect to implementing the EMS.

- Department managers are responsible for the completion of environmental management activities in their departments.
- Department personnel will be assigned specific responsibilities identified in the environmental management programme.
- All employees must know what they are to do, how they are to do it, and that they have authority to do what is required.
- The Implementation Team should act as advisor, co-ordinator, and facilitator to these efforts.
- All employees must be supported by the necessary authority, resources, and training to allow them to fulfil their responsibilities.
- The ultimate responsibility for accomplishing environmental goals remains with senior management.

Training, awareness and competency

Once the operating procedures and work instructions have been documented and roles and responsibilities clarified, it is important to assess the skills employees require to carry out their environmental responsibilities. All employees should be given a broad understanding of the organisation's environmental issues and policy, and awareness of how their job potentially affects the environment. Some employees may require task-specific training.

A variety of methods can be used for awareness training. Cards, posters and many other methods can be used to increase awareness and to promote understanding of the organisation's environmental goals and priorities. For task-specific or competency improvement, on-the-job-training can be used. Training records are required to be up-to-date. Training should be tailored to the differing needs of the various levels and functions within the organisation, see Table 3.5.

Communications

Effective environmental management requires effective communication, both internally and externally. Effective communication will help explain the environmental policy and EMS. This relates to the overall organisational vision, the motivation of the workforce, the acceptance of plans and efforts and the understanding of roles and expectations. Effective communication also demonstrates

***Step 1*:**	Assess training needs & requirements.
***Step 2*:**	Define training objectives.
***Step 3*:**	Select suitable methods and materials.
Step 4:	Prepare training plan (who, what, when, where, how).
***Step 5*:**	Conduct training.
***Step 6*:**	Track training (and maintain records).
***Step 7*:**	Evaluate training effectiveness.
Step 8:	Improve Training Programme as needed.

Table 3.5 Key steps in developing an EMS training programme; after STAPLETON and COONEY (1996)

management commitment, helps monitor and evaluate performance and identify potential system improvements (STAPLETON AND COONEY 1996).

Taking steps taken to obtain the views of the stakeholders, who can be neighbours, customers, community groups, and regulators, will also help to gain a better understanding of how the project is perceived by people outside the organisation. The stakeholders can bring forward important environmental issues that should be addressed in the EMS. Thus, an effective EMS should include procedures for the following (STAPLETON AND COONEY 1996):

- Internal communication between different organisational levels and functions
- Consulting, receiving, documenting and responding to external communication.

Appropriate communication methods include the following:

- Internal methods such as:
    - newsletters
    - intranet
    - staff meetings
    - memos
    - training
- External methods such as:
    - web site or e-mail list
    - press releases and media
    - annual reports
    - advertising
    - informal discussions

EMS documentation and manual

To ensure that the EMS is well understood and operating correctly, the people doing the work must be provided with adequate information. Other external parties, such as customers, regulators, and the public, also need to understand how the EMS is designed and implemented. Therefore, the EMS should be documented in a manual to be used by the concerned personnel.

An EMS manual is a series of explanations of the processes the organisation implements to conform to the EMS criteria (such as the EMS elements). The EMS should at least describe the system's elements and how they are related to each other and provide direction to related documentation. Additional documents, such as methods by which environmental aspects are determined, other implementation guides, standards, and forms of procedures and work instructions, should also be maintained.

EMS documentation can be presented either on paper or electronically. There are advantages to holding documents electronically, such as control of access and maintenance of up-to-date versions of documents.

EMS documentation should be simple, with references to more detailed documents or procedures. It should be updated as needed, based on any system improvements put in place. However, if too much detail is put in an EMS manual, more frequent updating of the manual may be needed. The EMS manual should include the following:

- The environmental policy
- The organisation's profile, structure and key responsibilities

- A description of how environmental aspects are identified, how documents are controlled and how legal requirements are fulfilled
- A description of activity- or process-specific procedures and work instructions
- Other EMS-related documents such as emergency response plans and training plans.

Document control

The organisation must provide employees with the right documents to allow them to perform their tasks properly. Such documents need to be correct and up-to-date. The organisation should thus have a procedure to describe how such documents are controlled. The implementation of this procedure should ensure that:

- EMS documents can be located when needed
- They are periodically reviewed to check that they are still valid
- Out-of-date documents are removed
- Responsibility is designated for preparing documents and keeping them up-to-date. A distribution list should be kept showing who has each copy and where the copies are located (see appendices for sample forms)
- When procedures or documents are revised, the changes should be recorded so that they can be tracked easily.

Operational control

Draft procedures should be prepared and reviewed with the people who will implement them. This will ensure that the procedures are appropriate, realistic and practical.

Examples of activities that might require operational controls include:

- Waste management and disposal
- Approval of the use of new chemicals
- Storage and handling of raw materials and chemicals
- Equipment servicing
- Management of contractors.

A review of existing procedures is also important as some may be required to control significant impacts. The development of charts to track the necessary controls is needed (Tables 3.6 and 3.7).

The maintenance of equipment which could have significant environmental impacts or result in non-compliance must be carried out. A plan is needed to manage maintenance and its effectiveness should be assessed before making significant changes.

Emergency preparedness and response

Despite an organisation's best efforts, accidents and other emergency situations still occur. Effective preparation and response can reduce injuries, prevent or minimize environmental impacts, protect employees and the community and reduce losses.

An effective programme for emergencies should:

- Assess the potential for accidents and emergencies
- Prevent incidents and their associated environmental impacts
- Plan procedures for responding to incidents
- Test periodically the emergency plans and,
- Mitigate impacts associated with these incidents.

It is important to review the project's emergency response performance after an incident has occurred. This review can be used to modify procedures and improve responses.

Operation or Activity	Procedure is needed (none exists)	Procedure exists, but is not documented	Procedure exists and is documented	No procedure is needed
1	**X**			
2		**X**		
3		**X**		
4			**X**	

Table 3.6 An example of a chart that is designed to keep track of what controls are needed; after STAPLETON and COONEY (1996)

Hints on writing procedures

- Understand the existing process; construct a flow chart, and build on informal procedures where they exist
- Focus on steps needed for consistent implementation
- Use a consistent format and approach
- Review draft procedures with employees who will have to implement them; better yet, enlist the relevant employees to help write them
- Keep procedures simple and concise

Table 3.7 Hints on the writing of EMS procedures (STAPLETON and COONEY 1996)

The plan should describe the following

- Potential emergency situations such as fires, explosions, spills or releases of hazardous materials, and natural disasters
- Any hazardous materials used on-site and their locations
- Key organisational responsibilities, especially emergency co-ordinators
- Arrangements with local emergency support providers
- Emergency response procedures, including those for communications
- Locations and types of emergency response equipment
- The maintenance of emergency response equipment
- The training and testing of personnel, including the on-site emergency response team
- The testing of alarm and public address systems
- All evacuation routes, exits and assembly points, using maps where appropriate

Table 3.8 Checklist for emergency preparedness and response plans (STAPLETON and COONEY 1996)

Monitoring and measurement

Monitoring and measurement enables an organisation to:

- Evaluate environmental performance
- Analyze the causes of problems
- Assess compliance with legal requirements
- Identify areas requiring corrective action
- Improve performance and efficiency.

The organisation should develop procedures to:

- Monitor key characteristics of any activities which can have significant environmental impacts or compliance consequences
- Measure progress in meeting objectives; appropriate performance indicators should be selected to help understand how well the EMS is working. Performance indicators should be simple, objective, measurable and relevant.

Indicators could be in the form of:

- Qualitative data: documents, records, systems, products, safety procedures, emergency preparedness and responses, disaster controls.
- Quantitative data: levels, limits and standards for:
    - Water quality
    - Air emissions
    - Waste amounts
    - Soil quality
    - Noise
    - Radiation

Some examples of EMS performance indicators:

- Concentration of pollutants per litre of water
- Amount of hazardous waste generated per year
- Percentage of employees completing environmental training
- Average time for resolving problems
- Energy use per unit of production
- Percentage of solid waste recycled
- Weight of non-retained fish caught in trawling activities
- Number of dead or diseased fish in aquaculture ponds.

It is also important to develop procedures for:

- The calibration and maintenance of monitoring equipment. Records of the processes should be kept according to the organisation's documentation procedures.
- Periodic evaluation of compliance with applicable laws and regulations. Therefore, an organisation should have procedures which systematically identify and prevent violations.

Non-conformance and corrective and preventive action

One of the essential elements of the EMS is to investigate and identify nonconformity. Corrective and preventive actions should be both implemented and tracked for their effectiveness. All EMS nonconformities, including legal non-compliance, should be recorded so that patterns and trends can be identified. Identifying trends allows the organisation to anticipate and prevent future problems.

The organisation must be committed to resolving any problem within a given time period. Corrective actions should resolve the immediate problem and ensure that the same or similar problems do not exist or arise elsewhere in the organisation.

Records

Permanent records are proof of how the organisation is implementing the EMS. Such records have an internal purpose as a reference and as evidence to management and staff. They are also evidence of compliance or non-compliance for customers, regulators and the public.

The basis of record management is to decide what records need to be kept, how they are to be kept and for how long. The disposal of undesired records should also be considered. Forms should be simple and easy to understand. Selective access to records should be determined especially for documents which need to be kept secure. An electronic EMS record management system could also be used. Electronic records can provide an excellent means for rapid retrieval of data as well as controlling access to sensitive records.

Examples of the different types of records are (STAPLETON and COONEY 1996):

- Legal, regulatory and other code requirements
- Results of the identification of environmental aspects
- Reports of progress towards meeting targets
- Permits, licenses and other approvals
- Job descriptions and performance evaluations
- Training records
- EMS and regulatory compliance audit reports
- Reports of identified nonconformities, corrective action plans and action taken
- Hazardous material spills and other incident reports
- Communications with customers, suppliers, contractors and other external parties
- Results of management reviews
- Sampling and monitoring data
- Maintenance records
- Equipment calibration records.

EMS auditing

Environmental auditing is a verification process for evaluating evidence to determine whether specified environmental activities, events, conditions, systems, and information conform to audit criteria. The end results of this process are then communicated to the concerned party. International guidelines related to auditing include:

- **ISO 14010**: Guidelines for Environmental Auditing - General principles on environmental auditing.
- **ISO 14011**: Guidelines for Environmental Auditing - Auditing procedures.

Once the EMS is established, verifying its implementation is crucial. Periodic audits help determine whether all the requirements of the EMS are being carried out as specified. Conducting an audit allows organisations to:

- Ensure environmental legislative compliance
- Evaluate potential environmental liabilities
- Check compliance with ISO 14001
- Plan for future legislative changes
- Reduce environmental risks
- Allow for continual improvement
- Gain ISO Certification.

For the EMS audit program to be effective, the following should be considered:

- Developing audit procedures
- Determining audit frequency
- Selecting and training auditors
- Maintaining audit records.

The audit structure should include the following:

- The audit program
- Audit planning
- Audit execution
- Reporting
- Corrective and preventive actions.

The principles of Environmental Auditing include:

- The setting of objectives and scope
- Objectivity and independence
- Skill and professional judgment
- Confidentiality
- The following of systematic procedures for audit
- The agreeing on audit criteria with client & lead auditor
- An understanding of the chance of uncertainty in audits.

Details of the auditor's qualifications:

- Scientific qualifications and degree
- Appropriate knowledge and experience in the environment field
- Management and leadership skills
- Training courses taken
- Professional recognition and registration.

Audit planning:

- Date, duration and location of audit
- Reference documents (ISO 14001)
- The objectives and scope of the audit
- Identification of the aspects of the audit
- Methods and sampling
- Identification of key staff to interview
- Priority areas
- Meeting schedule
- Confidentiality
- Report format
- Record keeping.

Audit reports must include:

- Details of the organisation being audited
- Details of the audit team
- Date and duration of audit
- The agreed objectives and scope of the audit
- Agreed criteria (ISO 14001)
- A statement confirming the confidential nature of the report
- A list and summary of audit processes including obstacles
- The conclusions of the audit.

Results of the EMS audit should be linked to a corrective and preventive action process. To determine an appropriate frequency for the EMS audits, the following factors should be considered:

- The nature of organisation operations and activities
- The significance of environmental aspects and impacts
- The results of the monitoring processes, and
- The results of previous audits.

It is suggested, however, that the EMS should be audited at least annually.

Subsequent audits can be conducted at one time or broken down into smaller parts relating to the needs of different sites and activities. Selected staff can be trained to carry out internal audits by experienced training firms. Internal auditors should be trained on auditing techniques, skills and management system concepts. They should also be familiar with environmental regulations, facility operations and environmental science. Auditors should also be independent of the activities being audited.

External auditors can also be contracted to organise independent internal audits. They can also perform the certification audit to provide the organisation with verification that its EMS complies with international standards, such as ISO14001. During an audit, the auditors should review any identified deficiencies with the people who work in the relevant area. This will help to verify that the audit findings are correct and can reinforce employee awareness of EMS requirements.

The audit results are usually presented to top management, or their representatives. The organisation should then ensure that identified deficiencies are corrected according to a timeframe and that corrective actions are documented.

The management review

Management reviews are a key to continual improvement as they keep the EMS efficient and cost-effective. The results of internal audits are usually discussed in meetings where decisions on actions to be taken are made accordingly. After documenting these actions, a follow-up is required to ensure their adequate implementation. Progress should be tracked to completion.

Certification and self-declaration

The organisation can choose to demonstrate its compliance with standards to the world through certification. This compliance is verified by an independent and accredited body (certifier) whose external auditors carry out the preliminary and main audit. Such certifying firms obtain their permits from official accreditation bodies in their country of origin such as UKAS in UK, NAB in Ireland and the Ministry of Environment in Greece. Certifiers conduct periodic audits to verify the organisation's commitment to continual improvement and compliance with standards. An organisation may also choose to self-declare its compliance with an EMS standard.

Recommendations

It is recommended:

- That fishery projects be subjected to EIA.
- That EIA procedures and guidelines be incorporated into the environmental decision making process.
- That EMS be introduced into the environmental decision making process.
- That PERSGA improves its capability in EIA and EMS and seeks the technical support of local, regional and international establishments in building this technical capability.
- That an environmental authority's staff working in the fields of EIA and EMS needs to be well trained and qualified in both fields of expertise.
- That a registry be established for consultants and consultancy firms working in EIA and ISO 14001 to ensure quality of work.

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Appendices

Appendix I: Examples, sample forms and procedures for EMS for fishery/aquaculture projects

ENVIRONMENTAL MANUAL
ISSUE No. -----

Approved by :- Company Chairman & General Manager

Note: This document is for circulation within (*Company name*) only and it, or extracts from it, shall not be passed or copied to other companies or persons not employed by (*Company name*) without written permission of the General Manager.

Compliance with an Environmental Manual and supporting procedures does not in itself confer immunity from legal obligations.

Signed for and on behalf of (*Company name*):

General Manager:

Date:

Revision Record of the EMS Manual

Amendment Number	Date	Text Affected	Issue Status

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1. Company Profile

The following needs to be completed in a detailed manner:

- Company name:
- General Manager name:
- Company representatives:
- Organisational structure and chart:
- Contact address:
- Tel.:
- Fax:
- E-mail:
- Services being provided:
- Description of the project under the company management:

Project location:

ENVIRONMENTAL PROCEDURE 1

Environmental Policy

1 Scope:

To define the Policy for the control and improvement of the direct and indirect aspects and impacts upon the environment by activities.

2 Responsibility:

The responsibility for implementation of the Environmental Policy is with the Management Representative with support from the Environmental Coordinator.

3 References:

Organisation's Environmental Policy.

4 Procedures:

4.1 Environmental Policy:

The management and personnel of the project believe that it is in the best interests of the residents of the region, the management and employees of the project, that they strive to achieve and maintain sound environmental performance in all aspects of their activities and operations.

In particular we are committed to:

- Meeting in full the standards imposed by environmental legislation which impact upon any operations and ensuring that others who are involved meet the same standards.
- Preventing pollution by the identification of environmental risks and effects, and setting internal standards commensurate with best practice.
- Working within the framework of an Environmental Management System, commensurate with the requirements of ISO 14001, including procedures and the setting of objectives and targets to achieve measured continual improvement.
- Ensuring that environmental criteria are considered in all projects where there is control or influence.
- Setting standards for the selection and engagement of suppliers and contractors with a view to encouraging improvements in their environmental performance.
- Promoting environmental protection as a mutual objective for management and employees at all levels.
- Providing training and instruction at all levels to motivate and enable environmental procedures to be followed.
- Effectively communicating this policy to all employees and making it available to other interested parties on request.

4.2 Review:
The management representative will convene and chair the environment committee at not less than quarterly intervals. The agenda for these meetings includes but is not limited to the following:

- Reviewing the adequacy of the current Environmental Policy and its management
- Reviewing non-compliance trends
- Reviewing the results and effectiveness of corrective actions
- Areas of concern
- Reviewing progress on current environmental objectives and targets
- Allocating responsibilities and time scales on the environmental objectives and targets of current actions
- Reviewing incident reports
- Reviewing the performance of pollution abatement equipment
- Reviewing progress on major environmental audit report recommendations, allocating responsibility and timescales
- Any other business

5 Documents:

The following documents are maintained in support of this procedure:

- Environmental Policy and Procedures

ENVIRONMENTAL PROCEDURE NO. 8

Environmental Effects Evaluation and Register

1. Scope
To provide a record of the identified and significant direct and indirect environmental effects of ---------- aspects and impacts relative to its operations and activities, emergencies, incidents and accidents.

2. Responsibility
The responsibility for maintaining this record is delegated to the Environmental Coordinator, and to persons identified in the text.

3. References
Environmental Aspects and Impacts Assessments

4. Procedure

4.1 Register
The Environmental Coordinator will maintain a register which tabulates all environmental effects evaluations carried out by or on behalf of ----------, records the effective date of all such evaluations, and identifies the purpose for which such evaluations are maintained.

4.2 Register Sections
Initially the basic sections of the Register will be:

- Waste Management Plan
- Hazardous Substances (General)
- Hazardous Substances (Specific substances)
- Water Pollution incident reports
- Soil and Groundwater incident reports
- Spill reports
- Aspects and impact evaluations

4.3 New Activities
Department Managers are to ensure that any changes, additional or new activities or services which may have an effect on the environment are reported in writing to the Environmental Coordinator for evaluation and recording in the effects register if appropriate.

5. Records
The following records are maintained in support of this procedure:

- Register of Environmental Effects
- Environmental Effect Reports as listed in 4.2 above
- Reports required by 4.3 above

ENVIRONMENTAL PROCEDURE NO. 9

Incident Reporting

1. Scope
To define an incident and the procedures for investigating, reporting and disseminating information regarding incidents.

2. Responsibility
Responsibility for implementing the procedure is delegated to the managers and supervisors at the locations at which an incident occurs and to other persons identified in the text.

3. References
Environmental Procedure No. 6 Operational Control.

4. Procedure

4.1 Definition of "Incident"
An incident is an occurrence which gave rise to environmental damage or which, in slightly different circumstances, could have done so.

4.2 Examples of "Incidents"
Each manager has the freedom to define types or categories of incident over and above those listed below. They do not, however, have the freedom to remove any from those listed below:

- Failure or substandard performance of pollution control equipment
- Spillage of fuel, or lubricants, which exceeds 5 litres or escapes from the perimeter of the location on which it was spilled
- Damage to containers holding hazardous materials during storage or handling
- Leaks to soils from contained sources of hazardous materials
- Abnormal emissions to atmosphere
- Abnormal discharges to controlled waters which result in pollution
- Abnormal discharges to open ground which result in soil contamination
- Failure of tanks, pipes or dispensing equipment during operations
- Venting to atmosphere of Montreal Protocol controlled substances
- Failure of tanks during routine tests

4.3 Reporting of incidents
Incident reports are to be generated by the manager of the facility where the incident occurs. Incident reports are to be given a unique serial number giving the identification number of the site and a sequential report number. Incidents are to be investigated initially by the manager within whose area they occur. Copies of completed incident reports are to be forwarded without delay to the Environmental Coordinator and in any event as soon as possible after the incident becomes apparent.

4.4 Investigation of Incidents

Incident Reports, as detailed in Appendix A, are to be completed in all relevant circumstances. The facility's manager or the senior person on the site is to complete Part A detailing the date and time, location, type of incident and substance or plant involved. Part B is to be completed in consultation with the relevant manager detailing the cause of the incident, remedial or corrective action taken, recommendations to prevent a recurrence and details of any environmental damage or complaints resulting. Reference must be made to any similar type of incident which has previously occurred at the same location giving the relevant identification number of the previous incident.

4.5 Dissemination of Incident Reports

Environmental incidents or accidents are a fixed-agenda item for the Environment Committee. Incident reports are also to be presented to the Executive Management Team by the manager in whose area the incident took place. Where the Environment Committee or the Environmental Coordinator believes there are lessons which could be learnt by others or where a trend is emerging, incident reports are to be brought to the attention of all employees. Where incidents reveal deficiencies in the Environmental Management System the Environmental Coordinator is to draft procedures, to be approved by the Environment Committee, to correct the deficiencies identified.

5. Records

The following records are to be maintained in support of this procedure:

- Incident reports
- Environmental Committee Minutes

Sample Incident Report

Report Serial No. ……./ …….

Part A:

- Location:
- Date and time of incident:
- Type of incident (spill, leak, damage, complaint etc.):
- Substance and / or plant / equipment involved:
- Description of incident:
- Name of person completing Part A of report:

Part B

- Cause of incident
- Remedial or corrective action taken
- Recommendations to prevent recurrence
- Environmental damage or complaints resulting
- Previous similar incidents at same location
- Details of regulatory involvement

Signed: _____

Manager Name: _____

ENVIRONMENTAL PROCEDURE NO. 10

Hazardous Substances – Identification & Accounting

1. Scope
To define the term "Hazardous Substance' in relation to the (*Company name*) Environmental Management System. Additionally, to detail the method of accounting for the presence of such substances.

2. Responsibility
The responsibility for implementing this procedure is delegated to those persons identified in the text.

3. References
- Environmental Policy
- Environmental Procedures

4. Procedure

4.1 Categories of Hazard
For purposes of this Environmental Management System the following categories of substance, as supplemented by those contained in 4.2 below shall be considered hazardous:

- Very toxic
- Toxic
- Harmful
- Irritant
- Corrosive
- Any substance listed in the "Carcinogen Approved Code of Practice" carrying the R45 Risk Phrase

4.2 Additional categories of Hazard
The Approved Supply List (4th Edition) issued by the Health and Safety Commission contains certain Risk and Safety Phrases which relate to Environmental Effects.

These substances which are considered to be environmentally harmful are:

A: Risk Phrases:
- R50: Very toxic to aquatic organisms
- R51: Toxic to aquatic organisms
- R52: Harmful to aquatic organisms
- R53: May cause long term adverse effects on the aquatic environment
- R54: Toxic to flora
- R55: Toxic to fauna
- R56: Toxic to soil organisms
- R57: Toxic to bees

- R58: May cause long term adverse effects in the environment
- R59: Dangerous to the ozone layer

B: Safety Phrases:
- S29: Do not empty into drains
- S40: To clean floor and all objects contaminated by use of this material
- S56: Dispose of this material and its container as Hazardous or Special waste
- S57: Use appropriate containment to avoid environmental contamination
- S59: Refer to manufacturer for information on recovery / recycling
- S60: This material and its container must be disposed of as Special waste
- S61: Avoid release to the environment, refer to special instructions

Where possible, and where environmentally friendly alternatives exist, alternative products to those carrying the Risk and Safety Phrases listed above shall be used. Primary instances where alternatives shall be sought are where they may enter the drains or surface water drains from operations carried out either by (*Company name*) staff or by contractors on behalf of (*Company name*).

4.3 Prevention of pollution from environmentally harmful products
Under no ordinary operating circumstance shall environmentally harmful chemicals be allowed to enter controlled waters, as defined by the Water Resources Act (UK). The use of certain fire fighting agents which may have environmentally harmful effects are not intended to be covered by the above instruction when used in the fighting of fires at (*Company name*).

4.4 Accounting for Environmentally Harmful products
Safety Engineers are to identify products which carry either the *symbol*, *risk* or *safety phrases* listed in 4.1 and 4.2 above, which are stored or used at work sites in their area. A list of such substances is to be forwarded to the Health and Safety Executive (HSE) Manager who will use the resources at his disposal to identify the availability of environmentally friendly alternatives. Details of environmentally friendly alternatives are to be notified to Environment Committees for substitution.

4.5 Information provision
Environmentally harmful products MUST be accompanied by the relevant Material Safety Data Sheet (MSDS). Products arriving on site without the relevant MSDS are to be reported to the HSE Manager who will contact the local supplier. Local suppliers, having been warned of their failure to provide MSDSs, who continue to fail to do so will be reported to the Administration Manager for punitive action. The ultimate punitive action is cancellation of contract.

5. Records:
The following records are maintained in support of this procedure:

- List of environmentally harmful substances stored or used
- List of environmentally friendly alternative substances
- Warning letters
- Environment Committee minutes

ENVIRONMENTAL PROCEDURE NO. 12

Contractor and Supplier Selection

1. Scope
This procedure details the steps to be taken in selecting contractors and suppliers of goods and services to be used by (*Company name*) and incorporates the recommendations relevant to the environment from the (*Company name*) Environmental Strategy.

2. Responsibility
Responsibility for implementing this procedure is delegated to all managers.

3. References
- Environmental Policy
- Hazardous substances procedure

4. Procedure

4.1 Selection of Suppliers and Contractors
Prospective suppliers and contractors for the provision of goods and services to (*Company name*) must be notified at the earliest possible stage in the tender process that environmental probity will be a factor taken into account in the selection of the successful applicant.

4.2 Contract conditions
Suppliers and contractors of goods and services must undertake in their contracts to comply with all environmental legislation and prevent pollution in the execution of contracts with (*Company name*). They must also undertake to notify the HSE Manager of the details of any environmentally harmful substances they intend to use in the execution of their contracts and the precautions they intend to employ to prevent pollution by those substances.

4.3 Assessment of Environmental Probity
Regular contractors and suppliers to (*Company name*) are to be requested to supply details on the form which is attached to this procedure as an appendix.

Where a supplier or contractor gives answers to any question in part 2 of the form which are unacceptable, the HSE Manager is to satisfy himself that the continuation of the contract presents no risk to (*Company name*) or to its good name and he should work with the contractor to achieve improvement to a satisfactory standard. Where improvement to a satisfactory standard cannot be achieved or it is the opinion of the HSE Manager that the continuation of such a contract does present such a risk he shall do one of the following:

- Make recommendations to the Environment Committee, which must be communicated to the supplier or contractor, to remedy the shortcomings;

- Recommend to the Environment Committee that the contract be cancelled where it is not possible to remedy the shortcomings of the supplier or contractor.

Notify the supplier or contractor, who is regarded as satisfactory for approval by the Environmental Coordinator and endorsed by the Environment Committee, that their details have been recorded on a register held by the Administration Manager.

5. Records

- Letters to prospective suppliers and contractors
- Contract conditions
- Details of environmentally harmful substances to be used
- Details of precautions to be taken
- Environmental probity questionnaires
- Recommendations to remedy shortcomings
- Recommendations to cancel contracts
- Environment Committee minutes
- Register of approved suppliers and contractors

Sample Environmental Probity Questionnaire

Please provide the information requested in Part A of this questionnaire together with a copy of your Company's Environmental Policy which must be signed and dated.

Part A

- Name of Company
- Registered address
- Name and designation of officer with environmental responsibility
- Details of contract with (*Company name*)
- Does your Company have an Environmental Policy? Yes/No
- How is your Company Environmental Policy communicated to your employees and the purchasers of your goods and services?

Part B

Please supply full details in response to each subject from this part of the questionnaire, and demonstrate, where necessary, the effectiveness of the measures you have in place.

- Details of objectives and targets set to meet the Environmental Policy commitments;
- Details of how your company's environmental performance is monitored, particularly, but not only, in relation to individuals;
- Details of environmental training given to staff including how it is recorded and updated;
- Details of your environmental incident reporting system, including the method of review and reporting of findings to affected purchasers of your goods and services;
- Details of how you communicate and enforce your company environmental requirements, particularly in relation to your subcontractors or others who may affect you by their actions;
- Details of how your company's internal audits are carried out and recorded, including how findings, deficiencies and non-compliances with Environmental Policy requirements are followed up and acted upon;
- Details of any civil claims made against your company in relation to any contracts, in particular for the provision of similar goods or services you are either providing, or seeking to provide, to (*Company name*);
- Details of any statutory notices served on the Company in relation to environmental enforcement in the past 3 years;
- Details of any convictions for environment- or pollution-related offences in the past 3 years.

Name of person providing information ……

Position in Company ……

Signature ……..

ENVIRONMENTAL PROCEDURE NO. 13

Marine Pollution

1. Scope

This procedure defines the response to the Environmental Policy commitment to prevent pollution in respect of the marine environment.

2. Responsibility

The responsibility for implementing this procedure is delegated to all managers throughout (*Company name*).

3. References

- Environmental Policy

4. Procedure

4.1 Notification and recording
Safety Engineers are responsible for carrying out inspections to identify any potential sources of marine pollution. Identified areas are to be reported to the HSE Manager for evaluation and suitable remedial action. The HSE Manager will instigate the required remedial action within a timescale appropriate to the risk. The HSE Manager will maintain a register of required remedial actions to ensure that their progress is tracked. Any unacceptable delay in instigating action will be reported directly to the Project Manager.

4.2 Use of temporary solutions
Where leaking equipment poses a marine pollution risk, temporary solutions, such as drip trays, may be used, but only until a permanent solution can be applied.

4.3 Setting Objectives and Targets
On receipt of the report detailed in 4.1 above the Environment Committee may set objectives and targets to remedy the situation where a long term solution is appropriate.

5. Records

The following records and documentation should be maintained in support of this procedure:

- Notification of potential marine pollution
- Register of remedial actions
- Environment Committee minutes
- Objectives and targets

ENVIRONMENTAL PROCEDURE NO. 14

Waste Management

1. Scope
To detail the steps to be taken by (*Company name*) to ensure compliance with their duty of care in relation to waste and hazardous waste in particular to provide guidelines for waste minimization, reclamation, recycling and the prevention of nuisance in relation to wastes produced by their activities and operations.

2. Responsibility:
The responsibility for implementing this procedure is delegated to all managers throughout (*Company name*).

3. References
- Environmental Policy
- Objectives and targets
- Waste Management Plan

4. Procedure

4.1 Storage of waste
All waste shall be stored only in containers and skips suitable for the purpose. Such containers shall prevent access by pests. Where waste containers are used for food waste the food must be held in suitable bags to prevent contamination of the waste containers or the waste containers be regularly cleaned.

4.2 Collection of waste
Waste collections shall be arranged at such intervals as to prevent overflowing and nuisance.

4.3 Segregation of wastes
Wastes shall be segregated at the point of production. Where commercial opportunities exist, the varying types of waste shall be reclaimed or recycled as per the waste management plan. Where necessary, waste such as cardboard shall be compacted to facilitate efficient storage.

4.4 Hazardous Wastes
Waste that would render a consignment to be classified as "Special" must not be allowed to leave the site with normal waste. Where such consignments are generated, local managers must contact the HSE Manager for advice on disposal. This procedure does not apply to wastes such as asbestos and PCBs which may be generated during the demolition phase of the contract as they will already be subject to special arrangements.

5. Records:
The following records are maintained in support of this procedure:

- Hazardous Waste Consignment Notes

ENVIRONMENTAL PROCEDURE NO. 16

Water Management

1. Scope
To detail the actions to be taken to minimize the use of water within (*Company name*).

2. Responsibility
The responsibility for implementing this procedure is delegated to all managers.

3. References
- Environmental Policy

4. Procedure

4.1 Vehicle Wash Stations
Water meters are to be placed at vehicle wash stations with readings reported to the Environment Committee by the HSE Manager on a quarterly basis. The Environment Committee may wish to consider the use of water recirculation systems. Any decision to convert to a recirculation system must take account of the Health and Safety implications for staff and customers and must be subject to risk assessment, paying particular attention the control of microbial activity in the recirculating water.

4.2 Sanitary Accommodation
Toilet blocks fitted with automatically flushing urinals and water closets shall have measures in place to conserve water when the toilets are not being used or the facility is closed. These measures can range from time switches to close valves when the facility is closed to movement indicators to restrict flushing during low occupancy. Water conservation measures shall not be allowed to impede or detract from the highest standards of hygiene in sanitary accommodation.

5. Records:
The following records are maintained in support of this procedure:

- Water meter readings
- Environment Committee Minutes

ENVIRONMENTAL PROCEDURE NO. 17

Performance of Pollution Control Equipment

1. Scope
To identify the performance requirements in relation to Pollution Control Equipment and the method of reporting substandard performance.

2. Responsibility
Responsibility for the implementation of this procedure is delegated to managers and those persons identified in the text.

3. References
Environmental Policy and Procedures

- Incident Reporting

4. Procedure

4.1 Definition of "Pollution Control Equipment"
Pollution Control Equipment, in the context of this procedure, is equipment or plant whose purpose is the prevention or mitigation of pollution to any medium by any pollutant that would otherwise escape to the environment.

4.2 Examples of Pollution Control Equipment (PCE)
Examples of PCE are:

Interceptors to prevent the escape of chemicals that would otherwise pollute drains, water courses or ground. This includes water treatment facilities, filters and liners.

The HSE Manager and other responsible managers have the freedom to identify and specify other types of plant and equipment as PCE. Such plant and equipment need not be owned by ---------- but is operated on its work sites in the performance of its operations or under the terms of contracts. An example is equipment to reclaim or recycle CFCs during refrigeration contract works.

4.3 Failure or substandard performance of PCE
Instances which give rise to either failure or substandard performance of PCE which has or could give rise to a pollution incident shall be the subject of an Incident Report. Such reports shall be treated as any other incident report and completed in accordance with the requirements of Environmental Procedure No. 9.

4.4 Inspection of PCE
Managers are to inspect PCE at regular intervals as agreed with the HSE Manager. Initially the inspection shall be daily, unless there are specific requirements which dictate more frequent inspections. Following a representative period of inspections, managers may relax the inspection frequency provided such a relaxation is agreed by the Environmental Committee and written into the Environmental Committee minutes. For each type of PCE inspection protocols detailing the points to be noted in the inspection shall be communicated, in writing, to managers by the HSE Manager.

5. Records
The following records are to be maintained in support of this procedure:

- Additional lists of PCE
- Incident Reports
- PCE inspection protocols
- PCE inspection frequency reports
- Environmental Committee minutes

Objectives and Target Management Programme Form

Objectives & Target Management Programme		
Objectives & Targets	**Overall Responsibilities**	
General Manager (Signature):	Environmental Representatives (Signature):	Date:

Management Programme			
Programme element/items	**Responsibilities**	**Due Date**	**Actual Date**

Tracking & Close Out	Intermediate reviews required Yes ❒ No ❒
Intermediate Review (Date and Signature):	Intermediate Review (Date and Signature):
Close out by management review (Date and signature):	

Appendix II Glossary of Terms

Audit: A planned, independent, and documented assessment to determine whether agreed requirements are being met.

Certification: Procedure by which a third party gives written assurance that a product, process, or service conforms to specified requirements.

Certification Body: Body that conducts certification of conformity.

Certify: To provide written assurance that a product, process, or service conforms to specified requirements.

Certified: The EMS of a company, location, or plant is certified for conformance with ISO 14001 after it has demonstrated such conformance through the audit process. When used to indicate EMS certification, it means the same thing as registration.

Compliance: An affirmative indication or judgment that the supplier of a product or service has met the requirements of the relevant regulation; also the state of meeting the requirements.

Compliance Audit: A systematic, documented, periodic and objective review by regulated entities of facility operations and practices related to meeting environmental requirements.

Conformance: An affirmative indication or judgment that a product or service has met the requirements of the relevant specifications; also the state of meeting the requirements. Usually refers to meeting requirements of the ISO 14000 management standards.

Continual Improvement: Process of enhancing the environmental management system to achieve improvements in overall environmental performance, in line with the organisation's environmental policy. Note - the process need not take place in all areas of activity simultaneously (ISO 14001).

Environmental Performance: The measurable results of the environmental management system, related to an organisation's control of its environmental aspects, based on its environmental policy, objectives, and targets (ISO 14001).

Environment: Surroundings in which an organisation operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelation. Note - surroundings in this context extend from within an organisation to the global system (ISO 14001).

Environmental Aspect: Element of an organisation's activities, products, and services that can interact with the environment (ISO 14001).

Environmental Audit: Systematic, documented verification process of objectively obtaining and evaluating audit evidence to determine whether specified environmental activities, events, conditions, management systems, or information about these matters conform with audit criteria, and communicate the results of this process to the client (ISO 14010).

Environmental Impact: Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products, or services (ISO 14001).

Environmental Management System (EMS): Organisational structure, responsibilities, practices, procedures, process, and resources for developing, implementing, achieving, reviewing, and maintaining the environmental policy (ISO 14001).

EMS Audit: A systematic and documented verification process to objectively obtain and evaluate evidence to determine whether an organisation's environmental management system conforms to the EMS audit criteria set by the organisation, and to communicate the results of this process to management (ISO 14001).

EMS Audit Criteria: Policies, practices, procedures, or requirements, such as covered by ISO 14001, and, if applicable, any additional EMS requirements against which the auditor compares collected evidence about the organisation's EMS (ISO 14011).

Environmental Performance Evaluation: Process to measure, analyze, assess, report, and communicate an organisation's environmental performance against criteria set by management (ISO 14031 WD4).

Environmental Policy: Statement by the organisation of its intentions and principles in relation to its overall environmental performance, which provides a framework for action and for setting of its environmental objectives and targets (ISO 14001).

Environmental Target: Detailed performance requirement, quantified wherever practicable, applicable to the organisation or parts thereof, that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives (ISO 14001).

Fence-line: The area in which an organisation chooses to implement its environmental management system, a department, division or specific operation.

Gap Analysis: A comparison of an organisation’s existing management structure for environmental aspects against the elements of an environmental management system. Used to identify what EMS elements are missing.

Interested Party: Individual or group concerned with or affected by the environmental performance of an organisation.

Quality System: Organisation structure, procedures, processes, and resources needed to implement quality management (ISO 8402).

Stakeholders: Those groups and organisations having an interest or stake in a company's EMS programme e.g. regulators, shareholders, customers, suppliers, residents, investors and special interest groups.

Standard: A recognized unit of comparison which provides a gauge of the "correctness" of those things we are comparing.

System: Collection of unit processes that when acting together, perform some defined function; what an organisation will do, who will do it, how it will be done (ISO 14004).

Third Party: Person or body recognized as being independent of issue involved, as concerns the issue in question. *Note: Parties involved are usually supplier "First Party" and purchaser "Second Party" and external auditor "Third Party" (ISO Guide 2).*

Verification: Process of authenticating evidence (ISO 14010). The act of reviewing, inspecting, testing, checking, auditing, or otherwise establishing and documenting whether items, processes, services, or documents conform to specified requirements.

ملخص تنفيذي

تقدم هذه الوثيقة مقترحات لوضع لوائح وإجراءات ودليل إرشادات تقييم الأثر البيئي ونظم الإدارة البيئية لمشاريع مصائد الأسماك / الاستزراع السمكى تم إعدادها للهيئة الإقليمية للمحافظة على بيئة البحر الأحمر وخليج عدن.

تشتمل هذه الدراسة علي ثلاثة جوانب رئيسية لمشاريع مصائد الأسماك ، وهي :

- مشاريع الاستزراع السمكى.
- مشروع ممارسات صيد الأسماك.
- الصناعات المتعلقة بمعالجة وتغليف المنتجات السمكية والاستزراع السمكى.

نظراً لأن كل دولة لديها نظمها القانونية والبيئية الخاصة بها فقد بذلت بعض المحاولات لضمان أن يكون العمل في الدراسة مزيجاً من المسائل الأكثر عمومية والمسائل الأكثر خصوصية وتحديدا. وهذا الأمر يتيح لكل دولة أن تعدل اللوائح والإرشادات والإجراءات الموصى بها بدون أن تفقد مزاياها ونظمها العلمية .

تنقسم الدراسة إلى قسمين حسب ما هو موضح أدناه :

- لوائح وإجراءات ودليل إرشادات تقييم الأثر البيئي .
- دليل إرشادات وإجراءات نظم الإدارة البيئية .

لقد نتجت هذه الدراسة عن توصية خرجت بها ورشة عمل عقدت في الغردقة بجمهورية مصر العربية خلال الفترة من 15 الي 17 سبتمبر 2002 نظمتها الهيئة بالتعاون مع منظمة الأغذية والزراعة العالمية، والمنظمة الإقليمية لحماية البيئة البحرية، مشروع اصلاح الساسات الزراعية بمصر، والمركز الدولى لإدارة الموارد المائية الحية. وقد طالبت توصيات ورشة عمل " الإدارة المستدامة للاستزراع السمكى البحرى وأنشطة المصايد صديقة البيئة" بوضع دليل إرشادات لتقييم الأثر البيئي ونظم الإدارة البيئية .

يجري تنفيذ برنامج العمل الاستراتيجي من قبل الهيئة الإقليمية بتمويل من البنك الدولي وبرنامج الأمم المتحدة الانمائى وبرنامج الأمم المتحدة للبيئة وبعض المنظمات المانحة الأخرى . لقد تم إعداد البرنامج عقب تحليل مكثف للمشاكل البيئية الإقليمية وقد تم اعتماده من قبل المجلس الوزاري للهيئة الإقليمية . يوفر برنامج العمل الإستراتيجي نظاماً تم وضعه علي نحو تعاوني بغرض صون وإدارة الموارد الساحلية والبحرية للإقليم [1]. يجري تنفيذ برنامج الأنشطة من خلال ستة مكونات متكاملة هي : تقليل مخاطر الملاحة والتلوث البحري ، و دعم وتشجيع الإدارة المتكاملة للمناطق الساحلية ، و الإستخدام المستدام للموارد البحرية الحية ، و صون الموائل والتنوع البيولوجي ، و إنشاء شبكة إقليمية للمناطق البحرية المحمية ، و تعزيز التوعية العامة والمشاركة . والجدير بالذكر أن هذه الدراسة تتوافق تماماً مع برنامج العمل الاستراتيجي للبحر الأحمر وخليج عدن وأهدافه .

[1] الإقليم يعني المنطقة التي ورد وصفها في المادة رقم (2) " التغطية الجغرافية " من الاتفاقية الإقليمية للمحافظة على بيئة البحر الأحمر وخليج عدن