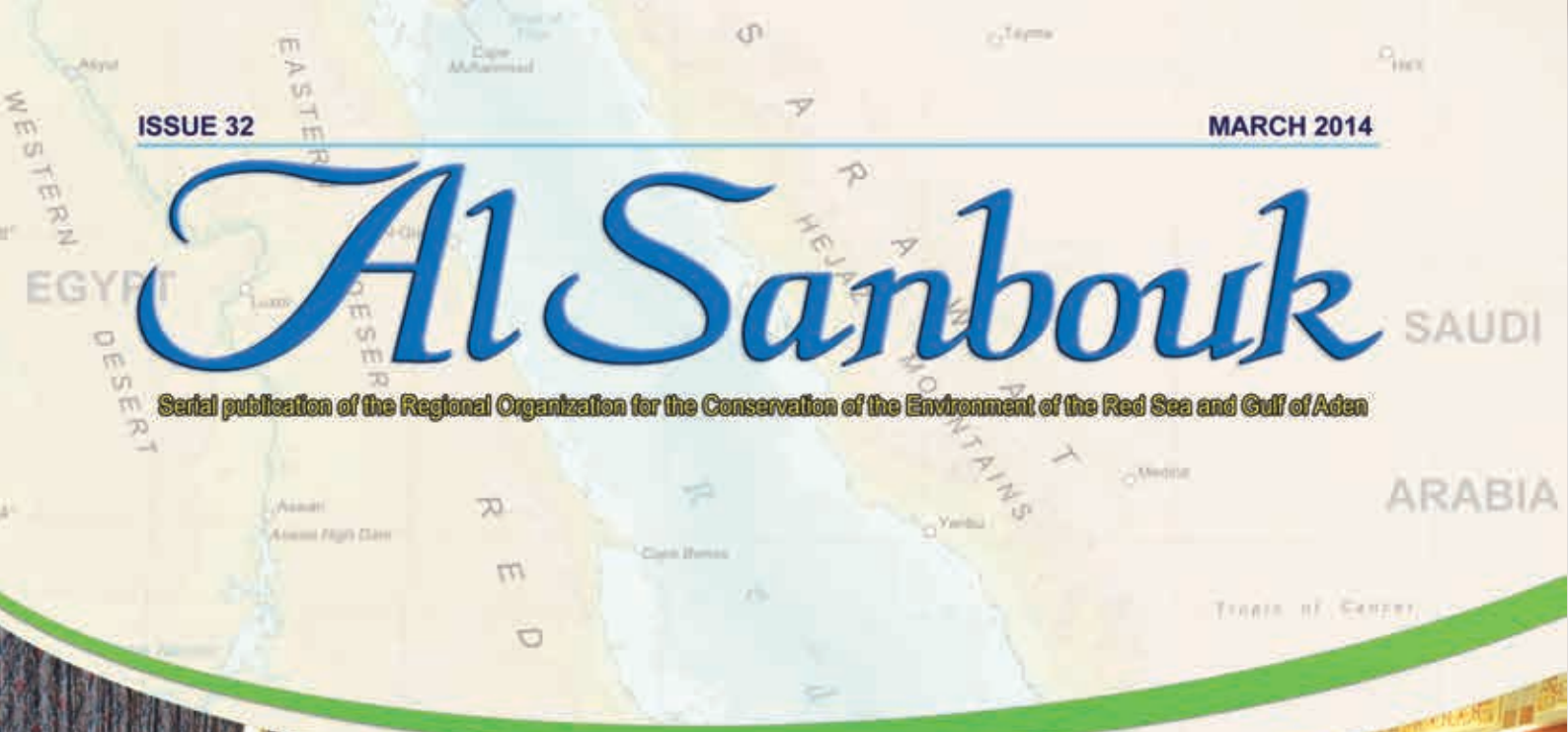


Al Sanbouk

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




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

Contents

■ Editorial.....	3
■ 15th Meeting of the PERSGA Ministerial Council	4
■ PERSGA Signs the Grant Agreement of the Project: Strategic Ecosystem Management of the Red Sea and Gulf of Aden	6
■ Ballast Water	
■ Larger Cargo More Ballast Water.....	8
■ Second National Workshop in Preparation for Drafting the Kingdom of Saudi Arabia National Strategy for Management of Ships' Ballast Water and Sediments, Jeddah, KSA. 21 Jamady Thany 1434 / 1st May 2013	9
■ Compliance Monitoring and Enforcement of Ballast Water Management Convention Aqaba, Jordan	10
■ National Training Workshop on Ballast Water Compliance Monitoring and Enforcement Port Sudan; Sudan	11
■ Sub-Regional Training Workshop on Ballast Water management Compliance Monitoring and Enforcement, Djibouti, Somalia, September 30th - October 3rd 2013	12
■ National Training Workshop on Ballast Water Management Compliance Monitoring and Enforcement, Yemen, 6th -8th Oct. '13	13
■ National Training Workshop on Ballast Water Compliance Monitoring and Enforcement Hurghada, Egypt.....	14
■ Persistent Organic Pollutant	
■ Protecting the Marine Environment from Chemical Pollutants in Yemen, April 2013.....	15
■ Hazardous Waste Management in Ship Recycling.....	16
■ An Isokinetic Stack Emission Sampling System for the Analysis of Dioxins and Furans.....	18
■ National Workshop on Specialized Environmental Inspection in the Coastal Area, Aqaba Jordan.....	19
■ Importance of Sound Waste Management in Cutting UP POPs Emissions on the Sudanese Coast of the Red Sea & Introduction to CAMEO Modeling Package	20
■ National Training Workshop on Stockholm Convention for Persistent Organic Pollutants and Meeting of the Saudi Arabia, National Chemical Safety Committee	21
■ Cooperation with IMO	
■ Regional Training Workshop on Port State and Flag State Control for Protection of the Coastal and Marine Environment, Jeddah, Kingdom of Saudi Arabia January 6th - 7th, 2013	22
■ National Workshop on Oil Spill Risk Assessment in Egypt, May 27th - 29th 2013	23
■ MARPOL Convention Annexes I, IV & V: Adequate Reception Facilities for Waste. Hurghada, Egypt, 3rd - 5th June '13	24
■ Energy Efficiency and Cutting Green House Gas Emissions from Ships; MARPOL Annex VI.....	25
■ National Training Workshop on Environmental Considerations for Port State and Flag State Control Inspections, Jeddah, Saudi Arabia - 23rd - 26th December, 2013.....	26
■ Marine Biodiversity	
■ Training Program to Strengthen the Capacity to Monitor and Restore the Living Resources of the Marine Environment, Jazan, April 2013	30
■ Rehabilitation of marine living resources, Al-Wajh, Kingdom of Saudi Arabia	32
■ Climate Change	
■ Launching a new On-ground Project Addressing Adaptation to the Impacts of Climate Change in Yemen.....	34
■ Side Event at the UNFCCC COP19-CMP9 in Warsaw.....	35
■ Management of Blue Carbon Resources in PERSGA Region.....	35
■ PERSGA Secretary General Addresses COP-19.....	37
■ The UNFCCC COP 19/CMP 9 Meetings in Warsaw Poland.....	38
■ Impacts of Sea Level Rise and Coastal Ecosystem Based Adaptations	39
■ Environmental Education	
■ National Workshop for School Clubs in Aden -Yemen	40
■ Training Workshop on Environmental Clubs Management (Sudan).....	40
■ Training Workshop on Environmental Clubs Management (Yemen)	41
■ School Clubs in Portsudan - Sudan	42
■ Red Sea and Gulf of Aden Celebration in Yemen and Sudan	43
■ Artificial Coral Reefs in the Gulf of Aqaba.....	46

The material presented in this publication does not imply the expression of any opinion whatsoever on the part of PERSGA concerning the legal status of any country, territory, city or area or of its authorities, or concerning delimitation of its frontiers or boundaries. Although PERSGA makes every effort to ensure the accuracy of information presented, it cannot be held responsible for any errors, quotes or false statements that appear in this publication.

 <p><i>Under the patronage of</i> Prof. Ziad H. Abu Ghararah Secretary General</p>	Editorial Board	
	<p><i>Chief Editor</i> Dr. Mohammad Badran</p> <p><i>Design and Supervision</i> Eng. Islam Taha Mohamed</p>	<p>Dr. Maher Amer Dr. Salim Al-Moghrabi Dr. Mohamed Satti Dr. Ahmed Khalil Mr. Habib Abdi</p>

To join our mailing list or to receive additional copies please contact:
The Regional Organization for the Conservation of the Environment of the Red Sea and Gulf Of Aden
 P. O. Box 53662, Jeddah 21583 Kingdom of Saudi Arabia. E-mail: information@persga.org

For previous issues please visit our website: <http://www.persga.org>
 The editors encourage you to submit articles, reviews, and photographs for publication but cannot guarantee that they will be used.

Editorial

The increase in PERSGA activities, which will be quickly realized by the reader of this issue of *Al Sanbouk*, is a reflection of the fruitful regional cooperation between PERSGA and its Member States. This continuous committed cooperation has been the essential building block for developing partnerships with international organizations and agencies, which in their turn have widened the prospects for the region and increased the benefits from international collaborations and initiatives, as well as leveraging access to greater technical and financial assistance. In particular, most international agencies place a great emphasis on a regional approach with coordination that secures the harmonization and synergy needed for implementing our shared regional objectives for the conservation of a marine environment that falls under the governance of several adjoining countries.

Significant advancements were made through partnerships between PERSGA and international agencies last year. Several agreements for implementing new joint projects were signed during the year. Foremost of these is the agreement signed between PERSGA and the World Bank for implementing the Red Sea and Gulf of Aden Strategic Ecosystem Management Project, funded by the Global Environment Facility. This was in addition to several other agreements for new joint projects that were signed with UNEP and IMO in support of PERSGA activities including: the Regional Program of Action for Protection of the Marine Environment from Land-based Activities; the Regional Initiative for Blue Carbon; the Regional Initiative for Implementation of Ecosystem Based Management; the Regional Program for Reduction of Pollution from Maritime Activities and Shipping; the Regional Training Program; and others. All these come alongside completion of a joint project on Reduction of Unintentional Emissions of Persistent Organic Compounds with UNIDO, another joint initiative with FAO to build up the Regional Mechanism for Cooperation in Management of Fisheries and Mariculture, as well as PERSGA's continuous



cooperation with regional organizations such as ISESCO and the Arab League.

As we recognize the tangible benefits from our regional cooperation, we look forward to more support and endorsement by the Member States. PERSGA is always looking ahead to strengthen its cooperation and coordination with the National Focal Points as well as with other national agencies, experts and stakeholders in order to implement its Regional Programs. Working through joint projects with Member States and international agencies achieves the best outcomes and ensures the credibility of PERSGA with international organizations and funding bodies. Recognizing this, PERSGA has recently revised its finance and administrative by-laws to cope with recent development in project management systems and the requirements of international donors and organizations. PERSGA has also attracted new experts to support its technical team to meet the recent expansion of its regional programs and projects.

Prof. Ziad H. Abu-Ghararah

PERSGA Secretary General

15th Meeting of the PERSGA Ministerial Council



The PERSGA Ministerial Council held its 15th Meeting on 9 April 2013 in Jeddah, Kingdom of Saudi Arabia. The Council includes ministers responsible for the environment in the Red Sea and Gulf of Aden countries which constitute the Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden.

The Meeting was chaired by HRH Prince Turki Bin Nasser Bin Abdulaziz (President of Meteorology and Environment- PME in Saudi Arabia) and the current Head of PERSGA Ministerial Council.

The ministerial meeting, which was preceded by PERSGA Focal Points Session on 7 April 2013, assessed the performance and achievements during 2011-2012, and discussed and approved PERSGA work-plan for the biennium 2013-2014.

The Ministerial Council issued and approved several important recommendations and resolutions. These focused primarily on the following:

- Building capacities for monitoring radioactive and hazardous substances in the region.
- Adoption of two Regional MoUs on Port State Control and Cooperation in Fisheries Management.
- Adoption of two new Regional Strategies for Ballast Water Management, and Reduction of Unintentional Emission of Persistent Organic Pollutants (POPs) in the coastal zone.





- Implementation of joint projects and collaboration during the biennium 2013/2014 with several organizations including WB, IMO, FAO, UNEP, UNIDO, UNESCO/IOC, ISECSCO and others.
- Adoption of the ecosystem approach to management of coastal and marine environments.
- Strengthening the Regional Network for Contingency Planning and Response to Marine Pollution Incidents.
- Implementation of the Regional Strategy for Adaptations to Climate Change.



PERSGA Signs the Grant Agreement of the Project: Strategic Ecosystem Management of the Red Sea and Gulf of Aden



The Grant Agreement for the project ‘Strategic Ecosystem Management of the Red Sea and Gulf of Aden’ was signed by PERSGA and the World Bank on November 4th 2013. Preparation of the project has taken significant time and effort, but the result is worth it. The Project will fulfill an important need in the region for managing the coastal ecosystem of the Red Sea and Gulf of Aden. The Project Document has been prepared in close and direct coordination with PERSGA Member States and thus the objectives are best oriented to serve the interest of the countries.

On-the-ground projects will be implemented at specific sites in the region, but will be designed in a way that lessons learnt from them are suitable to serve elsewhere. Not only that but specialists from all PERSGA Member States will participate in these activities to exchange experience and enhance interregional collaboration at the level of official authorities, local communities and experts. World class international experts will be invited to participate in these activities with the target of putting the region at an internationally advanced level in managing coastal ecosystems. The principle of Marine Managed Areas will be carefully applied enabling the local communities to make the best possible benefits from the ecosystem goods and services yet preserving the ecosystem for future generations.



The monitoring component that will take place in all PERSGA Member States not only will improve environmental monitoring capabilities in the region, but will also take the Regional Monitoring Program a step forward by introducing regular socioeconomic monitoring of the impacts of human activities and coastal management.



PERSGA is deeply thankful to all Focal Points for their continued support during the preparation phase. PERSGA is also thankful to the World Bank for supporting this initiative and realizing GEF funding for the Project. Special thanks are due to all World Bank Country Directors in the PERSGA

region for their support to this initiative ever since it started as an idea. Efforts of colleagues from the World Bank who worked tirelessly with PERSGA officers to make this moment happen are highly valued, particularly those who participated in the Project Preparation Grant phase: Ms. Tracy Hart,

Ms. Sophie Herman, Ms. Samia Al Duajj, Ms. Sanne Agnete and last but not least Dr. Africa Eshogba-Olojoba. Every possible effort will be made to translate this Grant Agreement into fruitful actions for the benefit of people in the PERSGA region. PERSGA continues to look forward to extended collaboration with the World Bank and to realize even larger projects in the field of ecosystem based management and other pressing issues protecting the marine and coastal environment of the Red Sea and Gulf of Aden.



Larger cargo more ballast water

BALLAST WATER

The world has recently witnessed rapid technological advancements in ship building resulting in the production of larger and faster ships. These are capable of carrying more cargo and are thus in need of more ballast water when sailing with a cargo significantly smaller than their design capacity. The relatively short periods between ports, due to faster sailing, also gives alien species a better chance for survival in the ballast water and sediments. This has resulted in alien species from ballast water being one of the four most important risks to marine and coastal environments. The main issues related to alien species carried in ballast water are environmental, risks to biodiversity, socioeconomic and health risks.

With these risks becoming a serious concern, several international initiatives have been triggered by UN organizations. The International Maritime Organization (IMO) started developing instruments to deal with ballast water and sediments in the early 1970s culminating in the International Convention

on Ballast Water and Sediments Management being adopted in 2004. This convention has not entered into force yet, however the time is approaching rapidly. The convention needs to be ratified by 30 IMO member states with ships representing 35% of international shipping before it enters into force. Currently, the convention has been ratified by 38 member states representing about 31% of international shipments.

Once the Convention enters into force, two approaches for ballast water management will be initiated. The first involves ballast water exchange on the high seas which is intended as a temporary approach that will not be sufficient as a Convention requirement after a specific date set out in the Convention itself. The second approach, ballast water treatment, is a permanent approach that every merchant ship travelling outside its Flag State will have

to apply once the date specified in the Convention Schedules becomes due.



GloBallast Partnerships

Second National Workshop in Preparation for Drafting the Kingdom of Saudi Arabia National Strategy for Management of Ships' Ballast Water and Sediments Jeddah, Kingdom of Saudi Arabia, 21 Jamady Thany 1434 / 1 May 2013



In collaboration with the Presidency of Meteorology and Environment in the Kingdom of Saudi Arabia (PME), the Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA) organized a one-day national training workshop on ballast water management. The workshop was held at PERSGA headquarters in Jeddah, on the 21st Jamady Thany 1434 / 1st May 2013. This was the last day of a working week for preparation of the draft national strategy.

National specialists from PME and the General Ports Authority, accompanied by a regional consultant, visited all the different agencies concerned with ships' ballast water management and interviewed the responsible officers there. Discussions in the workshop included both material prepared by the IMO GloBallast Partnerships Project as well as a presentation summarizing the work done earlier in November 2012 by PERSGA and PME to develop

the framework for the National Strategy on Ballast Water Management in Saudi Arabia.

The workshop was officially inaugurated by Dr. Hatem Al Motairy representing Dr. Samir Ghazi Assistant of the PME President General for Environmental Affairs. It was attended by about 20 participants officially nominated by the different stakeholders including governmental authorities and universities. After the official opening, Dr. Badran, PERSGA, Regional Coordinator of GloBallast Partnership activities gave an introduction on ballast water management. Presentations then continued to be delivered by the consultant Dr. Salim Al-Moghrabi (Jordan) and Dr. Badran (PERSGA) according to the program. The workshop was highly interactive and ended with a number of practical recommendations for preparing the Saudi Arabia national Strategy for Ships' Ballast Water and Sediments Management.

Compliance Monitoring and Enforcement of Ballast Water Management Convention, Aqaba, Jordan



The Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA) organized a national training workshop on compliance, monitoring and enforcement of the Ballast Water Management Convention. This was held in Aqaba, Jordan over the period August 19th - 22nd, 2013. Organizing the workshop comes in the framework of PERSGA's participation in the GloBallast Partnerships Project executed by the International Maritime Organization (IMO). The workshop was conducted in collaboration with the Aqaba Special Economic Zone Authority and the Jordanian Maritime Authority and was kindly hosted at the lecture hall at the Jordanian Maritime Authority. About 24 specialists representing different sectors concerned with ballast water management in Jordan participated in the workshop.

The world has reached quite an advanced stage in the identification and handling of alien invasive species. The Ballast Water Management Convention identifies two types of solution to the problem. One is a temporary solution that should end completely about one year after the Convention's entry into force. It depends on changing ballast water on the high seas according to preset criteria. The other solution

is more permanent and depends on ballastwater treatment. Here ballast water is sterilized onboard using a suitable treatment system while the ship is on route between different ports. The International Maritime Organization has so far approved about 20 different systems for water treatment.

The workshop was highly interactive and included two field visits. The first was to the Marine Science Station, Aqaba (University of Jordan/Yarmouk University) where a coastal water sample was collected and its plankton content viewed under microscopes in the laboratory. The second field visit was to the Greek ship SAMJOHN LIGHT at the Port of Aqaba where the participants were briefed by the chief engineer about the management of ballast water on board and procedures with Port State officers. Participants also toured the ship guided by the Chief Engineer and were introduced to the points where ballast water levels could be measured in the tanks and also to points where samples could be collected for analysis if needed. PERSGA would like to take this opportunity to express its deep gratitude to both the Marine Science Station and to the officers and crew of the SAMJOHN LIGHT for facilitating these field visits.

National Training Workshop on Ballast Water Compliance Monitoring and Enforcement, Port Sudan, Republic of Sudan



A national training workshop on compliance, monitoring and enforcement (CME) of the Ballast Water Management Convention for Flag and Port State Control in Sudan was organized by PERSGA in collaboration with the IMO GloBallast Partnerships Project. The workshop was carried out over four days from September 2nd-5th 2013 in Port Sudan, kindly hosted by the Sudanese Maritime Ports Authority. The opening addresses were given by the Red Sea State Minister of Environment, the Head of Sudanese Maritime Ports Authority, the PERSGA representative, and the Regional Coordinator of the GloBallast Partnerships Project. The training was delivered in Arabic using the finalized CME training package. This has been developed by the GloBallast Partnerships Project working together with the International Union for the Conservation of Nature (IUCN) and the World Maritime University (WMU). Support was provided by IMO ITCP, the Total Foundation and the MPA of Singapore, and the materials translated into Arabic by PERSGA.

The CME training workshop was delivered by Dr. Mohammad Badran (PERSGA) and two Regional consultants: Eng. Waleed Alsuheimat, Jordan and Dr. Abdullah Naser, Sudan. Representatives from the Sudanese Maritime Ports Authority also contributed by delivering parts of the material.

About 40 participants representing different stakeholders concerned with ballast water management in Sudan attended the workshop. The workshop included, on the second day, a field visit to the Red Sea Fisheries Research Station where a coastal water sample was collected and its plankton content seen under microscope in the laboratory. The third day also included a field visit on board the M/V JIN ZHOU HAI in Port Sudan, where the participants were briefed by the Ship's Chief Engineer about the management of ballast water on board and procedures with Port State Control Officers. Participants also toured the ship guided by the C/O and were shown how the level of ballast water in the tanks could be measured and samples for rapid and detailed tests could be collected.



Sub-Regional Training Workshop on Ballast Water Management Compliance Monitoring and Enforcement, Djibouti, Somali September 30th - October 3rd 2013



A four-day bi-national training workshop for Djibouti and Somalia on compliance, monitoring and enforcement (CME) of the Ballast Water Management Convention for Flag and Port State Control Officers was organized in Djibouti during the period September 30th - October 3rd 2013. The activity was funded by GEF UNDP GloBallast Partnerships Project and IMO's Integrated Technical Cooperation Program. The training was delivered in English using the CME training package that has been developed by the GloBallast Partnerships project in partnership with the International Union for Conservation of Nature (IUCN) and the World Maritime University (WMU), with support from IMO ITCP, the Total Foundation and the MPA of Singapore.

The workshop was inaugurated by the Secretary General of the Ministry of Urbanism, Infrastructure and Environment of Djibouti Mr. Dini Abdallah Omar and attended by about 25 participants representing various sectors dealing with the marine environment in the Republic of Djibouti and Somalia Federal Republic. Dr. Badran, PERSGA representative and Regional

Coordinator of the GloBallast Partnerships, in his opening address thanked the Republic of Djibouti for the organization of this important workshop and for support in inviting representatives from the Somalia Federal Republic to attend such an important workshop. He emphasized that this workshop has been developed by the GloBallast Partnerships project and it is held in the framework of cooperation between the IMO and PERSGA.

The CME training workshop was delivered by a consultant from the region, Dr. Salim Al-Moghrabi (Jordan) and Dr. Mohammad Badran from PERSGA. The workshop included, on the third day, a field visit to the Center of Studies and Research in Djibouti (CERD), where a coastal water sample was collected and its plankton content seen under microscope in the laboratory. The third day also included a field visit on board the ship (MPP Triumph), at the Port of Djibouti, that sails under the Marshall Islands Flag. Here the participants were briefed by the Chief Engineer about the management of ballast water on board and procedures with Port State Control Officers.

National Training Workshop on Ballast Water management Compliance Monitoring and Enforcement, Yemen October 6th - 8th 2013



A three-day national training workshop on compliance, monitoring and enforcement (CME) of the Ballast Water Management Convention for Flag and Port State Control Officers was organized in Aden, Republic of Yemen during the period October 6th - 8th 2013. The activity was funded by GEF UNDP GloBallast Partnerships Project and IMO's Integrated Technical Cooperation Program. The training was delivered in Arabic using the finalized CME training package that has been developed by the GloBallast Partnerships project in partnership with the International Union for Conservation of Nature (IUCN) and the World Maritime University (WMU), with support from IMO ITCP, the Total Foundation and the MPA of Singapore and translated to Arabic by PERSGA.

The workshop was inaugurated by the Deputy Governor of Aden, Mr. Ahmed Dalai and Mr. Murad Halmi Deputy Chairman of the Maritime Affairs Authority (MAA) and Dr. Mohammad Badran Director of Projects management PERSGA. The workshop was attended by about 35 participants representing various sectors dealing with the marine environment in the Republic of Yemen.

Dr. Badran, PERSGA representative and Regional Coordinator of the GloBallast Partnerships, thanked the Republic of Yemen for supporting the organization of this important workshop. He emphasized that this workshop has been developed by the GloBallast Partnerships project and it is held in the framework of cooperation between IMO and PERSGA through the National Focal Point in Yemen, the Environmental Protection Authority. Dr. Badran emphasized also that ballast water management is a collaborative work that cannot be handled by one authority alone and urged the different authorities concerned in Yemen to collaborate in order to achieve satisfactory results.

The CME training workshop was delivered in Arabic by a consultant from the region Dr. Salim Al-Moghrabi (Jordan) and Dr. Mohammad Badran of PERSGA. It witnessed active discussions between the participants and emphasized the importance of such activity in the capacity building of the various stakeholders. The workshop also included, on the third day, a field visit to Aden Ports where the various activities of the Port and the main characteristics of its strategic position as a link between Europe and Asia were outlined.

National Training Workshop on Ballast Water Compliance Monitoring and Enforcement, Hurghada, Egypt



A three-day national training workshop on compliance, monitoring and enforcement (CME) of the Ballast Water Management Convention for Flag and Port State Control Officers was organized in Hurghada, Egypt from 2 - 4 December, 2013. Welcome addresses were given by the EMARSGA Director, and the Red Sea Port State Authority. About 30 specialists representing different Egyptian agencies concerned with ballast water management participated in the workshop. The activity was funded by the GEF UNDP GloBallast Partnerships Project. The training was delivered in Arabic using the CME training package that has been developed by the GloBallast Partnerships Project together with the International Union for Conservation of Nature (IUCN) and the World

Maritime University (WMU), with support from IMO ITCP, TOTAL Foundation and the MPA of Singapore, and translated into Arabic by PERSGA. The CME training material was delivered by Dr. Mohammad Badran, PERSGA representative and Regional Coordinator of the GloBallast Partnerships Project, a national consultant Dr. Gehan el Sakka, and Eng. Kamel Kazzaz the GloBallast Partnerships Project National Coordinator and Focal Point.

In addition to the presentations the workshop also included field trips. The participants visited the National Institute of Oceanography and Fisheries (NIOF) in Hurghada on the second day. Here a coastal water sample was collected and its plankton content viewed under microscopes in the laboratory. The second day also included a field visit on board the Saudi passenger ship (Mahabah) in the Port of Safaga. The participants were briefed by the First Officer about the management of ballast water on board. They also toured the ship and were shown how the level of ballast water in the tanks could be measured. The workshop witnessed active discussions between the participants and emphasized the importance of such national activities for capacity building of the many stakeholders.



Protecting the Marine Environment from Chemical Pollutants in Yemen, April 2013



PERSGA held a two-day national training workshop on Computer-aided Management of Emergency Operations (CAMEO) software in Aden, Republic of Yemen on 16th April 2013. The workshop introduced the fundamental elements of the software package as they relate to emergency situations to national experts from Yemen.

The training included technical information on the application of CAMEO and the integration of its components (CAMEOfm, CAMEO chemicals, MARPLOT and ALOHA). This was followed by a period of hands-on training conducted using a number of simulation examples to demonstrate the use of the software to respond to chemical incidents.



The workshop was held in Aden and was attended by 45 national experts from various maritime authorities, the Ministry of Environment and other agencies. The workshop also included training on an air sampling device. This piece of equipment has been provided by PERSGA to the General Authority for the Protection of the Marine Environment in Aden. The device will be used to collect air samples from industrial areas. It can provide data on the concentration and spread of organic pollutants and hence assist with evaluations of their impact on the population.

Hazardous Waste Management in Ship Recycling



PERSISTENT ORGANIC POLLUTANT

In the framework of its training program and regional strategy in enhancing hazardous substances management, PERSGA has organized a training workshop on Hazardous Waste Management in Ship Recycling. The workshop took place at the Centre for Emergency Mutual Aid in the Red Sea and Gulf of Aden “EMARSGA”, Hurghada Egypt, during the period May 20th -21st 2013.

The ship breaking and recycling industry (SBRI) converts end-of-life ships into steel and other recyclable items. Ship recycling offers the most environmentally sustainable way of disposing of old vessels, with virtually every part of the hull and machine complex being reused or recycled as scrap metal. Although the industry is beneficial from a life-cycle assessment point of view, over the years it has gravitated toward countries with low labor costs, weak regulations on occupational safety, and limited environmental enforcement. The “global shift” in the industry to countries with comparatively weaker regulatory systems is of particular concern as ships contain many hazards that can have significant detrimental effects on humans and the environment if not dealt with properly. Environmental protection is limited in most yards and sound management of asbestos, polychlorinated biphenyls (PCBs), ozone-depleting substances (ODS), and a range of heavy metals is virtually nonexistent. Lately some efforts

at minimizing the release of such pollutants in the environment are emerging in some countries. Recognizing the need for coordinated action on the issue, the International Convention for the Safe and Environmentally Sound Recycling of Ships was adopted by a diplomatic conference under the auspices of the International Maritime Organization in Hong Kong, China, in May 2009. The Hong Kong Convention (HKC) enters into force once ratified by 15 countries with specified capacities of tonnage and recycling facilities.

The supply of vessels for scrapping from the shipping sector is subject to large variations as a consequence of the global demand for seaborne transport. Between 2004 and 2008 shipping saw unsurpassed freight rates as a result of high demand for maritime transportation. That high demand kept even older ships in operation during that period. This resulted in a record low number of vessels being offered for scrapping. On average, some 700–800 ships larger than 499 gross tonnage are scrapped annually, but during the shipping industry’s global boom years the figure was only 300–400 vessels. Following the recent economic recession, however, the demand for maritime transportation has declined. As a result, the number of vessels scrapped in 2009 was estimated to have reached 1,200 equal to a capacity of more than 25 million gross tonnage. The future demand for scrapping is not expected to fall to previous



lows even if the global economy picks up. This is due to the generation of a massive order book in the shipbuilding yards during the boom years, which will be completed by 2013. Thus tonnage will be in excess of demand for at least 5-10 years to come. Already today, more ships are laid-up than for the past 20 years and unless global market conditions change dramatically, a significant part of this fleet will undoubtedly go directly for scrapping. If ships are exported or imported for scrapping they would be subject to the Basel Convention which was set up to control the transboundary movement of hazardous waste and its disposal.

The workshop was organized in collaboration with UNIDO to enhance awareness in the PERSGA region of the risks as well as the advantages of the ship scrapping business. The main objectives of the workshop were to:

- enhance awareness of ship recycling activities focussing on environmental and health aspects associated with handling hazardous material
- identify from national representatives the current status & needs for ship scrapping or recycling in PERSGA countries
- discuss international conventions relevant to

ship recycling namely Hong Kong Convention, Basel Convention, Rotterdam Conventions and Stockholm Convention as well as conventions from the World Labour Organization

- discuss and agree on recommendations for appropriate training needs and capacity building for protection of the marine and coastal environment of the PERSGA region from organized or unorganized ship recycling and ship scrapping activities

Approximately 20 participants attended drawn from government officers responsible for environmental safety and occupational health at ports, shipyards and maritime customs as well as representatives from the private sector involved in handling waste in general and hazardous waste in particular. The workshop was presented in English and Arabic and was facilitated by Dr. Nikos Mikelis an international expert on the Hong Kong Convention, Eng. Adel al Shafe'e a regional expert on the Basel Convention, and Dr. Mohammad Badran the PERSGA Projects Coordinator of the Marine Pollution Reduction Program. The workshop constitutes a significant step towards meeting PERSGA's objectives in joining the GEF-funded international project on environmentally sound management of ship recycling.

An Isokinetic Stack Emission Sampling System for the Analysis of Dioxins and Furans



PERSGA and its member states have developed a strategy for the reduction of unintentionally produced persistent organic pollutants (UP-POPs). Within this framework, an isokinetic stack emission sampling system has been provided to the Egyptian Environmental Affairs Agency (EEAA). The system was delivered to the Red Sea Branch of EEAA in conjunction with a training workshop covering techniques for the collection of samples of dioxin and furan for analysis, sample handling and operation of the equipment.

The workshop took place during the period June 2 - 6, 2013. The primary objective was to train national specialists from Egypt in the handling and operation of the isokinetic sampling system and establish a team with the skills to collect and analyze samples for their dioxin and furan content. The training was attended by two specialists from the EEAA in addition to a representative from PERSGA. The training was organized in two parts:

- Theoretical training which included lectures introducing the isokinetic system and stack emissionsamplingrequirements and techniques, in addition to the calculations related to the sampling process. EPA methods

1,2,3,4,5 & 23 were also introduced during the training.

- Practical training, which was divided into two parts, The first part was an indoor training on operating the sampling system in the laboratory and collecting samples using a model chimney built locally at the laboratory. The second part was performed in collaboration with one of the hospitals in Hurghada, which contains a medical waste incinerator, where the chimney was used for practical training on handling the system and collecting real stack emission samples. The training also included sample handling and system cleaning before and after the sampling process.



National Workshop on Specialized Environmental Inspection in the Coastal Area, Aqaba Jordan



A national workshop on specialized environmental inspection in the coastal zone was organized under the patronage of H.E. Dr. Mohannad Hararah, Environment Commissioner at the Aqaba Special Economic Zone Authority (ASEZA). The workshop was carried out as a collaborative exercise between ASEZA and PERSGA within the framework of the regional strategy for cutting persistent organic pollutant emissions in the coastal zone of the Red Sea and Gulf of Aden. H.E. Professor Ahmad Abu Hilal Dean of the Faculty of Marine Sciences, Executive Director of the Aqaba Branch of the University of Jordan, and Dr. Mohammad Badran Director of Project Management at PERSGA addressed the opening session. The speakers welcomed the participants from various disciplines and emphasized the importance of the workshop and its significance in protection of the coastal and marine environment.

The workshop was carried out at the University of Jordan Aqaba Branch during the period June 10th - 11th 2013. It emphasized the principle of partnership between industry, higher education

and government as well as the public awareness and shared responsibility in environmental protection and sustainable exploitation of resources. The main objective of the workshop was to introduce specialists from industry and from higher education to specialized industrial inspection and to the authorities working on it in Jordan at ASEZA, Ministry of Environment and the Royal Administration for Environmental Protection.

Recommendations from the participants at the conclusion of the workshop stressed the importance of environmental awareness and self-monitoring within industry. They also included a recommendation that similar workshops be conducted with practical sessions included. Participants representing industry expressed the will of their administrations to contribute by providing technical and human resources for future workshops. Participants from the university expressed their interest in teaching parts of the material presented in the workshop in material taught at the Faculty of Marine Sciences.

Importance of Sound Waste Management in Cutting UP POPs Emissions on the Sudanese Coast of the Red Sea and Introduction to CAMEO Modeling Package



PERSISTENT ORGANIC POLLUTANT

As part of the implementation process of the Regional Strategy for reducing emissions of unintentionally produced persistent organic pollutants (UP-POPs), PERSGA organized a national training workshop in collaboration with the Red Sea University, the Marine Environmental Protection Administration and the Red Sea State Cleaning Corporation. The workshop, titled “The Importance of Sound Waste Management in Cutting UP-POP Emissions on the Sudanese Coast” also included an introduction to the CAMEO package for modeling the spread of gaseous chemicals.

The workshop was carried out on September 3rd-4th 2013 at the Distance Learning Unit in the Red Sea University. It was inaugurated by H.E. Minister of Environment and Tourism of the Red Sea State, Director of the Red Sea University and PERSGA representative Dr. Mohammad Badran. The national speakers thanked PERSGA for organizing the workshop and urged the participants to make the best possible use out of it. The PERSGA representative in turn thanked Sudan and the Red Sea State for hosting the workshop. The event was coordinated at the national level by Prof. Ahmad Abd el Aziz Dean of Scientific Research, Red Sea University. Mr. Othman Khalil Director of the

Red Sea State Cleaning Corporation was closely involved with the organization of the workshop. About thirty national specialists, in addition to four specialists from PERSGA, participated in the workshop, which witnessed four technical sessions and a session for drafting conclusions and recommendations.

The workshop came out with a number of recommendations. The main recommendations include: the urgent and indispensable need to improve legislation concerning environmental protection; completing the designs and operating selected landfills following scientifically based international standards, acknowledging that one landfill could be enough at the time being but with the rapid expansion of the population south of Port Sudan it is essential that another landfill be considered for that area; enhancing environmental trust funds at the national and state levels with contributions from the Ports and Oil Terminals as they may face numerous types of pollution; considering establishing an environmental and ecological unit in the Maritime Emergency Centre; encouraging competition between different companies and between the private and public sectors as a tool for improving services and cutting the cost of waste management.

National Training Workshop on Stockholm Convention for Persistent Organic Pollutants and Meeting of the Saudi Arabia National Chemical Safety Committee



PERSGA organized a two day national training workshop in collaboration with the Presidency of Meteorology and Environment on the Stockholm Convention on Persistent Organic Pollutants. The convention, that was signed in 2001 and became effective in 2004, aims to eliminate or restrict the production and use of these particular organic pollutants in order to reduce their harmful effects on the environment and human health. The workshop was carried out on December 17-18 2013 at PERSGA headquarters under the patronage of HE General President Dr. Abdulaziz Al Jasser and in the presence of HE PERSGA Secretary General Prof. Ziad Abu Ghararah.

In his opening address Dr. El Jasser pointed out the close relevance of the workshop's topic to our life as POPs may affect human health in addition to having adverse economic and social impacts. He expressed the strong intention of PME to implement the Stockholm Convention as timely and precisely as possible and urged the participants, who totaled about 30 specialists from different governmental agencies comprising the Saudi Arabia Chemical Safety Committee, to play their role in collaborating with PME in this respect. Prof. Abu Ghararah in turn emphasized

the persistent nature of these pollutants and their ability to move in different media and cross borders, which calls for regional and international collaboration when facing the risk of such pollutants. He stressed the close coordination with PME in handling POP matters in the Kingdom. The training workshop was facilitated by Dr. Mohamad Jamal el Hajjar and Dr. Mohammad Badran and was delivered in Arabic. It covered various subjects relevant to the Stockholm Convention, an introduction to the Convention and Saudi Arabia's status in the Convention in addition to discussing the use of Best Available Technology Best Environmental Practices "BAT BEP" in cutting POPs emissions and an outline for preparing the Saudi Arabia National Implementation Plan (NIP).

On the second day, December 18, the Saudi Arabia Chemical Safety Committee chaired by Mr. Suleiman El Ziben convened and discussed several issues including the Stockholm Convention and came out with practical conclusions and recommendations for initiating and facilitating the processes of preparing the Saudi NIP in fulfillment of the obligations of the Stockholm Convention.

Regional Training Workshop on Port State and Flag State Control for Protection of the Coastal and Marine Environment Jeddah, Kingdom of Saudi Arabia January 6th - 7th, 2013

PERSGA organized a regional training workshop on the role of Port State and Flag State control in the protection of the coastal and marine environment over the period January 6 - 7, 2013.

The workshop, held in Jeddah, was opened by the Secretary General (SG) of PERSGA Prof. Ziad H. Abu-Ghararah. He welcomed the participants and remarked on the importance of conducting such workshops, especially with the advent of enforcement of some major maritime environmental conventions such as the Ballast Water Management (BWM) Convention.



The PERSGA SG also highlighted some of the important activities and projects that PERSGA is engaged with in cooperation with member states. About 30 specialists representing different stakeholders from the region participated in the workshop, which was facilitated by the regional consultant Dr. Mohab Abu el Kawam and PERSGA expert Dr. Mohammad Badran. In four working sessions over two days, the following issues related to the Flag State and Port State role in the implementation and enforcement of the BWM convention were presented and discussed: the generation and management of a new Port State Control MoU in the Red Sea Region, and the varying roles of the Flag State vs the Port State in monitoring compliance by ships transiting and visiting ports of member governments in the region. During the third and fourth sessions, the means of optimum compliance with the BWM convention was explained to the participants. Participants came out with



some important recommendations that demonstrated the need to establish institutional and financial arrangements for the administration and implementation of the BWM convention throughout PERSGA member states at each Maritime Administration, and highlighted the importance of future training needs to PSCOs at the national level. This may need to be segregated to provide comprehensive technical expertise to contributing maritime administrations. At the end of the workshop participants were given all of the materials presented in the workshop on CD.

National Workshop on Oil Spill Risk Assessment in Egypt May 27th - 29th 2013



In collaboration with the National Focal Point in Egypt, Egyptian Environmental Affairs Agency (EEAA), PERSGA organized a national workshop at EMARSGA during the period May 27th - 29th 2013 on oil spill risk assessment. About 35 specialists from different stakeholders in the oil shipping and production industry participated in the workshop. In addition to speakers representing the different stakeholders and PERSGA, two more facilitators from the Arab Academy of Technology and Maritime Transport were invited.

The workshop was highly interactive and presentations covered a wide range of topics including the principles of conducting risk assessment and risks at oil production facilities, ports and the Suez Canal. Presentations also



covered risks of oil spills on sensitive habitats and protected areas and the role of military forces in controlling oil pollution in Egyptian territorial waters and EEZ. A half-day introduction to the CAMEO package was also provided.

The workshop was conducted as part of a national series being organized by PERSGA in its member states to enhance their preparedness for future oil spill events. The (EMARSGA) Centre, has this type of training as part of its operational mandate. A series of national contingency planning workshops have been carried out in all PERSGA member countries following OPRC IMO standards.

These training workshops have two primary objectives: preparedness and response training; and updating of the National Contingency Plans. In Egypt, upon request of the national specialists, the workshop focused on risk assessment as OPRC L2 courses are provided regularly.

The workshop ended with a number of recommendations emphasizing public awareness and outreach as strong tools for combating the large number of small routine oil spill incidents that occur and for adopting suitable measures to reduce or eliminate such events.

MARPOL Convention Annexes I, IV & V: Adequate Reception Facilities for Waste. Hurghada, Egypt, June 3rd - 5th 2013



COOPERATION WITH IMO

A Regional Workshop was organized by PERSGA in collaboration with IMO at EMARSGA in Hurghada, Egypt, over the period June 3rd to 5th 2013 on the MARPOL Convention Annexes I, IV and V relating to Adequate Reception Facilities. About 20 specialists from six PERSGA countries participated in the workshop. The workshop facilitated by Dr. Mohab Abu el Kawam and coordinated by Dr. Mohammad Badran, was highly interactive and provided a lush environment for the exchange of expertise and an open discussion of issues causing the delay in putting the Special Area status for the Red Sea and Gulf of Aden into effect.

In view of the importance to the Region of all States becoming parties to MARPOL, PERSGA has been helping to support this process. In 2005 PERSGA conducted a fact finding mission on the MARPOL requirements in the region. IMO has helped Sudan in a socioeconomic study concerning MARPOL ratification. PERSGA and IMO have also helped Yemen to identify its position regarding ratification of the MARPOL Convention.

PERSGA, with support from IMO, organized a workshop in 2009 on MARPOL Special Area Status. The Board of Ministers in its meeting in March 2010 requested countries and PERSGA to take the necessary actions to facilitate putting into effect the Special Area status of the Red Sea and Gulf of Aden. This workshop is another

step forward in joint PERSGA and IMO efforts to determine adequate reception facilities needed in the region and develop a practical approach to putting a request to IMO to consider defining a date for putting the Special Area Status of the Red Sea and Gulf of Aden into effect.

The main objectives of the workshop were to

- refresh participants information on MARPOL Convention and its regular updates
- discuss MARPOL convention regulations of Annexes V and VI in some detail
- identify from national representatives current status of reception facilities in PERSGA countries
- identify from national representatives reception services provided to ships in case of absence of structural reception facilities
- identify from national representatives their countries' positions towards the MARPOL Convention and discuss difficulties preventing some countries from ratifying the Convention.
- discuss and agree on practical steps with identified timelines for putting the Special area status of the Red Sea and Gulf of Aden into effect

Energy Efficiency and Cutting Green House Gas Emissions from Ships; MARPOL Annex VI



The Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA) organized a regional training workshop on Energy Efficiency and Cutting GHG Emissions from ships at its headquarters in Jeddah over the period November 25th - 26th 2013. The workshop was supported by the International Maritime Organization (IMO) International Technical Cooperation Program (ITCP), who provided the course material which was prepared by the World Maritime University (WMU). The course, inaugurated by H.E. PERSGA Secretary General, was attended by about 25 participants and facilitated by an international consultant Dr. Aykot Olcer from WMU, a regional consultant Captain Mutaz Farrag from the Arab Academy, in addition to a PERSGA expert Dr. Mohammad Badran.

The issue of GHG emissions from shipping is the focus of IMO MARPOL Convention Annex VI, namely in Chapter 4 of the Annex; Regulations for Energy Efficient Operation of Ships. This is a legally binding instrument that entered into force in January 2013. Therefore, State Parties and their Administrations have to be prepared to meet the requirements, obligations and schedules defined under this most recent Annex of the MARPOL Convention.

The workshop aimed to promote awareness within the region concerning the issue of GHG emissions from ships. It shed light on the latest MARPOL requirements that include the establishment of Energy Efficient Design Index (EEDI) for all new ships, as well as the certification requirements and development of Energy Efficiency Management Plans (SEEMP) for all ships. The Chapter puts forward a schedule for these measures: 1 January 2013 for SEEMP on all ships and EEDI on new ships; for older ships, EEDI will be implemented over three phases from 1 January 2015, 1 January 2020, and 1 January 2025.

The two-day workshop provided an effective platform for participants to exchange views and expertise on the subject. The workshop fully prepared the participants to deliver similar workshops to their counterparts in their home countries. Participants were provided with complete copies of all training materials including powerpoint presentations and handout materials. The participants expressed their full satisfaction with the course and indicated that they will be able to use the information learned in their professions and will pass on the knowledge to their colleagues.

National Training Workshop on Environmental Considerations for Port State and Flag State Control Inspections Jeddah, Saudi Arabia – December 23rd - 26th 2013



In collaboration with the Presidency of Meteorology and Environment in Saudi Arabia (PME), the Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA) organized a National Training Workshop on Environmental Considerations for Port State and Flag State Control Inspections. The workshop took place under the patronage of HE PME President General Abd El Aziz El Jasser and in the presence of HE PERSGA Secretary General Prof. Ziad Abu Ghararah at PERSGA headquarters during the period December 23rd - 26th 2013. About 25 specialists from different government agencies participated in the workshop, which was facilitated by the international expert Dr. Mohab abu el Qawam and PERSGA expert Dr. Mohammad Badran.

HE Dr. El Jasser emphasized in his opening address the importance of the shipping industry as ships carry about 90% of international trade

and as the shipping industry itself contributes a large fraction to the global economy through its companies and shipping fleets. Thus it was essential for this sector to be properly organized so that society gets the best possible benefits from it with the least possible environmental impacts. The International Maritime Organization (IMO) has been leading this initiative and has established several international conventions regulating the shipping industry, concerning safety, operational and environmental protection. Ships' compliance to the international conventions is, in the first place, the responsibility of the state identified by the flag the ship flies, called the Flag State. However because of the nature of shipping activities, moving across the oceans calling at ports of other countries and staying under jurisdictions of such countries while in their waters, it was essential that these countries would be given power to control ships' compliance through what is called Port State Control. This important workshop aimed to train Saudi specialists on the application of



the appropriate environmental control measures contained in both Port State and Flag State Control protocols. H.E. pointed out that this is not a job that can be done by a single agency, but it has to be a national effort in which all relevant government agencies and the private sector practice the best possible levels of collaboration. He expressed his gratitude to PERSGA for organizing the workshop and to the Ministry of Transport, the General Ports Authority and Jeddah Islamic Port for their collaboration in facilitating the practical part of the training; and thanked the participants for their participation wishing the workshop successful deliberations.

HE Prof. Abu Ghararah in turn, pointed out in his opening address that the importance of the workshop stems from three points. First is the nature of the Red Sea as a semi-closed sea characterized of the presence of large areas of

highly diverse beautiful coral reefs, with Saudi Arabia being the eighth country in the world with respect to the coral reef area in its waters. Second is that the Red Sea is an important ship traffic route serving about 21,000 ships per year. Third is the compliance to international conventions and collaborating with the international community in protection of the marine environment from pollution from ships. HE pointed out that PERSGA has prepared a

Port State Control MoU for countries of the Red Sea and Gulf of Aden, signed so far by four countries, and emphasized the importance of ratification of the MoU.

In addition to the theoretical training, the workshop contained a practical class that was conducted at Jeddah Islamic Port. Here the participants visited two ships and were given practical explanation on how violations to environmental regulations of international conventions may occur. The main conventions discussed in the workshop were MARPOL with its six Annexes, London Dumping Convention, Bunker Convention and the Ballast Water Management Convention. In addition regional collaboration in the framework of Regional Port State Control MoUs was also discussed pointing out the value of these legal instruments in harmonizing

inspection efforts between the countries and fostering regional collaboration in protection of the marine and coastal environment, while saving time and money through distributing the effort of ship inspection between partner countries and exchanging information through a common information base.



H.E. Dr. Al-Jassir, Chair of 15th PERSGA Ministerial Council and President of PME Visits PERSGA Headquarters



H.E. Dr. Abdelaziz bin Omer Al-Jassir, the President of Meteorology and Environment Kingdom of Saudi Arabia, visited PERSGA on 2nd January, 2014. This was the first visit from H.E. as the new President of PME and Chairman of the current PERSGA Ministerial Council Session 2013-2014. On this occasion, PERSGA organized a round table forum to provide H.E. Dr. Al-Jassir with an overview of PERSGA's mission, its programs, and the issues addressed at the regional level with their linked on-the-ground projects and activities which are implemented in each of the member states in collaboration with the national focal points.

The round table forum was opened with a welcome address and key presentation by H.E. Prof. Ziad bin Hamza Abu Ghararah, PERSGA Secretary General. The presentation provided a brief overview of PERSGA's history and establishment, its mission, legal framework and the progress made throughout the period of its emergence as a regional organization. He outlined the major achievements made, particularly the significant enhancement of regional legislation and the development of new protocols, expansion

of programs, and greater collaboration and partnerships with international and regional organizations.

The welcome note and key presentation by the PERSGA Secretary General was followed by three presentations on PERSGA's programs and activities, delivered by their coordinators. The presentations provided more detailed accounts of PERSGA's current and planned activities under various program components: Marine Pollution from both Sea and Land-based Activities; Climate Change and Living Marine Resources; and Biodiversity, Marine Protected Areas, and Environmental Awareness and Education.

At the end of the round table forum, H.E. Dr. Al-Jassir addressed the audience, noting and appreciating PERSGA's regional efforts and achievements. He values the close cooperation between PERSGA and PME, and emphasized that the Kingdom of Saudi Arabia, as the host country for PERSGA, is keen to maintain this collaboration and provide PERSGA with full support to achieve its mission for the conservation of the coastal and marine environments of the region.

PERSGA's Recent Publications

PERSGA continues to publish new reports, newsletters and documents related to its field surveys and studies. During 2013 PERSGA issued many publications and continued with the preparation of others such as Al Sanbouk and EMARSGA newsletters, maps, guidelines, leaflets and other outreach materials. Below are some examples of these publications:

Guidelines for diving sites with mooring buoys on the Jeddah coast, Kingdom of Saudi Arabia (Arabic)

PERSGA installed 40 mooring buoys along the Jeddah coast and issued these guidelines that include three dimensional illustrations of the sea bed and updated information on many sites derived from underwater surveys conducted during 2013.



Examples of PERSGA activities in the Kingdom of Saudi Arabia (Arabic)

PERSGA recently issued a booklet describing examples of its major activities in the Kingdom of Saudi Arabia. The book documents the outputs of activities and projects conducted in Saudi Arabia in cooperation and collaboration with the Presidency of Meteorology and Environment (PME). It also includes a detailed list of the specialists who participated in the training and capacity building activities.



Brochure about PERSGA (Arabic/English)

PERSGA issued an outreach brochure that explains the 'who, what, where and why' of PERSGA and describes its goals and objectives. The brochure, written for a non technical audience, includes a summary of information on all major activities and will be distributed at events, conferences and through public awareness activities.



PERSGA Training Program 2014 (English Language)

At the end of 2013 PERSGA updated its training plan and list of technical meetings for the year 2014 to include new projects and partnerships that are being executed; the training manual has been updated accordingly.



Sanbouk and EMARSGA newsletters (Arabic/English)

PERSGA has published issue number 32 of its Al Sanbouk newsletter. The issue included activities and projects conducted by PERSGA in 2013, in addition to scientific articles and some national activities taking place in PERSGA member states. The EMARSGA center published issue number 4 of the EMARSGA newsletter that covered the activities of the center and its cooperation with IMO and other regional and international partners.



Training Program to Strengthen the Capacity to Monitor and Restore the Living Resources of the Marine Environment, Jazan, April 2013



At the end of April 2013, PERSGA carried out a training program for building national capacity for monitoring, evaluation and restoration methods at Jazan. PERSGA prepared an integrated training program to create and strengthen national teams able to achieve and implement environmental survey and damage assessments on a scientific basis compatible with international and regional standards.

All those involved and interested in the protection of the marine environment from Jazan participated in this training program. PERSGA covered the implementation and financing of the program through its permanent program component: "Biodiversity Program".

The program extended from 9:00 a.m. to 04:00 p.m. daily for three days. The trainees acquired the opportunity to find out more information on the different topics of marine environment through references and data that were presented and explained during the program.

The PERSGA team introduced documentaries and scientific films, images that contributed towards raising the capacity of the trainees to understand more about the importance of the marine environment. The program included several panel discussions that gave the trainees an opportunity to understand important information and tools for the conservation of the marine environment.

At the end of the third day the trainees visited the coast of Jizan to learn about the environment and the threats facing mangrove trees and forests, as well as see practical on-the-ground methods for mangrove monitoring and restoration. During early May 2013, a team from PERSGA and the Presidency of Meteorology and Environment (KSA) made an exploratory tour of the Farasan Islands to collect information about the islands and the history of the Harid Festival.

The team met many of the inhabitants of the island, led by Sheikh, fishermen and the historian of the archipelago (Mr. Ibrahim Moftah) to talk

about the phenomenon and the history of the Harid festival. The conclusion of the interview and meetings are as follows:

The Harid (parrot fish) season is a unique phenomenon repeated annually at Fararasn Island in an area called by the same common name as the parrot fish (Harid), specifically on “Hadies’s Coast”.

The Island’s fishermen recognize the arrival of Harid by a characteristic smell coming from the beach after sunset around period of the full moon at the end of March and beginning of April of each year.

This smell arises from the corals’ eggs as the corals release their eggs all at once on one specific night of the year in a phenomenon called “coral reef mass spawning”.

It is the tradition of the people of the Island to celebrate this historic day with songs and folk



dances as it is a day of great importance in the culture of Farasan’s people.

Some observations suggest that parrot fish come to Hadies’s Coast to breed and to lay their eggs. However, the views, observations and preliminary information gathered from fishermen during the field visit indicate that parrot fish may visit Hadies’s Bay to rest or feed during their migration from the south to the north of the Red Sea. These views and observations need further research to explain the phenomenon.



Capacity Building for Coastal and Underwater Survey Methods and the Rehabilitation of Living Marine Resources, September 2013.



In September 2013, PERSGA carried out a training program to build national capacity in monitoring, evaluation and rehabilitation methods at Al-Wajh, in the Kingdom of Saudi Arabia.

PERSGA has prepared an integrated training program to create or strengthen the ability of national teams to implement environmental surveys and damage assessments on a scientific basis compatible with regional and international standards.

All those interested or involved in the protection of the marine environment from Al-Wajh participated in this training program. PERSGA covered the implementation and financing of the training through its permanent program component "Biodiversity Program".

The program lasted for seven hours each day for three days. The trainees were given the opportunity to find out more information on different topics related to the marine environment through references and data that were presented and explained during the program.

PERSGA coordinators introduced many documentaries and scientific films providing images that contributed towards raising the capacity of the trainees and helping them to understand more about the importance of the marine environment. The program included several panel discussions that gave the trainees an opportunity to exchange ideas and develop a better understanding of the important concepts and the need for conservation of the marine environment.



At the end of the training program the trainees visited the coast of Al-Wajh City to learn more about the nature and threats that face the coast

with special references to beach improvement and coastal land filling, as well as for the implementation of monitoring and rehabilitation methods on the ground.



Launching a new On-ground Project Addressing Adaptation to the Impacts of Climate Change in Yemen



PERSGA and the Environment Protection Authority (EPA) in Yemen are preparing to launch a new joint on-ground project entitled “Building resilience of coastal ecosystems in Yemen for adaptation to climate change impacts”. The project addresses coastal ecosystem-based adaptation, including tangible conservation and restoration actions on the Yemeni Red Sea coast as demonstration activities.

During June - July 2013, the regional coordinator of Living Marine Resources & Climate Change and the regional coordinator of Marine Protected Areas conducted a project preparation mission to Yemen. A series of consultation and coordination meetings were held at EPA headquarters in Sana’a, the EPA branch in Hodeida, and the city municipality. The project team also conducted

field visits to mangrove locations near Hodeida, whereby key sites were selected for the future collection of mangrove propagules, for the establishment of the proposed mangrove nursery and for restoration activities.

The mission also included a training session on mangrove restoration methods, which was organized at the EPA office at Hodeida. The training was focused on: site selection; propagule collection and nursery raising; transplanting wild seedlings for raising in nurseries, and from nursery to selected planting sites; in addition to some other aspects of mangrove restoration such as community participation, monitoring, etc. The training targeted the technical staff at EPA Hodeida branch, who will be involved in the mangrove restoration activities of the project.



Management of Blue Carbon Resources in the PERSGA Region

In collaboration with UNEP, PERSGA organized the 1st regional workshop on “Assessment and Management of Blue Carbon Resources in the Red Sea and Gulf of Aden” during 15-16 September 2013 at PERSGA HQ in Jeddah. Participants in the workshop included specialists from PERSGA member states, Saudi Arabia, Jordan, Egypt, Sudan, Djibouti and Yemen, in addition to experts from PERSGA, UNEP, AGEDI (UAE) and an international consultant from Perspectives GmbH (Switzerland).

Blue carbon is the carbon dioxide sequestered and stored by coastal wetlands and vegetations, which play a role in the uptake of carbon dioxide emissions and mitigation of climate change. The most important blue carbon habitats include mangroves, sea-grass and coastal salt marshes. The regional workshop came as a part of a regional initiative launched by PERSGA in collaboration with UNEP, and was preceded by a regional scoping study focusing on assessing the blue carbon resource potential and policy options in the PERSGA region. The long term objectives include establishing a database for blue carbon resources and planning for their conservation and development in the region, as well as mainstreaming blue carbon in economic valuation of coastal ecosystems, and in climate change and coastal protection policies.

In the press release, the PERSGA SG emphasized that blue carbon is an emerging topic in climate change global discourse, which might be considered in future IPCC and national communication reports, while IPCC is currently developing guidelines on blue carbon assessment. He indicated that the regional scoping study conducted by PERSGA suggests considerable blue carbon resources in the region, with Saudi Arabian coasts showing a relatively higher resource potential. This encouraged PERSGA to launch a demonstration project in Saudi Arabia in collaboration with PME and the Ministry of Petroleum and Mining.

Side Event at the UNFCCC COP19-CMP9 in Warsaw

PERSGA combined efforts with Saudi Arabia in organizing a joint side event at the UNFCCC COP19-CMP9 held in Warsaw 11-22 November 2013. The side event entitled “Carbon Management Efforts and Activities” took place on 14th November at the COP venue (Warsaw National Stadium), and was attended by many participants from the delegates of parties, observer organizations, NGOs and media in attendance at the COP.

The side event was moderated by Prof. Ziad Abu Ghararah, the Secretary General of PERSGA, who opened the event by welcoming the audience and provided a brief background on the objectives and themes of the side event. He clarified that the topics comprise two main parts. The first one focusing on strategies and initiatives for carbon management in the oil industry and green economy established in some GCC states, including Saudi Arabia, Kuwait and United Arab Emirates. The other part

focused on blue carbon in the Red Sea and Gulf of Aden (PERSGA region), the blue carbon resource potential, regional conservation management efforts, policy options, and PERSGA’s regional blue carbon initiative as a case in point addressing blue carbon habitats for ecosystem based mitigation and adaptation, and integration of blue carbon in climate change and conservation policies. This part also included an update on new assessment guidelines developed by IPCC.

Following this brief introduction, the agenda included a series of presentations delivered by the key speakers in the side event, comprising the following:

- Saudi Arabia Carbon Management Roadmap, by Dr. Ahmed A. Al-Eidan, Petroleum Engineer, Upstream Carbon Management Coordinator, Saudi Aramco, Saudi Arabia



- Opportunities in Green Economy, by Mr. Solaiman Al Rifai, Dubai Carbon Centre of Excellence, United Arab Emirates
- GHG Management in Kuwait Oil Sector, by Mr. Atef Al-Jameeli, Kuwait Petroleum Corporation (KPC), Kuwait
- Blue Carbon in the Red Sea and Gulf of Aden: Potential and regional conservation management efforts, by Dr. Ahmed Khalil, Regional Program Coordinator, Living Marine Resources and Climate Change, PERSGA
- Regional Blue Carbon policy options, entry points and future perspectives for the Red Sea and Gulf of Aden region, by Dr. Axel Michaelowa, Senior Founder Partner, Perspectives Climate Change
- Country Case Study on Integration of Blue Carbon in National Climate Change and Conservation Policies, by Mr. Nagmeldin Goutbi, Coordinator National Climate Change Unit in Sudan's Higher Council for Environment and Natural Resources
- 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories:

Wetlands, by Mr. Ismail Elgizouli, IPCC Vice-Chair

In the discussion following the presentations, several questions and points were raised, focusing chiefly on how to sustain such national and regional initiatives, carbon policies integration and opportunities for carbon management options in the wider region considering upstream and downstream systems in oil sectors and energy production and consumption, while particular emphasis was also put on conservation and enhancement of blue carbon habitats as natural carbon sinks.

In this connection, it has been highlighted that the coasts of the Red Sea and Gulf of Aden (PERSGA region), and the GCC region support rich Blue Carbon ecosystems, including extensive sea-grass beds, salt marshes and mangroves. In addition to carbon capture and storage, these ecosystems also support the renowned marine biodiversity of the region, and its fisheries, as well as providing other services such as coastal protection and soil stabilization. Therefore, their conservation and enhancement is a win-win strategy addressing both ecosystem based mitigation through carbon sequestration and storage, and ecosystem based adaptation, such as moderating climate change impacts, support of economic diversification, and reducing coastal vulnerability.



PERSGA Secretary General Addresses COP-19

PERSGA Secretary General Prof. Ziad H. Abu-Ghararah, addressed a high level session at COP19 in Warsaw, his speech included the following:

It gives me much great pleasure to speak to you on behalf of the Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA).

PERSGA is an intergovernmental organization hosted by the Kingdom of Saudi Arabia in Jeddah, and has a regional Mutual Aid Center for Marine Emergencies (EMARSGA) hosted by the Arab Republic of Egypt in the city of Hurghada.

Ladies and Gentlemen,

It is certain now that the marine environment is one of the most vulnerable environmental system to the impacts of climate changes. The loss of marine biodiversity, sea level rise and flooding, ocean acidification, change to the balance and mix of water and its circulation patterns are all typical of the adverse impacts of climate change. Timely and adequate adaptation measures are essential to reduce

the impact of climate change. Hence, PERSGA member countries have prepared, endorsed and started the implementation phase of a regional ecosystem based adaptation strategy emphasizing the importance of conservation and rehabilitation efforts.

Coastal and marine mangroves, sea grasses and wetlands are not only the natural protection line against the negative impacts of climate changes, but also play an essential mitigation role by sequestering and storage of carbon (blue carbon).

In conclusion, we in PERSGA believe that any arrangements or future agreements on climate change should not undermine the role of marine and coastal environments in the mitigation and adaptation to climate change, and should include modalities and proper mechanisms to promote development and conservation of the marine environment.

Thank you, Mr. President

The UNFCCC COP 19/CMP 9 Meetings in Warsaw Poland

The 19th UNFCCC Conference of the Parties (COP19) which was held in Warsaw Poland from 11th November was attended by more than 10,000 people, including national delegations, NGOs, advocates, journalists and business leaders. The talks were made difficult by the necessity to balance, on the one hand, developing countries' demands that developed countries meet their obligations resulting from the Copenhagen Accord, and, on the other hand, the urgent necessity to move forward on commitments in anticipation of the Paris COP in 2015. The meeting almost agreed on four crucial decisions namely:

1. The establishment of a clear path towards 2014 and 2015 negotiations
2. The establishment of a loss and damage mechanism (LDM)
3. Progress with respect to climate finance
4. The establishment of modalities for national forest monitoring systems.

With respect to the pathway towards a universal climate agreement in 2015, the delegations only agreed to prepare themselves in order to be able to negotiate commitments in Lima 2014 and Paris in 2015.

Negotiations on the LDM were successful and the COP established the Warsaw International Mechanism for Loss and Damage, although the US, the EU and other developed countries had opposed the measure fearing new financial claims. The negotiation was undoubtedly encouraged by the devastating impacts from Typhoon Haiyan in the Philippines. Interestingly, while a LDM is neither mitigation nor adaptation, the delegates agreed, following a US proposal, to nest the mechanism under the existing Cancun Adaptation Framework. The mechanism will be subject to review in 2016.

As to climate finance and the future of the Green Climate Fund, developing countries failed to obtain a \$70 billion intermediary pledge for 2016 but the adopted decision "urges developed country Parties to maintain continuity of mobilization of public climate finance at increasing levels from the fast-start finance period in line with their joint commitment to the goal of mobilizing USD 100 billion per year by 2020" and developing countries pledged to gradually increase their payments. In addition, the decision urges increased transparency in the funding and payment process and requests developing parties "to prepare biennial submissions on their updated strategies and approaches for scaling up climate finance from 2014 to 2020", subject to review by the Standing Committee on Finance.

As deforestation accounts for 17% of global CO₂ emissions, another important achievement of the COP is the establishment of modalities for national forest monitoring systems, guidelines and procedures for the technical assessment of submissions, and modalities for measuring, reporting and verifying.

During our stay in Warsaw we observed one of the more efficient public transport systems, consisting mainly of electric trams and buses roaming the city. Also, we observed two strange incidents during the meeting, one was convening of the International Coal Industry Conference during the time of the COP which overshadowed the meeting considering that coal is known as one of the worst sources of CO₂ emission. The second was the dismissal of Poland's Minister of the Environment in a sudden cabinet reshuffle before the end of the meetings, although he was the chairperson of the conference as Poland was the host country to the COP 19!

Dr. Mohamed Satti

Impacts of Sea Level Rise and Coastal Ecosystem Based Adaptations



In collaboration with UNEP-ROWA and ISESCO, PERSGA organized a regional training workshop on “impacts of sea level rise and coastal ecosystem based adaptations” during 6-8 January 2014 at PERSGA Headquarters in Jeddah, Saudi Arabia. Attended by 20 participants from the Red Sea-Gulf of Aden and the Arabian Gulf countries, the workshop brought together specialists from Saudi Arabia, Djibouti, Egypt, Jordan, Sudan, Yemen, Bahrain and the United Arab Emirates to exchange knowledge, promote regional capacity for assessing the impacts of climate change on vulnerable coastal areas, and to discuss methods to build resilience in key coastal habitats.

The workshop agenda included a 3-day interactive program, integrating background information, group exercises and discussions. The training package and tool-kits covered a variety of issues but focussed on assessment of the vulnerability of coastal communities and coastal habitats - coral reefs, seagrass, mangroves and salt marshes - to the potential impacts of climate change,

for a variety of different climate change scenarios. Furthermore, the training program included toolkits and strategies for strengthening resilience of mangroves and coral reefs, and implementation of coastal ecosystem based adaptation solutions. The workshop discussions were focused on issues concerning knowledge, capacities and policy gaps for vulnerability assessment and EbA planning and implementation, in addition to drawing recommendations for future capacity building and project interventions in this field. The workshop resource team included experts from PERSGA, UNEP-ROWA and the Arabian Gulf University.



National Workshop for School Clubs in Aden -Yemen

PERSGA organized a workshop for school principals and supervisors of extracurricular activities at intermediate schools in the city of Aden - Republic of Yemen - on Monday, April 13, 2013. The objective was to activate school environmental clubs. The workshop comes within the framework of the establishment and activation of "Clubs of the Red Sea" in selected coastal cities during the years 2013 - 2014 as part of the implementation of the regional strategy for environmental education for sustainable development in the Red Sea and Gulf of Aden.

During the workshop lectures were provided on the importance of conserving marine environments as well as the requirements and stages of the establishment of the environmental clubs at schools. Almost twenty participants attended the workshop in addition to the Director of the General Authority for Environmental Protection - Aden Branch and

other staffs members.

All participating schools expressed willingness to create or activate environmental clubs in their schools during the academic year 2013-2014, with the environmental clubs spread over all districts of the city of Aden.

It is worth mentioning that there are actually 92 environmental clubs in districts of Aden undertaking environmental awareness in general, with specialized committees in the field of protection for the marine and coastal environment.

Beyond the establishment, operation and supervision of school clubs dedicated to marine and coastal environments, PERSGA plans to allow students at the secondary level to join in the program at least once during their schooling.

Environmental Clubs Management (Sudan)

PERSGA organized a training workshop on the management of marine environmental school clubs in Portsudan - Republic of Sudan during 29-30 October 2013. The workshop was delivered to supervisors of clubs from about 20 intermediate schools. The content explained how to create and manage clubs and to implement the PERSGA programme for environmental education for the Red Sea and Gulf of Aden.

At the opening ceremony the Minister of Environment and Tourism expressed his recognition and appreciation to PERSGA for its efforts in promoting environmental awareness and raising their awareness of the importance of conserving the Red Sea and Gulf of Aden environments.

The workshop comes in the framework of the implementation of PERSGA's strategy and action plan for environmental education for sustainable development. The programme included a series of workshops introducing the importance of the living marine resources in the region and



also explaining the necessary elements and requirements to create and manage environmental school clubs and particularly how to use PERSGA's kit for environmental education both inside and outside the classroom.

At the end of the workshop the participants received documents and reference materials that would enable them to build their knowledge and skills related to marine environmental protection.

Environmental Clubs Management(Yemen)



In collaboration with the Aden branch of the Environment Protection Authority in Yemen, PERSGA organized a training workshop on the management of marine environmental school clubs from 1-2 October, 2013. The workshop, held in Aden, was offered to club supervisors from about 20 intermediate schools. The aim was to build enthusiasm to create and manage local clubs as part of PERSGA's programme for environmental education in the Red Sea and Gulf of Aden.

At the opening ceremony, the Head of the Aden branch of the EPA expressed his recognition to PERSGA for the efforts to disseminate environmental awareness to students and promote

conservation of the Red Sea and Gulf of Aden environments.

The programme included a series of workshops introducing the importance of the living marine resources in the region and also explaining the necessary elements and requirements to create and manage an environmental school club, particularly how to use the PERSGA kit for environmental education both inside and outside of the classroom.

The workshop was closed with the distribution of attendance certificates. Each participant also received a pack of documents and references to assist them in learning more about marine environments.

School Clubs in Port Sudan – Sudan

ENVIRONMENTAL EDUCATION



PERSGA organized a workshop for principals and activities' supervisors from intermediate schools in the city of Port Sudan, on April 23. The workshop was presented within the framework of a programme called "Red Sea Clubs" that is being implemented in selected coastal cities during 2013 and 2014. This program fits into PERSGA's regional strategy for environmental education for sustainable development in the Red Sea and Gulf of Aden.

During the workshop lectures were provided on the importance of conserving marine environments as well as the prerequisites and stages for the establishment of environmental clubs in schools. Almost 23 participants attended the workshop in addition to representatives from both the Ministry of

Environment and the Ministry of Education in the Red Sea State.

All participating schools expressed their willingness and their readiness to create marine environmental clubs within their extra-curricular activities schedules during the school year 2013-2014. Also, the Ministry of Education promised to adopt the "Red Sea Clubs" programme as an integral part of students' activities in the whole State.

There are almost 130 intermediate schools in Port Sudan and PERSGA plans to integrate them during the coming two years which means that more than 2600 students will experience an awareness scheme about the Red Sea and Gulf of Aden's marine resources and will be able to convey the message to the local community.

Red Sea and Gulf of Aden Day Celebration in Yemen and Sudan



Each year, in September, PERSGA celebrates the date of its establishment by organizing different awareness activities for the general public in coastal cities.

This year, 2013, PERSGA organized a gala at



the Golden Beach in Aden, Yemen. More than 200 students and high-ranking officers from the Ministries of Environment and Education took part in the event. All the students, wearing PERSGA t-shirts, enjoyed a presentation on the importance of marine resources before engaging in a beach cleaning campaign.

In Port Sudan more than 150 students from three schools undertook a cleanup operation at the Corniche beach. The participants attended speeches on marine life and the need for society to conserve natural resources.

The Secretary General from the Ministry of Education and the Minister of Environment and Tourism in the Red Sea State honored the awareness campaign and encouraged students and teachers to continue these activities until the message reaches all of society.



Development of Regional MoU Concerning Cooperation in Management of Fisheries and Aquaculture in the Red Sea and Gulf of Aden 05-06 February 2013, Jeddah



The Regional Taskforce Meeting for the “Development of MoU for Cooperation in Management of Fisheries and Mariculture in the Red Sea and Gulf of Aden” was organized by PERSGA during 05-06 February 2013 at PERSGA headquarters. The meeting was attended by representatives from the PERSGA member states, (including Djibouti, Egypt, Jordan, Saudi Arabia, Somalia, Sudan and Yemen), the PERSGA Coordinators for Living Marine Resources and Biodiversity & MPAs Programmes.

The meeting examined, discussed and thoroughly reviewed the regional MoU proposal in its Arabic and English versions. After recommending several major and minor amendments, the meeting provisionally agreed on the final structure and contents of the MoU draft in both versions, which shall be submitted to the countries for final review and remarks before opening the MoU for signature by member states.

The future plan for development of the MoU as

agreed by the meeting included the following activities:

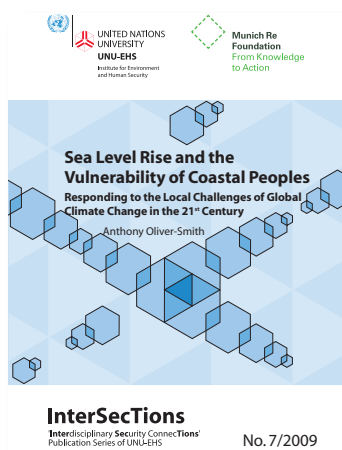
- Finalize amendments and exchange the amended MoU draft between PERSGA LMR Coordinator and taskforce members for final review and remarks
- Prepare the French version and submit the MoU drafts in three languages to the member states for country remarks
- Follow up revision and feedback from countries through the regional coordinator and taskforce members
- Incorporate country remarks, as appropriate, to finalize the MoU documents in Arabic, English and French

When the final MoU document is ready, invite the member states to nominate authorized plenipotentiaries to sign the MoU at a regional meeting to be organized at PERSGA in Jeddah.

Book Review

Sea Level Rise and the Vulnerability of Coastal Peoples: Responding to the Local Challenges of Global Climate Change in 21st Century (2012).

The book is authored by Prof. Anthony Oliver-Smith from the Institute of Environment and Human Security of the United Nations University and provides a very good and interesting overview of the impact of sea level rise. His analysis is not restricted to the risks directly occurring in the coastal zones; it also includes social, economic and cultural impacts in the inland regions of the countries affected. The extent to which people are impacted depends on such factors as vulnerability, adaptability, flexibility as well as the political framework.



The book indicates that earth's climate undergoes constant change, as a rule, over a very long period. Since the mid-19th century, however, our globe has been steering towards a warm period such as the earth has not experienced over the last several million years. If the projections of the UN's Intergovernmental Panel on Climate Change (IPCC) actually materialize, which is more than likely in the absence of any appropriate counter-measures, the mean temperature of the atmosphere will continue to rise by 2 to 4 degrees centigrade by the end of the century, with serious implications for mankind, flora and fauna. One of the consequences will manifest itself through increased intensity and greater frequency of weather related hazards.

The book consists of six sections and ends with a conclusion and further reading on the subject:

Section I

- 1.1 A Human Systems Ecology Perspective
- 1.2 Society, Nature and Environment

- 1.3 Adaptation and Mitigation

- 1.4 Vulnerability and Risk

Section II

- 2.1 Global Climate Change

- 2.2 Global Climate Change and Sea Level Rise

- 2.3 Physical Exposure to Sea Level Rise

- 2.4 Sea Level Rise and Socially Constructed Vulnerability

Section III

- 3.1 The Social Impacts of Sea Level Rise

- 3.2 Local Culture and Sea Level Rise in Tuvalu

- 3.3 Local Economy and Sea Level Rise in Bangladesh

- 3.4 Sea Level Rise and Impending Displacement in Alaska

- 3.5 The Unexpected Risks of Resettlement in Vietnam

- 3.6 Building Resilience to Sea Level Rise on the US Gulf Coast

Section IV

- 4.1 Sea Level Rise and Population Displacement and Resettlement.

Higher global ambient temperatures, thermal expansion of ocean waters, subsidence of coastal lands and increased melting of sea ice are just some of the factors that can contribute to sea level rise. Coastal spaces are of high importance to the socio-economic objectives of many societies. The threat of sea-level rise, combined with much human activity in coastal areas, make it imperative that these coastal areas become subject to sustainable management and protection. Coastal zone management and protection policies can provide this function, as well as help to minimize the impacts of sea-level rise (e.g. in terms of storm surges). As such coastal zone management and protection is also an adaptation strategy for sea-level rise. Hydrographic data and information is important to both coastal zone management and protection, and to sea-level rise strategies by providing components for modeling and spatial dimensions for the application of policies.

Reviewed by: Dr. Mohamed Satti

Artificial Coral Reefs in the Gulf of Aqaba



PERSGA, in cooperation with the Aqaba Special Economic Zone Authority (ASEZA), has sponsored a pilot project to adopt coral ramets, or small coral branches, and build an artificial coral reef in the Gulf of Aqaba, Jordan.

In order to enhance and extend knowledge and ideas within the region, PERSGA trained a group of specialists from all the partner countries to develop their skills and expertise and participate in a unique experience. This work will contribute towards the conservation of biodiversity in the Red Sea and Gulf of Aden and towards finding new sources of income and investment returns. The project has received coverage in local newspapers and magazines and on European television channels. This article provides an overview of the project, its objectives and its implementation mechanism.

What is a coral?

Existing for over 200 million years, coral reefs, nicknamed “the rainforests of the sea”, are vital to maintaining the biological diversity of our world’s oceans. Coral reefs are highly diverse and complex ecosystems covering 30% of the world’s coastlines. Besides the building and protection of coastline by reefs, a growing human population depends on resources from this habitat, as it provides home and vital nursery grounds for 25% of all marine species on the planet. In addition, as colorful undersea gardens, reefs offer a delicate balance of beauty, serenity and life, making them a paradise for snorkelers and divers.

What are the threats to corals and coral reefs?

Coral reefs and other marine ecosystems are facing increasing stress from causes that include rising sea temperature, over-exploitation and land-based

sources of marine pollution. Climate change is now recognized as one of the most serious long-term threats to biodiversity. Scientists estimate that 25% of the world's coral reefs are already dead. If current trends continue we may face the entire loss of this precious resource within the next 50-100 years.

What is an artificial coral reef?

Building an artificial reef involves placing solid structures under water that are suitable for attaching coral fragments. These fragments grow to form new coral colonies. These form the basis of a whole new ecosystem. Eleven different types of artificial reef structure were cast from exposed granite aggregate and cement mixtures as shown in the figure. From 4 to 40 replicates were constructed from each type. To increase the structural complexity of the square blocks, a net of plastic tubes with various diameters was incorporated into the structure. The height of the structures ranged from one to four meters. Some block types were joined together underwater to form the higher and more complex reef structures up to four meters high. Blocks were deployed at depths ranging from 8 to 25 meters depth over an area of approximately 40,000 square meters.

Why build an artificial coral reef?

The most important objectives for building an artificial reef are as follows:

1 - Protection for Natural Coral Reefs

Reefs may be damaged inadvertently by divers kicking up sand, bumping into reefs through poor buoyancy control, or holding-on to take photographs. An artificial reef can strengthen the natural reef as it increases the number of reproducing coral colonies present. Also, artificial reefs can create an alternative attraction for divers and be used as a tool by managers of marine protected areas to give



the natural reef site an opportunity to recover from previous diving pressure.

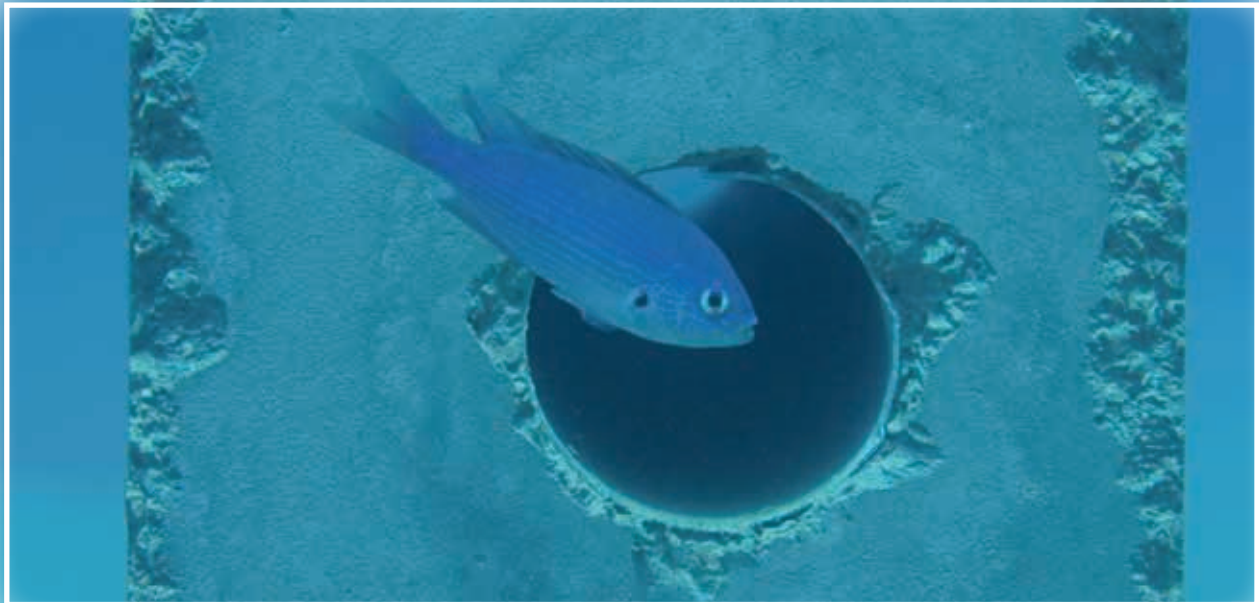
2 - Encourage Eco-Tourism

Eco-tourism is used as a tool for attracting tourists. Through the development of ecological programs, tourists could participate in and contribute to the protection of the environment. Visiting artificial reef sites and adopting orphan coral ramets could be one of those tools.

Many countries suffer from low numbers of visiting tourists and from the lower numbers of tourists revisiting the country for a second or third time, despite the huge amounts of money spent on tourism promotion. This project raises the idea of promoting the adoption of a cultivated "orphan colony" by tourists, hoping that this will drive them to revisit their coral and track its growth and progress over the years.

Visitors could be asked if they would like to adopt a coral and become a member of an international family sharing a noble cause to:

- Conserve globally threatened ecosystems
- Contribute to the establishment of an artificial coral reef known for its varied and unique biodiversity



- ➔ Get involved in the rehabilitation of damaged coral reefs in the region
- ➔ Enhance environmental awareness within your community
- ➔ Enhance the production of oxygen in the oceans
- ➔ Reduce the levels of carbon dioxide in the atmosphere
- ➔ Contribute to reducing the effects of global warming
- ➔ Encourage eco-tourism

3 - New Income Generation

Artificial reefs can contribute to the establishment of corals in places usually devoid of reefs, such as sandy areas. These reefs can enhance the fish population providing new fishing sites for the local fishing community. In addition it will increase the numbers of divers in these areas providing a further source of income for many sectors such as transport, hotels and dive centers.



4 - Coral Reef Restoration

Cultured corals could be used in the rehabilitation of damaged reefs following accidents. The collection and sale of natural corals is prohibited by international conventions, such as CITES. However, corals can be traded if proven to be cultured and the costs could be incorporated into claims for reef compensation. Cultured colonies could also be sold to restore reefs damaged by natural stressors such as sea temperature rise that causes coral bleaching.

5 - Raise Public Awareness

Artificial reef projects could be used as a



living tool in the hands of various government institutions and non-governmental organizations and create real partnerships with local communities, promoting the importance of the protection of the marine environment.

6 - Global Warming

Climate change leading to global warming is now recognized as one of the most serious long-term threats to biodiversity. It has become widely accepted that the main cause behind global warming is the increase in the concentration of greenhouse gases such as carbon dioxide in the atmosphere. This project will contribute to the reduction of the impact of global warming by reducing the level of carbon dioxide from the atmosphere as corals use carbon dioxide in two vital processes: photosynthesis and calcification.

7 - Sustainable Development

This project could be used as a tool to balance our need for development and protection of the environment. Red Sea areas are witnessing accelerated economic growth at all levels. Some vital facilities or industries along the beach might require the destruction of part of the existing natural coral reef. Therefore, the state obliges the project owner to transfer those corals and for them to be replanted at another site before embarking on his project, rather than allowing those colonies to die. The use of artificial reefs and reef restoration techniques would be valuable countermeasures to the loss of natural reef areas.



About the Author:

Dr. Salim Al-Moghrabi, born in 1962 in Amman - Jordan, is a member of the PERSGA team. He has served in a number of different positions in the Aqaba Special Economic Zone Authority (ASEZA) since joining that organization in 2001. Most recently he was the ASEZA Commissioner for Environment and Health Control. He has been the chairman of several management committees and a member of the board of directors at several companies in Aqaba. Prior to this period, from 1992, he was a researcher at the University of Jordan/Marine Science Station in Aqaba. His university education led to a Ph.D. in Biology (1992) from the University of Nice-Sophia Antipolice (France). He obtained his B.Sc. and M.Sc. in Biology from the University of Jordan in 1983 and 1985 respectively. Dr. Al-Moghrabi is married and has four children (three boys and a girl). His interests include SCUBA diving, underwater photography, travel, languages and literature.