

Projects Description for ARASIA TC Programme

TC Cycle 2014-2015



Project Number: RAS/7/025

Project Title: Assessing the Impact of the Phosphate Industry and Off-Shore Oil and Gas Operations on the Marine Environment

Overall objective: To assess the impact of phosphate and offshore oil and gas industries on marine environment and human health due to the consumption of seafood by the population of the ARASIA Member States.

Project duration: 2 years

PROJECT DESCRIPTION

Regional gap / Problem / Need analysis: Phosphate and oil and gas industries are considered major industries in the Member States of the Cooperative Agreement for Arab States in Asia for Research, Development and Training related to Nuclear Science and Technology (ARASIA). These industries discharge their wastes (such as phosphogypsum, scales, sludge, produced water, drilling cuttings, etc.) into the marine environment and pose environmental problems due to their operations (exploration, mining, processing, transportation, uses, etc.). Thousands and millions of cubic meters of such wastes are disposed in the marine water yearly where they are dispersed and transported in the region. Some of these settle with sediments while others may be transported over long distances due to water currents. These wastes and emissions contain enhanced levels of NORM (naturally occurring radioactive materials), heavy and toxic elements (such as Hg, Pb, F, etc.) and organic contaminants. National projects and recent completed ARASIA projects (RAS7018 and RAS720) have identified such contaminants in the near marine environment. However, the problem needs to be assessed in more detail in order to determine the contaminants' fate and their impact on marine life and human health due to the consumption of marine food (fish, etc.). Sources of contaminants should be determined on a regional scale since water currents transport contaminants from one area to another where mathematical models should also be used. Therefore, a regional project is required to coordinate such activities.

This project is proposed as a regional activity for the following reason(s): Some national projects have been initiated to study the impacts of such discharges (Jordan, Syria, Lebanon, and KSA). However, other countries have not assessed this problem yet where the experienced could enhance their capabilities to initiate such activities. In addition, cross boundary contamination is well could occur due to water current. Therefore, a regional project is necessary in order to assess the impact and establish a regulation for such disposal or limit and cooperation between the ARASIA MS is required. One of the major outcomes of the recent completed ARASIA projects (RAS7018 and RAS720) was the harmonization of the methodology used for marine pollution assessment in addition to good cooperation among the concerned parties in the ARASIA MS. On the other hand, similar projects in other regions were initiated and some of them completed.

Stakeholder analysis and partnership: The project involves many parties including the following: (a) the industry, namely phosphate and offshore oil and gas production companies are concerned about their health, safety and environment policies which should be achieved not only the national, but also regional and interregional level. To this end, they support projects assessing the environment and human health due to their operations in order to mitigate impacts. The outcomes of the projects will help these companies realize such mitigations; (b) environmental organizations function as regulators and seek results of such projects in order to formulate their regulations and limits, which should be based on assessments and be more reliable. This will help in controlling discharges into the environment including the marine environment. In the fishery sector, regular monitoring will contribute to conserve living marine resources. For tourism, including tourists and concerned ministries and investors, the cleanness of the coastal water is the main requirements and the

project will identify the hot spots along the sea coasts in order to mitigate them. NGOs and the population: people living at sea coasts and consuming seafood are concerned about the quality of their food, therefore the project results could contribute to the protection of food and human health.

Role of nuclear technology: There are several radioactive contaminants (such as radium isotopes, polonium-210, plumbum-210, uranium,) that are discharged by the phosphate and offshore industries where only nuclear techniques can be used for analysis. Neutron activation analysis (NAA) and inductively coupled plasma mass spectrometry (ICPMS) are widely used for trace element analysis where very low concentrations are expected to be present in the marine environment due to dilution.