**Project Description for ARASIA TC Programme**

**TC Cycle 2018-2019**

**Project Number: RAS6089**

**Project Title:** Strengthening Nuclear Medicine Applications in States Parties through Education and Training to Fight Non-Communicable Diseases (ARASIA).

**Overall Objective:** To improve the quality of life of patients with non-communicable diseases by improving the level of knowledge, skills and the capabilities of human resources in ARASIA States Parties.

**Project Duration:** (2018 – 2021)

**Project Description:** Phase I of the project focused on the clinical applications of nuclear medicine for fighting non-communicable diseases (NCDs) throughout the world and, particularly, in developing countries. Of 56 million global deaths in 2012 (WHO/IARC), 38 million (or 68%) were due to NCDs, the main four of which are cardiovascular diseases, cancers, diabetes and chronic lung diseases. As a Phase II project, there is reinforcement of the thematic approaches to improve management of NCDs in the region with additional emphasis on therapeutic applications of nuclear medicine techniques in adult and paediatric patients, as well as quality assurance/quality control (QA/QC) of equipment, radioprotection and radiopharmaceutical production under quality management guidelines (QUANUM). Most of these States still have inadequate nuclear medicine capabilities and continued assistance through this Phase II project is essential. Consequently, nuclear medicine services in the ARASIA States Parties will definitely need continued vital support in human capacity development in order to meet and cope with the rising demands for such services. Therefore, this project is expected to further stimulate regional cooperation among nuclear medicine facilities in ARASIA States Parties and to contribute to strengthening the nuclear medicine capacity in the region, thereby contributing to the improved management of NCDS in the region.

**Problem to be addressed:** The burden of NCDs is rising disproportionately among lower income countries and populations. In 2012, nearly three quarters of non-communicable disease deaths (i.e. 28 million) occurred in low and middle income countries with about 48% of deaths occurring before the age of 70 in these countries. To lessen the impact of NCDs on individuals and societies, a comprehensive approach was developed under Phase I that required all sectors, including health, finance, planning and others, to work together to reduce the risks associated with NCDs, as well as promote the interventions to manage them. These include capacity building activities on optimizing nuclear medicine techniques in the management of NCDs, all under the thematic area of best clinical practice and quality management. Several regional training courses, meetings and scientific visits have contributed towards achieving the targeted outcomes and objectives

of the regional projects. ARASIA 75 Member States have benefited from these technology transfer initiatives as well as developed appropriate networking with other regions in order to optimize the use of nuclear medicine technologies in NCD management. Nuclear medicine is an area of medical imaging that uses radionuclides and plays an important role in many diseases. In the case of cancer and cardiovascular diseases, new techniques, such as positron emission tomography (PET) and single photon emission computed tomography (SPECT), have become extremely important, because they allow for the visualization of organ activity and detection of early stage diseases.

**This project is proposed as a regional activity for the following reason(s):** Non-communicable diseases are a major cause of mortality and morbidity in the Asia Pacific region. There is an urgent need to combat them through effective management. Hence, combined efforts to relieve the region from the disease burden is required which will lead to an improvement in health care. A regional project will target the needs of all countries and furthermore, it will assist in the development of networks in the region that will support further improvement and sustainability beyond the timeframe of the project. A regional project is the most costeffective method for implementing the envisaged activities. The Asia Pacific region is unique in that it comprises both developing and developed countries. By joining hands, developing countries of the region can benefit from the technical know-how and expertise of those countries which are more advanced in health care. There is a high potential of technical cooperation and expertise exchange, and expected benefits of expert networking between technically advanced countries and developing countries within the Asian Pacific region. There are many universities in the region which are conducting nuclear medicine courses regularly. These universities can help in conducting the accredited courses and can initiate MOOCs-type online nuclear medicine courses. Regional and national societies, such as the Asia and Oceania Federation of Nuclear Medicine and Biology (AOFNMB); the Asian Regional Cooperative Council for Nuclear Medicine (ARCCNM); and the Arab Society of Nuclear Medicine (ARSNM) will be important platforms for technical cooperation.

**Stakeholders:** (1) Nuclear medicine physicians and staff of nuclear medical centres of the region will be the end users and direct beneficiaries who will gain expertise in the different diagnostic and therapeutic nuclear medicine techniques in non-communicable diseases and therefore have high importance and influence. (2) Patients of NCDs are the main beneficiaries who are likely to have chances of better management of their diseases; they also have high importance. (3) Referring physicians are among the end users, who are responsible for the treatment and will also get benefits from more precise diagnoses. As such, they have strong influence. (4) The IAEA is among the main sponsors, providing funds and experts assistance with strong influence and high importance. (5) Referring doctors and healthcare policy makers are affected parties by the project activities to promote the awareness of the benefits of nuclear medicine techniques in the diagnosis and treatment of NCDs.

**Partnerships:** Partnerships will be established with (1) professional societies like ARCCNM, AOFNMB, ARSNM, WFMNB; (2) counterpart institutions within the ICNMP; and (3) university hospitals acting as local counterparts in the TC projects for hosting regional training courses (RTCs). The professional societies will also support recruiting lecturers and organizing training activities at the national and regional level in nuclear medicine. National societies of nuclear medicine and radiology in participating Member States are likely to collaborate with the project team members in organizing training activities at the national level.

**Role of nuclear technology:** Nuclear medicine is the use of unsealed radiation sources for diagnosis and treatment. The technology has significantly improved after the introduction of hybrid systems (SPECT/CT and PET/CT). PET scans are obtained after injecting PET tracers, which are short lived radioisotopes and positron emitters. The CT component of PET/CT uses X rays. In SPECT/CT, radiotracers are injected and tomographic images are obtained, which are then superimposed on the CT images. Radionuclide therapy uses unsealed radionuclides in the treatment of various cancers, bone pain palliation, painful joints etc. Nuclear medicine imaging modalities have the advantages of non-invasive tools to detect any abnormalities. Radionuclide therapy offers the benefits of targeted therapy. The IAEA is expected to provide overall project coordination with government parties, technical support, financial resources, and knowledge management resources.