Public Version

REGIONAL COOPERATIVE AGREEMENT

ANNUAL REPORT 2018

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SECTION 1 - OVERVIEW OF THE RCA PROGRAMME IN 2018

1. Summary of the RCA Programme in 2018

There were twelve (12) active projects in 2018, among which there were four (4) projects in the field of human health, four (4) projects in food and agriculture, two (2) projects in the field of environmental protection, one (1) project on groundwater resources and one (1) project in support of the RCA management. Three of the projects (RAS5070, RAS6083 and RAS7029) were to be finalized in 2018, and were getting salient achievements. The highlights of all active projects are given in Section 2. Detailed information on them is available on the IAEA web-based platform Programme Cycle Management Framework (PCMF) and basic information may be found on the RCA Website (www.rcaro.org).

List of RCA projects in 2018 is shown in Annex 1

The implementation of the RCA projects was well in line with the defined work plans. In 2018, thirteen (13) regional training courses (RTCs) were held with twenty-two (22) experts recruited as lecturers, among whom thirteen (13) were from the region. Two-hundreds-and-seventy-three (273) persons were trained in these training courses. Nineteen (19) regional meetings were held in 2018. These included project progress and final review meetings, project planning meetings, expert meetings and workshops. A total of three-hundreds-thirty-seven (337) participants, including fifteen (15) experts, participated in these meetings. In addition to these project-related meetings, two (2) policy level meetings were conducted, namely the 40th Meeting of National RCA Representatives and the 47th RCA General Conference Meeting.

In addition, nineteen (19) expert missions were conducted in 2018, which provided necessary technical assistance to some GPs for their effective participation in RCA projects. The total duration of the missions was ninety-seven (97) expert-days, and of the twenty-nine (29) experts recruited, twenty-one (21) were from the RCA GPs. One (1) home-based assignment was implemented, which was carried out by two experts, one from the RCA GP and the other from outside of the region. The total duration of the home-based assignment was ten (10) expert-days.

2. Management and Implementation of the RCA Programme in 2018

2.1 Summary of Financial and In-Kind Contributions

The budget allotment from the TC Fund for 2018 was €1.4 million. The encumbrances and actuals in 2018 were €1.3 million at an Implementation Rate of about 93%.

GPs continues supporting the RCA Programme through extra-budgetary contributions and in-kind contributions. 5GPs, China, Japan, Korea, Malaysia and Philippines provided a total of €508,970 extra-budgetary contributions in 2018.

“In-kind” contributions have been recognized since the RCA Agreement commenced in 1972. In line with TC practice, "In-kind" contributions are understood as cost-free goods and/or services provided by a Party (Donor) for the benefit of one or other Parties (Recipients) in the implementation of a specific project. The RCA GPs have agreed that for reporting purposes, the financial contribution of each RCA GP to the RCA programme be calculated based on an adopted and non-discriminatory measure of the “In-kind" contribution and presented in the RCA Annual Reports. The total amount of “In-kind” contributions made by the RCA GPs was calculated as €1,258,380 in 2018.

2.2 Planned Regional Events in 2019

The implementation of the RCA activities focused mainly on regional training courses and meetings. Hosting RCA events is voluntary, and the RCA GPs have been very cooperative in this

respect. By hosting events, the GPs not only contribute to the RCA programme but also have the opportunity to benefit from the regional events as more national participants can attend.

In 2018, thirteen (13) RCA GPs extended their cooperation and support to the RCA by hosting RCA regional events (meetings and training courses). It is expected that those GPs which have not had the opportunity to host RCA events will consider doing so in the future.

Indicative plan for RCA regional events in 2019 is given in Annex 2

2.3 Progress Monitoring and Reporting

Progress monitoring and reporting of the projects was undertaken through the annual progress reports by NPCs and the consolidated Project Progress Assessment Reports (PPAR) submitted by the LCCs. All PPARs for 2018 under the RCA programme were submitted timely via the IAEA IT platform https://tcreports.iaea.org. To continue this good practice, NRs are requested to ensure that NPCs submit national reports to LCCs in time so that LCCs have sufficient inputs and time to consolidate and submit PPARs to the IAEA.

In addition, the progress of the projects was also reviewed at the 40th Meeting of the National RCA Representatives and the 47th RCA General Conference Meeting. These mechanisms have proved to be useful in the monitoring of projects and identification of challenges in project implementation and it will be continued.

2.4 Challenges in Implementation

As the membership of the RCA has grown, there arose a need for additional resources to fund expanded participation in projects. Despite the considerable efficiencies that the RCA has made in supporting projects addressing identified regional needs and priorities, a number of worthy proposed projects are not able to be implemented because of limited funding resources. In this regard, the Declaration which encourage the GPs to continue to make contributions to the TCF in full, as well as to provide extra-budgetary contributions were sent out to GPs.

Although, the RCA programme was successfully implemented in 2018 with a view to further enhancing the effectiveness and efficiency of the RCA programme, GPs recommended that NRs designate appropriate persons as NPCs, Alternate NPCs and National Project Teams from the start of project implementation, and to nominate qualified/suitable candidates to participate in regional events, and that the Agency provide necessary information to the hosting organization in a timely manner for a better preparation of regional activities.

List of National Representatives in 2018 is given in Annex 3

NRs are also recommended to submit nominations on time and in full through the InTouch+ platform. Hard copy nominations should be submitted through Official Mail only in exceptional cases, as the submission of hand filled nomination forms has repeatedly caused delays and errors in implementation.

3. Summary of the RCA Regional Office (RCARO) Activities Related to Promotional and other Non-technical Activities in 2018

The RCARO continued its efforts in 2018 to publicize the activities of the RCA and establish collaborations with other international/regional organizations with common interests.

RCARO promoted the RCA through operation of the RCA website (www.rcaro.org), participation in various regional/international conferences and the RCA expert support programme. In an effort to enhance partnership, RCARO implemented the RCA/UNOSSC partnership project on Electron Beam Applications for Value Addition to Food and Industrial Products and Degradation of Environmental Pollutants in the Asia Pacific Region. To expand support for the benefits of the

RCA GPs, RCARO initiated the RCA Research Project on Air Quality and Environmental Impact Assessment of Industrial Activities in Asian Region, under the RCARO Managed Project.

- RCARO updated information on the RCA and RCA projects on the RCA website for the RCA GPs. According to the recommendations of the 47th GCM, RCARO established a new platform for Quadripartite Forum to foster information exchange amongst the four IAEA regional agreements.
- The RCARO participated in the international conference on the 12th Congress of the World Federation of Nuclear Medicine and Biology held in conjunction with the project review meeting of RAS6083 (April, Australia), Global South-South Development Expo (November, USA) and IAEA Ministerial Conference on Nuclear Science and Technology: Addressing Current and Emerging Development Challenges (November, IAEA).
- RCARO held the Research coordination meeting of the RCA Research Project in May, Korea inviting 17 participants from 10 participating countries, technical officer and members of Research Review Committee (RRC). The meeting reviewed the status of research activities on air pollution monitoring in the region and finalized work plan of each country. RCARO made financial contributions for Research Contract Holders in December based on the RRC's review on the CSI Annual Progress Reports.
- Under the RCA/UNOSSC project on Electron Beam Applications, RCARO held a Regional Training Course on electron beam applications for shelf-life extension and phytosanitary measures on foods in March, inviting 18 trainees from 11 participating countries. A Mid-term Review Meeting combined with technical workshop was held on in October, Indonesia. The meeting reviewed project achievements and confirmed detailed work plan for 2018-2019. Expert missions to MON and SRL were implemented where experts provided on-site consultations on treatment of wastewater treatment.
- RCARO organized a Regional Training Course on Cyclotron base Radiopharmaceuticals in December, Korea, inviting 14 participants from 7 RCA/ASEAN Member States and conducted Regional Training Courses in cooperation with eminent Korean institutes for the RCA.
- In accordance with the decision of the 45th GCM, RCARO supported IAEA's secretariat functions for the RCA. RCARO has supported preparation and coordination of the 40th NRM and the 47th GCM, including preparation of agenda, background documents and 2017 Annual Report. RCARO also hosted the Meetings of Working Groups on RCA MTS 2018-2023 and RCA GOR on 30 July – 9 August in Korea.

The RCARO actions related to promotional and other non-technical activities in 2018 are given in Annex 4

SECTION 2 - DETAILS OF THE TECHNICAL PROGRAMME IN 2018

- **Others**

RAS0082	**Facilitating Activities Implemented under the RCA Framework**
Objective	**To facilitate the implementation of the 2018 RCA and the enhancement of the effective and efficient operation and management of the RCA programme**

Project Activities in 2018

Event	Title	Summary of Purpose	Dates	Host Country
Meeting	6th Meeting of the RCA Programme Advisory Committee	To review the 2nd round concepts which will be prepared by LCCs	29 Jan. - 2 Feb.	Austria
Meeting	Meeting of the Working Group on RCA MTS 2018/2023 Coordination	To discuss, propose/recommend necessary and appropriate solutions/measures/options and/or mechanisms for mobilization of financial resources for RCA programmes and submit to the 40th RCA NRM for consideration and decision; To refine the work plan for 2018/19 and prepare the report of the WG to submit to the 40th RCA NRM	12-14 Mar.	Austria
Meeting	Preparatory Meetings and the 40th RCA NRM	To review the implementation of the RCA programme in 2017, the planning for the RCA programme implementation in 2018, the preparation of the RCA programme for 2020-2021 and other relevant issues	26-30 Mar.	Korea
Meeting	Regional Meeting to discuss the RCA MTS 2018/2023 and review the RCA GOR	To review the MTS 2018/2023 Performance Indicators implementation and discuss/prepare annual report, and to update/restructure the GOR 2014 document	30 Jul. - 9 Aug.	Korea
Meeting	Preparatory Meetings and the 47th RCA GCM	To review the implementation of the RCA programme in 2018, the planning for the RCA programme implementation in 2019, the preparation of the RCA programme for 2020-2021and other relevant issues	10-14 Sep.	Austria
Meeting	Project Design Meeting for the 2020/2021 TC Cycle	To enhance project designs for selected RCA concepts	12-16 Nov.	Austria

Meeting	RCA Project Design Meeting for 2020/2021 TC Cycle	To enhance project designs for selected RCA concepts	19-23 Nov.	Austria

Project highlights for 2018

The project RAS0082 supported the management of the RCA programme in an effective and efficient manner, especially activities under RCA projects in 2018 were planned well in advance, which resulted in good implementation. The RCA programme for 2020-2021 has been developed in a systematic manner. A project design meeting was organised to review and enhance eight draft project documents (including LFM and work plan), discussed and agreed on the follow-up actions/measures to ensure the RCA project documents for 2020-2021 TC Cycle are well formulated, complying with the TC requirements. The RCA GOR was updated to improve the effectiveness and efficiency in the management of activities under of the RCA framework.

Programme Advisory Committee was also held to review the Agency's technical review of the second round concepts that were prepared by the Lead Country Coordinators and related procedures for the RCA Programme for 2018-2019 and to discuss preparation of the RCA Programme for 2020-2021.

40th Meeting of National RCA Representatives, March, Korea

47th General Conference Meeting, September, IAEA

- **Agriculture**

RAS5070	**Developing Bioenergy Crops to Optimize Marginal Land Productivity through Mutation Breeding and Related Techniques**
Objective	**To cultivate improved varieties of bioenergy crops on marginal lands**

Project Activities in 2018

Event	Title	Summary of Purpose	Dates	Host Country
Training Course	RTC on Nuclear Techniques in Soil, Water and Nutrient Management Under Marginal Land	To provide advanced knowledge and skills to participants on the role of nuclear techniques to better understand and manage soil water and nutrients under marginal land	9-13 Apr.	Pakistan

Expert	Home-based Assignment	To develop the best soil, nutrient, water and crop management practices for marginal land brochure	2-11 Jul.	USA, Austria
Expert	Expert Mission	To enhance the capacity of the Institute of Plant and Agriculture Sciences (IPAS)	29 Jul. - 3 Aug.	Mongolia
Training Course	RTC on Advanced Tissue Culture Techniques Combined with Mutagenesis for Crop Improvement	To provide participants theoretical as well as practical information with mutation induction and application of in vitro techniques and in vitro screening for biotic and abiotic stress tolerance in crop breeding	10-14 Sep.	Vietnam
Meeting	Final Regional Coordination Meeting on Developing Bioenergy Crops to Optimize Marginal Land Productivity through Mutation Breeding and Related Techniques	To review and assess the implementation of the project, and develop follow-on plans	22-26 Oct.	Indonesia

Project highlights for 2018

This regional project was implemented successfully according to the work plan. More than one hundred young scientists in the region were trained on plant mutation breeding and related techniques, which contributes significantly to enhancing the regional capacity.

Through national mutation breeding programs, more than 150 new mutant lines of bioenergy crops on marginal land were developed. N-15 or C-13 isotopic techniques were introduced and applied to improve the efficiency of soil, water and nutrient use for bioenergy crop cultivation on marginal land in many countries.

The guideline entitled “Best Soil, Nutrient, Water and Crop Management Practice for Marginal Land” was formulated and distributed to participating countries for use.

RTC on Soil, Water and Plant Nutrition Management, Pakistan

Final Project Review Meeting, Indonesia

RAS5077	Promoting the Application of Mutation Techniques and Related Biotechnologies for the Development of Green Crop Varieties
Objective	To increase environmentally friendly crop productivity through the application of mutation techniques and related biotechnology

Project Activities in 2018

Event	Title	Summary of Purpose	Dates	Host Country
Meeting	Experts Meeting on Compiling of Screening Protocols for Target Green Traits in Selected Crops	To develop a protocol book with focus on both screening techniques and physiologic analysis for abiotic stresses and nutrient uptake	12-16 Mar.	Pakistan
Training Course	RTC on Methodologies and Mechanisms for Screening against Abiotic Stresses	To provide theoretical background and hands on training on screening techniques for crop tolerance to drought, salt and heat stress	9-20 Jul.	Indonesia
Meeting	Mid-Term Project Review Meeting	To review progress of project, update participants on new technologies and update national and regional work plans	3-7 Dec.	Nepal

Project highlights for 2018

In 2018, this project started its activities with the Experts Meeting held in March in Faisalabad, Pakistan, in order to develop a protocol book focusing on screening techniques and physiologic analysis for abiotic stresses and nutrient uptake. The meeting was attended by 7 experts from AUL, INS, PAK and the IAEA. A regional training course on Methodologies and Mechanisms for Screening against Abiotic Stresses was held in July in Jakarta, Indonesia, involving 19 trainees from 13 GPs. In December, a mid-term review meeting was held in Kathmandu, Nepal, where the progress of the project was reviewed future national and regional work plans were updated.

RAS5081	Enhancing Food Safety and Supporting Regional Authentication of Foodstuffs through Implementation of Nuclear Techniques
Objective	To improve food safety, enhance consumer confidence and increase trade by establishing a robust and independent means of verification of origin of foodstuff

Project Activities in 2018

Event	Title	Summary of Purpose	Dates	Host Country
Meeting	Project Kick-off and Coordination Meeting	To review the current status of each participating country, set up the baseline from which the project success may be measured, discuss and agree on project implementation plan	5-9 Feb.	Austria
Training Course	RTC on the Fundamentals of Using Nuclear Techniques for Verifying Food Authenticity	To provide training on practical aspects of sampling, sample preparation, making isotope and elemental measurements as well as theoretical aspects of applying these technologies to food authentication and traceability	25 Jun. - 6 Jul.	New Zealand
Expert	Expert Mission	To raise awareness of food adulteration and fraud and its potential impact on food safety under RAS5081	15-19 Oct.	Fiji
Expert	Expert Mission	To enhance awareness of food adulteration and fraud under RAS5081	12-16 Nov.	Cambodia
Training Course	RTC on the Use of Advanced Nuclear Techniques for Verifying Food Authenticity (Train the Trainer Course)	To develop a training resource within the region, covering topics such as advanced analytical techniques with emphasis on quality management and data handling	19-23 Nov.	Malaysia

Project highlights for 2018

The first year of the project was successfully completed with the kick-off meeting in February 2018 attended by the 19 participating GPs. This was followed by a Regional Training Course held in New Zealand, for 24 participants on the fundamentals of nuclear techniques applied to food authentication. A further an advanced training course was held in Malaysia, for 10 trainees on IRMS and ICPMS applied to food authentication. The trainees from this advanced course will provide training during the second 'fundamentals' course scheduled for September 2019 in Beijing, thereby initiating the "self-sustaining" training cycle. In addition, two expert missions were also completed in Cambodia and Fiji to raise awareness of food fraud and its potential impact on food safety. Currently discussions are underway to connect the project to a sustainable Global Food Authenticity Network being established by the Laboratory of the Government Chemist (UK) to provide a 'One-Stop Shop' information of the participating countries, such as News, Events, Discussions, Policy & Law, Centres of Expertise, Research, Methods, Quality Control and Training. The SharePoint website with training resource is available at https://nucleus.iaea.org/sites/nafa-projects/RAS5081/SitePages/Home.aspx.

RTC on the Fundamentals of Using Nuclear Techniques for Verifying Food Authenticity, June, New Zealand

RAS5084	**Assessing and Improving Soil and Water Quality to Minimize Land Degradation and Enhance Crop Productivity Using Nuclear Techniques**
Objective	**To enhance the capacity of countries in the Asia-Pacific region for using nuclear techniques of assessing and improving soil and water quality** **To implement best agricultural practices for minimizing land degradation and enhancing crop productivity**

Project Activities in 2018

Event	Title	Summary of Purpose	Dates	Host Country
Meeting	Project Kick-off and Coordination Meeting	To review the current status of each participating country, set up the baseline from which the project success may be measured, discuss and agree on project implementation plan, plus desktop training and laboratory tour to Seibersdorf Laboratory	5-9 Feb.	Austria
Training Course	RTC on the Application of FRNs and Stable Isotopes for Soil Quality and Soil Erosion Investigation	To provide basic training on site identification, characterization, sampling design & techniques, sample preparation for FRN and (2) theoretical principles on the use of stable isotopes to monitor and track sediments	6-10 Aug.	Vietnam
Expert	Expert Mission	To raise awareness of food adulteration and fraud and its potential impact on food safety under RAS5084	8-12 Oct.	Fiji
Training Course	RTC on the Advanced Application of Fallout Radionuclides for Soil and Water Quality Investigations	To provide training on the sampling, measurement, analysis, interpretation and application of FRNs for soil and water quality investigations	12-16 Nov.	Australia

Project highlights for 2018

This project, which began in 2018, held its first Project Coordination Meeting in February 2019 at the IAEA headquarters in Vienna. Nineteen National Project Coordinators attended, presented and discussed their country reports and capacity baselines and developed national work plans related to the project. The first Regional Training Course was held in August in Vietnam, involving 14 participants from 13 RCA GPs. Training was provided in the basic theoretical and practical

application of fallout stable isotope analysis for soil quality and soil erosion investigation. The second Regional Training Course held in November in Australia was also well attended by 18 participants from 16 RCA GPs, for more advanced training building off the fundamentals of the first course. Both regional training courses included field visits where demonstrations of site selection and soil sampling techniques were conducted, as well as laboratory demonstrations, and data analysis and modelling workshops. Several countries have successfully applied the techniques to their national projects and have initiated close collaborations between national institutions, most notably Pakistan and Thailand.

RTC on the Application of FRNs and Stable Isotopes for Soil Quality and Soil Erosion Investigation, August, Vietnam

RTC on the Advanced Application of Fallout Radionuclides for Soil and Water Quality Investigations, November, Australia

- **Human Health**

RAS6083	**Improving Patient Care and Enhancing Government Parties Capacity in Nuclear Medicine Programmes in RCA Region**
Objective	**To improve health in non-communicable diseases in the RCA region**

Project Activities in 2018

Event	Title	Summary of Purpose	Dates	Host Country
Meeting	Project Review Meeting and Workshop on Updates on Theranostics	To review/update the current protocols on therapeutic nuclear medicine and review/update the work plan for 2018	16-20 Apr.	Australia
Expert	Expert Mission	To train NTC on statistical parametric mapping	7-11 May	Thailand
Expert	Expert Mission	To train experts on enhancing access and affordability of nuclear medicine procedures in various clinical situations	16-20 Jul.	Philippines
Expert	Expert Mission	To train experts on theranostics, hybrid imaging and SIRT	13-17 Aug.	Vietnam
Expert	Expert Mission	NET and Prostate Cancer Theranostics	11-16 Sep.	Indonesia

Expert	Expert Mission	To train experts on improving patient care and enhancing RCA GPs capacity in nuclear medicine programmes in RCA region	1-5 Oct.	Mongolia
Expert	Expert Mission	To train experts on enhancing access and affordability of nuclear medicine procedures in nuclear neurology	26-28 Nov.	Pakistan
Meeting	Workshop on Leadership Skills for Emerging Challenges in Nuclear Medicine	To explore the different hybrid imaging modalities and challenges, employed in the diagnosis, staging and management of relevant oncologic conditions	26-30 Nov.	Austria
Expert	Expert Mission	To train experts on enhancing access and affordability of nuclear medicine procedures in nuclear neurology	28 Nov. - 2 Dec.	Indonesia
Meeting	Final Project Review Meeting and Workshop on Nuclear Medicine Techniques for Dementia	To review and assess the implementation of the project, and develop follow-on plans	17-21 Dec.	Singapore

Project highlights for 2018

The project successfully implemented the activities for 2016-2018 according to the work plan. The project activities consisted of 5 project management meetings and technical workshops, 1 regional training course on theranostics and dementia and 15 expert missions held in 10 RCA GPs (Bangladesh, China, Indonesia, Malaysia, Mongolia, Myanmar, Pakistan, Philippines, Thailand and Vietnam). An e-learning module on "Peptide Receptor Radionuclide Therapy (PRRT) for Neuroendocrine Tumor (NET)" was also developed and uploaded on the RCA website and IAEA Human Health Campus. Expert mission materials and meeting documents were uploaded onto the project platform on the RCA website for sharing amongst participating countries (www.rcaro.org).

The project output has been achieved by satisfying the key performance indicators during the 3-year period. 2,774 Nuclear Medicine Professionals were trained and networked in oncology, cardiology and neurology, representing an increase of 140% and 116,750 new Nuclear Medicine procedures practiced for non-communicable diseases showing an increase of 20% in comparison to the records of 2016. In addition, there has been forty-two fold increase in the communications and downloads of the educational materials. This represents a significant increase of the awareness of the roles of nuclear oncology, cardiology and neurology and impact of theranostics. Vietnam and Mongolia introduced new policies for strengthening of nuclear medicine facilities and new research groups on neuroimaging and thyroid were established in Philippines, Thailand and China, Japan and Korea respectively. Based on the training materials developed under the project, development of e-learning modules was considered for continued education of nuclear medicine professionals.

Expert Mission, September, Indonesia

Final Review Meeting and Workshop in Neuroimaging, December, Singapore

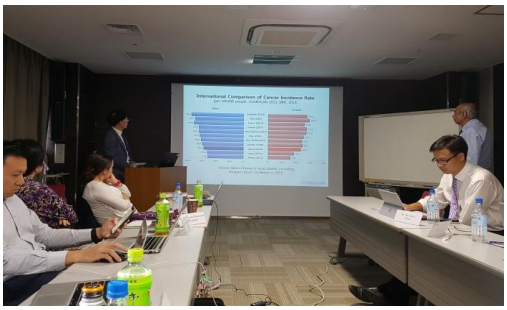
RAS6085	**Enhancing Stereotactic Body Radiation Therapy for Frequent Cancers in the RCA Region**
Objective	**To improve clinical outcomes in cancer patients treated with Stereotactic Body Radiation Therapy (SBRT)**

Project Activities in 2018

Event	Title	Summary of Purpose	Dates	Host Country
Expert	Expert Mission	To explore different areas of training in the field of radiotherapy based on regional needs and country specific expertise and also to develop coordinated activities among training hubs	7-9 Aug.	Japan
Training Course	RTC on Clinical Applications of SBRT in Lung, Liver and Spine Cancer with Emphasis on QA and QC	To enhance the quality of stereotactic body radiation therapy (SBRT) service	8-12 Nov.	Australia
Expert	Expert Mission	To enhance the application of Stereotactic Body Radiation Therapy	28 Nov. - 1 Dec.	Vietnam

Project highlights for 2018

In 2018, two expert missions and one regional training course were conducted under this project. One expert mission was held in Japan to review the current status and work plan of the SBRT regional training hubs and discuss operation of a SBRT website. The other expert mission was conducted in Vietnam to enhance the application of Stereotactic Body Radiation Therapy (SBRT). Further, a regional training course on clinical applications of SBRT was held in Australia and provided practical training in the delivery of advanced radiotherapy treatment for radiation oncologists, medical physicists, radiation therapists and dosimetrists in the Asian Region. Every participant shared each country's current status on radiotherapy treatment and discussed about improving their' own capacities.



Expert Mission, August, Japan

Expert Mission, November, Australia

RAS6086	**Strengthening Cancer Management Programmes in RCA States Parties through Collaboration with National and Regional Radiation Oncology Societies**
Objective	**To improve the cancer management of RCA GPs by training radiation oncology professionals in collaboration with RCA and Asia Pacific national/regional radiation oncology societies**

Project Activities in 2018

Event	Title	Summary of Purpose	Dates	Host Country
Meeting	First Project Coordination Meeting	To review the current status of each participating country, set up the baseline from which the project success may be measured, discuss and agree on project implementation plan	14-18 May	Japan
Training Course	RTC on Image Guided Brachytherapy	To enhance the cervical cancer treatment in the RCA region	4-8 Sep.	Indonesia

Project highlights for 2018

The year 2018 was the first year of this 4-year project. The Project Coordination Meeting had successfully outlined and detailed the activities and work plan of the project. There were 26 participants from 19 GPs and the IAEA. The first RTC in Indonesia on "Image-Guided Brachytherapy (IGBT)" involved 32 participants from 16 participating GPs and was held in conjunction with the 3rd meeting of Federation of Asian Organizations for Radiation Oncology (FARO). The aim of this project was to strengthen cancer management program in the RCA region through cooperation of the regional radiation oncology societies such as FARO. National training courses were also held as planned in Thailand, Indonesia, China with more than 150 participants.

Project Coordination Meeting, May, Japan

RTC on Image Guided Brachytherapy, September, Indonesia

RAS6087	**Enhancing Medical Physics Services in Developing Standards, Education and Training through Regional Cooperation**
Objective	**To improve health care to patients in the region through the application of appropriate, effective and safe radiation medicine, utilizing competent medical physicists, consistent with IAEA requirements and guidelines**

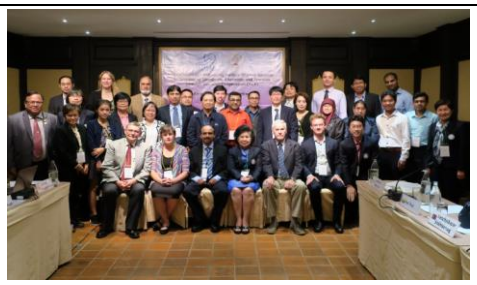
Project Activities in 2018

Event	Title	Summary of Purpose	Dates	Host Country
Meeting	First Coordination Meeting and Workshop	To review the current status of the education and training of medical physics in participating countries, set up the baseline from which the project success may be measured, discuss, identify and agree on national and regional work plan for 2018/2019	19-22 Mar.	Thailand
Expert	Expert Mission	To train experts on RAS6087 and assessment of clinical residents and conduct an orientation program	27-31 Jul.	Thailand
Expert	Expert Mission	To conduct a workshop for clinical training	24-26 Oct.	Malaysia

Project highlights for 2018

The project was initiated with a regional meeting in Chiang Rai early this year which also included a workshop on assessment. Participants from 19 RCA GPs were present, including participants from Laos and Cambodia for the first time. As this is a TCDC project, the theme of the meeting was on how to meet the needs of developing countries in strengthening medical physicists' clinical role in cancer treatment and diagnosis. Highlights include the achievement of Thailand who confirmed a stakeholder agreement to facilitate the continuing instruction and support for a Lao medical physicist in Bangkok on a periodic basis. The initiation of clinical training in Malaysia on radiotherapy and nuclear medicine was another highlight, which was the continuing adoption of the e-learning platform, AMPLE, for clinical training. This was also seen in the new Thailand program, which has become

more and more active in clinical centres outside of Bangkok. Further, the NGO 'Medical Physicists for World Benefit (MPWB)' has requested an alliance with the work of the project to provide teaching resources to developing countries. A formal agreement is progressing following representation through the Australian Counsellor (Nuclear) in Vienna.



First Coordination Meeting, March, Thailand

- **Environment**

RAS7028	**Enhancing Regional Capabilities for Marine Radioactivity Monitoring and Assessment of the Potential Impact of Radioactive Releases from Nuclear Facilities in Asia-Pacific Marine Ecosystem**
Objective	**To improve the integrated regional quality-assured capabilities for marine radioactivity monitoring and for impact assessment of routine and accidental releases of radioactivity into the marine environment**

Project Activities in 2018

Event	Title	Summary of Purpose	Dates	Host Country
Training Course	RTC on Analysis of Strontium-90 and Tritium in Seawater	To build theoretical and practical capacity for participating countries to enhance the analytical techniques for Sr-90 and Tritium in seawater	12-23 Mar.	India
Expert	Expert Mission	To provide training and advice in the area of marine radioecology research and applications	19-23 Mar.	Indonesia
Expert	Expert Mission	To train experts on marine environmental radiological risk assessment	9-13 Apr.	China
Training Course	RTC on Radiochemical Analysis of Marine Environmental Samples	To provide participants with specific training in the theoretical background, practical applications and interpretation of state-of-the-art radio-analytical methods for the	4-15 Jun.	Australia

		determination of radionuclides in marine environmental samples		
Training Course	RTC on Rapid Assessment of Radionuclides in the Marine Environment	To build capacity for the rapid measurement and assessment of radionuclides potentially released to the marine environment	10-21 Sep.	USA
Meeting	Mid-Term Project Review Meeting	To review the project progress at the regional and national levels, update participants on new technologies and update national and regional work plans	29 Oct. - 2 Nov.	Thailand

Project highlights for 2018

In 2018, the project has successfully conducted three Regional Training Courses in India, Australia and USA and a Mid-term Review Meeting in Thailand. The RTCs were on the analysis of radionuclides ^{90}Sr, ^{3}H, Pu, ^{241}Am, ^{210}Po and ^{226}Ra of marine samples, including rapid determination of Pu and ^{241}Am. During the trainings, sampling techniques were also demonstrated. Those trainings are very important in relation to the capabilities in radioactivity monitoring of potential impact of radioactive releases from nuclear facilities in the region. Forty-nine participants from 17 RCA GPs have completed the trainings and shared with the members of their national project teams. Mid-term review meeting was conducted in reviewing achievements and problems that were encountered during the implementation of the project, identifying gaps and fine-tuning work plan for 2019-2020. In addition, the construction of ASPAMARD (Asia-Pacific Marine Radioactivity Database) website (http://aspamard.pnri.dost.gov.ph) is now completed and all RCA GPs can upload their marine radioactivity data of seawater, sediments and biota on the website.

RTC on Analysis of Strontium-90 and Tritium in Seawater, March, India

RTC on Radiochemical Analysis of Marine Environmental Samples, June, Australia

RAS7029	**Assessing the Impact of Urban Air Particulate Matter on Air Quality**
Objective	**To enhance capacity using Nuclear Analytical Techniques in assessing the impact of fine particulate matter on human health, visibility and historic monuments**

Project Activities in 2018

Event	Title	Summary of Purpose	Dates	Host Country
Meeting	Regional Workshop on Long Range Transport of Atmospheric Aerosols in the Asia-Pacific Region	To provide training on source apportionment and long range transport data of air particulate matter	14-18 May	China
Meeting	Final Project Review Meeting	To review and assess the implementation of the project, and develop follow-on plans	19-23 Nov.	Indonesia

Project highlights for 2018

The Final Project Review Meeting was held in November 2018, in Bali, Indonesia. It was agreed that the project RAS7029 was successful and achieved its objective. The salient results of the project included: six thousand eight hundred and fifty samples (6850) were collected; four thousand six hundred and eighty (4680) samples were analysed; the long-term fine and coarse ambient particulate matter and source fingerprint databases for the Asia-Pacific region and interpretation of the recent results (source apportionment and long-range transport) were updated; Environmental Protection Agency in many countries used the database achieved from the project for policy decisions, issuance of regulations and standards in relation to air pollution; eighty-eight stakeholders have engaged in the project.; and forty-four international journal publications were published from the result of the project.

Regional Workshop on Long Range Transport of Atmospheric Aerosols in the Asia-Pacific Region, May, China

Final Project Review Meeting, November, Indonesia

RAS7030	**Assessing Deep Groundwater Resources for Sustainable Management Through the Utilization of Isotopic Techniques**
Objective	**To improve the capability for efficient and effective planning for sustainable management of deeper groundwater resources**

Project Activities in 2018

Event	Title	Summary of Purpose	Dates	Host Country
Expert	Expert Mission	To train experts on basic principles of isotope hydrology and data interpretation	5-9 Mar.	Malaysia
Training Course	RTC on the Use of Isotope Techniques in Assessing Groundwater Quality	To train the participants in the use of isotope and related techniques in the assessment of groundwater resources and address hydrogeological problems	6-10 Aug.	Indonesia
Meeting	Technical Workshop on Ground Water Recharge and Dynamics Using Isotopic Techniques	To present results from national investigations and discuss these with invited experts; and to discuss possibilities for application of new isotopic tracers for groundwater assessment	17-21 Sep.	China
Expert	Expert Mission	To train experts on field work designing and data interpretation	24 Sep. - 5 Oct.	Philippines

Project highlights for 2018

This project was well in progress as per agreed regional and national work plans. The regional training course on the use of isotope techniques in assessing groundwater quality was held in Jakarta, Indonesia, August 2018. Eighteen project team members from BGD, CPR, IND, INS, JAP, Lao PDR, MAL, MYR, PAK, PHI, SRL, THA and VIE, participated in the training course. A workshop on ground water recharge and dynamics using isotopic techniques was held in Beijing, China, September 2018. The NPCs from participating countries presented the progress made since the start of the project. The project teams of participating countries conducted field works. Water samples were also collected for isotopic and chemical analysis.

Water Sample Collection, Sri Lanka

Samples Handling in the Laboratory, Myanmar