

Public Version



REGIONAL COOPERATIVE AGREEMENT

ANNUAL REPORT 2017

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SECTION 1 - OVERVIEW OF THE RCA PROGRAMME IN 2017

1. Summary of the RCA Programme in 2017

There were thirteen (13) active projects in 2017, among which there were five (5) projects in the field of human health, three (3) projects in food and agriculture, two (2) projects in the field of environmental protection, one (1) project on groundwater resources, one (1) project on the industrial application of non-destructive testing and one (1) project in support of the RCA management. Detailed information on all active projects 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 2017 is shown in Annex 1

The implementation of the RCA projects was well in line with the defined work plans. In 2017, thirteen (13) regional training courses (RTCs) were held with fifty (50) experts recruited as lecturers, among whom thirty-nine (39) were from the region. Three hundred and thirty-nine (339) persons were trained in these training courses. Nineteen (19) regional meetings were held in 2017. These included project progress and final review meetings, project planning meetings, expert meetings and workshops. A total of four hundred and nineteen (419) participants, including thirty-four (34) experts, participated in these meetings. In addition to these project-related meetings, two policy level meetings were conducted, namely the 39th Meeting of National RCA Representatives and the 46th RCA General Conference Meeting.

In addition, in 2017, twenty-one (21) expert missions were conducted, which provided necessary technical assistance to some GPs for their effective participation in RCA projects. The total duration of the missions was eighty-one (81) expert-days, and of the thirty-one (31) experts recruited, twenty (20) were from the RCA GPs. Nine (9) home-based assignments were implemented, among which six (6) assignments were carried out by experts from the RCA GPs and three (3) assignments by experts outside the region. The total duration of the home-based assignments is ninety-four (94) expert-days.

2. Management and Implementation of the RCA Programme in 2017

2.1 Summary of Financial and In-Kind Contributions

The budget allotment from the TC Fund for 2017 was €1.88 million. The encumbrances and actuals in 2017 was €1.75 million at an Implementation Rate of about 93%.

The total of the extra-budgetary contributions received in 2017 was €83,149. The RCA GPs are encouraged to provide extra-budgetary contributions to the RCA programme as a means of contributing to the overall performance/implementation of the RCA programme and demonstrating their ownership of the programme.

“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 will 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 €1,471,520 in 2017.

2.2 Planned Regional Events in 2018

The implementation of the RCA activities focused mainly on regional training courses and regional 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 2017, fifteen (15) 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. This will be considered in the planning for the project implementation in 2018.

Indicative plan for RCA regional events in 2018 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 2017 under the RCA programme were submitted timely via the IAEA IT platform <https://tcreports.iaea.org>.

In addition, the progress of the projects was also reviewed at the 39th Meeting of the National RCA Representatives and the 46th RCA General Conference Meeting. These mechanisms have proved to be useful in the monitoring of projects and identification of challenges in project implementation, and will be continued.

2.4 Challenges in Implementation

In general, the RCA programme was successfully implemented in 2017. However, in order to further enhance the effectiveness and efficiency of the RCA programme, NRs are requested to adhere to the RCA GOR, especially to 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.

NRs are requested 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. NRs are also 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.

List of National Representatives in 2017 is given in Annex 3

As of 2017, the IAEA fully implemented the Agency-Wide Information System for Programme Support (AIPS), covering planning, finance, procurement, project management, human resources and administration. It takes time to get acquainted and use AIPS properly; therefore, NRs, LCCs, NPCs and concerned people are requested to maintain close and timely contact with the RCA FP to resolve any issues that may arise.

3. Summary of the RCA Regional Office (RCARO) Activities related to Promotional and other Non-technical Activities in 2017

The RCARO continued its efforts in 2017 to publicize the activities of the RCA and establish collaborations with other international/regional organizations with common interests.

The activities of the RCA were publicized through the publication of the RCA information on the RCA website, participation in various relevant regional/international conferences and the RCA expert support programme. The RCARO also implemented the IAEA/RCA Project on Improving Patient Care and Enhancing Government Parties Capacity in Nuclear Medicine Programs in the RCA region (RAS6083)

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

- During the past six years since the last renewal of the RCA website in 2011, a number of resource documents, menus, functions had been added to that website to accommodate the needs of the GPs. For effective information management and improving technical compatibility, RCARO made an overall upgrade of the website including design, storage and software in a more user-friendly manner (www.rcaro.org).
- The RCARO updated the RCA activity video, reflecting recent activities carried out under the RCA projects, policy meetings and RCARO activities in cooperation with the IAEA and RCA GPs. RCARO demonstrated the video at the Asia-Pacific Ministerial Summit on Environment held in September 2017 and uploaded it onto the RCA website.
- According to the established guidelines, RCARO prepared and uploaded the public version of the RCA Annual Report on the RCA website with support of the RCARO temporary staff.
- The RCARO participated in the international conference on the IAEA Technical Cooperation Programme: Sixty Years and Beyond – Contributing to Development (May 2017, IAEA) on the occasion of the IAEA’s 60th Anniversary, and at the World Nuclear & Radiation Expo (June 2017, Korea). At these conferences, RCARO set up a RCA booth displaying banners on RCA activities and used RCA brochures, Success Stories, and a promotional video for promotion of the RCA. At the request of the IAEA, RCARO also participated in the Asia-Pacific Ministerial Summit on Environment (September 2017, Thailand) and set up a RCA booth displaying posters on the RCA and RCA projects in the Environment sector, demonstrated the updated RCA activities video, and distributed RCA promotional materials such as RCA brochures and Success Stories.
- The RCARO supported four RCA experts from Bangladesh, Indonesia, Thailand and Vietnam for their RCA promotional activities at international conferences held in 2017.
- Under RAS6083, five expert missions to BGD, PHI, INS, MAL and THA were carried out, engaging eight experts in the requested thematic areas. RCARO participated in the regional workshop and progress review meeting held on 20-24 February 2017, in Hanoi, Vietnam, to review the project progress and confirm details of 2017-2018 workplan, as well as to share recent development of theranostics. At the request of the meeting, RCARO also initiated development of an e-learning module on theranostics in consultation with the Technical Officer of the project. Further, a regional training course on Theranostics and Dementias was held on 4-8 December 2017 in Osaka, Japan. The training course was accredited by the European Accreditation Council for Continuing Medical Education (EACCME).
- Upon approval of the 38th NRM on the implementation of RCARO Managed Projects, RCARO conducted a survey of the NRs in 2016 on the implementation of RCA Research Projects (RP) and found that Environment was the most interested area of research. RCARO received seven proposals in this area from five GPs (BGD, INS, MAL, PHI and VIE) and the 39th NRM recommended review of all seven proposals by the Research Review Committee (RRC - RCA PAC took the role, assisted by experts). Upon consultation, the RRC and RCARO SAC recommended the INS proposal on air pollution as a potential Research Project Theme (RPT). This proposal was approved as a RCA RP by the 46th GCM. Participation of ten GPs in the project was confirmed after review by the RRC: three as Agreement Holders (AUL, ROK, and NZE), and seven as Contract Holders (BGD, INS, MAL, MON, NEP, PHI, and SRL).
- A follow-up project of the RCA/UNOSSC project on Electron Beam Applications had been approved for implementation for 2017-2019 with total budget of US\$500,000. RCARO held the project coordination meeting on 10-11 May in Phuket, Thailand, and agreed on a workplan for 2017-2019.

According to the work plan, RCARO held a Regional Training Course in Advanced Knowledge and On-site Training on Electron Beam Applications for Degradation of Environmental Pollutants in the Asia Pacific Region on 13-21 July 2017 in Korea. Expert missions to MYA and MAL were undertaken by two experts in the requested areas.

- In accordance with the decision of the 45th GCM, and RCARO's assistance to the secretariat functions of the IAEA, RCARO has supported the IAEA in preparation and coordination of the 39th NRM and the 46th GCM, including preparation of agendas and background documents. RCARO also hosted the RCA joint Working Group Meeting for implementation of the RCA MTS 2018-2023 on 31 July – 2 August in Korea. In September, the IAEA and RCARO signed Practical Arrangements to facilitate RCARO's assistance to the IAEA.
- To assist the needs of the RCA GPs, RCARO implemented the RCARO/KAIST Nuclear Engineering Master's Degree Course, the RCARO/KAERI regional training workshop, the IAEA/RCARO/KINS joint training course, the RCARO/KIRAMS training course and the RCARO/ARCCNM Training Course.¹

The RCARO actions related to promotional and other non-technical activities in 2017 are given in Annex 4

¹ This cooperation was implemented outside the framework of the RCA Agreement, which supports and strengthens the partnership between RCA, ARCCNM, KAIST and KAERI.

SECTION 2 - DETAILS OF THE TECHNICAL PROGRAMME IN 2017

➤ Others

RAS0074	Enhancing the Management of the Regional Agreement and Programme
Objective	Enhancing the Management of the RCA Agreement and its Programme (RCA)

Project Activities in 2017

Event	Title	Summary of Purpose	Dates	Host Country
Meeting	Meeting of the RCA Programme Advisory Committee	To review the technical review of the Agency on draft project design documents and related procedures for RCA Programme for 2018-2019 and preparation RCA Programme for 2020-2021	6-10 Feb.	Austria
Meeting	Meeting of the RCA Working Group on the RCA MTS 2018-2023	To discuss matters related to Working Groups on Financial Gap Analysis and Resource Mobilization, Human Resource Development and Coordination for execution of the RCA Medium Term Strategy 2018-2023	13-16 Feb.	Austria
Meeting	Preparatory Meetings and the 39 th Meeting of the National RCA Representatives	Preparatory Meetings (RCA Chairs and 24 th SAC Meetings) and the 39 th Meeting of the National RCA Representatives	2-6 Apr.	Bangladesh
Meeting	Preparatory Meetings and the 46 th RCA GCM Meeting	Preparatory Meetings (RCA Chairs and 25 th SAC Meetings) and the 46 th RCA General Conference Meeting	14-15 Sep.	Austria
Expert	TC Expert Mission for Preparatory Work in Support of Newcomers	To discuss areas for future cooperation with China to enhance capacity building efforts for newcomers.	20-22 Nov.	Austria

Project highlights for 2017

The project enabled the policy meetings of the RCA - the 39th Meeting of the National RCA Representatives and the 46th General Conference Meeting; and several Working Group Meetings for 2018-2019 RCA Programme aimed at enhancing the RCA Programme and operational management. The 39th NRM and 46th GCM reviewed and discussed:

- arrangements for the 2018-2019 RCA Programme,
- preparation for the 2020-2021 RCA Programme,

- the reports of the Working Groups on Financial Gap Analysis and Resource Mobilization, Human Resource Development and Coordination for execution of the RCA Medium Term Strategy 2018-2023,
- the possible creation of an RCA Fund,
- updating of the 2014 RCA GOR, and
- measures to strengthen partnership with FNCA, PIDF and other regional cooperative agreements (AFRA, ARASIA and ARCAL).

In relation to the IAEA's challenge in staffing, the IAEA and RCARO signed a Practical Arrangement to facilitate the provision of assistance by RCARO to the Agency on the RCA administrative functions. A meeting of the RCA Programme Advisory Committee was also held to review the Agency's technical review of the draft project design documents and related procedures for the RCA Programme for 2018-2019 and to discuss preparation of the RCA Programme for 2020-2021.



39th Meeting of National RCA Representatives, April, Bangladesh



46th General Conference Meeting, September, IAEA

➤ Industry

RAS1020	Building Capacity for Applications of Advanced Non-Destructive Evaluation Technologies for Enhancing Industrial Productivity
Objective	To develop a pool of trained technologists and technology practitioners in industrial digital radiography (DR) and computed tomography (CT) for applications in metal casting, rubber and plastic moulding, industrial prototyping, reverse engineering and routine non-destructive examination (NDE) of industrial components in the RCA region; to impart specialized training to key stakeholder members, who will in turn act as catalysts in their respective countries for technology propagation, and to provide for productivity enhancement in the industrial quality assurance (QA) processes through process automation

Project Activities in 2017

Event	Title	Summary of Purpose	Dates	Host Country
Expert	Expert Mission	To produce training document on infrared thermography	8-19 May	Russian Federation

Event	Title	Summary of Purpose	Dates	Host Country
Expert	Expert Mission	To update document TCS17 on NDT for civil engineering	12-23 Jun.	India
Expert	Expert Mission	To evaluate the situation of NDT in Mongolia and assist counterpart for strengthening the activities in the field	26-30 Jun.	Mongolia
Training Course	RTC on Digital Industrial Radiography and industrial Computed Tomography	To benefit technical personnel engaged in research; training and certification activities of advanced radiography testing (RT) based non-destructive testing and evaluation technologies	17-28 Jul.	Malaysia
Meeting	Expert Group Meeting	To review and discuss on Fluoroscopy, improvement of quality, optimization and technology transfer	24-28 Jul.	Vietnam
Training Course	RTC on Capacity Building in Computed Tomography (CT) for NDT in MSs	To benefit technical personnel engaged in research, practice and training activities in non-destructive testing and evaluation using industrial radiography testing (RT) and willing to adapt digital industrial radiology (DIR) and industrial computed tomography (CT)	25-29 Sept.	India
Meeting	IAEA/RCA Final Progress Review and Coordination Meeting	To present, review and evaluate the progress implementation and achievement against the project outcomes and objectives; and to discuss and finalize the details of the activities stipulated in the work plan of the follow-up project	20-24 Nov.	Australia
Expert	Home-Based Assignment	To prepare document on NDT for civil structures testing	4-13 Dec.	Canada and Uzbekistan

Project highlights for 2017

The project was completed in 2017, successfully meeting its objectives to develop a pool of trained technologists and practitioners in industrial Digital Radiography (DIR) and Computed Tomography (CT) for applications in metal casting, rubber and plastic molding, industrial prototyping, reverse engineering and routine Non-Destructive Examination (NDE) of industrial components in the RCA region. One hundred and twenty-one (121) participants were trained on the applications of advanced NDE (DIR/CT) through five Regional Training Courses, and more than 300 experts were further trained by the participants in the RTC using their knowledge at national training courses such as seminars, and short-term training programmes. The awareness and application of the advanced DIR/CT technologies have been increased and expanded in most of the participating countries.



Regional Training Course on Capacity Building in Computed Tomography for NDT in Member States, September, India



Final Progress Review and Coordination Meeting, November, Australia

➤ **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 2017

Event	Title	Summary of Purpose	Dates	Host Country
Training Course	RTC on Methodologies and Mechanisms for Screening against Abiotic Stresses Using Mutation Breeding and Molecular Markers	To provide participants with theoretical and practical information on the application of molecular markers in mutation breeding, including screening of target traits in crops	22-26 May	Thailand
Meeting	Coordination Meeting to Review the Progress of the Field Trials	To review the project progress and update the project work plan and discuss the current status of soil, nutrient and water management and plant mutation breeding practices and the gaps and needs for the application of soil and water management techniques and mutation breeding activities	3-7 Jul.	Viet Nam
Training Course	RTC on Best Practices to Improve Soil Fertility and Crop Productivity under Marginal Lands	To provide training on the role of nuclear, isotopic and conventional techniques for developing best soil, nutrient and water management practices to improve soil fertility and	13-17 Nov.	Malaysia

	using Conventional and Isotopic Techniques	quality and enhance crop productivity of marginal land		
Expert	Expert Mission	To support and advise CP on sorghum mutation breeding program	6-10 Nov.	Myanmar

Project highlights for 2017

Two Regional Training Courses on methodologies and mechanisms for screening against abiotic stresses and best practices to improve soil fertility and crop productivity were successfully held in May (Thailand) and November (Malaysia) respectively for a total of 57 young scientists. About 30 senior scientists and experts participated in the Project Coordination Meeting to review and discuss the progress of field trials conducted in Vietnam and the guidelines on the efficient use of the isotopes on soil, water and nutrients. The Expert Mission to Myanmar was held in conjunction with a national training course on sorghum mutation programme for 30 scientists in November. China, Indonesia, Malaysia, Myanmar and Sri Lanka had produced 52 new sorghum and kenaf bioenergy crops.

 <p>RTC on Screening against Abiotic Stresses Using Mutation Breeding and Molecular Markers, May, Thailand</p>	 <p>Expert Mission, November, Myanmar</p>
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RAS5071	Strengthening Adaptive Climate Change Strategies for Food Security through the Use of Food Irradiation
Objective	To strengthen adaptive climate change strategies for food security through increased awareness and utilization of food irradiation

Project Activities in 2017

Event	Title	Summary of Purpose	Dates	Host Country
Meeting	Regional Coordination Meeting	To present the project findings to senior officials with responsibilities for climate change and food security issues, review the project activities at national and regional level against the agreed work plan, consider and agree the	2-6 Oct.	Philippines

		publication of project findings in technical and non-technical journals		
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Project highlights for 2017

The overall project objective to strengthen adaptive climate change strategies for food security through increased awareness and utilization of food irradiation has been fully achieved. This was made possible through the development of information materials like brochures, fact sheets and leaflets. Of particular interest was the production of info-graphic video materials circulated recently by the IAEA and LCC to the climate change and researchers group for further translation into native languages (<http://webtv.un.org/en/ga/watch/food-irradiation-and-the-changing-climate-international-atomic-energy-agency-iaea/5715225064001/?term=&page=2?lanfrench>). A Regional Resource Document was finally developed and utilized to inform the Senior Executive Officers of climate change policy-makers on the benefits of food irradiation. Several countries held national seminars to promote the radiation technology and establish linkages with climate change groups. With the increased attention to climate change, the awareness of the radiation technology has been increased as one of the adaptive technologies for food security.



Regional Coordination Meeting, October, Philippines



Video on Food Irradiation and the Changing Climate

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

Project Activities in 2017

Event	Title	Summary of Purpose	Dates	Host Country
Meeting	Project Coordination Meeting	To review the current status of mutation breeding approaches in and crop varieties in the RCA region To discuss national/regional work plans and the role of the Asia and Oceania Association of Plant Mutagenesis (AOAPM)	20-24 Feb.	Myanmar

Training Course	RTC on Advanced Mutation Techniques for Induction and Screening of Green Traits in Crops	To provide scientific and technical information on optimization and application of new mutagenesis techniques for crop plant improvement programmes aimed at development of mutant plants with 'green' traits	14-18 Aug.	China
Meeting	TC Sponsored Participation in FNCA 2017 Workshop on Mutation Breeding Project	To promote the cooperation between the RCA and the FNCA on mutation breeding	31 Oct. -3 Nov.	Korea

Project highlights for 2017

The project was successfully initiated in 2017 and fully achieved its annual objectives by implementing activities according to the work plan. The First Project Coordination Meeting was held in February in Myanmar for 18 NPCs and experts to review and discuss detailed work plans and the work of the Asia and Oceania Association of Plant Mutagenesis (AOAPM). The Regional Training Course held in August in China provided theoretical and practical applications of advanced mutation for induction and screening of green traits in crops for 31 participants from 15 countries and local organizations. Most participating countries introduced new mutagenized crop species, and Bangladesh, China, India, Japan, Malaysia, Mongolia and Vietnam applied new mutation techniques using heavy ion beam irradiation. Australia and China conducted field assessments of efficient nutrient-use-mutants, Bangladesh, Korea, Laos, Malaysia, Myanmar screened early-mutant lines, and Indonesia and Pakistan and Sri Lanka screened stress-tolerant mutants.



Project Coordination Meeting , February, Myanmar



Regional Training Course on Advanced Mutation Techniques for Induction and Screening of Green Traits in Crops, August, China

➤ Human Health

RAS6071	Strengthening Radionuclide Therapy for High Impact Cancer Treatment Strategy in Member States of the Regional Cooperative Agreement
Objective	To reduce mortality and morbidity and improve the quality of life of cancer patients in the Member States of the region

Project Activities in 2017

Event	Title	Summary of Purpose	Dates	Host Country
Training Course	RTC on Principles and Practice on the Use of Radiopharmaceuticals for Bone Pain Palliation and Treatment of Other Malignancies	To train nuclear medicine physicians and referring physicians with experience in therapeutic nuclear medicine to enhance the practice of the use of radiopharmaceuticals for the treatment of bone pain palliation as well as other malignancies	24-28 Apr.	Philippines
Meeting	Final Project Review Meeting	To review the implementation and achievements of the project; to analyze and identify strengths, weaknesses, lessons learned, future needs of the region, and possible collaborations with potential partners, then to discuss and agree on a further cooperative plan for sustainability	21-25 Aug.	Indonesia

Project highlights for 2017

A Regional Training Course on principles and practice on the use of radiopharmaceuticals for bone pain palliation and treatment of other malignancies was successfully held in April, Philippines, for 74 participants from participating countries. Approximately 4,661 nuclear medicine physicians and related professionals were also trained on radionuclide therapy through national training programmes. Cambodia, Japan, Korea, Malaysia, Pakistan, Philippines, Singapore and Thailand have expanded radionuclide therapies, and the number of treatment facilities such as SPECT/CT and PET/CT/MRI has been increased in Cambodia, China, Japan, Korea, Myanmar, Nepal and Sri Lanka.



Regional Training Course on Principles and Practice on the Use of Radiopharmaceuticals for Bone Pain Palliation and Treatment of Other Malignancies, April, Philippines



Final Project Review Meeting, August, Indonesia

RAS6072	Strengthening Intensity Modulated Radiation Therapy Capability in the Region
Objective	To strengthen the practice of radiotherapy by adding the capability and safe practices of intensity modulated radiation therapy (IMRT) in the RCA region

Project Activities in 2017

Event	Title	Summary of Purpose	Dates	Host Country
Training Course	RTC on Intensity Modulated Radiotherapy for Breast Cancer, Pancreas Cancer, and Anorectal Cancer	To enable radiation oncologists, medical physicists, and radiation therapists to implement Intensity Modulated Radiation Therapy (IMRT) for breast cancer, pancreatic cancer and anorectal cancer effectively and safely in the clinic	6-10 Mar.	Japan
Training Course	RTC on Intensity Modulated Radiation Therapy for Lung and Oesophageal Cancers	To enable radiation oncologists and medical physicists to implement Intensity Modulated Radiation Therapy (IMRT) for lung and oesophageal cancers effectively and safely in the clinic	30 May -3 Jun.	Thailand
Expert	Expert Mission	To support Malaysian national training course on IMRT for lung and oesophageal cancers	8-9 Sept.	Malaysia
Training Course	RTC on Quality Audits of Intensity Modulated Radiation Therapy	To train radiation oncologists and medical physicists in quality audits of Intensity Modulated Radiation Therapy (IMRT).	27 Nov. - 1 Dec.	Singapore
Meeting	Final Review Meeting	To review and evaluate the overall activities and progress of the RCA project and plan the follow-up activities and future directions following the completion of the project	11-15 Dec.	Nepal

Project highlights for 2017

2017 was the final year of this 3-year project. Three Regional Training Courses and a Final Review Meeting were successfully held. Over the duration of the project, the number of GPs with IMRT capability increased from 13 to 16, and 202 radiotherapy health professionals were trained in various aspects of IMRT through seven RTCs covering basic principles of IMRT, disease-specific IMRT, and quality audits of IMRT. The RTCs had a flow-on effect in leading to various national training activities in IMRT, with the total number of radiotherapy health professionals trained being over 4,000 in 11 GPs. The number of radiotherapy centres offering IMRT was significantly increased from 396 at the beginning of this project to 538 at the end, which represented a 136% increase in IMRT capability in the RCA region.



RTC on Intensity Modulated Radiotherapy for Breast Cancer, Pancreatic Cancer, and Anorectal Cancer, March, Japan



Final Review Meeting, December, Japan

RAS6077	Strengthening the Effectiveness and Extent of Medical Physics Education and Training
Objective	To improve the quality of health care and patient safety in areas related to radiation medicine through the delivery of medical physics services

Project Activities in 2017

Event	Title	Summary of Purpose	Dates	Host Country
Expert	Home-based Assignment	To enhance AMPLE e-learning environment	3-7 Apr.	Australia
Expert	Home-based Assignment	To upgrade the assessment feature of the AMPLE e-learning environment	3-7 Apr.	Australia
Expert	Home-based Assignment	To coordinate clinical training pilots 2017	3-14 Apr.	Australia
Expert	Home-based Assignment	To improve the AMPLE resource on IAEA CLP4NET	19 Jun. - 18 Jul.	Austria
Expert	Expert Mission	To review clinical training programme in Philippines	24-28 Jul.	Philippines
Meeting	Final Project Review Meeting on Strengthening the Effectiveness and Extent of Medical Physics Education and Training	To review the project activities and achievements, to review the current status of medical physics education and e-learning, to review guidelines on certification and accreditation for medical physicists, to discuss means to support new RCA GPs and those with additional training needs	2-6 Oct.	Indonesia
Expert	Home-based Assignment	To update the AMPLE e-learning course.	23-26 Oct.	Australia

Expert	Home-based Assignment	To administer the AMPLE e-learning course	23-30 Oct.	Australia
Expert	Expert Mission	To review Bangladesh medical physics clinical training programmes	29-31 Oct.	Bangladesh
Expert	Home-based Assignment	To update analysis of medical physics workforce surveys	20-24 Nov.	Australia
Expert	Expert Mission	To review radiotherapy medical physics training	7-9 Dec.	Bangladesh

Project highlights for 2017

The main highlight for the project in its final year was the completion of all activities and the final meeting, where it was demonstrated that considerable progress has been made by many of the GPs in the improvement of medical physics education through clinical training. In addition, there was a training meeting in the Philippines for clinical training in all three specialties. In radiotherapy and diagnostic radiology, clinical training in the Philippines is into its 3rd or 2nd cohort and it appears the country is working well given the geographical spread of clinical registrars. In the case of Nuclear Medicine, the first training program in the Philippines is in the beginning phase. The final meeting for RAS6077 was held in Depok in Indonesia and was an outstanding success, due certainly to well-hosted and organized meeting conditions, as well as the cohesion demonstrated by the project NPCs and their welcoming of new GPs from more developing countries into the next cycle medical physics project.



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

Project Activities in 2017

Event	Title	Summary of Purpose	Dates	Host Country
Meeting	Mid-term Review Meeting and Workshop in Theranostics	To review project progress and update work plan and also to share knowledge in theranostics	20-24 Feb.	Vietnam

Expert	Expert Mission	To train experts on nuclear medicine techniques in thyroid diseases and oncology	24-28 Feb.	Bangladesh
Expert	Expert Mission	To train experts on nuclear medicine techniques in oncology and neurology	7-11 Aug.	Philippines
Expert	Expert Mission	To train experts on nuclear medicine oncology and cardiology	18-22 Sept.	Indonesia
Expert	Expert Mission	To train experts on nuclear medicine techniques in neurology	25-29 Sept.	Malaysia
Expert	Home-based Assignment	To produce E-learning module on theranostics	11-25 Nov.	Jordan
Expert	Expert Mission	To train experts on nuclear medicine techniques in neurology	13-17 Nov.	Thailand
Expert	Expert Mission	To finalize the E-learning modules on theranostics and neurology	27 Nov. - 8 Dec.	Austria
Training Course	RTC on Theranostics and Dementias	To train nuclear medicine physicians with consolidated experience in nuclear medicine on the treatment of neuroendocrine tumours, GI and liver cancer,	4-8 Dec.	Japan

Project highlights for 2017

The project successfully implemented the activities in 2017 according to the work plan, satisfying the performance indicators. Through the project, around 1,311 Nuclear Medicine professionals were trained and networked, and 10,261 nuclear medicine procedures were applied for diagnosis/treatment of oncologic, cardiovascular and neurologic patients in participating countries.

Five Expert Missions were conducted to BGD, PHI, INS, MAL and THA to train and promote diagnostic and therapeutic nuclear medicine procedures for both nuclear medicine physicians and referring doctors. The Expert Missions were held in conjunction with national conferences or nuclear medicine/workshops in the requested thematic areas. It was effective in transferring knowledge and recent development of the technology to the relevant experts. Expert Mission materials were uploaded onto the project platform on the RCA website (http://www.rcaro.org/undp_s11). A Regional Training Course on Theranostics and Dementias was held in December, Japan for 23 participants. The training course was accredited by the European Accreditation Council for Continuing Medical Education (EACCME). It was beneficial for the participants not only to enhance their expertise but also to maintain their professional competence by receiving 22 EACCME credits, recognized internationally. An e-learning module on theranostics is being developed and is expected to be launched in the first quarter of 2018.



Expert Mission, February, Bangladesh



Regional Training Course on Theranostics and Dementias, December, Japan

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

Project Activities in 2017

Event	Title	Summary of Purpose	Dates	Host Country
Training Course	RTC on Clinical Applications of Stereotactic Body Radiotherapy (SBRT) in Lung and Liver cancers.	To present an overview of the clinical applications of SBRT in lung and liver cancer to radiation oncologists and medical physicists To provide roadmap for a safe and effective clinical implementation of SBRT	22-26 May	India
Meeting	Mid-term Project Review Meeting	To review project progress and update work plan and to share knowledge in SBRT.	6-10 Nov.	Myanmar

Project highlights for 2017

The second Regional Training Course was successfully held from 22 to 26 May at Tata Memorial Centre, India. The technical focus was the clinical aspects of Stereotactic Body Radiation Therapy (SBRT) in lung and liver cancers. 27 radiation oncologists and medical physicists from 12 countries completed the course, and they appreciated the educational initiative and the warm hospitality of Tata Memorial Centre. The Mid-term Project Review Meeting was held from 6 to 10 November in Myanmar to share the project's progress and to review the work plan. Thailand (Ramathibodi Hospital) agreed to be a new Regional Training Hub for a beginners' group. A suggestion to form an Asian SBRT Society/Group for sustainable academic exchange was adopted, and the SBRT Interest Group of Asia Pacific (SIGA) was established by the participants during the meeting.



RTC on Clinical Applications of Stereotactic Body, May, India



Mid-term Project Review Meeting, November, Myanmar

➤ **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 Ecosystems (RCA)
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 2017

Event	Title	Summary of Purpose	Dates	Host Country
Meeting	Project Coordination Meeting	To review and assess the existing capabilities, gaps and needs in the participating countries in the area of marine radioactivity monitoring and assessment, to discuss and agree on implementation plan for 2017 and 2018	20-24 Mar.	Australia
Expert	Expert Mission	To review the status of methodological guidelines and technical content of training course on sampling and basic analytics	26-27 Jun.	Monaco
Training Course	RTC on Sampling and Basic Analytical Techniques	To build basic theoretical and practical capacity for participating countries to enhance sampling strategies, sample preparation methodologies and analytical techniques	14-25 Aug.	Indonesia

Project highlights for 2017

The First Coordination Meeting was successfully held in Sydney, Australia, in March inviting 17 National Project Coordinators and experts. The meeting confirmed the importance of the project for enhancing capabilities in radiological risk analysis and modelling of marine environments for better understanding of the impact of radioactive releases from nuclear facilities in the Asia-Pacific marine ecosystems. The meeting also agreed to share the acquired knowledge in marine radioactivity studies and methodologies and to strengthen regional collaboration. The first Regional Training Course on Sampling and Basic Analytical Techniques was held in Jakarta, Indonesia in August to train 21 young research scientists on radioactivity monitoring including sampling, preparation, and radio-analysis of marine metrics.



First Project Planning Coordination Meeting, March, Australia



Lab experiment RTC on Sampling and Basic Analytical Techniques, August, Indonesia

RAS7029	Assessing the Impact of Urban Air Particulate Matter on Air Quality (RCA)
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 2017

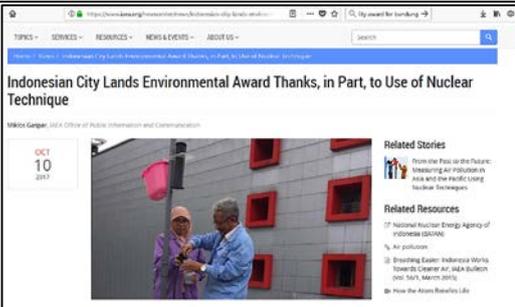
Event	Title	Summary of Purpose	Dates	Host Country
Meeting	Workshop on Cultural Heritage and Applicability of Nuclear Analytical Techniques	To discuss and share knowledge, experience and skills in the application of nuclear analytical techniques to monitor impacts of air particulate matter on cultural heritage objects.	12-16 Jun.	Myanmar
Meeting	Mid-term Progress Review Meeting Combined with Technical Workshop	To review and assess the project progress and results for 2016-2017. To interpret source apportionment and long-range transport data of air particulate matter in the Asia-Pacific region.	20-24 Nov.	India

Expert	Expert Mission	To provide technical advice and training on atmospheric aerosol sampling and analysis	23-28 Oct.	Nepal
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Project highlights for 2017

For assessment of the impact of urban air particulate matter on air quality, the project aims to identify the sources of fine and coarse particulate matter in the region. Fourteen countries from the region have collated their results in the world-first databases by applying nuclear analytical techniques for identifying 20-25 trace elements and source apportionment analysis that provides data on man-made and natural sources of air pollution. The databases are available on the Australian Nuclear Science and Technology Organization website:

<http://www.ansto.gov.au/ResearchHub/OurInfrastructure/acceleratorsciencecentre/ASP/FineParticleDatabases/index.htm>. Thirty seven (37) end-users in participating countries have used the databases to develop mitigation strategies for air pollution. Individual countries have developed strong linkages to multidisciplinary end-users and enhanced capabilities in nuclear analytical techniques. In particular, Indonesia has installed 17 sampling stations across the country; Pakistan conducted extended research; and Malaysia promoted nuclear analytical techniques through Regional Resource Unit (RRU) services at a national level.

	
<p>Bandung city, Indonesia was awarded for having the cleanest air in Southeast Asia</p>	<p>Participation in Panel Discussion at the International Conference on the IAEA Technical Cooperation Programme, June, IAEA</p>

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

Project Activities in 2017

Event	Title	Summary of Purpose	Dates	Host Country
Expert	Expert Mission	To implement fieldwork for Water Resources Assessment	16-20 Jan.	Palau
Expert	Expert Mission	To design sampling programs and research methodology for groundwater assessment	6-10 Feb.	Sri Lanka
Training Course	RTC on the Use of Isotope Techniques	To improve participants' knowledge and skills in the use of isotope techniques to assess	14-18 Aug.	Australia

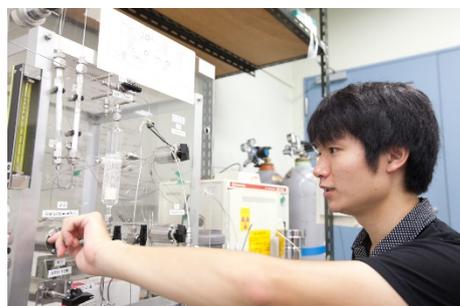
	for Groundwater dating	groundwater resources to better address hydrogeological problems.		
Expert	Expert Mission	To conduct isotope data interpretation	11-15 Sep.	Mongolia
Meeting	Mid-Term Progress Review Meeting	To review project progress in line with the work plan and specific objectives of the project, to share knowledge and experiences in the application of isotope techniques for investigations on groundwater dynamics and recharge rate, to discuss and agree on project implementation plan for 2018 and 2019.	6-10 Nov.	Sri Lanka

Project highlights for 2017

The project has made good progress as per the agreed regional and national work plans. The second Regional Training Course was held on 14-18 August 2017 in Sydney, Australia, for training 25 participants in the use of isotopic techniques for groundwater dating. The Mid-term Progress Review Meeting was held successfully on 6-10 November 2017 in Colombo, Sri Lanka, with NPCs reviewing the progress made under the project and agreeing with the workplan for 2018-2019. Participating countries collected water samples for isotopic and chemical analysis and measured the physical and chemical parameters of groundwater.



Measurement of Physical and Chemical Parameters of Groundwater, Bangladesh



Water Sample Analysis, Japan