Project Proposals for the RCA Programme 2020/2021
2nd Round Project Concept Template

Part 1: Information Sheet

Project proposals for the RCA Programme 2020/2021 are to be prepared using the attached template. Completed templates will be reviewed by the RCA PAC at the Meeting in Vienna being held 28 January to 2 February 2018.

- **PLEASE NOTE THAT ALL PROSPECTIVE CONCEPTS REQUIRE INFORMATION THAT IS LODGED ON THE RCARO WEBSITE (access is only required to the RCA information not the whole Members Only site).**
- **YOU WILL HAVE TO APPLY FOR A PASSWORD AND ACCESS CODE TO ENABLE ACCESS TO THIS INFORMATION.**
- **PLEASE GET ENDORSEMENT FROM YOUR NATIONAL REPRESENTATIVE FOR THIS ACCESS.**

The 2nd Round Concept Proposals will be evaluated against the response to the feedback you have received from RCA PAC on your 1st Round Concept Proposals as well as the criteria listed below:

- **Is its aims and objectives in line with priorities set out the RCA Medium Term Strategy for 2018/2023?**
- **Identify which elements of the MTS are being complied with.**
- **Why it should be a regional project.**
- **The essential role of the nuclear technology in the project.**
- **Does the proposal identify links to previous projects in this area of technology?**
- **Does the proposal overlap or duplicate current or previous RCA projects?**
- **Is a convincing case made to justify further projects in this area?**
- **Is there a strong TCDC component to exploit the benefits from the earlier projects?**
- **Is there a readily available baseline against which to measure the effectiveness of the project?**
- **If the proposal is essentially an extension of previous projects in this area that have been implemented for more than 2 TC Cycles, does the proposal include arrangements for the transfer of project leadership to others?**

In addition to the above, please address the following specific questions:

Was this concept identified at the 46th RCA GCM as requiring merger with other similar concepts?	**NO.**
If "YES" – was this concept prepared as a result of consultation with the other proposers?	**N/A**
If "NO" - why was this not undertaken?	**N/A**

(Please note that it is important to address all the dot points in the Concept Template.)

Your National Representative will be reviewing the concept document to ensure that it has been prepared in compliance with the RCA special requirements.

(Please be aware that, if your concept design does not take account of the special requirements for the RCA programme, it will be rejected.)

Part 2: Concept Template

Title:

- *The title should be as concise as possible and should summarize the objective of the project.*

Isotopes for Sustainable Wetlands to improve livelihoods in the Asia-Pacific

Compliance with the RCA Medium Term Strategy for 2018/2023:

All RCA projects have to comply with the RCA MTS for 2018/2023 - please refer to the MTS document.

- *Briefly indicate to which specific MTS priorities this project proposal contributes.*
- *How will these be achieved?*

With specific reference to the RCA Medium Term Strategy (MTS) 2018-2023, this project will contribute to multiple strategic directions. This project is aligned well into the category of 'Capacity building for developing countries' and relates to Strategic Directions 5, 2, 4 and 6 and with the Strategic Priorities C.2.1 and C.2.4 of the MTS. The specific contributions of this project are detailed below.

Strategic Direction 2: Enhances the contribution of RCA in the Asia Pacific region to meet development needs and priorities regarding sustainable management of wetlands and water resources.
Strategic Direction 4: Applies best practice safety standards to use nuclear techniques for a peaceful purpose of assessing contribution of wetlands to fisheries and carbon sequestration.
Strategic Direction 5: Builds human capacity in nuclear techniques to maximize benefits from participation in the RCA including social and environmental need in the Asia Pacific region.
Strategic Direction 6: By building human capacity, promotes self-reliance, good institutional governance and excellence in management.

Regarding strategic priorities, this project will make contribution to the following Strategic Priorities

C2.1 Priorities in Food and Agriculture, by clarifying the productivity base of wild fisheries, trophic connectivity with wetland resources, and better understanding vulnerability of wetlands to human activity, this project will contribute to increase agricultural productivity as well as help science-based decision making for the sustainable use of wetland resources

C2.4 Priorities in Environment, by clarifying foundational processes relevant to the two themes of Coastal and Marine Resources, and Water Resources. Coastal wetlands support the highest efficiency of carbon sequestration of any known environment, and the project will provide tools to provide greater certainty regarding the provenance of carbon captured. We will also train participants in tools required to identify the contribution of coastal wetlands to coastal and marine fisheries. The efficient use of Water Resources requires a balance between human use and environmental outcomes, and our project will showcase isotopic techniques applied in Australia to demonstrate the role of environmental water in sustaining freshwater wetland ecosystems. By improving understanding links between wetlands and aquatic resources and the capacity of wetlands to mitigate climate change, this project will improve the capability of participating countries to determine the significance of wetlands in maintaining livelihoods and promote wise use of wetlands for sustainable outcomes.

Overall Objective:

- *State the objective to which the project will contribute. (Note this has to be in line with the RCA MTS for 2018/2023. It should be a short description expressed as: To do ……..)*

Wetlands provide fundamental ecosystem services across the Asia-Pacific, supporting freshwater and marine fisheries, sustaining biological diversity and providing an efficient sink for atmospheric carbon. The project will enhance national capability in the sustainable management of wetlands, by training partners and regional organisations in the use of stable isotopic techniques which clarify the movement of carbon between components of wetland systems. These techniques have been applied to answer basic questions posed by natural resource managers: What sources of primary production drive fisheries productivity? What are the trophic interactions upon which healthy fisheries depend? How does the management of hydrology and the input of pollutants influence the integrity of wetland ecosystems? How much carbon is permanently sequestered and stored in wetland soils, and from where is this carbon sourced?

The overall objective of this project is to assist Government Parties with the application of isotopic techniques to wetland management and strategic conservation planning. Technical cooperation will focus on improved and standardised sampling protocols, the matching of isotopic analytical tools with specific questions relevant to wetland management, and the improved interpretation of ecosystem structure and processes, through greater technical proficiency and through the benefits of regional context and scale. The principal tasks involved are:

1. Enhance technical capabilities of participating GPs for wetlands sampling, sample preparation for isotopic analysis, sample analysis, data analysis and interpretation as well as application to wetland ecology and management.
2. Facilitation of regional networking for the development of a wetland database incorporating metadata, raw data and analysis derived from this project.
3. Establishing regional cooperation among nuclear science practitioners and end-users whom are educated and informed about the role of nuclear science in wetland sustainability.

Proposed Participating Government Parties:

- *List the Government Parties expected to participate in the project.*
- *Indicate each of those where you have baseline information on their requirements and needs:*

1. Australia

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2. JAPAN
(involvement to be confirmed)

3. New Zealand
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Coastal and Estuarine Processes Scientist
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(involvement to be confirmed)

4. China
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(Involvement confirmed)

5. Republic of Korea
(involvement to be confirmed)

6. Philippines
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(involvement to be confirmed)

7. Bangladesh

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(Involvment confirmed)

9. Pakistan
(involvement to be confirmed)

10. Thailand
(involvement to be confirmed)

11. Malaysia
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(Involvement confirmed)

12. Vietnam
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(involvement to be confirmed)

13. Sri Lanka
L.P. Jayatissa
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14. India
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Involvement confirmed

15. Cambodia
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16. Myanmar
(involvement to be confirmed)

17. Fiji
(involvement to be confirmed)

18. Palau
(involvement to be confirmed)

19. Singapore
Dr Dan Friess
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Dan.friess@nus.edu.au
(involvement to be confirmed)

20. Nepal
(involvement to be confirmed)

21. Laos
(involvement to be confirmed)

22. Mongolia
(involvement to be confirmed)

Technical Cooperation among Developing Countries (TCDC) Project Component:
Review the documentation on line – www.rcaro.org/ ???.

- *Outline the TCDC strategies to be used in the project to enhance regional cooperation:*
- *Will the project design feature partnering arrangements between those advanced and those less advanced in the technology?*
- *If so, list those expected partnerships.*

Fish are currently the major source of animal protein and livelihood for millions of people in the Asia-Pacific region. In this project, specific attention will be directed towards strengthening the capability for participating developing countries to undertake scientific best practice application of nuclear technologies to quantify the contribution of wetlands to fisheries. This will be achieved by engaging RGP and BLRP in all aspects of the project, including field trials, laboratory studies, analysis and information dissemination. The current capability of Resource Government Parties (RGP) and Basic Level Resource Parties (BLRP) in the application of nuclear techniques to determine trophic interaction of fisheries with wetland resources will be identified through discussions with participating countries during the development of this project proposal. Importantly, in terms of TCDC, the opportunity for sharing of developing countries' own expertise, technology, resources and facilities will be scrutinised and encouraged and, where identified, specifics included in the project design as the process progresses. Many of the participating organisations are in possession of, or have access to, EA-IRMS (Elemental Analysis - Isotope Ratio Mass Spectrometry) facilities used in this research. We will strategically match the technical and scientific capability and needs of participants in designing a program that provides for optimal use and co-ordination of facilities and expertise across the region. The project will emphasise the development of specific TCDC strategy following discussion with NPCs. The strategy will include the types of wetlands and key resources supporting livelihood across the region. Resources that support livelihood may differ among wetlands and countries. Current state of knowledge (e.g., application of isotopic and nuclear techniques on wetlands), analytical infrastructure and their use among participating countries will be included in the TCDC strategy. This simple specific strategy will help in achieving project objectives and contribute to the capacity building of RGP and BLRP. The specific TCDC strategies will be detailed as more confirmation of participation is received.

The level of TCDC will be better understood once all the NPCs for the project have been confirmed and they have provided information to the LCC on the current status in their country and their needs for this project. Countries such as Australia, New Zealand, Singapore and China have substantial analytical capacity and skills in the region on the application of isotopic techniques on wetlands. A specific partnership will be developed with other countries such as India, Japan, Malaysia and the Philippines that have analytical infrastructures (i.e. EA-IRMS) but limited experience and technical proficiency in the application of these techniques to wetland management. Similarly other countries in the region have limitations on access to

facilities and technical support in their application of nuclear techniques to wetland management. The specific partnerships will be identified as confirmation of participation is received.

Analysis of gaps / problems / needs as applied to the RCA region:

- *Outline the major gaps / problems/specific needs to be addressed by the project (~ 300 words):*

Wetlands provide many benefits (e.g., supply of water, production of food) to the large proportion of the population in the Asia-Pacific countries. Increasing human populations intensify pressure on wetlands, impacting on their ecosystem services. Fundamental to the management of wetlands is an understanding of the trophic linkages between harvested fish and wetland resources, and the additional value of wetlands in their C-sequestration potential. These dual values, carbon storage and carbon transfer to fisheries, are not well understood and can be elucidated by stable isotope techniques.

A major gap that this project will address is the limited current information about the quantitative value of wetlands as fishery resources in the Asia Pacific Region and their vulnerability to anthropogenic and environmental changes. Management and conservation of wetlands is hindered by inadequate quantifiable information on the ecosystem services provided by wetlands and their dependences on primary habitat. The consequence of this problem is that there is inadequate adaptation planning and management for wetlands, which leads to significant social, environmental and economic impacts. This is particularly alarming for the Asia Pacific countries, as many of the largest wetlands in the world, such as Kerala Backwater in India, the Sundarbans in Bangladesh, and Wasur National Park in Indonesia, are located in the region. A significant portion of the population in the Asia-Pacific countries depends on wetlands services for their livelihood.

Specifically, the project will address three major problems:

- Insufficient information on the contribution of wetlands to fisheries in the Asia-Pacific countries, specifically the carbon and nitrogen linkages between large wetlands and fish resources, and the food webs upon which they depend, that sustain livelihoods and food security across the region;
- Limited information regarding anthropogenic activity and pollution effects on the integrity of wetland ecosystems; and
- Limited knowledge of the carbon sequestration service provided by large wetlands, and the implications for national greenhouse accounting and emerging carbon trading markets.

The project will engage RGP countries to conduct pilot research/case studies in the significant wetlands in the region to quantify the three major problems identified above. Funding opportunity to conduct this exploratory exercise will be explored upon consulting with NPCs. Application of isotopic techniques to determine key processes relevant to wetland management will improve knowledge, provide a context for technical partnership and knowledge transfer, and provide the foundation of the first information database on this topic area. BLRP countries will benefit from through improved foundational knowledge supporting a more strategic approach to wetland management and conservation, through the increase in technical proficiency and in the development of targeted research plans for isotopic analysis in wetland research and management.

- *Review the resource documentation and list any past RCA projects that have addressed similar problems/needs in this area of technology.*

We have identified six past projects that peripherally relate to this project (see table below). Whilst they focused on the marine or coastal environment, they were not designed to provide skills and capacity-building related to the assessment of the contribution of wetlands to fish resources and how the integrity of wetland ecosystems is affected by anthropogenic activity and environmental change. The projects did not specifically apply stable isotopes and nuclear techniques to wetlands biota. The table details the foci of these projects, distinguishing them from the focus of this newly proposed project.

Project No.	Title	Focus
RAS/7/031	Assessing the vulnerability of coastal landscapes and ecosystems in the Asia-Pacific to sea-level rise and climate change	The application of radiometric and isotopic techniques to ascertain coastal vulnerability and resilience to sea-level rise through analysis of sedimentary records.
RAS/7/011	Enhancing the sustainability of the marine coastal environment	Development of a marine database - collected information on fate and behaviour of pollutants and harmful algal bloom concerns.
RAS/7/016	Establishing a benchmark for assessing the radiological impact of nuclear power activities on the marine environment in the Asia-Pacific region	Regional marine radioactivity monitoring programs, and development of concomitant quality management systems; dose response transfer functions factors for seafood; development of a regional database as ongoing repository for new data.
RAS/7/019	Harmonizing nuclear and isotopic techniques for marine pollution management at the regional level	Nuclear and isotopic techniques to fingerprint and identify land-based sources of marine pollution, estimate flux, and characterise transport and fate of land-based sources of pollution.
RAS/7/021	Marine benchmark study on the possible impact of the Fukushima radioactive releases in the Asia-Pacific Region	Evaluating the extent and the possible impact of the releases of radioactivity from the Fukushima Daiichi nuclear power plant into the marine environment.
RAS/8/083	Management of marine coastal environment pollution	Application of nuclear techniques to the effects of historical pollution; minimising the impact of effluent released to the coastal zones; and contributing to sustainable development through the effective design of coastal engineering works.

- *What are the major additional capabilities/skills in this area of technology that will be provided through this project (~ 200 words).*

Activities relating to assessing the sustainability of wetlands by GPs are inconsistent, and the spatial scale of analyses is generally insufficient. We propose a project that will introduce regional partners to the principles of stable isotope ecology, and provide training in analytical techniques and interpretation of a range of isotope values within ecosystems. This foundational training will provide the opportunity for implementation of a regional program of sampling and analysis for coastal and freshwater wetland systems of international significance. In particular, training proposed as part of this project will provide skills and build capacity for Basic Level Parties (BLP) and Intermidiate Level Parties (ILP) to expand their knowledge on the sustainability of wetlands and fisheries, including their capacity to undertake essential research, particularly skills in stable isotopes and radiochemistry analysis. In addition, participating countries will benefit from the application of state-of-the-art approaches to sampling, sample preparation, data analysis and interpretation. Engagement in this project will improve capabalities in the application of isotopic data for mixing model calculation to quantify contribution of wetlands source materials to the production of fish, including provenance of sequestrated carbon in wetlands.

Capabilities on the application of isotopic and nuclear techniques to quantify sustainability of wetlands vary among participating countries. The specific capabilities/skills needed by the participating GP will be addressed as more confirmation of participation is received.

Requirements for participation:

- *Indicate the minimum requirements that the counterpart institutions in Government Parties would need to meet in order to participate in this project.*

- *Indicate the status of expected participating Government Parties as "Resource" or "Recipient".*

Coordination of national programmes and the formation of National Project Teams is a standard strategy usually used for the implementation of RCA projects. Counterpart institutions should be national nuclear or environmental science (fisheries/ marine science, nuclear science, etc.) institutes, or National Research Agencies or Environmental Management Agencies. Participant countries must have basic capabilities to collect and prepare samples for analysis, including: field sampling equipment for fish and invertebrates, water sampling, taxonomic analysis of biota, sediment sieving, weighing and drying facilities, and EA-IRMS. Several leading universities in the region have EA-IRMS facilities or access to these facilities, and their participation will be encouraged, particularly in the promotion of further dissemination of these techniques. Advanced-Level Parties should have knowledge about the application of isotopic techniques on wetlands environments and basic to moderate level capacity to implement (access to isotope facilities or networks) nuclear techniques in fisheries and wetlands.

Intermediate Level Parties (ILPs) should have fieldwork and sampling capabilities and technical support for some of the capabilities of the Resource Parties (RPs) above, and knowledge of field sites. Basic level RPs should have fieldwork and sampling capabilities and knowledge of field sites.

Stakeholder analysis and partnerships:

- *Briefly describe who are expected to be the principal beneficiaries of this project and any role that will be defined for them in the project.*

Principal beneficiaries of this project will include both government and extractive industries. Government stakeholders include those agencies charged with environmental protection, fisheries management, and development and planning. Marine and coastal industry stakeholders include aquaculture, fisheries, agriculture and tourism, and people and communities who rely on wetland resources for their sustenance and livelihoods. Partnerships with national environment, fisheries management and planning agencies will provide opportunities to integrate with policy and management development and planning.

Representatives from these key agencies and end-user groups will be encouraged to join, or at least advise, each participating GP's National Project Team, including during the development of the project design. Under the RCA Guidelines and Operating Rules, each participating GP forms a National Team which is responsible for implementation of the project at national level according to the Work Plan.

The project activities are in a core area of IAEA expertise, and the IAEA Nuclear Analytical Environment Laboratories (NAEL) in Monaco will be a key institution for cooperation, supplying advice and technical support for the project. The IAEA-NAEL will provide administration, expertise and scientific/technical backstopping. ANSTO has well stablished working relationship with NAEL. ANSTO being involved as joint (or alternate) LCC would help in securing required support from NAEL. The project plans to develop communication networks with NAEL from the second round of the project development.

The Lead Country proponents of the project have a strong and effective network with international and Asia-Pacific nuclear, environmental and fisheries agencies, as well as leading expertise in wetland stable isotope ecology of food webs, data management and analysis, quality systems and project management. These existing linkages will assist in developing partnership opportunities and will be supported by existing networks of other GPs. High-level activities of the more advanced GPs will facilitate training and development of ILP and BLRPs in the use of up-to-date tools and data, and benefit from the lessons learned from previous projects in RGP.

- *Have any extrabudgetary funding possibilities, sponsors and partners been identified?*
- *Have any sponsors/partners been involved at the concept stage?*
- *Have any sponsors/partners made firm commitments of support at this stage?*
- *Have any sponsors/partners expressed firm commitments to extrabudgetary support?*

No definite opportunities for EB funding have been identified at this early stage of project development. Wetland resources are key to the food and income security for millions of people in the Asian-Pacific region, and Government and Non-Government Organisations (NGOs) working toward the sustainable management of wetlands will be vitally interested in this project. Given the significance of this project and the Lead Country's reputation in this area and its established networks, extra budgetary funding opportunities will be more intensely explored over the period of project development. More definite partnerships including the type of support (funding, in- kind contributions etc.) that are agreed by organisations will be cited as participation is confirmed.

No commitments have been made in a formal sense, but through preliminary discussions between the Lead Country proponents and regional colleagues on the periphery of international scientific meetings and conferences.

Role of nuclear technology:

- *Indicate the essential nuclear technique that is planned be used in this project.*
- *Outline why it is suitable for addressing the problems/needs in question.*

Wetlands provide foundation ecosystem services, supporting fisheries, sustaining biological diversity, and providing an efficient sink for atmospheric carbon. A fundamental task for wetland and fisheries management is the quantification of energy and nutrient dynamics, and food chain linkages, between aquatic species and wetland resources. Identifying the sources of carbon stored in the wetlands, and pathways to uptake in food-webs, promotes the conservation and restoration value of wetlands. Quantifying food web connections and carbon sequestration, and the extent to which anthropogenic developments and pollutants affect the integrity of wetlands and trophic linkages, targets the management and protection of ecosystem services provided by wetlands. But determining these ecosystem services is not straightforward, as sources of primary production driving food web connectivity and carbon storage can be varied and challenging to identify without nuclear techniques.

Stable isotope analysis has emerged as an important technique to quantify energy and nutrient flow and food web dynamics, with particular application in wetlands. The technique generally employs the stable isotopes of both carbon ($^{13}C/^{12}C$) and nitrogen ($^{15}N/^{14}N$). Carbon isotopes indicate the sources of nutrients and their cycling through an ecosystem, with important distinctions in carbon isotope values between key primary producers, including plants utilising different photosynthetic pathways (for example, marine plants compared to terrestrial plants). Nitrogen isotopes are used to indicate the trophic level of food web components. During the assimilation process, there is a small increase in the ratio of the heavier (^{13}C and ^{15}N) isotopes of the consumer species relative to the prey, known as trophic fractionation. Trophic fractionation for carbon (average 0.8 to 1.1‰) is much smaller than that for nitrogen (average 3.4‰). Stable isotope analyses have been used to quantify trophic connectivity among species in the ecosystem. Stable nitrogen isotopes can be used for tracking of pollutants derived from urban effluent or other anthropogenic sources that may affect the integrity of wetland ecosystems. They have also been used to identify the source of sequestrated carbon in the wetlands. Analysis of naturally occurring carbon and nitrogen isotopes is one

of the most powerful nuclear techniques that can identify the provenance of carbon being stored and transferred within wetland ecosystems.

The contributions of different wetland carbon sources (for example algal, seagrass, mangrove) to the food web can be calculated numerically using a source mixing model. In the mixing model, the $\delta^{13}C$ and $\delta^{15}N$ values of consumer species and their potential food sources are used with appropriate trophic enrichment correction to estimate the feasible contributions of sources to the diet of consumer species.

- *Is this the only available technique?*

- *Does it have a comparative advantage over non-nuclear techniques?*

A range of conventional survey techniques (e.g. nets, traps and video recording of species' movement to quantify abundance and diversity) and stomach content analysis (e.g. identify and quantify diet sources in the stomach of a consumer using microscopes), as well as molecular techniques (e.g. RNA to DNA ratios), have been used to assess habitat use and trophic connectivity between fish and wetlands (both freshwater and marine). However, these traditional techniques require a higher level of taxonomic knowledge to identify species and have lower precision and greater labour demands than nuclear techniques proposed in this research.

Dietary study (who is eating what?) is popularly applied to quantify trophic linkages using gut content analysis. This involves collecting and dissecting a broad range of organisms to determine food chain links. However, gut content analysis has several inherent limitations - they provide only a short-term (hours to days) dietary snapshot of recently ingested items. Moreover, not all ingested materials are necessarily assimilated, and ingested materials are generally digested quickly and are therefore rarely found in the stomach. As such, stable isotope analysis offers a more advanced, sensitive and rigorous methodology for assessment of wetlands food webs and the identification of sequestrated carbon in wetlands. The more conventional techniques can, however, be used in tandem with nuclear techniques to improve or verify the precision of conclusions.

Duration of the project:

- *Indicate the number of years estimated to be required to complete the project.*

A four-year project duration, commencing beginning 2020 until end 2023, is needed to achieve the project objectives.

Part 3: National Representative Endorsement for Project Concept

I have endorsed the proposer to have access to the RCARO web page for the resource documentation necessary to complete the attached concept document.

This 2nd Round Concept meets the RCA project requirements and I endorse it as a priority for the RCA Programme 2020/2021.

Signed: M. [signature] (for National Representative)

Date: 15/01/18

Part 4: RCA PAC 2nd Round Concept Review Template

RCA Project Concept Template Questions	Comment	Acceptable	Revise	Reject
Title: • *The title should be as concise as possible and should summarize the objective of the project.*				
Compliance with the RCA Medium Term Strategy for 2018/2023: *All RCA projects have to comply with the RCA MTS for 2018/2023 - please refer to the MTS document.* • *Briefly indicate to which specific MTS priorities this project proposal contribute.* • *How will these be achieved?*				
Overall Objective: • *State the objective to which the project will contribute. (Note this has to be in line with the RCA MTS for 2018/2023. It should be a short description expressed as: To do ……..)*				
Participating Government Parties: • *List the Government Parties expected to participate in the project.* • *Indicate each of those where you have baseline information on their requirements and needs:*				

Technical Cooperation among Developing Countries (TCDC) Project Component: *Review the documentation on-line - www.rcaro.org/ ???* • *Outline the TCDC strategies to be used in the project to enhance regional cooperation:* • *Will the project design feature partnering arrangements between those advanced and those less advanced in the technology?* • *If so, list those expected partnerships.*				
Analysis of gaps / problems / needs: • *Outline the major gaps / problems/specific needs to be addressed by the project (~ 300 words):* • *Review the resource documentation and list any past RCA projects that have addressed similar problems/needs in this area of technology.* • *What are the major additional capabilities/skills in this area of technology that will be provided through this project (~ 200 words).*				
Requirements for participation: • *Indicate the minimum requirements that the counterpart institutions in Government Parties would need to meet in order to participate in this project.* • *Indicate the status of expected participating Government Parties as "Resource" or "Recipient".*				

Stakeholder analysis and partnerships: • *Briefly describe who are expected to be the principal beneficiaries of this project and any role that will be defined for them in the project.* • *Have any extrabudgetary funding possibilities, sponsors and partners been identified?* • *Have any sponsors/partners been involved at the concept stage?* • *Have any sponsors/partners made firm commitments of support at this stage?* • *Have any sponsors/partners expressed firm commitments to extrabudgetary support?*				
Role of nuclear technology: • *Indicate the essential nuclear technique that is planned be used in this project.* • *Outline why it is suitable for addressing the problems/needs in question.* • *Is this the only available technique?* • *Does it have a comparative advantage over non-nuclear techniques?*				
Duration of the project: • *Indicate the number of years required to complete the project.*				

RCA PAC Assessment	
Is the concept recommended for further development? YES/NO **If not recommended, what are the major reasons?**	
RCA PAC Committee Member:	