

Project Concept Template

Project Proposals for the RCA Programme 2024/2025

Part 1: Information Sheet

Project proposals for the RCA Programme 2024/2025 are to be prepared using the attached template and submitted **BEFORE 31ST OF DECEMBER 2021**. Completed templates will be reviewed by the RCA PAC in January 2022.

Resource documents required for developing Project Concepts can be found in the RCA web-site – ([RCA Regional Office \(rcaro.org\)](http://rcaro.org)), under Projects/Resource Documents. (see below for the list of resource documents).

The Project Concept should be prepared in consultation with the stakeholders of the other participating GPs. Information on RCA stakeholders can be found in the RCA web-site ([RCA Regional Office \(rcaro.org\)](http://rcaro.org)), under Projects/Project Information.

Please request access to the RCA Members Only web-site from RCARO (email: rcaro@rcaro.org) through your National RCA Representative if you do not already have access.

A proposal will be evaluated against the following criteria:

- Alignment of the objectives with priorities set out the RCA Regional Programme Framework (RPF) for 2024/25.
- Whether the project addresses a regional need.
- Whether nuclear technology is an essential component of the project.
- Whether outcomes and achievements of previous projects in this area of technology are considered.
- 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?
- 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 another GP?

List of Resource Documents on RCA web-site (www.rcaro.org)

1. Timeframe for preparation, review and approval of Project Concepts
2. Brochure on Logical Framework Matrix (Quick Reference Guide on Designing IAEA TC Projects)
3. RCA Regional Programme Framework for 2024-29
4. Details of RCA TC Projects implemented in 2007-2019
5. List of TC Projects being implemented in 2020/21 and projects approved for 2022/24
6. Recommendations on Technical Cooperation among Developing Countries (TCDC)

Please note that your National Representative will be reviewing the concept document to ensure that it has been prepared in compliance with the RCA and IAEA Criteria for TC Projects

Please contact the Chair of the RCA Programme Advisory Committee, Dr. Prinath Dias at prinathd@yahoo.com if you need assistance.

Part 2: Concept Template¹

Title:

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

Enhancing Regional Laboratory Testing Capabilities to Generate Reliable Data on Multi-Chemical and Associate Microbial Hazards in Food (Pakistan Lead Country)

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

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

Member States in Asia are major food producers in the world. However, several cases of acute foodborne incidences have been recorded while long term public health effects are also a major concern, all due to chemical and microbiological hazards. Food borne diseases impede socioeconomic development by straining health care systems, and harming national economies, tourism and trade. Another challenge associated with these hazards is regular rejections and recalls of export consignments indicate disparities in their food control systems. Required level of competence to generate reliable scientific data on these levels through appropriate risk analysis is limited to meet diversified food safety challenges as per national, regional and international standards. Analytical capabilities of the laboratories can play critical component in this regard. The objective of the proposal is to enhance national laboratories capabilities and programmes of Asian member states for chemical food contaminants and any emerging food safety challenges. The hazards are broad must be controlled and risk of exposure should be assessed across the region, e.g. fresh water natural biotoxins (e.g. cyanotoxins), mycotoxins, food borne pathogens, veterinary drugs (banned or permitted), pesticide residues, toxic metals and/or radionuclides (but not limited to). These contaminants are also associated with antimicrobial resistance while several microbial hazards are zoonotic in nature and an important component of the One Health approach. A common approach that will ensure uniform understanding of occurrence levels is required possibly through a regional project. Relevant human resource will be built or strengthened through group or specialized individual trainings, collaborative knowledge and experience exchange programmes and related procurement. It will help member States to implement or set relevant standards and guidelines, better safeguard consumers and boost food trade. The project leverages advantages of nuclear & isotopic and conventional techniques to strengthen laboratory capabilities that underpin the systematic national testing.

Review the resource documentation and list any past RCA projects that have addressed similar problems/needs in this area of technology. Consider outcomes and achievements of previous projects, and avoid any overlap or duplication.

The proposal is in line with RCA Priority areas for 2024-2029 i.e. Thematic area- Agriculture: Priority Area – Food Safety (A1) i.e. Development of the analytical the analytical capability to use well-established nuclear and related techniques to detect food adulterants, chemical contaminants including veterinary drugs,

¹ If you have not been involved in drafting a concept before and if you are not fully acquainted with the RCA and its Programme you are encouraged to support advice and assistance from your RCA National Representative.

pesticides, natural toxins, microbial contaminants and radionuclides. The project is also in line with RCA thematic area on facilitating global trade; SDGs 1 and 2; regional development goals to enhance economic development; also linked to FAO Asia-Pacific Regional Strategic programme. There is one ongoing RCA project (RAS5081) under implementation with a different objective to improve food safety by establishing a robust and independent means of verification of origin of foodstuffs. Being Asia a key global food supplier having major concern for public health and international food trade, the project addresses the basic regional need on food safety.

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

Capabilities built under RAS5078 (with some more specialized training of the trainers) will largely be used under the project. The experience of participating institutes will be utilized to leverage the advantages of nuclear, isotopic and complementary techniques and facilitate implementation of the programs for proposed chemical contaminants analysis. Good sampling practices, reliable data collection and dissemination mechanisms to inform science based food safety and associated export policies and production practices will be strengthened. Reliability and competence of testing laboratories will be met, maintained and/or upgraded through ISO/IEC 17025:2017 accreditation and being PT provider. Scientific exchanges among member states will be focused as a mechanism to strengthen each other's capabilities and share knowledge and benchmarks areas of strength. Screening and confirmatory techniques (e.g. Radio-receptor binding assays, RIA, ELISA, GC-LC-MS/MS) will be established or strengthened through group trainings, twinning programs and/or experts visits to develop competent human resource. Undertaking joint activities to implement or set relevant food safety standards and guidelines through collecting exposure data on residues and contaminants will be focused. The project will also seek to enhance collaborative efforts initiated under RAS5078 and attract other relevant stakeholders/partners.

Overall Objective: (Required for the preparation of the IAEA Regional Programme Note)

State the overall long-term objective to which the project will contribute. This should reflect an impact related to the RCA Regional Programme Framework for 2024/29.

Problem and objective analysis using objective and problem trees is recommended. (See pages 9 and 10 of the Quick Reference Guide on Designing IAEA TC Projects in resource documents)

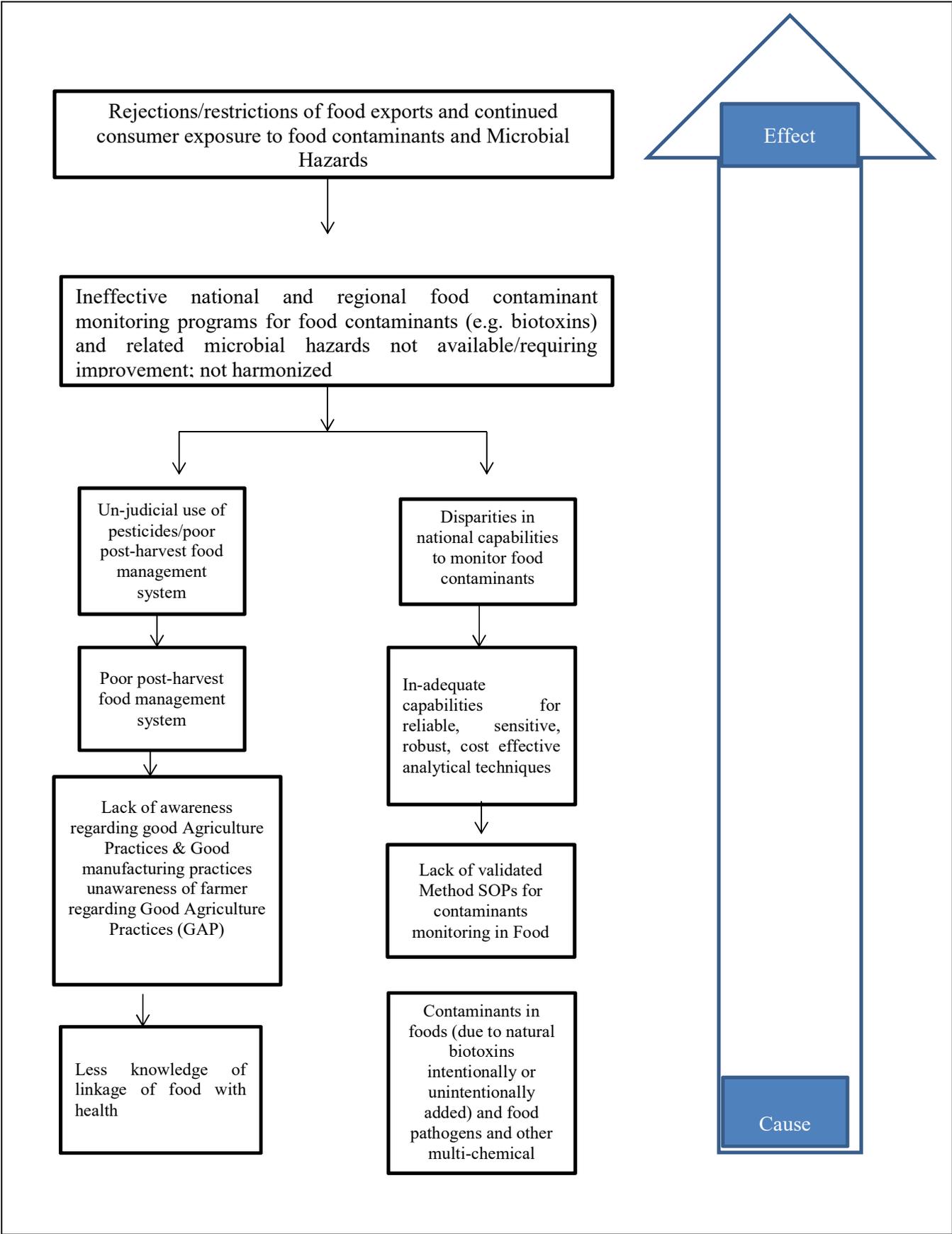
Overall Objective:

To enhance testing capabilities of member states laboratories, improve food safety and increase food trade in Asia/Asia Pacific through enhancing the role of nuclear (and allied analytical) techniques to control chemical/natural and microbial contaminants in food.

Objective Analysis: Asian countries are the major food exporters in the world. However, rejections/restrictions of food exports as well as continued consumer exposure to food contaminants and

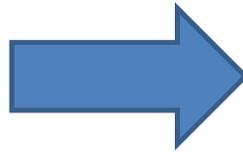
microbial hazards is common. National and regional food contaminant monitoring programs for food contaminants (e.g. biotoxins) and related microbial hazards not available/requiring improvement; not harmonized

Safe/quality foods for local public health and international markets should be ensured through national residue programs driven by a functional/efficient food safety laboratory of international repute. Isotopic/nuclear based analytical tools and conventional techniques (such as the use of radio receptor assay techniques, stable isotopes, radio-immunoassays, GC-LC/MS/MS etc.) can be effectively used and promoted. In summary, the projects hopes to enhance regional collaboration among food safety laboratories and facilitate harmonization of laboratory practices that monitor natural biotoxins, food pathogens, veterinary drug residues and related chemical/natural contaminants in foods. Interaction of food safety laboratories with non-technical stakeholders will be enhanced. Expansion and improvements in food safety Asia network (www.foodsafetyasia.org), currently aiming at self-sustainability and being as wide as possible in the region, will provide a foundation for common regional positions on international standards/guidelines and international trade demands/requirements.



PROBLEM

OBJECTIVE



Rejections/restrictions of food exports and continued consumer exposure to food contaminants and Microbial Hazards



Enhancing international trade of food products and public health through efficient national control programs strengthened through laboratory networks using harmonized reliable nuclear/isotopic and complementary techniques

National and regional food contaminant monitoring programs for food contaminants (e.g. biotoxins) and related microbial hazards not available/requiring improvement; not harmonized



Strengthening of Food Safety Asia Network (www.foodsafetyasia.org) regional laboratory network that supports national control programs for biotoxins and food pathogens and other multi-chemical

Disparities in national capabilities to monitor food contaminants; need to harmonize laboratory capabilities



Harmonization of analytical techniques; sharing of expertise and experiences; participation in interlab/PT studies, group trainings, technical exchanges

Ineffective monitoring programs that do not meet international requirements for control of intentional and unintentional contaminants in food and environment



Improving monitoring programs that meet international requirements for control of intentional and unintentional contaminants in food

Demand for highly reliable, sensitive, robust, cost effective analytical techniques required that are operated by competent personnel in a well -equipped laboratory that meets international standards to support



Set up of highly reliable, sensitive, robust, cost effective analytical techniques that are operated by competent personnel in a well -equipped laboratory that meets international quality standards

Demand for highly reliable, sensitive, robust, cost effective analytical techniques required that are operated by competent personnel in a well -equipped laboratory that meets international standards to support



Generating laboratory data to create awareness on food contaminants and informing GPs

Project Outcome: (Required for the preparation of the IAEA Regional Programme Note)

The outcome is the planned result of a project, achieved through the collective effort of stakeholders and partners. It represents the change or improvement that occurs as a result of the project. Should be worded in past tense. (e.g. The capability fordeveloped)

The testing capabilities of national and regional laboratories strengthened to generate reliable data on natural Biotoxins (specifically fresh water cyanotoxins), microbial pathogens and other toxic multi-chemical contaminants in food employing nuclear/isotopic and related conventional techniques to enhance national food safety and increased international trade.

Competent food safety laboratories available in Asia with functional nuclear/isotopic, complementary analytical facilities and reliable monitoring plans for chemical contaminants and residues in plant and animal products. The proposal aims to existence of advanced, cost-effective, achievable analytical strategy in collaborating institutes for food contaminants analysis of local and exportable samples to a minimum of 1000 samples annually/member states with the following associated outputs:

- Pool of trained trainers with greater competence in the analysis of Natural Biotoxins (specifically cyanotoxins), microbial pathogens and other toxic multi-chemical contaminants in plant and animal derived foods.
- Monitoring plans/programs developed or improved, and residue/contaminant occurrence data generated.
- Tailored regional reference and PT materials for food contaminants/residues generated or capabilities to produce such materials built, and technical capabilities and knowledge shared.
- Laboratory accreditation attained, expanded, or sustained.

RCA Projects are to be designed to have a Socioeconomic Benefit:

What is the potential socioeconomic benefit that would be realised from the project concept over a 5 to 7-year horizon?

Enhanced food safety & quality for the consumer and the ability to meet requirements in terms for international trade in food products is the main socioeconomic benefit for the region. The project will contribute in improvement of “One Health Approach” for human, animal and environment health protection issues. Information on risk assessment of safety of food will be available and data will be shared with health related stakeholders. Training of analytical facilities will be available to the scientist of various fields. Food safety laboratories (whose capabilities will be advanced/strengthened through the project) will be active in collecting and analysing food/feed samples, disseminating findings and informing good agricultural practices and relevant policies. Institutional capabilities will be enhanced. National regulatory agencies/institutions, farmers/producers, food exporters, research institutions among others, will also benefit from the project as laboratories become more functional and gain greater reputation. National/regional consumers will have access to quality/safer foods and the competitiveness of food exports will be enhanced as a result of a strong/sustainable laboratory network. Additionally, there will be increased surveillance and levels of safer animal feeds so as to produce safe animal-derived food. Farmers/producers who will also be instrumental in providing analytical samples and consumers (support for advocacy and awareness) will be end-users/final beneficiaries. All these efforts will help to improve socioeconomic growth and development

of the member states in Asia over the years.

Proposed Participating Government Parties:

List the Government Parties expected to participate in the project. Indicate target and resource GPs:

The project is open to all RCA members for participation. However, following countries of RAS5078 (Non-Agreement) are expected to participate in the project:

- 1) Bangladesh
- 2) Indonesia
- 3) Jordan
- 4) Lao P.D.R.
- 5) Lebanon
- 6) Malaysia
- 7) Mongolia
- 8) Myanmar
- 9) Oman
- 10) Pakistan (Lead Country)**
- 11) Papua New Guinea
- 12) Philippines
- 13) Sri Lanka
- 14) Syrian Arab Republic
- 15) Thailand
- 16) Viet Nam

Technical Cooperation among Developing Countries (TCDC) Project Component:

Please refer to the resource documents (RPF and Recommendations on TCDC)

Will the project design feature partnering arrangements between those advanced and those less advanced in the technology to be transferred through this project?

If so, list those expected partnerships.

Since this is a new area for most RCA GPs, the opportunities for TCDC would be limited but exist using a train-the-trainer and twining programme approaches. More competent Member State laboratories with better capabilities will be supported to provide better leadership in the network/region. Previous/on-going participation in national and regional technical programs e.g. RAS5078 (Non-agreement) will used as a building block.

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.

The prospective official/established institutions in Asia/Asia Pacific member states have routine operational national laboratories following good practices and have standard chemical/waste management programs with necessary human resources and infrastructure. These laboratories are actively involved in screening and/or confirmatory analysis of chemical/natural and microbial food contaminants with institutional support to facilitate development and implementation of planned activities that will be enhanced through the project.

Stakeholder analysis and partnerships:

Briefly describe who are expected to be the end-users and principal beneficiaries of this project. Indicate whether the end-users contributed to development of the Concept.

The most immediate stakeholders and beneficiaries of the project will be laboratories in various organizations, ministries, regulatory agencies, food producers and those involved in marketing. Food safety laboratories (whose capabilities will be advanced/strengthened through the project) will be active in collecting and analysing food/feed samples, disseminating findings and informing good agricultural practices and relevant policies. Research and academic institutions will also play a role. Farmers/producers who will also be instrumental in providing analytical samples and consumers (support for advocacy and awareness) will be end-users/final beneficiaries. Institutional capabilities will be enhanced. National regulatory agencies/institutions, farmers/producers, food exporters, research institutions among others, will also benefit from the project as laboratories become more functional and gain greater reputation. National/regional consumers will have access to quality/safer foods and the competitiveness of food exports will be enhanced as a result of an expanded/strong/sustainable laboratory network. There will be increased surveillance and levels of safer animal feeds so as to produce safe animal-derived food.

Internationally, the project will seek buy ins from stakeholders in Member State including complementary government institutions; intergovernmental institutions such as but not limited to the FAO, WHO, OIE, WTO, UNIDO and related organizations concerned with public health and food safety/security in the region. The private sector, key institutions and development partners, bilateral/multilateral organizations (e.g. USDA, FDA, EPA, the EU) and other like-minded institutions (keen on capacity building and strengthening food safety control systems as well as promoting trade) will be key stakeholders. The project can establish linkages with regional cooperative agreements e.g. ARASIA.

Have any extrabudgetary funding possibilities been identified? **NO**

Role of nuclear technology:

Indicate the essential nuclear technique that would be used and outline why it is suitable for addressing the problems/needs in question.

Isotopic/nuclear based analytical tools/techniques (such as the use of radio receptor assays, radio-immuno assays stable isotopes, etc.) enable rapid screening and easy to use and handle. The stable isotopes help to improve analytical method performance, especially precision. A wide range of deuterated or carbo-13 labelled analytes will be used. The project will involve: use of radio receptor assay techniques based on ^3H and ^{14}C tracers; use of gas chromatography with ^{63}Ni based electron capture detectors (beta radiation based); radio-immuno assays using ^{125}I ; use of stable isotopes with liquid/gas chromatography coupled with mass spectrometry; elemental analyses with ICPMS (including isotope dilution/ratio), Atomic Absorption Spectroscopy etc. IAEA has lot of experience of standardizing, validating and establishing methods for detection of pesticides, veterinary drugs, mycotoxins etc. employing radiometric and nuclear techniques. Therefore, experience, support and recommendations of the IAEA in this project (in terms of trainings, provision of analytical standards and related accessories) will be highly beneficial to facilitate the application of nuclear technology.

*Is this the only available technique that could be applied to address the problem/ need? **Yes**
Does it have a comparative advantage over non-nuclear techniques?*

As compared to non-nuclear techniques, nuclear isotopes are authentic, unique as probe, behaves like parent, don't alter sample composition, low levels tracing is possible and measured radioactivity is indicative of amount of original material.

Duration of the project:

*Indicate the number of years required to complete the project. **4-Years (2024-27)***

Part 3: National Representative Endorsement for Project Concept

As the RCA NR of (RCA GP).....Pakistan....., I have reviewed the Project Concept thoroughly and confirm that it meets the following requirements:

1. The objective of the Project Concept is aligned with priorities set out the RCA Regional Programme Framework (RPF) for 2024/25.
2. The project addresses a regional need.
3. Nuclear technology is an essential component of the project.
4. Outcomes and achievements of previous projects in this area of technology have been taken into consideration
5. There is no overlap or duplication with current or previous RCA projects
6. Further projects in this area can be justified (if relevant)
7. The Project Concept has a strong TCDC component

Signature:



Name:

DR. GHIYAS UD DIN
Director International Cooperation
(RCA National Representative)
Pakistan Atomic Energy Commission
Islamabad

Date:

23rd Dec. 2021.