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ARCAL

**REGIONAL CO-OPERATION AGREEMENT FOR THE PROMOTION OF NUCLEAR SCIENCE AND TECHNOLOGY IN LATIN AMERICA AND THE CARIBBEAN**

**PROCEDURES MANUAL**

**FROM ARCAL**

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| **ANNUAL REPORT**  **Country: JAMAICA** |

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1. **EXECUTIVE SUMMARY**

For the 2022 period, Jamaica had active participation in six (6) ARCAL projects.

**Table 1. Jamaican Active Projects**

|  |  |
| --- | --- |
| Project Counterpart(s) | Project # and Title |
| Prof. Charles Grant | RLA0070: Strengthening Regional Cooperation (ARCAL CLXXXVI) |
| Mr. Haile Dennis | RLA1022: Improving the Satisfaction of Regional Demand for Products and Services of Nuclear Research Reactors (ARCAL CLXXX) |
| Mr. Haile Dennis | RLA5089: Evaluating the Impact of Heavy Metals and Other Pollutants on Soils Contaminated by Anthropogenic Activities and Natural Origin (ARCAL CLXXVII) |
| Ms Tracia-gay Kareem Kennedy-Dixon  (Is this project still open) | RLA6084: Strengthening Regional Human Resource Development in Different Areas of Radiopharmacy (ARCAL CLXIX) |
| Prof. Minerva Thame | RLA:6089: Using Stable Isotopes to Reduce Nutritional Risks in Pregnant Women and Their Impact on Infants (ARCAL CLXXXIV) |
| Mr Johann Antoine | RLA7023: Assessing Atmospheric Aerosol Components in Urban Areas to Improve Air Pollution and Climate Change Management (ARCAL CLIV) |

Two (2) projects (RLA: 6089 & 5089) of the six projects have just commenced and therefore had made little progress, one project (RLA 7023) had major malfunctions on two (2) out of three (3) pieces of equipment, however good progress was made up until the time of the equipment malfunctions. Project RLA0070 progressed as planned with Jamaica participating in two (2) regional meetings.

1. **PARTICIPATION OF THE NATIONAL COORDINATOR IN ARCAL ACTIVITIES**

Project counterparts reported attending a total of 7meetings and training session (virtual and face to face), all of which were deemed to be very successful.

1. **RESULTS**

a. XXIII Meeting of the ARCAL Technical Coordination Board (OCTA), Vienna (Austria), 16-20 May 2022.

b. Regional Meeting on ARCAL Communication Strategy, Belize City, Belize - 12 to 16 Dec 2022.

c. For the calendar year 2022, one hundred and sixty (160) filters were analysed for black carbon content using the MABI.

1. **DIFFICULTIES AND PROBLEMS ENCOUNTERED IN IMPLEMENTING PROJECTS AND THE AGREEMENT**

Concerns were raised regarding the language barrier and its impact on the Jamaican counterparts to adequately contribute/participate fully which effectively excluded them from the discussions and project planning . For virtual meetings, the use of live translation by google translate was helpful but was far from ideal. A possible solution is to make provisions for translation/interpretation.

**VALUATION OF THE CONTRIBUTION OF THE RLA (ALL JAMAICAN) PROJECTS TO THE ARCAL PROGRAM**

|  |  |  |
| --- | --- | --- |
| ITEM | REFERENCE VALUE | AMOUNT in € |
| 1. Experts/conference attendees sent abroad by the Agency (IAEA) | €300 per person per day (including travel days) | €3,600 |
| 1. Local cost of the venues of a regional event held in the country (working group/training courses/workshops/ seminars) | €5000 per week | 0 |
| 1. Local costs of national events included in the activity plan | €3000 per week | 0 |
| 1. Fellowship holder whose local expenses are borne by the country | €3500 per fellowship holder per month | 0 |
| 1. Publications | Up to €3000 | 0 |
| 1. Database establishment and/or updating | Up to €5000 | 0 |
| 1. Shipment of reagents/radiation sources/radioisotopes/other material | Up to €5000 | 0 |
| 1. Services provided (e.g. irradiation of material) | Up to €5000 | 0 |
| 1. Time worked as DTM | Maximum €700 per month | 0 |
| 1. Time worked as project coordinator | Maximum €500 per month | €11250 |
| 1. Time worked as local specialists collaborating on projects (maximum of 3 specialists per project) | Maximum €300 per month per specialist | €6000 |
| 1. Contributions to the implementation of each project, broken down as:    1. internal/external subsistence    2. internal/external transport | Maximum €7500/project | Internal Transport  €150 |
| 1. Expenditure by the country on the project (infrastructure, equipment, etc.) | Maximum €10 000 | 0 |
| **TOTAL** | | **€17400** |

This report has been compiled by Charles Grant, ARCAL National coordinator. Individual project counterpart summaries are presented in appendix 1 of the report.

**Appendix 1.**

**PROJECT COUNTERPART SUMMARIES:**

**INTRODUCTION**

**RLA0070:** “Strengthening Regional Cooperation” (ARCAL CLXXXVI)”

The objective of this regional programme is to enhance regional cooperation by establishing mechanisms aimed at strengthening technical cooperation among developing countries, and the regional programming for Latin America and the Caribbean (LAC).

**1. EXECUTIVE SUMMARY**

Jamaica participated in the following project meetings/workshops:

1. XXIII Meeting of the ARCAL Technical Coordination Board (OCTA), Vienna (Austria), 16-20 May 2022.
2. Regional Meeting on ARCAL Communication Strategy, Belize City, Belize - 12 to 16 Dec 2022.

**2. IMPACT OF PROJECT ACTIVITIES IN THE COUNTRY**

1. *XXIII Meeting of the ARCAL Technical Coordination Board (OCTA)*

In addition to the selection of projects for the upcoming project cycle, I took the opportunity to meet with several members of various IAEA technical departments, this included meetings with Mr. Hua Liu Deputy Director General, the Director of Technical cooperation for Latin America and the Caribbean, Mr. Longoria, Mr. Pérez, Section Chief of the Latin America Division and the Caribbean and the Programme Management Officer for Jamaica, Ms. Nicola

Additional meetings included:

* IAEA Technical team for the upgrade of the Instrument and Control System for the SLOWPOKE-2 Reactor at ICENS, during the meeting the technical specifications were finalized, and the open tender process agreed upon, May 20, 2022, Vienna Austria.
* IAEA Deputy Director General for Technical Cooperation to discuss the state of IAEA programmmes in the region and to discuss setting ICENS up as Technical Service Organization (TSO) for the English-speaking Caribbean, May 19, 2022, Vienna Austria.
* IAEA Technical Officer for Education and Training regarding the introduction of a Post Graduate Education Course in “Radiation Protection and Safety of Radiation Sources”, May 19, 2022, Vienna Austria.
* IAEA Technical team for the Programme of Action for Cancer Therapy (PACT), to discuss the possibilities of collaborating with the Nuclear Medicine department at the UHWI and the International Centers for Precision Oncology Foundation (ICPO), May 19, 2022, Vienna Austria.
* IAEA Technical team for Radiation Safety, to discuss the setting up of a Secondary Standard Dosimetry Laboratory at ICENS, May 17, 2022, Vienna Austria.

1. *Regional Meeting on ARCAL Communication Strategy*

The overall output for the meeting in my estimation was quite extensive and was only achieved by the long-hours maintained by each working groups, this was also a feature of the general sessions. The lessons learnt will prove quite beneficial to the ICENS and by extension the Latin American and Caribbean countries.

**3. RESULTS**

1. *XXIII Meeting of the ARCAL Technical Coordination Board (OCTA), Vienna (Austria), 16-20 May 2022.*

The year 2021 continued to be a year marked by the COVID-19 pandemic, in which many of the meetings and workshops planned in the framework of ARCAL projects and activities could not be carried out; others, however, were carried out virtually. Many projects that would end in 2021 had to be extended until 2022.

1. *Regional Meeting on ARCAL Communication Strategy*

The overall output for the meeting in my estimation was quite extensive and was only achieved by the long-hours maintained by each working groups, this was also a feature of the general sessions. The lessons learnt will prove quite beneficial to the ICENS and by extension the Latin American and Caribbean countries.

**4. DIFFICULTIES AND PROBLEMS PRESENTED DURING THE PROGRESS OF THE PROJECT:**

None reported.

**PROJECT COUNTERPART SUMMARIES:**

**INTRODUCTION**

**RLA1022: “**Improving the Satisfaction of Regional Demand for Products and Services of Nuclear Research Reactors” (ARCAL CLXXX)

**1.**  **EXECUTIVE SUMMARY**

Summary of participation in the project:

1. participation by the project coordinator (coordination meetings, workshops and working groups);

First Coordination Meeting (virtual) – February 14 – 17, 2022

Virtual Meeting of Counterparts to discuss MOU for the establishment of regional network, October 13, 2022

Project communication meeting, November 8, 2022

1. resources contributed by the country to the project (include the detailed account as required in the table of financial cash indicators).

N/A

**2. IMPACT OF PROJECT ACTIVITIES IN THE COUNTRY**

Highlight actual contributions of project activities, quantitatively and qualitatively, as far as possible.

Not many project activities were executed during the year but the establishment of the regional network of research reactors and proposed activities within the network has the potential to be of major impact to the nuclear medicine and environmental research programmes in Jamaica.

**3. RESULTS**

None reported.

**4. DIFFICULTIES AND PROBLEMS ARISING DURING PROJECT IMPLEMENTATION**

Outline problems and difficulties encountered during project implementation, with emphasis on solutions.

Many of the meetings were primarily held in Spanish. This made it quite challenging for participants from Jamaica to adequately contribute/participate fully and was effectively excluded (by the language barrier) from the discussions and project planning. For virtual meetings, it was suggested that the subtitle feature be used along with live translation by google translate but this was far from ideal and just isn’t a practical solution. A possible solution is to make provisions for translation/interpretation by real people.

**PROJECT COUNTERPART SUMMARIES:**

**INTRODUCTION**

**RLA5089: “**Evaluating the Impact of Heavy Metals and Other Pollutants on Soils Contaminated by Anthropogenic Activities and Natural Origin” (ARCAL CLXXVII)

**1.**  **EXECUTIVE SUMMARY**

Summary of participation in the project:

1. participation by the project coordinator (coordination meetings, workshops and working groups);

First Virtual Coordination Meeting, March 21-24, 2022

Virtual XRF working group meetings - May 12, June 6, June 23, August 19, 2022

Project communication meeting, June 17, 2022

RLA5089 Harmonization of sampling protocol meeting, November 22 – 25, 2022, Lima, Peru

1. resources contributed by the country to the project (include the detailed account as required in the table of financial cash indicators).

N/A

**2. IMPACT OF PROJECT ACTIVITIES IN THE COUNTRY**

Highlight actual contributions of project activities, quantitatively and qualitatively, as far as possible.

With the project in the fairly early stages of the development of sampling and analysis protocols, contributions of project activities to actual impact within the country was expected to be somewhat limited. However, the progress achieved in these activities and the future potential contributions to national impact to which they point will be significant.

**3. RESULTS**

None reported.

**4. DIFFICULTIES AND PROBLEMS ARISING DURING PROJECT IMPLEMENTATION**

Outline problems and difficulties encountered during project implementation, with emphasis on solutions.

Many of the meetings were primarily held in Spanish. This made it quite challenging for participants from Jamaica to adequately contribute/participate fully and was effectively excluded (by the language barrier) from the discussions and project planning. For virtual meetings, it was suggested that the subtitle feature be used along with live translation by google translate but this was far from ideal and just isn’t a practical solution. A possible solution is to make provisions for translation/interpretation by real people.

**PROJECT COUNTERPART SUMMARIES:**

**INTRODUCTION**

**RLA6089: “**Using Stable Isotopes to Reduce Nutritional Risks in Pregnant Women and Their Impact on Infants” (ARCAL CLXXXIV)

Nothing activities to report on, project awaiting ethics approval for the work to proceed.

**1. EXECUTIVE SUMMARY**

**2. IMPACT OF PROJECT ACTIVITIES IN THE COUNTRY**

**3. RESULTS**

**4. DIFFICULTIES AND PROBLEMS PRESENTED DURING THE PROGRESS OF THE PROJECT:**

None reported.

**INTRODUCTION**

**RLA6084:** " Strengthening Regional Human Resource Development in Different Areas of Radio-pharmacy "(ARCAL CLXIX)

This project aims to strengthen the partnerships of national institutions in the region to provide access to radiopharmaceuticals in all countries. Brazil, Cuba, Uruguay, Argentina and Peru, possess infrastructure that can serve as a basis for the propagation of the activity and overall regional solutions that benefit all the participating countries. Relevant international partners are the World Health Organization (WHO) and the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR).

**1. EXECUTIVE SUMMARY**

1. Participation by the project coordinator (coordination meetings, workshops and working groups);

* The working group with participants from seven selected countries (Uruguay, Cuba, Argentina, Panama, Mexico, Columbia and Jamaica) did significant work throughout 2021. This group was previously tasked to strategize virtually on the production of specialization programmes in radiopharmacy including different types of training.
* May 25, 2022 – First virtual meeting of the national counterparts
* August 22, 2022 – Submission of abstract from the regional project for acceptance at the upcoming International Symposium on Trends in Radiopharmaceuticals in Vienna, Austria from April 17-21, 2023.

1. Resources contributed by the country to the project (include the detailed account as required in the table of financial cash indicators).

There was no financial contribution made to the project by Jamaica.

**2. IMPACT OF PROJECT ACTIVITIES IN THE COUNTRY**

Highlight actual contributions of project activities, quantitatively and qualitatively, as far as possible.

• As the only English-speaking Caribbean country involved in the project, there is great need for the development of a regional strategy and training programmes to overcome human resource development gaps in this field in a sustainable manner. Participation in this Regional project will have significant impact on the training of pharmacists and other scientific professionals in the Radiopharmacy.

• Efforts from this project will be based on a regional network of collaboration and training between academic institutions and health-care facilities. This harmonized strategy will employ different forms of radiopharmacy training including e-learning combined with experiential practice. The University of the West Indies, Mona Campus (which currently offers a Doctor of Pharmacy program) in collaboration with the University Hospital of the West Indies is ideally poised to benefit from the implementation of this activity. The UWI is currently ranked as the #1 university in the Caribbean, within the top 2% in Latin America and in the top 4% of universities in the world. This project is therefore of immense benefit to the specialized training of pharmacists in Jamaica as well as other countries in the Caribbean.

**3. RESULTS**

None reported.

**4. DIFFICULTIES AND PROBLEMS PRESENTED DURING THE PROGRESS OF THE PROJECT:**

•There have been several delays in the scheduled activities for the project, primarily due to the COVID-19 pandemic which has severely affected global travel and face-to-face interactions.

•As a result, there were no significant project activities during the year 2022. The Regional Training Course (Pilot) on Radiopharmaceuticals was originally earmarked for October 12-16, 2022 in Bogota, Colombia. This was however postponed until March 13-17, 2023.

•The initial framework for the project included a course on SPECT in Colombia and on PET in Costa Rica. Due a lack of funding however, there was a scaling down of the scheduled activities.

**INTRODUCTION**

**RLA7023:** Assessing Atmospheric Aerosol Components in Urban Areas to Improve Air Pollution and Climate Change Management (ARCAL CLIV)

In Latin America and the Caribbean, as in other regions, the scientific knowledge about air quality in megacities is uneven, which represents a clear opportunity for transfer of knowledge, from some urban areas with more experience to others with lower levels of experience. Examples are Santiago in Chile, Sao Paulo in Brazil and Mexico City in Mexico, where due to the adverse geographical conditions and the consequent high levels of contaminants measured, the problem of air pollution has been extensively studied during the last 20 years, while in other cities, capabilities for physicochemical characterization is limited. A regional project will allow not only the possibility to perform regional training activities, but also to create a network of researchers that provide the basis for improving atmospheric studies on a continental scale. Furthermore, the need to identify synergies and co-benefits of taking joint actions to reduce the emissions of greenhouse gases and toxic pollutants in the region was raised in the 19th Meeting of the Forum of Ministers of Environment of Latin America and the Caribbean (held in Los Cabos, Mexico, in March 2014).

**1. EXECUTIVE SUMMARY**

a) participation by the project coordinator (coordination meetings, workshops and working groups);

There was no participation by the project counterpart/coordinator in coordinating meetings, workshops, or working groups. There appears to have been no actions in RLA 7023 in the year 2022 as it relates to the mentioned activities.

b) resources contributed by the country to the project (include the detailed account as required in the table of financial cash indicators).

**2. IMPACT OF PROJECT ACTIVITIES IN THE COUNTRY**

Qualitatively, results are available for black carbon, and this will be an important addition to the data that is available for air quality in the Jamaican urban environment. Furthermore, the nature of the multi-wavelength absorption black carbon instrument (MABI) means that sampling can take place across many locations and the filters simply brought to the laboratory and the filters non-destructively analysed. They are then available for further analysis by other techniques.

**3. RESULTS**

1. For the calendar year 2022, one hundred and sixty (160) filters were analysed for black carbon content using the MABI.

**4. DIFFICULTIES AND PROBLEMS PRESENTED DURING THE PROGRESS OF THE PROJECT:**

The major problem for the implementation of the project was the malfunctioning of the motors for the both the high-volume and low-volume samplers. Forty (40) air filters were sampled from the high-volume sampler and forty-four (44) air filters from the low-volume sampler before the malfunctions for each samplers occurred respectively. The motor was removed from the high-volume sampler and sent to Mona-Tech Engineering Services Ltd, the University of the West Indies’ Mona Campus technical services. When the low-volume sampler also malfunctioned that was removed from the sampling site and brought back to the International Centre for Environmental and Nuclear Sciences (ICENS). An assessment was done and subsequently, the motor was removed and also sent to Mona-Tech Engineering Services. The motors were kept for an extended period while the sampling was indefinitely suspended. It appears that Mona-Tech Engineering Services does not have the capacity to repair the motors and so steps have been made to find services who can solve the issue.

Filters were sent abroad to Shimadzu analysts for method development to allow for the Shimadzu ED-XRF spectrometer to be used as one of the techniques to analyse the air filters. After an extended period, the Shimadzu scientists’ last update at the end of September was that they had not found a satisfactory method to analyse the air filters. It is likely that elemental analysis of the samples will therefore have to be conducted by neutron activation analysis and possibly inductively-coupled plasma-mass spectroscopy. The former only saw the gamma spectroscopy system pressed into service in the latter part of 2022 after an Ortec DSPEC LF Digital Signal Processing Gamma Ray Spectrometer was purchased and the order completed in October 2022. The ICP-MS will likely be commissioned in mid-2023 and not be available sometime after that, so analysis will be delayed.