

Conclusions and Recommendations of the 21st FNCA Coordinators Meeting

1. Based on the Joint Communiqués of the 21st FNCA Ministerial-Level Meeting (MLM) on the new direction of the FNCA, the Coordinators Meeting (“the meeting”) agreed to accelerate further the FNCA activities related to agricultural development, food security, environmental protection, human health, nuclear security, and human resource development. The meeting also agreed to maximize efforts to normalize the FNCA project activities promptly and seven regular meetings in response to the constraints brought by the COVID-19 pandemic while ensuring the safety of the project researchers and participants as a prerequisite and subject to national health policies.
2. The meeting implemented end-of-project evaluation on four projects terminated at the end of March 2020, namely, a) Radiation Oncology, b) Research Reactor Utilization, c) Radiation Safety and Radioactive Waste Management, and d) Nuclear Security and Safeguards. The evaluation results and comments on these projects are as follows:

- a) Radiation Oncology

To establish optimal treatments for predominant cancers in Asia, the FNCA Radiation Oncology Project has been conducting several clinical studies of radiotherapy and chemotherapy for more than 20 years. From the results of clinical studies, some treatment protocols have become standard protocols in FNCA member countries. Especially for cervical cancer, the results of CERVIX-IV indicate that concurrent chemotherapy and prophylactic extended-field radiotherapy are feasible and effective for patients with locally advanced cervical cancer in East and Southeast Asia.

- b) Research Reactor Utilization

As test and research reactors are basic and fundamental tools of nuclear energy and nuclear science development, NAA, Isotope production, Neutron Scattering, Nuclear Science, BNCT and NR (Neutron Radiotherapy), Material Research, New Research Reactor, and Human Resource Development have been discussed for three years. It was agreed that every country requires new research reactors to use them for useful RI production, NR, and BNCT. Discussion on possible future cooperation on these themes should be continued

Regarding NAA on the SPM sub-project, analytical results will be summarized in each participating country, and some of them will be reported in scientific journals as research papers. For NAA on the REE sub-project, a round-robin test was performed by several participating countries and the results of the test were reported at the workshop held by the IAEA. The results were also published in the IAEA document.

c) Radiation Safety and Radioactive Waste Management

Because almost all countries in the FNCA are planning to construct low-level radioactive waste disposal facilities/long-term storage facilities, the safety features and the actual design of the disposal facility, as well as public acceptance, have been discussed in the project.

The Interim Report on Low Level Radioactive Waste Repository, which focuses on general policy and specific site safety assessment of LLW repository in each FNCA member country, was compiled in March, 2020. The report contributes to enhancing the knowledge related to radiation safety and radioactive waste management in each country.

This project is expected to also focus on NORM/TENORM radioactive wastes and characterization processing and disposal of disused sources in the following term.

d) Nuclear Security and Safeguards

The 3-year-long activities of this project have produced excellent outcomes including raising awareness regarding the importance of nuclear security and safeguards, facilitating sharing of information on nuclear security and safeguards, promoting capacity-building for nuclear security and safeguards, and enhancing nuclear security and safeguards regimes through workshops and open seminars.

Concerning nuclear forensics (NF), Table Top Exercises (TTX) on evidence sample collection, initial investigation at NF laboratory, and identification of unknown nuclear materials by FNCA project leaders and National Police have been conducted.

The project activities were reported at the IAEA International Conference on Physical Protection of Nuclear Material and Nuclear Facilities (2017), the 60th Annual Meeting of the INMM (Institute of Nuclear Material Management) (2019), and the IAEA International Conference on Nuclear Security (2020).

3. With improved procedures for evaluating project proposals endorsed at the 17th MLM, all FNCA coordinators performed ex-ante evaluation for six project proposals from project leaders considering the relevance, effectiveness, efficiency, impact, and sustainability. Consequently, the meeting agreed to launch new phases of four three-year projects from JFY 2021, namely, "Radiation Oncology", "Research Reactor Utilization", "Radiation Safety and Radioactive Waste Management", "Nuclear Security and Safeguards" with the comments shown in item 5.
4. Regarding new project proposals, some member countries assigned low scores on the evaluation criteria for the project proposal "177Lutetium-Labeled PSMA radionuclide therapy for metastatic prostate cancer" and "FNCA collaborative study on technology, safety, and security of Small Module Reactors (SMRs) and Floating Nuclear Power Plants (FNPPs)". Therefore, these proposals were rejected according to the guidelines for evaluating new project proposals. Nevertheless, the meeting suggested the following points:
 - a) In addition to the three types of cancers, a possible future cooperation scheme for other types of cancer such as prostate cancer should be discussed in the "Radiation Oncology" project.

b) Exchange of information and discussions on SMRs and FNPPs could be conducted during the “New Research Reactor” session of the “Research Reactor Utilization” project.

5. a) Radiation Oncology

- This project allows member countries to gain new knowledge. Moreover, it is firmly believed that the results could positively impact cancer treatment results and patient surveillance in the future.
- As the hands-on training on 3D-IGBT helps the radiation oncologists and the medical physicists of the member countries to learn about this new technique, the hands-on training should be conducted in various countries.
- Cooperation with the IAEA/RCA should be promoted in the study of palliative radiotherapy, as it was encouraged in the 43rd meeting of the national RCA representatives held in April, 2021.
- In addition to the three types of cancers, possible future cooperation schemes for other cancer treatments, such as prostate cancer, should be discussed within the project framework.

b) Research Reactor Utilization

- This project is an excellent platform for information sharing, network construction, and further technical improvement among FNCA member countries. However, workshops are held once a year, and it is recommended that online seminars or meetings be held in addition to workshops for information exchange.
- Neutron activation analysis should be entirely discussed in a workshop because analysis, such as PM2.5 elemental composition, plays essential roles in the extensive applications of environmental sciences.
- The RRU project will bring great benefits to the country, which is considering a new research reactor; cooperation on human resource development should also be discussed in this project.
- It is recommended that the exchange of information and discussion on SMRs and FNPPs should be conducted during the “New Research Reactor” session in this project.
- It is also recommended that other particular concerns of the member countries including the issue on the upgrading of Reactor Protection System (RPS) of the existing aging-research reactor be discussed.
- At least two researchers from each member state should participate in the project meeting. One member should be from the organization responsible for the operation and the management of the research reactors, while the other should be a researcher responsible for the selected topic, such as NAA, or RI production.

c) Radiation Safety and Radioactive Waste Management

- The project addresses building national capacity to protect the public and environment against ionizing radiation, including ensuring the safety of food and environment and assisting the member countries with safety improvement related to radiation safety and radioactive waste management.
- NORM/TENORM radioactive wastes, which are expected to become significant social issues in many Asian countries, should be discussed intensively in this project.

- It is recommended that Clearance of Very Low Level Radioactive Waste be considered in the project.
- Scientific visits, advisory missions, or even hands-on practice should be performed in the future for the problems faced by several countries, such as handling of decommissioning of nuclear facilities, and NORM / TENORM waste.

d) Nuclear Security and Safeguards

- The project addresses identified objectives effectively; however, it requires additional good practices from member country experience. Considering bringing more good practice as lessons learned among FNCA member countries is recommended.
- A nuclear forensics mechanism in the Asian region, whose promotion was called for at the Washington Security Summit in 2016, should be discussed and put into action in three years. In particular, hands-on exercises or TTX on nuclear forensics are important to enhance the necessary measures for nuclear security and their sustainability in each member country.
- It would also be better to promote a close cooperation with the IAEA and other relevant organizations in the area of nuclear security measures.

6. The meeting discussed the progress of three ongoing projects in the fields of radiation utilization development and climate change science. These projects are “Mutation Breeding”, “Radiation Processing and Polymer Modification for Agricultural, Environmental and Medical Applications”, and “Research on Climate Change using Nuclear and Isotopic Techniques”. The meeting acknowledged that the projects were successfully implemented with the effective cooperation of member countries. The end-of-project evaluation of “Radiation Processing and Polymer Modification for Agricultural, Environmental and Medical Application” project and “Research on Climate Change using Nuclear and Isotopic Techniques” project and the intermediate review of “Mutation Breeding” project will be conducted in the next Coordinators Meeting to be held next year; however, the negative impacts of COVID-19 on the project activities should be fully considered in the evaluation of the project. The comments for each project are as follows:

a) Mutation Breeding

Several new mutant varieties/lines of rice, wheat, or soybean developed in member countries have been disseminated widely and expected to affect the economy of several countries positively. Continuing efforts are expected towards sustainable agriculture and resilience against rapid climate change.

b) Radiation Processing and Polymer Modification

This project aims to provide a broader application of radiation processing technology and has produced some excellent results on “Degraded Chitosan for Animal Feeds” and “Hydrogel for Medical Application” studies. It is suggested to accelerate the implementation of the project outcomes with end-users, including the private sector, and consider the possibility of commercialization,

c) Research on climate change

This project focuses on providing insights into the mechanism and process of climate change in the past using nuclear technology-based methods and analyses. Moreover, the project aims to gain and share the knowledge for interpreting phenomena causing climate change. The meeting positively evaluates that “practical guide on soil sampling, treatment and carbon isotope analysis for carbon cycle studies” was compiled in 2020. Moreover, the meeting firmly expects the Asian-scale database of soil organic carbon degradability to be constructed in the near future by using this analysis method.

7. The meeting agreed that project workshops would be hosted by respective member governments in JFY2021, as shown in the attached Annex. All workshops should be held between September 2021 and March 2022. Project leaders will participate in each workshop in person or using a video conference system. If participating in person, it is recommended that all participants should be vaccinated against COVID-19 before the workshop.

As the COVID-19 pandemic is still affecting FNCA project activities in 2021, the meeting suggests that each project should use a video conference system for specific topics when necessary, in addition to regular project meetings.

8. It was agreed that the FNCA projects should make efforts to reinforce cooperation with relevant international institutions, including the IAEA and the OECD/NEA.

Attachment: Annex mentioned in the Article 7