

## 2021 IER Advisory Board Meeting Minutes

When : March 23, 2022 (Wed) 6pm ~ 8:00pm

Where : Online

Participants : 18

<Advisory Board (ADB) > (4)

Prof. Brenda Howard (UKCEH) : BH Prof. Sergey Fesenko (RIRAE) : SF

Prof. Wolfgang Raskob (KIT) : WR Dr. Satoshi Yoshida (IES) : SY

<IER title omitted > (11+3)

Nanba (KN), Alexei (AK), Takamura (NT), Tsukada (HT), Yoschenko (VY), Wada (TW), Hirao (SH),

Wakiyama (YW), Takata (ht), Igarashi (YI), Tatsuno (TT), (3 office staff)

※Names of speakers/proposers in the minutes below are indicated by initials.

※WR and TT left earlier.

1. IER Director's remarks
2. Greetings from ADB
3. IER Members introduction (from Nanba)
4. Annual Symposium 2021

(KN) Number of participants (Oral: 100 (92 online, 3 onsite, 5 media), Poster: 98, Symposium for the public: 130 (117 online, 8 onsite, 5 media))

WR : The Annual Symposium is a very important activity, and it is good that they are continuously held separately for the general public and for experts. Regarding the presentations for the general public, while a variety of topics have been presented in the past, it may be a good idea to consider narrowing down the topics in the future. For example, the presentations could be focused on tritium, which is of great interest to the public, and related environmental issues, management, and other aspects of tritium management.

BH : I think that the content of the meeting was appropriate for both experts and citizens, as well as meaningful in terms of the 10th anniversary of the accident. I agree with WR that it is important to narrow down the topics based on both scientific and public views of the areas of interest which need further research. The presentations by the experts were comprehensive from a scientific perspective.

SF : It is regrettable that we could not hold the meeting on site, but overall it was a good symposium. IER has been working on the tritium issue since last year, and will be expected to take further action in response to the discharge of treated water. In addition, there are forest related issues. In Chernobyl, a cesium concentration increase in forests was observed after the accident, and a similar trend can be expected after the Fukushima accident. Concentrations in agricultural products are not a problem, but forest products are still uncontrollable, so it will be important to predict the dynamics over the next 10 years or even longer. It was very impressive that presentations with scientific insights at the symposium and at the international symposium in October.

SY : It was a well-organized symposium under the difficult situation caused by the COVID-19. However, I had an impression that the message of the symposium was not very clearly delivered throughout the symposium. If the focus should be on future topics, perhaps a general discussion should have been held. As for the public, it would be desirable to hold the meeting on-site to directly feel people's reactions. In the future, if the meeting is to be held online, it would be recommended to devise a more effective way to collect reactions and impressions from the general public.

(TW) We conducted a survey, and the results were generally favorable. The results will be shared with the Advisory Board members after the meeting. (Shared on 3/24)

5. Activity Report 2021

After the director explained improvements in the report from the previous year, opinions were exchanged on an item-by-item basis.

(a) IER Updates

SY : Why is the agreement with Tomioka Town concluded now (10 years after the accident)? Will it be concluded with other municipalities as well?

(KN) For some time after the accident, we have been in close contact with local governments and have conducted various environmental radioactivity studies based on mutual understanding of the local situation and research needs. Even now, as the reconstruction of the town has been progressed, issues related to environmental radioactivity remain, and new issues have arisen as a result of the lifting of the evacuation order. However, due to changes in personnel, it has become difficult that information is handed over and shared. The purpose of the agreement is to ensure sufficient information sharing and record keeping, and similar agreements are planned to be concluded with other municipalities.

(b) Financial statements

BH : It is good that improvements were made by adding items related to safety management, etc. The amount of one grant from MAFF is comparatively large, but I wonder why there is no description of this project in the annual report.

(TW) This is the project to effectively stabilize and increase biomass of marine fish (flatfish) through the release of seedlings. We also try to evaluate the safety of radioactive sites around the coastal areas especially in shallow waters where the juvenile fish live (areas vulnerable to human activities) with observing the movement of juvenile fish after release as well as the behavior of radionuclides in the environment (water, sediment, biota), using ICT transmitters. We plan to add a description about this project to the activity report.

(c) Research Activities

SF : (1) Activities for rivers and lakes are substantial and deserve evaluation. The only thing, the goal 2 should be deleted since it is included in 1. (2) Ocean should be addressed in cooperation with the modeling group, as risk assessment will become an even more important issue with the release of treated water. (3) Ecosystem is a key project from the perspective of consolidating data from other projects. Now that 10 years have passed since the accident, long-term forecasts should be further enhanced through the use of models. Further studies on the redistribution of radioactive materials in the soil, including forest litter layer, understory plants, and roots, are also important. (4) Measurement and analysis have achieved very impressive results in research and development. The high accuracy with which radioactive strontium can now be measured at 1 Bq/L in 1 microliter is astonishing. (5) Only speciation described about "other projects", which may be considered as a separate project since the content is a very important activity with high applicability. Also, although only a general description of dosimetry is given, consideration should be given to providing information of interest, such as how much lower than 1 mSv the actual dose is. (6) Modeling is well coordinated with rivers and lakes, and is achieving good results. Perhaps it should be linked to other or all projects, such as tritium issues in oceans and ecological forestry issues.

(AK) The goal setting for rivers and lakes was intended to emphasize what was presented in the paper, but we agree with the advice and will improve the description.

(VY) I understand the need to examine the physical parameters that elucidate the long-term dynamics of forest ecosystems. We have made some efforts to do so and have submitted a paper, which is currently under review. We have worked to elucidate local (habitat site) specific parameters that determine long-

term dynamics. We would like to conduct a detailed analysis in the future and have made several applications for funding, but have not been successful so far.

WR : I will not mention outside of my field model radioecology, but there is excellent research being done in all areas. The new "future vision" presented at the end of each project is the basis for the vision paper and is highly commendable. However, the vision for mutual collaboration is not very clear in any of the projects. This point needs to be improved. It is not good to have an institute organized with disparate visions for the projects, so that when the director changes, it is no longer possible to smoothly collaborate among the projects. Second, although the IER conducts basic research on environmental radioactivity ecology and disseminates information effectively, I feel that it falls short of its original purpose, which was to help the general public by providing scientific knowledge that will lead to the public's needs, environmental restoration, and improvement of the living environment. We would like to see the project promote the application of research to better improvement measures in agriculture, forestry, fisheries, etc. as a vision for the future (in 10 years).

(KN) We would like to work with local governments to achieve operational management that also leads to social implementation.

BH : It is important to publish results on specific topics and to present papers on them. A key strength and advantage of IER is the interaction and close collaboration among researchers in different scientific areas. It is important to ensure good communication between data gatherers and modellers to inform and enhance model development. This will enhance scientific progress. It will ensure that IER's strengths will be utilized to produce effective research outcomes.

(KN) Although there is no clear description in the activity report, each project and the modeling project are working together and have published papers. We would like to improve the description in the future.

SY : The linkage between the modeling project and other projects is imaginable but difficult to understand the actual situations. It should be specifically stated what data was provided, how it was utilized, and what results were achieved. It is important to continue to work on the tritium issue in the ocean, and it is hoped that this will lead to a reduction in public concerns, etc. We suggest that relevant sampling strategies (location, frequency, etc.) be clearly stated, especially if done in collaboration with other research institutions.

(ht) The model is also being used in tritium research, and we are currently working on a paper to be published. In addition, we have been measuring OBT (organically bound tritium) in cooperation with Hirosaki University and the IES. A description of the sampling strategy and other information will be added to the activity report. In the next year, we plan to report on treated water and tritium.

SF : One suggestion, how about presenting the sampling locations using a map? This will give an overall picture. Regarding the linkage with modeling, rivers and lakes are clearly described, including the provision of information. We suggest improvements in other projects (especially the ecosystem group).

WR : It is anticipated that there will be increased interest in ocean and forest fires. It is likely that the knowledge of processes in the oceans (compared to terrestrial areas) and forest fires (as occurred in Chernobyl) is insufficient, and much research and study is required to elucidate these processes. Efforts should be considered, including a robust modeling approach.

BH : There is much detail of the research conducted. It is important to also report what the findings (results) were and their relevance in all topic areas.

(KN) We will make improvements.

SF : The successful continuation of the ERAN collaboration is contributing to the advancement of science. Very impressive.

SY : How will the SATREPS Chernobyl project continue?

(KN) The end of the project has been extended to the end of the next fiscal year due to COVID-19, and we

believe that the final goal needs to be coordinated with JICA/JST, taking into account the current situation. Since there are already acquired data and samples, we can present the results based on the analysis, but we will consult with JICA/JST regarding the future, including the second project application.

SY : If there is anything the Advisory can do to assist with the second project application, for example, a letter of support, we would be happy to help. (SF and BH agree)

(d) Education & Dissemination

(KN) There is no reassurance that the Master's program will be filled to capacity, and it is likely that the program will be unfilled. Efforts to increase the number of international students are also necessary, and we would appreciate the advisory's cooperation in disseminating information.

SF : It is a good idea to have recruitment notices posted on the International Union of Radiecology and IAEA websites. Please share the recruitment information with us as we will help you with advisory.

BH : Improving the website to keep it up to date is needed. This may help in encouraging more students to apply for master's degree positions. We (ADB) would like to help provide information to universities in the countries where we reside.

(KN) We appreciate your cooperation. We would like to collect scholarship information and enhance the information. We will share information as soon as the application guidelines for FY2023 are announced around May or June.

SF/SY : The establishment of the doctoral program is a significant development that will lead to further growth of the institute.

BH : Regarding information dissemination, there are some inaccessible links on the IER website, please check them if possible. It seems that old (about 20 years old) photos of staff members are being used, so they should be updated. Also, it would be good to post more recent activities (updates) more frequently and more clearly, in shorter, plain text, and with photos.

(TW) The four students who plan to enroll in the Master's program next year have collected information on IER's website. We are considering improving the website to attract even more students.

BH : Younger people often use social networking sites such as TikTok rather than web sites.

(TW) We too recognize the importance of multiple SNS (Twitter, YouTube, etc.) and would like to consider this. We are also aware that there are connectivity issues and would like to improve them.

SF : Perhaps consider inviting a wider national and international audience to participate in the seminars. There were a number of seminars that I myself found interesting. Also, please consider introducing a Radiological Atlas (a map with extensive information) on the Fukushima accident.

(KN) There are issues of time difference, etc., but we will consider it.

6. Others

(KN) Will ask the four Advisory Board members to prepare a consensus advice letter by email.

## Comments from Advisory Board in writing

### **Prof. Brenda Howard**

IER have continued their research activities effectively despite the constraints of covid. The team has also maintained its focus of engagement with the local community which is valuable for both parties.

There seems to have been a significant shift in emphasis by reducing agricultural research activities reporting activity concentrations, empirical ratios and remediation to a more mechanistic approach. The emphasis has increased for non human biota, aquatic systems and forests.

The annual report has been modified and positively addressed comments expressed during the 20-21 advisory board.

IER has continued to enhance its web site and to report activities and publications promptly providing information in both Japanese and English. Information on website usage would be helpful – which parts are accessed most? The three online interviews of researchers are excellent.

IER has made a significant effort to provide information on the occasion of the tenth anniversary of the FDNPP accident, notably the international conference despite the practical difficulties.

The research activities in all areas continue to be impressive and have clearly not been too detrimentally affected by the covid pandemic. Referred paper output has been very impressive, although some papers in higher impact journals would be good.

### **Prof. Sergey Fesenko**

With pleasure the reviewer notes that most of the advice and recommendations to the Activity Report on 2020-2021 made by the Advisory Board in March 2021 were successfully implemented. As earlier, the IER research program was based on six projects: (i) "Rivers and Lakes", (ii) "Oceans", (iii) "Ecosystems", "(iv) Speciation Radiochemistry", (v) "Measurements and Analyses", and (vi) "Modelling". The projects presentations in the Activity Report were substantially amended and are well-illustrated by pictures reflecting project activities. A subsection "future vision" was included to each project demonstrating options for future projects developments. Major findings of the research projects are well presented in the publications at the national and international levels. The research goals of the IER projects are quite complimentary now, despite there is some room for further improvements in research activities. A modelling component can be added to the Ocean and Ecosystems projects. It would be advisable also to include to each project with the sampling (observation) sites map to demonstrate how they complement each other. It would make more visible the IER research highlighting sites and areas, which are specific for each project. It is also recommended to add research goals explicitly addressed to the management options to mitigate consequences of the Fukushima Daiichi accident. The importance of tritium studies in 2022 should be also noted.

Further development received activities of the Environmental Radioactivity Research Network Centre (ERAN), which was accredited by the MEXT till March 31, 2028. The collaboration of the Institute with other partners in and outside Japan successfully continued despite the COVID 19 constraints. By now, the IER serves as the host institution for 30 other projects, which well fit the IER research projects and contribute to the success of the IER scientific programme. The scope of the partnership between the IER and the IAEA became wide and includes nearly all issues related to the environmental impact assessment. Highly important extension received also educational activity. The IER is a unique institution for education of the students specializing in environmental radioactivity. In 2021 the Master's Program was supplemented with the Doctoral Program major in Environmental Radioactivity and this was a big step in the Institute further development.

The FY2021 contained many social and information dissemination events organized by the IER, including 8th IER Annual Symposium, two dialogue meetings and International Symposium on the 10th anniversary of the accident at Fukushima Dai-ichi Nuclear Power Plant. All these events were extremely successful and attracted high interest

both experts and public.

Overall, FY2021 was one more very successful year in the IER short history. The Institute has reached a lot of achievements in a variety of the areas, including research, education, and collaboration with other national and international organizations.

### **Prof. Wolfgang Raskob**

As the year before, Covid-19 prevented a physical participation in the Annual Symposium of the IER as well as a physical meeting of the Advisory Board. Nevertheless, colleagues from IER provided all information for the evaluation in time and the Web meetings are getting more and more stable. Let us hope that the meeting next year will be performed again in person.

All scientists working the six research areas perform excellent research under the headings Rivers and Lakes / Ocean / Ecosystems / Speciation Radiochemistry / Measurement and Analysis / Modeling. This outstanding research was disseminated via national and international journal papers, presentations and talks to local population and I want to highlight again the importance of dissemination activities at all levels.

Following the recommendations from last year, each of the research area provided a vision for future work activities. This is highly appreciated and can serve as the basis for a common vision paper for the whole IER.

The integration of monitoring and modelling inside most of the research areas will also enhance the understanding of the underlying processes and thus help in interpreting observations and structuring future research. As understanding of the environment is very interdisciplinary and interconnected (e.g., contamination of soil – precipitation, run-off, transport in rivers – in the ocean and in fish), many different disciplines have to work together. So far the six research areas seem to be still separated, even if activities seem to be were close. Therefore, a stronger interaction between research areas might improve the overall quality of research.

The work of IER concentrates on classical radioecological topics, however, the initial objective was to serve as a mediator between science and the general public. The dissemination is clearly done via the many seminars and integrating presentations for the general public in the Annual Seminar. However, the topics such as application of the research for a better remediation strategy is missing.

Engagement in international committees and activities might be intensified as the research work is outstanding and should made public world-wide.

With the war in Ukraine, continuation of STREPS is questionable, however, collaboration with Ukrainian institutions should continue as much as possible.

### **Dr. Satoshi Yoshida**

Through collaboration with many universities and research institutes, including those overseas, IER has steadily conducted research and achieved many academic results. In light of the situation 10 years after the accident, the IER is focusing on research on the long-term behavior and future predictions of radionuclides, while appropriately responding to current social needs, such as tritium. In addition, the IER continues to actively promote initiatives to return the research results to the local residents of Fukushima prefecture and to develop human resources.

In particular, the establishment of a doctoral program in April 2021 in addition to the master's program is the result of the Institute's efforts over the years. The level of research conducted by the graduate students enrolled in these programs is high, and it is expected that they will become the core of human resource development in this field in the future.

Among the research collaborations, SATREPS, in particular, has contributed to solving the ongoing long-term environmental problems in the Chernobyl area, while at the same time providing numerous scientific findings that can be applied to the Fukushima environment and fostering international experience for young researchers. The program was extended for one year due to the COVID-19 pandemic, but given the international situation in Ukraine, implementation will be even more difficult. I hope that the research will be resumed once sufficient

safety is ensured, and that discussions will proceed toward the next project. This is a valuable project that links two areas affected by the major nuclear accidents, and its continuation is strongly encouraged.

Each of the individual studies has steadily produced results. In this context, it is highly commendable that the university has established its basic stance by initiating research on tritium, which is scheduled to be discharged into the ocean, while also obtaining the university's own project funding. I hope that the IER will continue to disseminate easy-to-understand information rooted in academic data while collaborating with related organizations in Japan and overseas.

Finally, I would like to pay tribute to the Ukrainian, Russian, and related researchers who have maintained high quality research activities in the midst of a tense and difficult international situation.