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The Suetsugi district co-expertise experience in Japan after the Fukushima accident

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Abstract

The article presents the different stages of the co-expertise process, which took place in the community of Suetsugi located about 30 km South from the Fukushima nuclear power plant, to improve radiological protection and the living conditions of the residents. The originality of the process lies in the fact that it was initiated and led by residents of the community with the help of local leaders and volunteer experts. It was also followed regularly by some members of the ICRP. The first part presents the different stages of the process that took place in the community of Suetsugi. The second part draws some lessons from the experience, which has significantly contributed to enriching the formalisation of the co-expertise process in particular with regard to the recovery of social trust and the role and attitude of experts during the recovery phase after a nuclear accident.

Introduction

The Suetsugi community is located on the seashore 27-28 km away south from the Fukushima Daiichi Nuclear Power Plant (FDNPP) and 20 km north from the center of Iwaki City (Figure 1). The village covers only 7.4 km². It is made of a valley with rice paddies surrounded by sharp hills covered by forest. The population in March 2011 just before the accident was 479 residents in 127 households of local old families sharing their activities between farming and working

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in the nearby cities of Iwaki and Futaba. Some of the residents were working for subcontracting companies from TEPCO. Some were retirees who came to settle there to enjoy the sea and the nearby mountains.

The tsunami that followed the Great East Coast Earthquake on March 11, 2011 hit Suetsugi, and killed seven persons. On March 13, the municipality of Iwaki City sent a bus to Suetsugi and asked residents to “voluntarily” evacuate the village because Suetsugi was not designated as a mandatory evacuation area by the government. Many residents decided to leave. The government ordered on March 15 people residing in the 20 to 30 km area around the FDNPP to stay confined to their homes. Most of the people followed the order in general but one elderly woman who stayed did not stop her farm work during this period. The government lifted the sheltering order for Suetsugi on April 22. By the end of that month, the government asked residents of the 20 to 30 km area to stop producing the agricultural products voluntarily. Residents started to return to the village about one month after being evacuated. However, most of the young families with young children did not come back.

The months that followed were a difficult period for residents who returned their homes, marked by growing concern due to the presence of radioactivity in their environment for which they had no information and felt completely disarmed. This feeling was largely reinforced by the numerous reports in the media, most often incomprehensible and, moreover, contradictory. It is in this context that a resident of Suetsugi, took the initiative in summer 2011 to undertake with the help of other residents a campaign to measure radioactivity in the village. This event marked the start of what has become over the years an exemplary experience of cooperation between the Suetsugi community

and volunteer experts who put themselves at their service. The first part of this chapter describes the different stages of the co-expertise process, which took place in the Suetsugi community. The second part presents the various actions that contributed to disseminating the experience and ensuring its sustainability. The third draws lessons from Suetsugi’s experience, in particular with regard to the conditions and means for the practical implementation of the co-expertise process to address post-accident issues as well as in terms of the role and attitude of the experts involved and the restoration of social trust. It is to mention here that a large part of this chapter is a

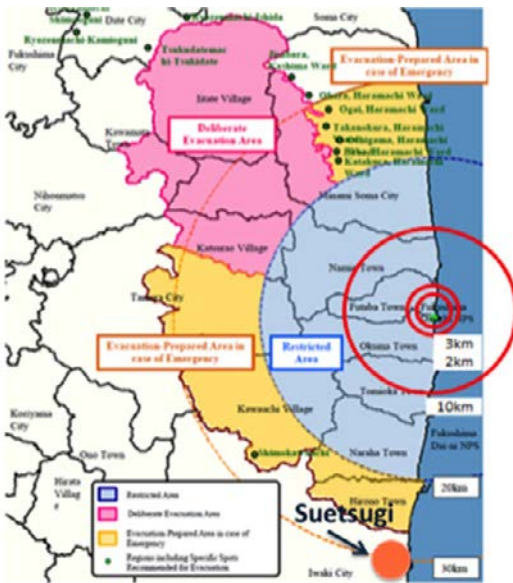


FIGURE 1. Location of the Suetsugi community (photo: Ethos in Fukushima).

revised version of an article originally published in the Radioprotection Journal (Lochard et al., 2020). It reiterates the main points of that article and presents recent developments in relation with the co-expertise process.

1. The initial steps of the co-expertise process

1.1. *The first citizen initiatives*

Very distressed by the deadlock in which he found himself after several months of forced inaction, Shinya Endo, a construction worker also farmer from Suetsugi, took the initiative to launch a measurement campaign to find out where and how much Suetsugi was contaminated. Beyond better understanding the local radiological situation, his objective was primarily to get an idea of the possibilities of resuming agricultural activities in the valley. During the autumn and winter of 2011 using materials borrowed free from Iwaki city hall and with financial support from the Suetsugi ward, he measured, with the help of a group of community volunteers, the ambient dose rates throughout the valley and in particular in the rice fields and around the dwellings. The group also took soil samples, which were measured by a private company. It is to note that at the very early stage of their measurements, several dozens of residents joined the measurement activity, then the number of volunteers had gradually declined. Finally, only 5 or 6 members continued until the end of March 2012.

An initial meeting with residents, organized in collaboration with Ethos in Fukushima (EIF), a civil society association in Iwaki, was held on March 30 and April 1, 2012, with the support of a radiologist from Fukushima Medical University (FMU) (Ando, 2012). The objective was to measure ambient dose rates and discuss the general situation in the village. This radiologist joined voluntarily the process initiated at Suetsugi following an invitation from the founder of the group Ethos in Fukushima. It is interesting to note in passing that they first met on Twitter on the occasion of a meeting concerning the radiological situation in September 2011 before the launch of the collaborative initiative in Suetsugi. It turned out that social media played an important role in the process that followed these first initiatives. The measurement of individual doses started in April 2012 with a dozen personal active dosimeters borrowed from a regional NGO involved in the post-accident activities of Fukushima. Six people initially wore the dosimeters for a period of three to four weeks.

1.2. *The dialogue with ICRP*

The founder of Ethos in Fukushima who had been involved since February 2012 in the ICRP Fukushima Dialogue Initiative, took advantage of the third Dialogue meeting held in Date City to invite an ICRP delegation to visit Suetsugi and meet the residents (Ban, 2016; Lochard et al., 2019). Several dozens of them and representatives of the media gathered at the Community House and they

had the opportunity to express their concerns and ask many questions about the radiological situation in the village (Figure 2). What is the risk in Suetsugi? Can our children come to visit us with their children? Can we eat the products from our gardens? Will I ever be able to resume my farming activities? How effective is the decontamination? There was a perceptible tension in the audience and even anger by some participants at the start of the meeting. But a constructive dialogue was gradually established.

Concerning the many questions on the risk, ICRP members explained that ultimately it depends for each person on where they lived, their daily activities and their lifestyle. Without having precise information on the radiological situation of the village, it was difficult for them to answer those questions. They advised participants to take steps to better understand where, when and how they were exposed. They also suggested establishing contact with experts to help them carry out the measurements and interpret the results.



FIGURE 2. The July 2012 meeting with ICRP in Suetsugi (photo: Ethos in Fukushima).

Following this first visit, ICRP members regularly returned to Suetsugi. From July 2012 to Fall 2025 with an interruption due to COVID-19 pandemic, members of the Commission met with the community 16 times. Each meeting was an opportunity for fruitful exchanges for both parties. Building on Belarus' experience in co-expertise (Lochard, 2013; Lochard et al., 2026), the residents were able to benefit from some useful advice from the ICRP members particularly concerning the process to follow with the measurements of radiation. The latter also took advantage of these visits to enrich their understanding of the mechanisms at work in the process. Residents of Suetsugi participated at the 7th ICRP dialogue meeting held in Iwaki in November 2013. On this occasion, the round table discussion was organized between the community and the ICRP members.

1.3. *The decontamination and waste issues*

The decontamination of Suetsugi was carried out by Iwaki City with the support of the Ministry of Environment of Japan. It started at the end of December 2012 and finished in summer of 2013. Initially eagerly awaited by residents, this decontamination was complicated when it came to storing the contaminated waste on the territory of the community. Since the city of Iwaki owns a wastewater treatment plant in the Suetsugi ward away from the dwellings, it was decided after several meetings with the residents to store the waste near the plant temporarily. However, some residents were very concerned about the potential consequences of this decision on their health. Coincidentally, the ICRP's third visit in March 2013 took place when the decontamination work was already well advanced and the visit to a decontamination site as well as the storage site was organized by the EIF and some volunteers of Suetsugi. This was an opportunity for many residents to ask questions about the effectiveness of the decontamination works and the risks associated with the storage site. Explanations about the design and operation of the storage site as well as on-site measurements about ambient dose rates showing that a few meters away from the bags of waste stacked on the site the dose rate was similar to that of the village gradually reassured the inhabitants. During the debriefing session at the Community House, the ICRP members advised the participants to organize themselves the radiological monitoring of the site.

In autumn 2013, Iwaki City proposed to Suetsugi to also store the fly ashes from the city incinerator in the same storage site. In return, Suetsugi asked the city of Iwaki to provide it with the necessary services to carry out its measurement activities. The negotiation went for several months because Iwaki City was reluctant to specially support Suetsugi which were only a tiny fraction of Iwaki City. The standstill was broken when a member of the support team of the Cabinet Office of Japan for the Fukushima affairs who already knew the Suetsugi's activity through the ICRP Dialogue came to Iwaki City Hall to negotiate with the municipality. At the end of the meeting, the city of Iwaki agreed that the national budget intended for reconstruction projects in the area devastated by the nuclear disaster would be used for Suetsugi's activities. In exchange for the reception of the ashes of the incinerator, the Suetsugi community finally received the financial support for D-Shuttle personal cumulative dosimeters recording dose per hour (Chiyoda Technol, 2018; Naito et al., 2026) and the surveillance of the site by independent experts: Dr Miyazaki from FMU and Prof Yoshiyuki Mizuno, a professor of nuclear physics from Kyoto Women's University, who engaged in dissemination of information on radiation risk after the accident (Mizuno and Ando, 2012).

Later on, ICRP members visited several times the waste storage site together with residents and had the opportunity to discuss and analyse with them the measurement results for both the decontamination waste and the fly ashes. It is worth to note that the residents kept monitoring the ambient dose rate there twice per week for five years until the fly ashes were transferred. All this experience has shown that it is possible to involve residents concerned with the storage of low-level radioactive waste in the decision-making process concerning

their future but also in their radiological monitoring. It is remarkable that after having assessed the risk associated with the storage of decontamination waste, the residents used their know-how to negotiate the reception of additional waste. Finally, all the decontamination waste had been transferred to the interim storage site in Futaba and Okuma and fly ashes to the final disposal site in Tomioka by the beginning of 2020.

1.4. The whole body measurement campaigns and the food product measurements

In April 2013, the first whole body measurement campaign was organized by the Suetsugi community and EIF with the help of Dr Makoto Miyazaki. 124 residents, young and old, men and women, took two chartered buses to go to Hirata central hospital in the Fukushima Prefecture about 60 km away from Suetsugi. At a meeting in May, they discussed the results of the campaign. Despite the wide variety of lifestyles and eating habits, radioactive caesium levels were below the detection limit in most people. It was a good surprise for the participants. In view of the results, many of them, reassured, decided not to continue the whole-body measurements.

The second campaign was organized in October 2013, with subsequent campaigns continuing about twice a year until the end of 2016. Results showed a drop in the number of detectable doses as well as the levels of contamination. Despite the implementation of the internal contamination measurement campaign and its first rather encouraging results, residents still remained concerned with local products, including products from the forest, which were very popular before the accident. Among other consequences, their quality of life had deteriorated, as they have had to give up offering their children, grandchildren or relatives the products they had grown themselves or picked in the forest. This persistent concern led the EIF and some volunteers of Suetsugi who were promoting the co-expertise process to organize a session of measurements of food products from the gardens at the occasion of the fourth visit of ICRP members in July 2013. It was an opportunity to discuss the radiological quality of the products according to their provenance: shops, vegetable gardens, forest. Participants to the meeting asked questions about the interpretation of the values observed for potassium 40 and caesium 134 and 137 and why most results of whole-body measurements were below the detection limit. They also inquired about the possible reasons for a few results being above the detection limit, the effectiveness of changing diet and the comparison with the results in Belarus provided by the ICRP members. The session ended in a heart-warming atmosphere with a meal prepared with the food products that had been measured.

A year later, at the occasion of their fifth visit in May 2014, ICRP members discussed once again the results of whole-body measurement and the impact of individual choices related to diet. A resident lady explained that her husband had recently returned to the forest to pick up bamboo shoots that were his favorite. After measuring them and despite a moderate contamination, he nevertheless decided to eat them thus balancing his anxiety about the radiation and

his desire to taste the fresh bamboo shoots, which he is very fond of. The ICRP members advised the lady to ask her husband to participate in the next whole body measurement campaign to verify the impact of the bamboo shoot season on his internal contamination. This anecdote made it possible to highlight the importance of individual measurements of radiation to restore self-confidence in affected people. Incidentally some participants referred to families who had not returned to Suetsugi because of concerns about potential risks at the NPP.

1.5. *The D-Shuttle experience*

In April 2014, Chiyoda Technol Corporation loaned 30 D-Shuttle dosimeters to the Suetsugi community. Neither the city of Iwaki nor the government was involved in this initiative. Residents carried out measurements through the intermediary of Prof Hayano, a nuclear physicist from the University of Tokyo, who became involved with the population of Fukushima Prefecture after the nuclear accident (Hayano, 2015). In January 2015, Iwaki City and the Suetsugi community officially signed an agreement and decided to lease the D-Shuttle for a fee (see Section 3.7). The contract was to rent 100 units for a year. Therefore, for the period from January 2015 to April 2016, a total of 115 units distributed to almost every household were in operation in Suetsugi. The measurements revealed exposure levels lower or slightly higher than 1mSv per year.

This initiative had a considerable impact. Not only was each resident able to know her/his individual external exposure, but moreover thanks to the explanations of Dr Miyazaki she/he was able to understand on what occasions this exposure was received (Miyazaki, 2017). They discussed the results of the measurements together at meetings in the Community House, which allowed the community to gradually become aware of the role of lifestyles on the exposures and thus to establish a direct link with their daily actions (Ando, 2016). From there the atmosphere within the community evolved, and the residents became more self-confidence and serene as evidenced by the testimony below.

1.6. *Resumption of the full Suetsugi festival (spring 2014)*

The community of Suetsugi used to organise a festival every first weekend of April, the highlight of the ceremony taking place on the beach when a group of people supporting a portable shrine enters the sea. After the accident in March 2011, the annual festival was cancelled because Suetsugi was under the government sheltering order. However, already in spring 2012 the residents decided to resume the festival partly, skipping the beach ceremony because of the destruction caused by the tsunami. In April 2014, the residents were able to resume the full festival (Figure 3). with the final ceremony on the beach. This was an important step in rebuilding social ties in the community, although many of the young evacuees were not present. ICRP received an official invitation to participate to the April 2016 Suetsugi festival.



FIGURE 3. The Suetsugi Festival (photo: J. Lochard).

1.7. *The Suetugi project*

The idea of bringing together the various measurement activities developed so far in a coherent project has slowly taken shape over time. After a visit to Belarus organized in October 2011 on the sidelines of the ICRP dialogue initiative, it was realized that a key element in consolidating the involvement of residents would be the establishment of a food measurement centre along the lines of the radiological quality control centres which had been established within the framework of the CORE program in the district of Bragin in Belarus (Lochard, 2026). The challenge was to find a room and a person to take the measurements, but this remained difficult to implement without a sufficient budget. What started as voluntary activities got finally funding from January 2015 for a whole package, called the “Suetsugi Project” including:

- the distribution of D-Shuttle dosimeters to the community;
- a half-yearly whole body counter campaign;
- the support of a part-time counsellor in charge of measurements;
- weekly foodstuff measurement sessions at the community centre;
- the publication once every four months of a newsletter;
- the scientific and technical support from Fukushima Medical University (FMU) experts.

Thanks to this framework, residents could go once a week to the community centre to measure their food products and speak with Ms Maiko Momma, a resident of Yotsukura near Suetsugi, hired as a consultant by the project. Her role was not only to carry out the measurements of the samples brought by the residents, but also to provide them with information on the radiological quality of the local products and to answer questions related to the external and internal exposures in Suetsugi.

The newsletter, Suetsugi Dayori (Suetsugi News), was distributed to share the measurement results and general information on the life of the community with all residents. Also, it was to keep contact with those who had left the community after the accident and who started a new life elsewhere. 15 newsletters had been published from 2015 to 2020.

The project was able to receive financial support from Iwaki City between January 2015 to March 2017 and from FMU between April 2018, and March 2020. Finding these supports was not easy, which costed a lot of time and energy. It is thanks to their obstinacy and the quality of their activities, recognized by many national and international experts, that the inhabitants of Suetsugi were finally able to benefit from supports that met their wishes.

2. The diffusion and transmission of experience

2.1. *The “local radiation consultants”*

Suetsugi’s experience, which was communicated at a very early stage through the ICRP dialogue initiative in Fukushima, had a direct influence on the Japanese policy regarding sustaining recovery of the affected people. Members of the Japanese Cabinet Office support team who attended an ICRP dialogue meeting in July 2012 visited Suetsugi on several occasions. The idea of the “local radiation consultants” system to support the residents in the affected areas, which appeared in the “Basic Policy on Measures Security and Safety upon Return”, promulgated by the government in autumn 2013, was directly inspired by the activities undertaken by the community of Suetsugi (Arima, 2016). This system was intended to play a central role in informing and advising people on radiological protection matters in areas where evacuation orders were lifted. A major challenge encountered in the practical operation of the system concerned how to train and develop the consultants. When implemented as an administrative programme, it was difficult to adopt a trial-and-error approach of the kind used in Suetsugi. Moreover, administrative bodies tended to expect consultants to perform their roles perfectly well from the very beginning — an unrealistic demand in practice. In an effort to improve the competence of the consultants, meetings were held by the Ministry of the Environment which is responsible for the system on a continuous basis to promote exchanges among those engaged in the consultant system across the municipalities, which included practitioners in the field. From the Suetsugi community, the key local leaders participated in these meetings. However, despite similarities in approaches to radiation-related issues, the institutional challenges faced by the administratively led consultant systems differed in many respects from those encountered in Suetsugi, which had developed from a grassroots, non-governmental initiative. The ways in which these challenges were addressed also diverged accordingly.

2.2. *The Suetsugi video*

On two occasions — September 2016 and August 2017 — students from the Phoenix Leader Education Program for Renaissance from Radiation Disaster at Hiroshima University carried out fieldwork as a part of their course in Suetsugi. Welcomed at the Community House, the students listened to presentations on the events that followed the tsunami and the nuclear accident, as well as the radiological protection activities undertaken by the residents. Then, they visited the village, including the newly constructed breakwater to protect the village from tsunami risk, and the radioactive waste storage site. Back at the Community House, they attended a food contamination measurement session before taking part in a dialogue with residents, who shared their personal experiences of the accident and its aftermath. These exchanges were marked by detailed explanations and a strong willingness on the part of the residents to convey the experience that had been collectively emerged within the community.

It was on the occasion of one of the students' visits that the idea producing a video on the community's experience emerged. The video entitled "Regaining Confidence after the Fukushima Accident: the Story of the Suetsugi Community" was shot with members of the community and was uploaded to YouTube in 2018 in three versions: Japanese, English, and French (Miyai et al., 2018). It begins with a reminder of the triple disaster and then describes the stages of the co-expertise process. To this day, it remains the most precise testimony of what occurred in the community, concluding by highlighting how the community regained a certain sense of serenity and confidence (Figure 4).

As a resident expressed it very well, "After everything, I'm no longer in fear. I won't use the word 'security'... it's more like a peace of mind". Concerning confidence, a resident said in the video "That we are not forgotten, someone cares for us that makes a difference. I'm not alone, there's someone I can trust... An actual human being, not something you read in a book".



FIGURE 4. The Suetsugi video⁵ (photo: Yu Miyai).

⁵ English version: https://www.youtube.com/watch?v=L_ZhjixM6oM
 Japanese version: <https://www.youtube.com/watch?v=47sMGk87MuA>
 French version: <https://www.youtube.com/watch?v=Yi5UDSJffEw>

2.3. The Suetsugi Atlas

In time, participants in the co-expertise process felt the need to gather all the available information produced after the nuclear accident concerning the radiological situation as well as the testimony of residents on their paths towards the rehabilitation of their living conditions. Driven by the desire to transmit the experience of the community to present and future generations, the “Suetsugi Atlas project” launched in 2017, founded partly within the framework of the Suetsugi project. The project benefited from technical support of a professional editor and scientific advice from the experts involved in the co-expertise process. Through the interview process, residents were encouraged to look back once again on the period following the nuclear accident and to articulate their experiences as their own individual stories. Even before the creation of the Atlas, residents of the Suetsugi district had already had multiple opportunities to speak about their experiences through interviews for the Suetsugi Newsletter and through visits by observers. By repeatedly narrating their own experiences in this way, what had initially been a confusing and overwhelming series of events — difficult to grasp at the time — gradually came to be endowed with meaning as a lived narrative. Giving meaning to one’s own experience, and thereby being able to perceive the world one inhabits as meaningful, occupies an important place in the process of recovery after a nuclear disaster. Only through this process, it can be said, is everyday life able to regain a sense of stability. At the same time, the interviews also revealed the limitations of the co-expertise process in Suetsugi. Feelings of unfairness experienced during decision-making in the recovery process, as well as dissatisfaction with administrative authorities stemming from the lack of opportunities to be involved in those decisions, persisted over a long period. Moreover, the restoration of trust toward experts in general — particularly those who were not directly involved in the co-expertise process — remained extremely limited. In addition, challenges that exceeded the community’s own capacity to respond, such as population decline and regional revitalisation, continued to persist (Ando et al., 2026). Addressing the latter would likely require more integrated and strategic initiatives, such as the CORE program (Lochard et al., 2026).



Paper back and Kindle versions
<https://www.amazon.co.jp/dp/B0BGSV4ZQY>

FIGURE 5. The Suetsugi Atlas on Internet (photo: Ethos in Fukushima).

In late 2014, a meeting was held in Tokyo with various representatives of ministries and authorities from towns and villages of the Hamadori region, the most affected by the radiation in the Fukushima Prefecture. The experience of Suetsugi was presented which was unknown to the other communities and the importance of technical support from experts was emphasized. In the following days, representatives of a neighboring community visited Suetsugi to go deeper in the experience.

Suetsugi also has become over time a popular place for many delegations of both national and foreign experts concerned with better understanding the process of involvement and empowerment of the local population and the nature of its activities.

2.4. *Maintaining vigilance*

Beyond the concern of their individual exposures, the residents of Suetsugi also monitored the general evolution of the radiological situation of the whole community. This vigilance was first exercised following the storage of decontamination waste and the reception of fly ashes from the city of Iwaki. Small groups of villagers regularly visited the storage site to take measurements to ensure the stability of the situation. From the moment that the inhabitants were equipped with D-Shuttle dosimeters, these were used not only to assess the individual doses but also as a means of monitoring a possible rise in ambient radiation in the event of an incident perceived as always possible at the Fukushima power station. In fact, the residents had spontaneously supplemented the main function of the dosimeters for monitoring individual exposures with an alarm function.

Residents' commitment to exercising collective vigilance, combined with the monitoring of individual internal and external exposures and the radiological quality of the products, have gradually contributed to restoring social confidence within the community (Ando, 2018). Moreover, experts demonstrated their commitment to the community by making regular visit to Suetsugi. They confirmed the positive development of the local radiological situation, which also contributed to the restoration of social trust (Earle et al., 2007).

Over time the number of residents measuring their products has gradually decreased. Some started relying on those who continued the measurements to stay informed about the situation, which alleviated their burden. Others, seeing the results of the measurements, began to question whether or not it was necessary to continue the monitoring system. Finally, in January 2020, the decision was made to end the scheme at the meeting among those who were engaged in the co-expertise process including the residents because they now knew what to do and who to ask if something happens to them because food measurement is always available every day at the Iwaki City branch. It is undeniable that over time the residents of Suetsugi have acquired a practical radiological protection culture, which allows them not only to appreciate their radiological situation but also how to manage it for themselves and their love ones.

2.5. The cooperation with the Fukushima Dialogue NPO

In November 2023, during a follow-up meeting with residents — held on several occasions after completion of the Suetsugi Project, one of them expressed concerns about the discharge of treated water containing tritium from the Fukushima Daiichi nuclear power plant into the Pacific Ocean, which has been implemented since August 2023 after a long nationwide controversy. Although he acknowledged that the dilution of tritium offshore was significant, he nevertheless was questioning the possibility of reconcentration in the small bays along the coast near the village. During the discussions that preceded the first discharges into the sea, he had questioned experts in public meetings but had not received a clear answer. Since the NPOs delegation was also unable to provide an answer to his concern, it was decided to take action to measure the concentration of tritium areas likely to re-accumulate it.

Since measuring tritium required specialized equipment beyond the NPO's capacity, they sought professional laboratory support. This led to a collaboration with Professor Yuji Torikai at Ibaraki University, whose laboratory agreed to work alongside the residents and the NPO. A first measurement campaign took place in April 2024 with the participation of local residents, who selected sampling sites along the Suetsugi coast in consultation with university experts (Figure 6). The results of these measurements showed no significant difference before and after the releases. These results were confirmed over time, providing reassurance to the residents. This recent episode shows that the spirit of collaborative expertise remains alive within the population. Whenever the radiological situation is questioned, the measures are implemented to pinpoint the problem. This is a good illustration of the community's vigilance.



FIGURE 6. Suetsugi residents collecting samples (photo: R. Ando).

3. Some lessons from the Suetsugi experience

The co-expertise process described in this article is exemplary in more than one way. First, it was an initiative taken by the residents themselves. Suetsugi's experience shows that, in the context of an open society where large amounts of information circulate, affected people can gain the means of measurement and recruit experts and professionals through social media. They can take ownership of the situation they face and find ways to overcome it. It is certain that the past experience of Belarus, especially the ETHOS project, was a constant source of inspiration, as evidenced by the many questions posed to the members of the ICRP. From this point of view, all co-expertise processes must be documented and disseminated to help affected communities in the event of possible nuclear accidents in the future. Moreover, the residents of Suetsugi have shown a lot of creativity and independence in the way of implementing the co-expertise process. They have studied the measurement results together and decided on next steps sometimes with experts but also without them. In this approach, the role of local leaders was key to ensuring the continuity of the process.

Another lesson from Suetsugi's experience is that scientists, researchers and experts joined the process spontaneously and served the community over the long-term. Here again, the role of social media was decisive in "recruiting" goodwill. The process has also shown that, to be credible, experts should not only master the scientific basis of radiation protection and its practical implementation, and act in a transparent manner, but must also demonstrate empathy and, above all, respect people's freedom of choice while remaining faithful to their long-term commitment (Zoelzer, 2020). These are necessary conditions for gradually restoring confidence among the affected people.

By its very nature based on dialogue and the appropriation of the radiological situation with which the affected people are confronted, a co-expertise process is an approach which proceeds in stages, and which takes time. It is necessary to allow each participant time to assimilate the modalities and mechanisms by which he or she is exposed to the various radioactive sources present in the daily environment. Everyone has to gauge the importance of the exposures to which she/he is exposed and ultimately makes decisions about life choices. All this necessarily takes time.

The process of empowerment in which residents of Suetsugi acquired the practical culture of radiological protection was relatively similar in its development to that of the villages of Belarus (Lochard, 2013) in the late nineties. It was, however, more rapid because of the use of social media and the new generation of measurement means, in particular, individual dosimeters for external exposures allowing a direct link with the daily activity of those who wear them. Not only the deployment of the co-expertise process, but also the provisions to ensure its sustainability were put in place fairly quickly.

Most notable was the ability of the process leaders to negotiate and ultimately secure financial support. Although Suetsugi's experience served as a model for national authorities, as described above, it did not spread as might be expected. The deployment of local consultants in other affected communities certainly played a decisive role in engaging the population but did not foster

a level of commitment comparable to that which emerged in Suetsugi. Beyond demonstrating the effectiveness of the approach, the Suetsugi experience also revealed the limits of the public authorities' willingness to trust the population to develop local projects aimed at improving both individual and collective protection, as well as living conditions.

Conclusion

During its 15th visit to Suetsugi in August 2019, the ICRP delegation held a Round-Table discussion with local residents involved in the experiment. During the discussions, they freely expressed their views and feelings. They emphasized that in the aftermath of the accident, there was a state of total chaos, and the local administration faced significant challenges in adapting their conventional procedures to the unprecedented situation. They noted that the measures undertaken within the framework of the co-expertise process effectively addressed residents' concerns. This process played a crucial role in enabling constructive negotiations regarding the acceptance of the Iwaki fly ash in their community. In conclusion, they stressed that the ability to express their concerns had always been vital, and that the Belarus experience provided essential insights. They observed that people's perspectives had evolved over time, and that ultimately, the experience had been a long and inspiring journey for the future.

At the end of the meeting, the Commission's scientific secretary presented the village chief and residents with a plaque in recognition of their invaluable contribution to the advancement of radiological protection (Figure 7). A few months later, this experience, along with others, was highlighted in ICRP Publication 146, entitled "Radiological protection of people and the environment in the event of a large nuclear accident: update of ICRP Publications 109 and 111."



FIGURE 7. The ICRP visit in August 2019 (photo: Ethos in Fukushima).

Beyond confirming the key role of dialogue and radiation measurements in involving and empowering residents to improve their protection and living conditions, Suetsugi's experience has highlighted the importance for experts of adopting a clear ethical position while respecting people's freedom of choice (Schneider et al., 2019). It has also shown that the co-expertise process — whether initiated by local actors or experts — can only unfold if authorities at all levels create the conditions necessary to facilitate the process and support local initiatives and projects.

The Japanese experience, like that of Chernobyl two decades earlier, has shown that the support of local initiatives and projects, which is essential for the rehabilitation of the living conditions, remains an unresolved issue. The challenge was to find a room and a person to take the measurements, but this remained difficult to implement without a sufficient budget. This difficulty was strongly highlighted by the co-expertise process conducted in Suetsugi. Past experience has clearly demonstrated that, in order to address high level of concern, lack of knowledge and experience concerning radiological risk, widespread mistrust towards authorities and experts, and the profound socio-economic complexity generated by the accident, a change in governance is unavoidable— one based on the decentralization of decision-making and on confidence in the capacity of those affected to address the problems of their own communities (Eikelmann and Hériard Dubreuil, 2016).

Despite inevitable obstacles and difficulties, the Suetsugi's experience has confirmed that, given the complexity and challenges arising from a nuclear accident, all public and private actors as well as all stakeholders, need to commit to cooperating in responding to the problems and challenges of affected areas. The co-expertise process, which can be considered a social innovation (Bodin, 2017), has proven effective in empowering those affected, supporting the restoration of their well-being, and improving the quality of “living together” within their communities, ultimately enabling them to regain their dignity.

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