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Dear All

Good Afternoon. First of all, let me introduce myself. My name is Horst Monken Fernandes and I am an Environmental Remediation Specialist at the Decommissioning and Environmental Remediation Section of the International Atomic Energy Agency for the last 13 years.

I am so very sorry that I could not attend this very important International symposium hosted by The Society for Remediation of Radioactive Contamination in Environment (SRRCE) and the Ministry of the Environment in Koriyama City, Fukushima Prefecture.

After the accident at the Fukushima Dai-ichi NPP, which led to the radioactive contamination of large areas, I had the opportunity to be part of different missions organised by the IAEA in response to requests made by the Government of Japan that has formulated a programme for the recovery of these areas.



The first of these missions was organised in October 2011 and was aimed at providing support to the remediation works. The second one was a follow up mission implemented in October 2013 with the main purpose of evaluating the progress of the remediation activities achieved since October 2011.

I have also been involved in the preparation of the IAEA Report by the Director General on “The Fukushima Daiichi Accident” contributing to the chapter on the post-accident phase subsequently led a series of 4 expert meetings between the IAEA and the Ministry of Environment of Japan (MOE), between 2016 and 2017.

From the very beginning it has been appreciated that Japan has gone forward very quickly and allocated the necessary legal, economic and technological resources to develop an efficient remediation programme to bring relief to the people affected by the Fukushima Dai-ichi nuclear accident. Priority has been given to children and the areas that they typically frequented. The practical measures taken



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regarding public information and its involvement in the programme based on the needs of the local residents was acknowledged.

Attention was called to the need to cautiously balance the different factors that influence the net benefit of the remediation measures to ensure dose reduction. Avoiding over-conservatism in the adopted measures, which could not effectively contribute to the reduction of exposure doses, was recommended.

Another point that was highlighted was the need to pay attention to the potential risks of misunderstandings that could arise if the population were only or mainly concerned with contamination concentrations [surface contamination levels (Bq/m^2) or volume concentrations (Bq/m^3)] rather than dose levels. The investment of time and effort in removing contamination beyond certain levels (the so-called optimized levels) from everywhere, such as all forest areas and areas where the additional exposure was relatively low, would not automatically lead to a reduction of doses for the public. The



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consequent generation of large amount of residual materials was a concern, therefore authorities have been encouraged to maintain their focus on remediation activities that could bring the best results in reducing the doses to the public.

In 2013 many examples of good practice in stakeholder involvement, were observed. Large amount of crucial information (especially in relation to dose rates) has been produced since the accident that would later on helped to drive decision-making processes. It was clearly that there was a need to foster confidence both in the accuracy of the information itself and in how it was interpreted, especially in terms of safety perceptions. This aspect was seen as of particular importance when trusted intermediaries were to be used like doctors and other independent experts.

In the follow-up meetings between IAEA and MOE attention was called to the usefulness of improved information about decontamination factors achieved for specific techniques applied to



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specific materials or classes of materials in order to achieve better targeted clean-up efforts.

Experts involved in the IAEA-MOE meetings called attention to the fact that minor hotspots could still be present in the areas where full-scale decontamination has been implemented and that continued efforts would be necessary to identify these hotspots for further decontamination. The MOE was advised to consider developing routine hotspot surveying and rapid remediation action plans in the relevant areas. These plans would then be communicated to the stakeholders and this communication would help reducing potential concerns of returnees.

The large amounts of materials generated by the decontamination works led the Japanese authorities to face significant challenges to reduce these amounts. Recycling has been considered as well as different approaches for volume reduction (e.g. Classification, Chemical and Heat Treatment). The importance of developing a

recycling procedure as quickly as possible was agreed by the international experts attending the IAEA-MOE meetings. Reuse of the soil from decontamination was also considered BUT only under well-established situations.

In 2017 MOE reported that the “full-scale” decontamination was completed within the Special Decontamination Area according to the established plans. It was learned by the experts that the overall process of remediation was strongly influenced by interactions with stakeholders to facilitate the return of evacuees to their homes and the provision of sustainable living conditions.

A key point that was highlighted by the IAEA experts was the need to have MOE assessing the overall practices of stakeholder engagement in the decision-making process and extract important lessons learned.

If considered appropriate, future practices should be reoriented accordingly, especially during the repopulation of the evacuated areas and continuous remediation to reach the long-term clean-up



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goal. In this regards it would be helpful for the MOE to continuously assess the effectiveness of the stakeholder communication methods and strategies that the MOE adopts for more efficient approaches.

Putting all the lessons learned in perspective and going beyond the topics of decontamination and stakeholder related aspects it can be said that the efforts that have been put in place by Japanese authorities to remediate the areas affected by the Fukushima Daiichi NPP accident can be examined in different layers that embrace a wide range of topics. Those topics include – but are not restricted to - policy/strategy elements; techniques and technologies to be used in different remediation related situations e.g. site characterization, decontamination, monitoring, dose assessment; waste management and stakeholder engagement and communication.

A key element in any large-scale remediation effort is the existence of related Policies & Strategies established at a high level. In this regard the Act of the Special Measures – that was enacted to frame



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the remediation works in Japan – was of special value. Ideally, such Policies & Strategies should be available before the occurrence of an accident. In this regard, the IAEA led Conference on Decommissioning and Environmental Remediation that took place in Madrid (2016) stressed the need to develop national policy, strategies and means of national dialogue for remediation of post-accident sites containing residual radioactivity.

Another important aspect is the imperative need to consider the remediation process in its whole life-cycle i.e. in such a way that the consequences of one particular set of activities can be appreciated in the overall context of the consequences that they will entail. The aspiration of affected communities in implementing large scale decontamination programs to clean-up affected areas (in an attempt to return the affected sites to background conditions) needs to be balanced with, for example, the amounts of wastes that will need to be managed including the temporary storage of these wastes,



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transportation to storage facilities and their final disposal. In this regard it's crucial that mechanisms of decision making that can translate into clear (quantitative) indicators the implications of each and every decision are in place. Again, the Madrid Conference recognized that Integrating public engagement into decision making concerning environmental remediation, particularly taking into account desired end-states, is extremely complex. Therefore, the need to establish international guidance for post-accident remediation, with special focus on mechanisms to involve stakeholders in the decision-making process is a challenge to be faced by the international community.

As already highlighted the remediation works in Japan generated considerable amounts of materials that now need to be managed. Among these materials, contaminated soils are of particular importance. If soil recycling is to be considered internationally agreed criteria – especially for conditional uses – will need to exist.



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Therefore, there is a need to give further consideration to this topic which, by the way, was already highlighted by the 1st IAEA Mission to Japan in 2011.

These are only some few points that might be highlighted in this short communication. For sure the existing amount of information related to the remediation of off-site areas affected by the Fukushima accident constitute an incredible asset to be shared and communicated with the international community in a comprehensive manner.

To conclude, let me thank you again for this opportunity. I deeply regret that I could not be attending this important meeting in person.

Hope to meet you all in the near future and I send you very best regards with my most sincere wishes of continued success and accomplishment.