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Linking Humanitarian and Nuclear Response Systems

A study by the UN Office for Coordination of Humanitarian Affairs

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EXECUTIVE SUMMARY

The accident at the Fukushima Daiichi nuclear power plant in March 2011 − as a consequence of the Great East Japan earthquake − triggered a broad reflection on the question of the response to nuclear emergencies. As part of this, the UN Secretary General asked the Emergency Relief Coordinator, and Chair of the Inter-Agency Standing Committee (IASC), to study ways to enhance the capacity of the organizations of the IASC.

This study and its recommendations reflect a broad consensus amongst the members of the humanitarian and nuclear emergency response communities, embodied, respectively, by the Inter-Agency Standing Committee (IASC) Sub-Working Group on Preparedness and by the Inter-Agency Committee on Radiological and Nuclear Emergencies (IACRNE). The study also acknowledges that many of the global-level issues identified in the *United Nations system-wide study on the implications of the accident at the Fukushima Daiichi nuclear power plant* have already been addressed or are in the process of being addressed.

The study begins by providing a view of humanitarian crisis that incorporates both the definition of disaster (an event exceeding the capacity of the affected community or society to cope) and international humanitarian assistance (direct or indirect provision of goods and services to the affected population on the part of international actors). The study then considers the likely "humanitarian" consequences of a large-scale nuclear accident, identifying long-term mass population displacements as by far the most significant one. The study also reviews in some details the experience of the largest such events on record (particularly Chernobyl and Fukushima). Interestingly, hardly any of the many emergency response interventions by international organisations can be qualified as typical or traditional humanitarian assistance. Furthermore, as broadly confirmed by the respondent to an online survey, it is difficult to imagine that a country with civilian nuclear capacity would find itself in a position to request for the kind of large-scale international assistance that is typical of humanitarian operations.

A conclusion of the conceptual part of the study is therefore that, according to current terminology and to the way in which humanitarian operations are understood by the stakeholders, there is little ground to consider major nuclear accidents as humanitarian crises in the traditional sense. Furthermore, it would appear that, much like the case of the response to sudden-onset natural disasters, the overall scope of international assistance following nuclear accidents concentrates mainly around coordination and information management.

The study considers the many dimensions of the so-called human dimension of nuclear emergencies, identifying areas of possible involvement for international actors as the dissemination of information for the communities, de-stigmatisation and the promotion of community-based approaches.

An altogether different challenge is posed by the presence of international (humanitarian and development) actors in countries where there is there possibility of a nuclear accident. In these situations, safety and security staff, business continuity and response preparedness require special attention, particularly on the part of the United Nations. Special training and the development of relevant standard operating procedures are also important in case of the deployment of significant numbers of international staff to an environment with radiological risks.

The study continues by reviewing the role of International Atomic Energy Agency (IAEA) in the coordination of international response, describing the Joint Plan as the interagency framework for preparedness and response and Inter-Agency Committee on Radiological and

Nuclear Emergencies (IACRNE) as the coordinating mechanism between participating international organisations. On the humanitarian side, the Inter-Agency Standing Committee (IASC) is the policy-making mechanism at the global level. The IASC sub-Working Group on Preparedness, in particular, promotes inter-agency preparedness, contingency planning and early warning. At the field level, the coordination of operational activities of an often very large number of actors in the fields happens through the Humanitarian Clusters system, under the leadership of a Humanitarian Coordinator.

In the last section, the study explores potential areas for capacity enhancement for humanitarian actors and nuclear emergency response organisations. As such, the following recommendations are made:

1. Given the importance of the human dimension (such as the dissemination of information for the communities, de-stigmatisation and the promotion of community-based approaches) in nuclear emergencies, and the key role that some of the humanitarian organisations can play in this respect, it is recommended that the IASC Working Group[1] considers this issue, possibly including through the development of essential technical guidance.

2. It is recommended that the IASC Working Group invites the IAEA to take part in a special session at which the human dimension of nuclear emergencies and other aspects of the humanitarian-nuclear emergencies interface are discussed.

3. It is recommended that OCHA – on behalf of the humanitarian community-, UNDP – as manager of the Resident Coordinator System -, IAEA, UNDSS, UNMSD and WHO discuss arrangements and procedures for the possible creation of a critical support cell to be activated in countries with radiological emergencies. In addition, modalities should be defined for the early transfer of the information OCHA gets through its participation in the emergency meetings of IACRNE (particularly concerning the IAEA/UNSCEAR estimates/modelling forecasts) to the IASC Principals to support decision making.

4. It is recommended that risk and crisis communication drafts are produced in advance by UNDSS, ready to be customised at local level. These should include explanations of terms, safety levels, UN response mechanisms and guidance on what to do in case of a radiological emergency. A system for the regular dissemination of reliable, authoritative information among the country staff should also be developed.

5. It is recommended that, in countries with civilian nuclear capability, the UN Country Teams' (or, where relevant, the Humanitarian Country Teams') response preparedness and contingency plans specifically include nuclear hazards. In these countries, IAEA should provide technical assistance.

6. It is recommended that Standard Operating Procedures for use in environments affected by radiological release are developed in conjunction with security and medical services. These SOPs should provide guidance on how to set up and enter an operation and how to safely extract staff in emergency and non-emergency situations. They should also specify which levels of radiation exposure necessitate decontamination measures.

[1] The IASC Working Group is The IASC Working Group is composed of the directors of the Emergency Programmes of the IASC agencies or their equivalent counterparts. It meets in regular intervals three times a year, usually in March, June / July, and November alternating between Rome, Geneva and New York for two and half days, hosted by IASC agencies on a rotational basis. The Working Group is chaired by the Director of OCHA Geneva, Mr. Rashid Khalikov. Supported by the IASC Secretariat, he is responsible for the preparation of issues, consultations and follow-up actions.

7. It is recommended that the security training of agencies with rapid deployment rosters includes radiological preparedness covering both threat assessment and response procedures. Further advanced training should also be provided to a subset of those on rapid deployment rosters. These staff could then become the organisation's first responders in this kind of events. IAEA should provide technical assistance for such capacity development initiatives.

8. In light of the significant role National Red Cross and Red Crescent Societies can play in response to nuclear emergencies; it is recommended that their international umbrella organisation, the IFRC, joins the Joint Management Plan and IACRNE.

9. In light of the importance of the human dimension in nuclear emergencies, and UNDP significant experience and knowledge in dealing with human consequences of nuclear disasters, it is recommended that UNDP joins the Joint Plan and IACRNE.

1. Introduction

Fukushima accident triggers system-wide reflection

The accident at the Fukushima Daiichi nuclear power plant was caused by the 8.9 magnitude Great East Japan (Tōhoku) earthquake, and resultant tsunami, of 11 March 2011. The Fukushima accident has given rise to concerns regarding the adequacy of international safety standards and conventions, the global emergency preparedness and response system, the effectiveness of national regulatory bodies, and the role of the International Atomic Energy Agency (IAEA).

As a result, the Secretary-General commissioned a study – "United Nations system-wide study on the implications of the accident at the Fukushima Daiichi nuclear power plant." [2] The study suggested three focus areas, the third of which looks at the "international emergency response framework in case of nuclear accidents and addresses the adequacy of disaster preparedness measures, cooperation between international organizations, and the development of new monitoring and scientific capabilities." In this connection, the study stated, "There is a need for an inclusive and consolidated response system." The study continued in stating, "[t]he different response mechanisms should be linked and mainstreamed, and an appropriate governance framework for coordination should be developed."

This was reiterated by the UN Secretary-General at a high-level meeting on "Nuclear Safety and Security" on 22 September 2011 in New York. He acknowledged the need to establish a closer link between the nuclear response system and the humanitarian coordination system in case of nuclear accidents, and asked the Emergency Relief Coordinator, and Chair of the Inter-Agency Standing Committee (IASC), to study ways to enhance the capacity of the organizations of the IASC in this regard.

Closer links between two communities

This report firstly considers the relationship between nuclear accidents and humanitarian crises, with the aim to understand the scope of a possible operational implication of international humanitarian partners in the response to nuclear accidents. It then proceeds to outline the inter-agency coordination arrangements for the response to nuclear emergencies and the headquarters- and field-level coordination mechanisms of the humanitarian community. In its final chapter, it proposes areas for enhanced capacities of humanitarian and nuclear emergency response mechanisms.

Methodology

This study was undertaken, under the supervision of the Joint UNEP/OCHA Environment Unit, by Piero Calvi-Parisetti, Professor of Emergencies and Humanitarian Action at Milan's University Institute for International Political Studies and humanitarian policy advisor to the UN and other international organizations in Geneva.

Extensive desk research aiming at clarifying conceptual and definitional aspects was followed by interviews with experts and officials of several concerned organizations, including IAEA, ICRC, IFRC, OCHA, UNDP, UNDSS and UNICEF. An online survey was deployed and responded to by some 15 representatives of 13 different organizations. Several, increasingly advanced versions of the draft report were reviewed by a restricted reference group. The final draft was circulated for comments to the members of the IACRNE and was presented and

[2] The report by the UN Secretary-General entitled "United Nations system-wide study on the implications of the accident at the Fukushima Daiichi nuclear power plant" was submitted to the UN Summit on Nuclear Safety on 22 September 2011

discussed at the November 2012 meeting of the IASC Sub-Working Group on Preparedness.

Despite the absence of a formal endorsement mechanism for such an independent study, the conclusions and recommendations of this report are assumed to reflect a consensus amongst the members of the humanitarian and nuclear emergency response communities.

2. Nuclear accidents and humanitarian crises

What kind of nuclear emergency?

The first step when setting out to understand the relationship between nuclear accidents and humanitarian crises is to clarify what kind of event is being considered. To this effect, it is useful to refer to the “industry standard”, namely the International Nuclear and Radiological Event Scale (INES), a tool for communicating to the public in a consistent way the safety significance of nuclear and radiological events. The INES Scale explains the significance of events from a range of activities, including industrial and medical use of radiation sources, operations at nuclear facilities and transport of radioactive material. Events are classified on the scale at seven levels: Levels 1–3 are called "incidents" and Levels 4–7 "accidents". The scale is designed so that the severity of an event is about ten times greater for each increase in level on the scale.

Of interest to this discussion are the three uppermost levels of the INES scale as applicable to nuclear facilities. In such events, the consequences of an accident extend beyond the facility itself, and have direct consequences on people and the environment resulting from the spread of radioactive material outside the confines of the installation. Historically, the release of radioactive material following a fire in the reactor core at Windscale Pile (UK) in 1957 is cited as an example of level 5 accident, a significant release following the explosion of a high activity waste tank at Kyshtym (Russia), also in 1957, is an example of level 6 accident, and the external release of a significant fraction of reactor core inventory at Chernobyl (Ukraine) in 1986 is an example of level 7 accident. In recent times, the Fukushima accident is also classified at level 7, and the fact that two essentially different events were classified at the same level may point, according to experts, to a weakness of the INES scale.[3]

Definition of disaster

The second step consists of adopting a suitable definition of “humanitarian crisis”. According the official definition of the UN International Strategy for Disaster Reduction (UNISDR), a disaster is “a serious disruption of the functioning of a community or a society involving widespread human, material,

[3] Both accidents involved breaches of radiological barriers and controls, overwhelming of defence-in-depth measures, and large-scale release of radioactive isotopes into the environment. The causes and sequence of the two events were, however, very different, in terms of reactor designs, the nature of the triggering events, and time-scale for resolution — this is a topic to be explored in more depth in some future post. The obviously big contrast is in the human toll and nature of the radioactive release. The Chernobyl event killed 28 people directly via the initial explosion or severe radiation sickness, and other ~15 died as directly attributed result of radiation-induced cancer. Further, Chernobyl led to a significant overexposure of members of the public in the local area and region, especially due to iodine-131 that was dispersed by the reactor fire, and insufficient protection measures by authorities. An increase in thyroid cancers resulted from this. In Fukushima, by contrast, no workers were directly killed by radiation (or explosions), and indeed none have been exposed to doses >250 mSv (with a ~1000 mSv being the dose required for people to exhibit signs of radiation sickness, through to about 50 per cent of victims dying after being exposed to >5000 mSv). No member of the public has, as yet, been overexposed at Fukushima. Further, much of the radionuclides released into the environment around Fukushima have been a result of water leakages that were flushed into the ocean, rather than attached to carbon and other aerosols from a burning reactor moderator, where they were largely deposited on land, and had the potential to be inhaled (as occurred in Chernobyl).

economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources." Disaster impacts may include loss of life, injury, disease and other negative effects on human physical, mental and social well-being, together with damage to property, destruction of assets, loss of services, social and economic disruption and environmental degradation. In this respect, the Chernobyl accident and the Fukushima accident can certainly be considered as disasters.

Are all disasters humanitarian crises?

Challenges arise, however, when considering the relationship between disasters and humanitarian crises. As an additional challenge to this discussion, one should also note that there is no universally accepted definition of humanitarian crisis and the parameters considered here, although widely accepted and employed, are arbitrary.

According to the ReliefWeb glossary, humanitarian assistance is "aid to a stricken population that complies with the basic humanitarian principles of humanity, impartiality and neutrality. Assistance can be divided into three categories based on the degree of contact with the stricken population: 1. Direct Assistance is the face-to-face distribution of goods and services. 2. Indirect Assistance is at least one step removed from the population and involves such activities as transporting relief goods or relief personnel. 3. Infrastructure Support involves providing general services, such as road repair, airspace management and power generation that facilitate relief, but are not necessarily visible to or solely for the benefit of the stricken population." What this definition fails to specify, however, is that these three forms of assistance are assumed to be provided by *international* actors.

It is essential to understand that, as far as this study is concerned, *humanitarian assistance essentially equates with international assistance*. The definition of disaster given above talks about events exceeding the coping capacity of the affected community or society. In this respect, for example, although localised flash floods can be highly devastating for the affected communities and exceed their coping capacity, they are typically responded to by *national* actors – government and civil society organisations. Such events would therefore qualify as disasters, but not as humanitarian crises. Conversely, there are other situations in which the government is either incapable (because of the scale of the disaster) or unwilling (because the disaster is related to a conflict, to which the government is a party) to assume the role clearly assigned to it by the international legal framework as being primarily responsible for assisting the affected population. These situations call for international assistance and are therefore considered humanitarian crises.

Humanitarian consequences of nuclear accidents

By looking at some of the likely "humanitarian" consequences of a level 7 nuclear accident, the following initial considerations could be made:

- The accident may result in limited acute excess mortality and morbidity, typically involving those involved in containment. It is questionable if such mortality and morbidity can be reduced at all, and in any case this is something of exclusive interest to national actors.

- The accident may result in chronic excess mortality and morbidity in the affected population, owing to exposure to radiation. This is potentially an extremely serious problem, but not one that is likely to be managed by international actors in a significant way. International expertise may be required at some point, but the bulk of the assistance to the exposed

population will be provided by the national Ministry of Health.

- The accident is also likely to result in large-scale and long-term population displacement. This is an event closely associated with the idea of traditional humanitarian assistance. After all, most of what international actors do in conflict and/or extensive drought/famine situations is assisting population forced to abandon their homes and livelihoods and in need of virtually everything. Key to the IASC definition of "complex emergency" – a term used to identify worldwide humanitarian crises resulting in population displacement – is "a considerable breakdown of authority" and of the capacity of the national government to assist the population. This is well exemplified by the protracted Darfur crisis, extending into Chad, and by the 2011 drought in the Horn of Africa, compounded by civil strife in Somalia. In such situations, international humanitarian actors provide virtually *anything* the population receives, both in terms of goods and of services. It is important to understand that such crises happen mostly in countries in which the capacity of the government was limited to begin with, and was further undermined by the crisis at hand. It is commonly accepted that, in such contexts, international humanitarian assistance is quite simply key to the survival of large sectors of the population. Civilian nuclear accidents, on the other hand, are most likely to happen in highly developed and highly industrialised countries – countries in which governments have very significant capacities, and in which civil society organisations and the private sector can contribute massively to the response to sudden population displacements. In such contexts, humanitarian assistance will focus on information management and coordination primarily, rather than on providing basic relief goods such as food and non-food items and essential services such as health, water, sanitation, shelter and education in any significant way.

Food security, logistic support and public health following Fukushima

Based on published data about the response to the Fukushima accident,[4] a more in-depth analysis of two areas of typical humanitarian concern has been carried out. These two areas – food security and public health, were chosen as the two lead agencies in the humanitarian cluster system (FAO and WHO respectively) are also part of the Joint Radiation Emergency Management Plan of the International Organisations – which will be described later – and as such were involved in the response to the Fukushima accident. These organisations are also members of the Inter-Agency Standing Committee, and directly involved in humanitarian response operations worldwide.

In terms of food security, a typical humanitarian response operation includes a range of interventions through which international organisations directly target all the levels of the so-called food distribution chain, from support to the local production and transport of food to the distribution of massive quantities of food aid, all the way to ensuring equitable food consumption within the household. In such situations, food security interventions by international organisations are critical to the very survival of the affected population. FAO activities related to the Fukushima accident, by contrast, were eminently of a technical support and policy advice nature: the agency helped to ensure the dissemination of information on food monitoring and food restrictions, the consideration of agricultural countermeasures and remediation strategies to mitigate the effects,

[4] UN System-Wide Study on the Implications at the Fukushima Daiichi Nuclear Power Plant (SG/HLM/2011/1); Report of the IACRNE 22nd Meeting (IACRNE-22-REPORT).

and the interpretation of standards related to radiological protection to the public. FAO was not involved in the provision of goods and/or services to the population.

The UN World Food Programme, which is not part of the Joint Management Plan but is a primary provider of humanitarian aid in crises worldwide, did indeed intervene in the aftermath of the Great East Japan Earthquake. On March 14, the Government of Japan requested that WFP support the country's own civilian response by providing logistical assistance and specialised equipment to facilitate the delivery of relief items to the affected areas. A four-month Special Operation[5] was then established for a total value of USD 4.8 million. The major budget components were some 45 mobile storage units and 36 prefabricated structures. The logistic support facilitated the storage, transport and delivery of 68,000 blankets and 625,000 packs of donated rations. This kind of intervention certainly qualifies as indirect humanitarian assistance following the definitions provided above, albeit on a substantially different scale from what is customarily done in complex emergencies.

In humanitarian terms, public health in emergencies primarily consists of community-level measures for the prevention, monitoring and control of communicable diseases. Only when primary health care has been effectively dealt with, international organisations, under the leadership of WHO, move to the provision of curative services at dispensary level and ultimately to the provision of medical care at referral hospital level. Like for food security, the direct involvement of international partners in the provision of health services is critical to the survival and well-being of the population. By contrast, WHO's role in the response to the Fukushima accident was limited to risk communication and the provision of technical information to member states, public and media. WHO was not involved either in the provision of goods and/or services to the population.

Worst disaster creates mostly long-term rehabilitation and recovery needs

The Chernobyl accident of 26 April 1986 is the most severe in the history of nuclear power industry. It caused widespread radioactive contamination of 23 per cent of the territory of Belarus, 5 per cent of Ukraine and 1.5 per cent of Russia. Despite the unprecedented scale of the accident, however, as of mid-2005, fewer than 50 deaths had been directly attributed to radiation from the disaster, almost all being highly exposed rescue workers, many who died within months of the accident but others who died as late as 2004. Experts agree that a total of up to 4000 people could eventually die of radiation exposure.[6]

In terms of excess morbidity, about 4000 cases of thyroid cancer, mainly in children and adolescents at the time of the accident, have resulted from the accident's contamination and at least nine children died of thyroid cancer; however the survival rate among such cancer victims, judging from experience in Belarus, has been almost 99 per cent. Most emergency workers and people living in contaminated areas received relatively low whole body radiation doses, comparable to natural background levels. As a consequence, no evidence or likelihood of decreased fertility among the affected population has been found, nor has there been any evidence of increases in congenital malformations that can be attributed to radiation exposure.

[5] WFP response to the Japan Special Operation – After Action Review, 13 March 2012.
[6] The numbers are contained in "Chernobyl's Legacy: Health, Environmental and Socio-Economic Impacts", a three-volume, 600-page report incorporating the work of hundreds of scientists, economists and health experts, assessing the 20-year impact of the largest nuclear accident in history.

Finally, in terms of population movements, as many as 330,000 people were relocated away from the affected areas; 116,000 of these were evacuated immediately after the accident. Information on emergency assistance, however, is scant. This owes to the fact that, during the first four years after the accident, the Soviet authorities decided to largely deal with the consequences of the explosion at a national level. Without Soviet support, the United Nations and its partners sought ways to provide emergency support, which included assessing the nuclear safety and environmental conditions of the contaminated area, and diagnose the various medical conditions that resulted from the accident. The UN also focused on raising the awareness of the area's inhabitants, teaching them how to protect themselves from radionuclides found in the environment and agricultural products.

In 1990, when the Soviet Government acknowledged the need for international assistance, emergency needs were no more. Since then, the United Nations organizations and major Non-Governmental Organizations have launched more than 230 different research and assistance projects in the fields of: health, nuclear safety, socio-psychological rehabilitation, economic rehabilitation, environment and production of clean foods and information/public education.

In 2004 the UN Secretary-General transferred responsibility for coordination of all UN activities related to the Chernobyl nuclear disaster from UN-OCHA to UNDP. At the same time the UNDP Administrator was appointed the UN Coordinator of International Cooperation on Chernobyl. UNDP now coordinates twelve UN agencies involved in Chernobyl relief and recovery, and chairs regular Inter-Agency Task Forces on Chernobyl, which meets regularly to review progress on UN initiatives and opportunities for cooperation. This transfer aimed to shift the emphasis of international assistance efforts from emergency relief to self-sustaining economic recovery and development. A number of lessons have been learned since then on developmental challenges that emerge in the aftermath of nuclear disaster, recovery efforts that are specific to nuclear fallout, and solutions that work on the ground. These can be replicated and applied in other nuclear disaster situations worldwide.

Do Chernobyl and Fukushima represent the full spectrum of potential humanitarian consequences?

The above considerations probably do not capture the entirety of the potential "humanitarian" consequences of a civilian nuclear accident and another two possible scenarios should be considered.

Firstly, an accident may happen in a country that has nuclear technology but may not have the capacity to respond adequately to a sudden mass population displacement. One case could be Armenia, whose Metsamor plant is one of just a few remaining nuclear power reactors that were built without primary containment structures and lies on some of Earth's most earthquake-prone terrain, only some 70 km from the country capital. Although this may actually be a rare, if not unique, case, it is certainly one to be taken into consideration.

Secondly, an accident in one country may trigger a mass population displacement in a neighbouring country, where the national authorities do not have the capacity to handle the emergency. This case, however, would qualify as a "traditional" humanitarian emergency, not unlike a conflict- or natural disaster-induced displacement.

Consistent (but possibly confused)

As part of this study, an online survey was deployed to investigate the opinions of humanitarian partners on their possible involvement in a nuclear accident

views amongst humanitarian partners

response operation. The results of the survey (from 15 respondents from 13 different organizations) are reported in Annex I.

Though limited in response, the survey points to two important considerations. Firstly, a majority of the respondents think that it is not very likely that a country with civilian nuclear technology may call for international assistance to deal with a population displacement crisis, and a very small part of the respondents consider this as unlikely. In general, it appears that respondents seem to overestimate the directly radiation-related consequences of the accident on the population, and perhaps, in their responses, did not fully keep in mind the definition of humanitarian assistance as considered for this study.

Security – rather than safety – concerns

A study such as this one has to take into consideration the fact that nuclear accidents can result from security-related threats, rather than from safety problems connected with the normal functioning of a nuclear reactor.

The first scenario that was considered is the hypothetical "preventive" bombing, by a foreign country, of facilities thought to be used for the production, assembly or testing of nuclear weapons. According to experts interviewed at the International Committee of the Red Cross, this is unlikely to involve the direct bombing of nuclear power plants. More likely, what would be bombed are missile assembly lines, test sites and uranium enrichment facilities. In all these cases, effects would be localised, and any excess radiation emission would remain quite limited. Even in the unlikely case that a nuclear reactor would be directly targeted; the effects would not be different from a Fukushima accident-like event.

The second scenario is simply the "unthinkable" – a nuclear detonation. Rather than from an act of war, this would more likely result from the loss of control on a warhead on the part of a country with military nuclear capability, or from a terrorist act. The consequences of such event would be of such magnitude (and its likelihood so limited) that it is considered outside the scope of this study.

A modest role for emergency international humanitarian assistance

The above analysis seems therefore to indicate that, according to current terminology and to the way in which humanitarian operations are understood by the stakeholders, there is little ground to consider major nuclear accidents as humanitarian crises in the traditional sense.

However, as described in section 5 of this report, a few areas have emerged from this study for which enhanced capacities of humanitarian and nuclear accident response organisations could be beneficial. Furthermore, as discussed in the next section, international humanitarian partners may find themselves operating in an environment that presents significant radiological risks. This requires special attention on the part of the humanitarian community.

3. Humanitarian partners operating in an environment with radiological risks

Development and emergency partners in nuclear countries

International organizations with humanitarian capacity are present in practically all the countries of the world. In most of these countries, such organisations operate in pursuit of the developmental part of their respective mandates. They remain, however, always ready to switch into emergency gear should a disaster occur. This is particularly the case of organisations such as UNDP, UNICEF, WHO and FAO, whose primary role is one of partnership with the government

and technical advice on a broad spectrum of developmental subjects. These organisations, like others, can also play a major role as providers of humanitarian assistance in small- and large-scale emergencies.

As documented in the cited WFP After Action Report following the Great East Japan Earthquake, the presence of such organisations in countries in which nuclear accidents are a possibility poses a number of challenges in terms of safety and security of staff, business continuity and possible emergency response operations. The following paragraphs outline some of these challenges. Section 5 of this report will point to some recommendations on how to address them.

Safety and security

The *United Nations Field Security Handbook* has a section that discusses operations in nuclear, biological or chemical warfare environments.[7] However, the Fukushima experience indicates that concerns arising from non-war-related nuclear accidents should be addressed as well. It is incumbent on the UN Designated Official to make decisions regarding the movement of UN staff in an environment in which there is radiation exposure: he or she should have access to a range of information including the whereabouts of staff, information about radiation exposure thresholds and data on cumulative exposure of staff. The current system for approving official travel is not designated for such functions.

Furthermore, conflicting or unverified information from different sources about the potential radiological threat is a well-known, major problem for the affected population. It is even more of a problem for staff of international organisations, who may have to travel to and work in contaminated areas and should have easy access to authoritative information in this regard. This is a complex challenge of risk communication and awareness that should be addressed in partnership with the UN bodies with a technical mandate on radiological matters.

Business continuity and emergency response

UN Country Teams around the world are expected to develop and regularly maintain/update general preparedness and specific contingency plans. General preparedness planning aims to establish a standing capacity to respond to a range of different situations that may affect a country or region by putting in place a broad set of preparedness measures. Preparedness plans are by their very nature multi-hazard and, in countries where the risk of nuclear accident exists, they should be taken into account in the hazard mapping and risk analysis phase. Such preparedness plans should integrate with national disaster management plans – this is all the more relevant in case of nuclear accidents.

Contingency planning is undertaken specifically for an emerging or anticipated crisis. This may be a new situation or a potential deterioration in an existing situation to which the international humanitarian community should respond. On top of being more specific, contingency plans also address the question: How do we continue to ensure a basic level of functionality in case X happens? Examples of this were the plans elaborated in many countries on how the UN Country Team should react to ensure minimum business continuity in case of a flu pandemic. The same should obviously apply in countries where nuclear hazards exist.

External influx on aid workers

Whatever their scope, humanitarian operations in a country in which there has been a nuclear accident may require the deployment of staff from other countries. In Japan, for instance, WFP deployed a number of Japanese staff members

[7] United Nations (2006) "Annex T: Policy with Regard to Operations in a Nuclear, Biological or Chemical Warfare Environment".

working in other duty stations to assist with their Special Operation. In particular, should a nuclear accident happen in a country in which, for other reasons, requires a large-scale response from the humanitarian system (a so-called IASC level 3 emergency), rosters such the Inter-Agency Rapid Response Mechanism (IARRM) would be activated. This would result in a significant influx of expatriate aid workers; in a radiation hazard environment, this presents a number of significant challenges deriving, for instance, from the absence of specific Standard Operating Procedures, specific equipment and infrastructure (staging areas for deployment). Most importantly, however, at least part of the deployed staff should possess the appropriate technical skills to operate in such hazardous environments.

4. Coordination of international response to nuclear accidents

The role of IAEA in the coordination of international response

In case of nuclear emergencies, the ultimate responsibility to protect life, health, property, the environment and quality of life lies with States. Therefore, national regulatory bodies require site-specific emergency plans for nuclear installations and States typically have preparedness plans to cope with such events at a national level.

If, despite extensive precautions, a release of radioactive material can lead to an actual, potential or perceived emergency, the management of particularly sensitive information is of paramount importance. In particular, other States and international organisations will need information to be able to address protection issues and consider the need for environmental monitoring. In fact, as detailed in a later section, such is the importance of information management that it accounts for most of the response activities of international organisations. The Early Notification[8] and the Assistance[9] Conventions are the prime legal instruments to facilitate the international exchange of information and prompt provision of assistance in the case of a nuclear accident or radiological emergency. In addition, various international organizations may have roles under these Conventions or other international instruments, or other statutory and legally assigned functions related to international exchange of relevant information, assistance or other aspects of emergency management.

In accordance with both Conventions, the IAEA — as the focal organization for response — has prime responsibility to activate this inter-agency response system. It receives reports of an incident or emergency from a designated competent authority in a State and verifies any unconfirmed reports. It establishes primary functional links with the reporting State and any affected States, providing direct communication with their national radiation emergency response organizations. It also establishes functional links with relevant international organizations. These organizations may establish links with other competent agencies, regional centres and programmes that are prepared to provide information/advice or assistance. Emergency communication channels include voice, fax, the internet and dedicated networks.

The IAEA shares information with other relevant international organizations. If any other participating international organization receives a request for information/advice or assistance in case of a radiation incident or emergency it will inform the IAEA and other relevant international organizations and coordinate

[8] Convention on Early Notification of a Nuclear Accident
[9] Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency

the provision of advice or assistance with them in accordance with their respective mandates and obligations.

The Joint Plan for international organizations

The interagency framework for preparedness for and response to an actual, potential or perceived radiation incident or emergency irrespective of its cause is set forth in the "Joint Radiation Emergency Management Plan of the International Organizations"[10] (the Joint Plan). The IAEA is the main coordinating body for maintenance of the Joint Plan. Obviously, the Joint Plan is intended neither to interfere with nor to replace any emergency response arrangements of States or international organizations. However, all States are invited to consider these arrangements in their own emergency management plans, where appropriate.

IACRNE as the coordination mechanism for preparedness and response

The Inter-Agency Committee on Radiological and Nuclear Emergencies (IACRNE) is the coordination mechanism between participating international organizations to ensure that coordinated and consistent arrangements for preparedness and response to radiation incidents and emergencies are developed and maintained. Detailed inter-agency procedures, communication channels and response arrangements, including those for providing media information, are documented separately from the Plan, and formalized by a simple exchange of letters between the parties.

The Committee is a mechanism for coordinating international exercises organized by any IACRNE participating organization, in order to optimize the involvement of international organizations and States in these exercises and to provide an opportunity to periodically exercise response arrangements in a coordinated manner. The participating organizations make efforts to harmonize their programmes for assisting States in strengthening national and regional arrangements. They encourage their counterparts at the national level to strengthen their cooperation and ensure that arrangements are coordinated nationally so that they are compatible with the inter-agency arrangements described in this Plan.

The question of international response

As mentioned above, in its operational aspects the Joint Plan can be seen primarily as a series of quite detailed steps and procedures for the exchange of sensitive information amongst a large number of partners. Such steps and procedures are specified both for the preparedness and for the response phase, and broken down by sub-phase according to different stages of an emergency.

What may result confusing for humanitarian practitioners, used to preparedness plans, which specify operational steps to be taken in response to an emergency for actually assisting the affected population, even under the "response" section the Joint Plan mostly specify steps and procedures for the exchange of information. In this case, the information is *about* the assistance that may be requested to and provided by different actors.

5. Coordination of international humanitarian assistance

[10] European Commission (EC), the European Police Office (EUROPOL), the Food and Agriculture Organization of the United Nations (FAO), the International Atomic Energy Agency (IAEA), the International Civil Aviation Organization (ICAO), the International Criminal Police Organization (INTERPOL), the International Maritime Organization (IMO), the Nuclear Energy Agency of the Organisation for Economic Co-operation and Development (OECD/NEA), the Pan American Health Organization (PAHO), the United Nations Environment Programme (UNEP), the United Nations Office for the Co-ordination of Humanitarian Affairs (OCHA), the United Nations Office for Outer Space Affairs (OOSA), the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), the World Health Organization (WHO) and the World Meteorological Organization (WMO).

Policy coordination at headquarters

The humanitarian community is a large and heterogeneous body of international organizations working to provide humanitarian assistance to people in need as a result of natural disasters, conflict-related emergencies, global food crises and pandemics. Such diverse organisations are confronted with a range of common problems, and have therefore to produce common answers through a policy development mechanism.

This is done at the global level through the Inter-Agency Standing Committee (IASC). Established by UN General Assembly resolution 46/182 in 1991, the IASC is the only decision-making body that includes UN agencies, the World Bank, the International Organization for Migration and other humanitarian organizations, such as the International Committee of the Red Cross, the International Federation of the Red Cross and Red Crescent Societies and non-governmental organizations. In other words, the IASC includes many of the largest humanitarian organizations that account for the majority of humanitarian assistance distributed worldwide. Organizations take part in the IASC as members from the UN family, or standing invitees (mostly non-UN organizations).

Coordination in the IASC takes place at different levels. The IASC Principals are the heads of the organizations that form the IASC, while the IASC Working Group brings together the emergency directors or other directors of the IASC organizations.

IASC Subsidiary Bodies assist the IASC Principals or the IASC Working Group by working on specific policy questions and other tasks. Subsidiary Bodies bring together the technical expertise of the IASC organizations. The guidance, tools and handbooks originating from these groups are known as “IASC products”. The Subsidiary Bodies regularly consult with staff working in humanitarian situations to ensure their experiences are reflected in IASC guidance.

Amongst the Subsidiary Bodies, particularly important for this discussion is the IASC Sub-Working Group on Preparedness. It was established in 2001 with the aim of strengthening and promoting inter-agency preparedness, contingency planning and early warning processes across the IASC community of humanitarian actors. In its latest Terms of Reference (2009), the SWG sets out to promote collaboration in emergency preparedness among humanitarian actors, to support effective and timely humanitarian response.

Operational coordination in the field

The coordination of operational activities of an often very large number of actors in the fields happens through the Humanitarian Clusters system, under the leadership of a Humanitarian Coordinator.

The Humanitarian Coordinator is appointed by the UN Emergency Relief Coordinator when a new emergency occurs or an existing humanitarian situation worsens in degree and/or complexity. In most cases, the function is combined with the function of United Nations Resident Coordinator, who is often also the Resident Representative of the United Nations Development Programme.

The entire spectrum of humanitarian activities is divided in some 11 sectors, and for each one a specific coordination mechanism is established as a Cluster. A Cluster is a group of agencies, organizations and/or institutions

interconnected by their respective mandates that work together towards common objectives. The purpose of the clusters is to foster timeliness, effectiveness and predictability while improving accountability and leadership. Every cluster is led by one or more Cluster Lead Agency(ies).

Sector/Area of Activity	Global Cluster Lead
Camp Coordination and Camp Management	UNHCR (IOM in disaster situations)
Early Recovery	UNDP
Education	UNICEF/Save the Children
Emergency Shelter	UNHCR (IFRC in disaster situations)
Food Security	FAO/WFP
Health	WHO
Logistics	WFP
Nutrition	UNICEF
Protection	UNHCR/OHCHR/UNICEF
Telecommunications	WFP
Water/Sanitation	UNICEF

The role of UNDP in the recovery phase

Although, as explained in the first section, the direct provision of emergency goods and services commonly associated with humanitarian assistance may be of limited relevance in the aftermath of nuclear accidents, activities in the field of recovery can be very important. For example, UNDP has gained strong experience in Chernobyl recovery, particularly in addressing the human dimensions of this nuclear accident. Developmental solutions at the community level in such crises can be very important.

- People that live in the affected communities lack the information they need to lead healthy, productive lives and how live safely with low-dose radiation. Information itself is usually not in short supply. What is missing are creative ways of disseminating information in a form that induces people to change their behaviour. The information has to come in easy to understand language, give practical advice, and delivered through the channels that people trust (local authorities, local teachers, health workers, local media, etc.).

- A nuclear disaster has a profound psychological impact on the people. The affected population experiences deeply rooted fears of radiation, anxiety, helplessness and despair. Forward-looking mentality can be restored through a set of measures, e.g. offering a reassuring message, psycho-social rehabilitation, involving people in decision-making process at the local level, reviving the spirit of activism, and undertaking initiatives of self-help.

- Application of community-based approach is most promising. Community-based projects can have different focus, but because community members are active participants in their implementation,

the biggest impact is restoration of self-confidence and strong partnership between the communities, civil society and local authorities. It is particularly important to rebuild community structures that were lost in the process of evacuation/resettlement and strengthen social interactions.

- Following nuclear disaster, the affected territories may become stigmatized, treated as “dirty and contaminated”. This has a negative impact on the livelihoods of the people (e.g., marketing the products, attracting investors, keeping young people in the region, etc.). A new approach to economic development of the regions can include policy and institutional changes that focus attention on highly affected areas, promote targeted assistance and system of benefits.

The Red Cross Red Crescent Movement

At its General Assembly in November 2011, The International Federation of Red Cross and Red Crescent Societies (IFRC) adopted a resolution which, referring to decisions it had already taken in previous years, urged the national and international components of the Red Cross Red Crescent Movement to take up a greater role in preparedness for and response to nuclear accidents. In particular, the resolution:

- reaffirms the commitment of the members of the International Federation of Red Cross and Red Crescent Societies (IFRC) to continue to develop and improve their response plans to assist affected populations in coping with the humanitarian consequences during and after a nuclear accident, as well as their procedures to protect staff and volunteers.

- commits to increase knowledge of the potential humanitarian consequences of nuclear accidents, to further clarify the roles and responsibilities of National Societies, the IFRC Secretariat and ICRC as part of contingency planning, to work with local communities in the proximity of nuclear facilities to ensure their awareness of and preparedness for possible accidents and to coordinate with other (non-Movement) stakeholders to ensure access to victims in the event of nuclear accidents.

- considers that more international cooperation is needed in responding to nuclear emergencies and therefore expresses our willingness to work with the ICRC, other humanitarian organisations, the International Atomic Energy Agency (IAEA), the other UN system to prepare for and respond to nuclear emergencies.

It is important to recall that, although the IFRC itself is certainly a part of the international humanitarian system, the member National Red Cross/Red Crescent Societies are not. In turn, owing to the special status of auxiliary to their respective governments, the National Societies may have a key role as part of the national disaster management system. In particular, as demonstrated by the American, Japanese, German, Ukrainian, Belorussian, Russian and Austrian RC, there is also a considerable opportunity for the National Societies to play a useful and important role, in agreement and under contract with the national authorities, in evacuation management, psychological support, distribution of protective gear, restoring family links and above all – long term health monitoring.

The IFRC, in turn, can play a key role in linking this vast network of resources available at national level with the international response coordination mechanisms.

6. Interaction between humanitarian and nuclear emergency response mechanisms and organisations

Recommendation by the UN Secretary-General

The UN system-wide study on the response to the Fukushima nuclear accident stated: "Effective local, national, regional and global preparedness and response cooperation capabilities and arrangements are essential in order to minimize the impacts of nuclear and radiological incidents and emergencies. Such arrangements are also fundamental to the mitigation and response to disasters caused by natural hazards. As the Fukushima incident illustrated, disasters can have sequential and collateral impacts that we have yet to imagine and plan for, not only for nuclear facilities but also for industrial complexes, weapons storage depots and major infrastructure such as hydroelectric dams, bridges and highways. Those considerations must motivate new efforts for integrated and innovative planning for preparedness and response."

In this last section, this report therefore explores potential areas of enhanced capacity for humanitarian actors and possible collaboration with nuclear emergency response organisations.

RECOMMENDATION ONE

Given the importance of the human dimension in nuclear emergencies, and the key role that some of the humanitarian organisations can play in this respect, it is recommended that the IASC Working Group considers this issue, possibly including through the development of essential technical guidance.

IAEA and the IASC

During the interviews carried out in the framework of this study, it has been suggested that the IAEA could become a member of the IASC in order to foster greater links between the humanitarian and nuclear emergency response communities. However, although the idea is worthy of consideration, it must be remembered that the IASC is comprised of operational humanitarian organisations. The IASC has always had to strike a delicate balance between representation (allowing the many voices of the humanitarian community to be heard) and effectiveness in decision making. For instance, the thousands of Non-Governmental Organisations providing humanitarian relief are represented in the IASC though three umbrella organisations.

In light of this, it is difficult to see how an organisation like IAEA, with hardly any direct operational involvement in humanitarian operations, could be considered for membership. However, the possibility exists – and it has been used several times in the past – to invite key organisations on an *ad-hoc* basis to discuss matters of mutual interest.

RECOMMENDATION TWO

It is recommended that the IASC Working Group invites the IAEA to take part in a special session at which the human dimension of nuclear emergencies and other aspects of the humanitarian-nuclear emergencies interface are discussed.

Addressing safety and security concerns

Humanitarian managers, from the IASC Principals to the Designated Official at the country level, should be enabled to make informed, responsible decisions on whether a humanitarian operation can be undertaken and, if so, under which conditions. The cited WFP report, for instance, suggests that a critical support cell, with participants from IAEA, UNDSS, UN Medical Services Division (UNMSD) and WHO should advise the Designated Official in making informed decisions. At the global level, the participation of OCHA in the IACRNE mechanism could provide a link to the IASC Principals and other global-level humanitarian coordination mechanisms.

Staff operating in the field should have access to accurate and up-to-date information on health and security issues. This information should come from authoritative sources within the United Nations, so to avoid the practice of seeking reassurance from alternative sources.

RECOMMENDATION THREE

It is recommended that OCHA, on behalf of the humanitarian community; UNDP, as manager of the Resident Coordinator System and the development agency of the UN system; IAEA; UNDSS; UNMSD; and WHO discuss arrangements and procedures for the possible creation of a critical support cell to be activated in countries with radiological emergencies. Modalities should be defined for the early transfer of the information OCHA gets through its participation in the emergency meetings of IACRNE (particularly concerning the IAEA/UNSCEAR estimates/modelling forecasts) to the IASC Principals to support decision making.

RECOMMENDATION FOUR

It is recommended that risk and crisis communication drafts are produced in advance by UNDSS, ready to be customised at local level. These should include explanations of terms, safety levels, UN response mechanisms and guidance on what to do in case of a radiological emergency. A system for the regular dissemination of reliable, authoritative information among the country staff should also be developed.

Preparedness and contingency planning

Contingency planning is a management tool used to analyse the impact of potential crises and ensure that adequate and appropriate arrangements are made in advance to respond in a timely, effective and appropriate way to the needs of the affected population. Contingency planning is a tool to anticipate and solve problems that typically arise during humanitarian response. Experience confirms that effective humanitarian response at the onset of a crisis is heavily influenced by the level of preparedness and planning of responding agencies/organizations, as well as the capacities and resources available to them.

RECOMMENDATION FIVE

It is recommended that, in countries with civilian nuclear capability, the UN Country Teams' (or, where relevant, the Humanitarian Country Teams') response preparedness and contingency plans specifically include nuclear hazards. In these countries, IAEA should provide technical assistance.

Deployment preparedness

The following two recommendations are directly inspired by the experience of the World Food Programme as detailed in the report cited at note 4. They are included in this report as they touch upon a number of important areas, critical for the entire humanitarian community in case of the deployment of

staff to a nuclear emergency.

RECOMMENDATION SIX

It is recommended that Standard Operating Procedures for use in environments affected by radiological release are developed in conjunction with security and medical services. These SOPs should provide guidance on how to set up and enter an operation and how to safely extract staff in emergency and non-emergency situations. They should also specify which levels of radiation exposure necessitate decontamination measures.

RECOMMENDATION SEVEN

It is recommended that the security training of agencies with rapid deployment rosters include radiological preparedness covering both threat assessment and response procedures. Further advanced training should also be provided to a subset of those on rapid deployment rosters. These staff could then become the organisation's first responders in this kind of events. IAEA should provide technical assistance for such capacity development initiatives.

RECOMMENDATION EIGHT

In light of the significant role National Red Cross and Red Crescent Societies can play in response to nuclear emergencies, it is recommended that their international umbrella organisation, the IFRC, joins the Joint Plan and IACRNE.

Addressing the human dimension

A number of areas are critical in the early recovery phase following a nuclear accident. These include the management of information for the benefit of the affected population, dealing with the psychological consequences of the event, supporting community-level interventions and working against the stigma that often affects people living in the area where the accident has occurred.

RECOMMENDATION NINE

In light of the importance of the human dimension in nuclear emergencies, and UNDP significant experience and knowledge in dealing with human consequences of nuclear disasters, it is recommended that UNDP joins the Joint Plan and IACRNE.

ANNEX I – Online Survey

1. Which organisation are you working for?

Merlin
International Rescue Committee
WFP (3 responses)
CWS-Asia/Pacific
World Vision Japan
MERCY Malaysia
Lutheran World Federation
OXFAM GB
UNICEF
FAO
OHCHR
Catholic Relief Services
World Bank

2. Today, 31 countries operate a total of 430 commercial reactors: Argentina, Armenia, Belgium, Brazil, Bulgaria, Canada, China, Czech Republic, Finland, France, Germany, Hungary, India, Japan, Mexico, Netherlands, South Korea, Romania, Russia, Pakistan, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, UK, Ukraine, and USA. How likely do you think it is, in general, that a country with civilian nuclear technology may call for international assistance to deal with the displacement crisis?

Very likely - 3
Not very likely - 11
Unlikely - 2
Very unlikely - 0

3. If national capacities were overwhelmed, for which of the following "traditional" humanitarian sectors do you think international actors may be called upon to intervene?

Primary Health Care (prevention, monitoring and control of communicable diseases) - 9
Secondary Health Care (curative services at dispensary/health post level) - 6
Tertiary Health Care (curative services at referral hospital level) - 5
Water (collection, treatment, stocking and distribution of large quantities of ground/surface water) - 13
Environmental sanitation (latrines, waste management) - 11
Food aid (mass distribution of dry rations) - 9
Food security (support to the local agricultural production) - 7
Emergency shelter - 13
Camp management - 6
Education - 4
Psycho-social support - 5

4. What other activities may international humanitarian actors carry out in direct support to the affected population, particularly in the early recovery sector?

Emergency Information Technology, Logistic supply chain maintenance

Livelihood support, management of IDPs in semi-permanent way (as people cannot return soon), advising and alerting the local government on foreseeable consequences and possible way forward (great amount of resources will be needed to deal with nuclear emergency, which could be billions USD).

In the developed country like Japan which has relatively high capacity to respond, demand for assistance of goods are comparatively limited. Services such as psychosocial support would also be difficult due to language and cultural issues. The largest needs are probably around information on radiation, contamination and safety issues. The international actors could provide neutral and objective information on such issues with scientific evidence.

Special unit to deal with nuclear contamination victims.

Cash to help restart livelihoods, supporting families hosting the displaced.

Cleaning up contaminants recovering water systems and livelihoods recovery.

Information on post-exposure health issues.

Measure suitability of food for consumption, and measure water and soil contamination.

Logistics support, livelihoods.

Advocating for access to information. It is very important that communities have trustworthy and reliable information regarding the nuclear accident, radiation levels, which areas are considered safe, what should be done to reduce levels of exposure etc.

Transitional shelter.

5. Besides the large-scale displacement, can you think of any other consequence of the accident that may require international humanitarian assistance?

Loss of livelihoods, destruction/loss of usual social services/infrastructure

Internal transportation mechanisms

Radiation spread (need to be monitored within the country as well as from cross boundary perspective), rapid rise in food price (depending on production capacity of the country), increased health risks (risk of cancer especially for children will rise within several years, so early containment is crucial), huge impact on agriculture and fishery sector.

The spread of nuclear contamination across national boundaries.

No.

If accident affects a food producing area - could affect the overall food availability in country.

Monitoring winds, meteorology, cloud movement, etc.

Soil, water and food nuclear contamination.

Surge in requirement for health assistance.

Assistance in the health sector.

The prevention, as far as is possible, of long term health affects from exposure to radiation should be considered and this means ensuring that reliable, impartial information and advice is given to the affected community regarding where it is safe to be, which foods to eat etc. Humanitarian organisations need to play a role in ensuring that such information and options are given to communities.

Collection and burial of corpses,

6. Is there anything that would make, from a humanitarian perspective, a nuclear accident-induced displacement crisis different from those created, for instance, by conflict or natural disasters?

Different only due to the specific context - but safe access to the effected populations (i.e. quarantine zones).

Depending on the cause of the incident the management may be different, i.e. terrorist vs technological causes, and be greatly influenced by the national management system response capability and capacity.

Yes, nuclear accident will pollute the land in which the people won't be able to return for quite some time (depending on radiation levels and types of radiation spread). It has significant impact in recovery of people's livelihoods, sense of communal harmony, and health risks that will need to be monitored for very long time (longer than contemporary humanitarian timelines). Nuclear accident creates a situation where risks cannot be physically seen, so at early stage, many actions by affected population (movements, decontamination, family separation) are based on perceptions, which also can be a cause of conflict.

It is very much different in terms of the place of temporary shelters that the government could prepare. In case of natural disasters, temporary shelters would be built in the places somehow near those where they used to live, but in a nuclear accident-induced case, people need to be located far from their hometown. This places enormous pressure on the displaced people, by making them feel unrest because they are not sure when or whether they can go back, they cannot see how their hometown are changing (being recovered), and in most cases they could lose a sense of "community" since their neighbours are not necessarily displaced in the same area for displacement.

Special treatment needed both physically and mentally of nuclear victims.

Huge issues on staff safety, do you deploy your roster of emergency teams in contaminated areas?

Length of time - may never be able to return.

Post-exposure issues: "ticking time-bomb inside" syndrome

Contaminated food and water

Yes, the likely health implications on humanitarian staff, restrictions on access, complications with health medical insurance, provision of long-term health assistance to humanitarian staff is required

Most countries with nuclear reactors are developed countries unlikely to call for humanitarian international assistance

Yes, since the harm from radiation is not visible, unlike the harm from a natural disaster or from conflict, communities need information and advice that is reliable. Governments often have other interests in covering up the extent or nature of the accident and so the information given may not be reliable and is very hard for affected people to assess.

Needful perhaps treatment of radiation effects, monitoring.

Clearly access will be an issue, on the one hand in terms of safety of humanitarian staff, but also politically (nuclear programs being considered issues of national security).

7. A nuclear accident in one country may induce, because of trans-boundary contamination, mass population displacements in neighbouring countries. If international humanitarian assistance was requested by these countries, would this be any different from other humanitarian crises?

Please refer to Extreme Emergencies - developed by consortium of NGOs in 2003.

No.

How the IHR are interpreted by bordering countries, the potential for border closures, airborne contamination leading to a public health threat of Regional/Global importance.

Yes, as noted earlier, these people won't be able to return back for very long time. So, we will be faced with similar situation of those living in Pacific islands that are submerging (environmental refugees), which we all know how difficult it is to accommodate such people in third countries (political will and negotiations are necessary before any actions).

Regulations and guidelines around radiation are difference amongst countries. For example, in Fukushima's case, the Japanese government declared 20km as restricted boundary, while US army announced 80Km from Fukushima power plant should be refrained to be visited. If contamination occurs across countries, it needs to be discussed on which regulations or guidelines international assistance should be based.

Yes, the identification of gaps and needs may be varies from one place to another.

Yes, often the countries mentioned above do have stronger government institutions which would mean strong coordination with government agencies and NGOs to maximise expertise and resources to where they are best needed.

Humanitarian issues the same but many nuclear plants in middle/high income countries - level of service required different from the basics most agencies can deal with/afford. Compensation - there would be an expectation that the country where accident occurred would have to pay for response, recovery etc.

Same as above: post-exposure issues.

Special equipment would be required.

Only the nuclear health implications.

In my view, the call for assistance will rather come from surrounding countries than from the country with civilian nuclear technology, as most of them are quite developed and have the necessary capacity themselves. Since a major nuclear incident, however, is likely to affect neighbouring countries, preparedness must be extended to those countries, especially when

these surrounding countries have limited capacity, e.g. applicable in South Africa, Mexico, South Korea, Pakistan etc.

Politically complicated, insurance issues would arise.

8. If the humanitarian community were to set up a dedicated capacity (such as, for example, an inter-agency arrangement) to deal with nuclear accidents, what would its basic functions be?

Please refer to Extreme Emergencies - developed by consortium of NGOs in 2003.

Assessment, confirmed stockpiles coordinated between organizations, standby staffing available for a coordinated response, stand-by funding for such a response.

One example would be to provide a coordination response capacity to deal with the consequences of a nuclear accident, there would be the need to have 1) dedicated team(s) Ready, Trained and Equipped, 2) systematic Standard Operating Procedures prepared, 3) educational advocacy aspects to management of such events taking a whole of society approach i.e. including National Disaster experts, international organisations, NGOs, the Red Cross/Red Crescent movement, together with civilian and military counterparts as well as private sector organisations responsible for critical services along with communities and civil society.

(1) Advising technical agencies who are responding on likely scenario of duration of emergency, population movement, livelihood creation, IDP accommodation, etc. (2) Monitoring of radiation spread as well as exposure (for those working in the field, how do we ensure that their level of radiation exposure is under acceptable level). (3) Reach out to leaders of the country showing possible consequences and way forward actions based on past experiences (Chernobyl, Fukushima) with regards to IDP management, health monitoring system including compensation scheme, livelihood creation, decontamination measures, etc.

It should be the body which can make clear recommendation with scientific evidence.

Universe protocol and guide lines for the humanitarian community.

Keeping a good contact data base of partners and their capacities as well as mapping out where population movement could take place in order to build contingency plans with Govt and NGOs in the regions. Carry our training on the effects of a nuclear fallout and simulation exercises. Learn lessons from Japan etc...Work on protocols with UNHCR the cluster lead on displacement.

Scenario planning, preparedness, guidance - inter-government/international protocols on who pays.

Information-provision, advocacy with authorities, training.

Contingency planning, and preparedness plans.

Logistic support, shelter, WASH and food as primary concerns.

It must have a protection element, for the reasons given above.

Prepare, simulate, pre-position related equipment.

Since capacity exists for disaster/crisis response also to address large displacements, I would think specialists in nuclear medicine are needed to advise on safety of staff issues and how to deal with affected people