RAPPORT

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DE RADIOPROTECTION
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Shinrai research Project: The 3/11 accident and its social consequences

Case studies from Fukushima prefecture

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Résumé

Ce rapport constitue le rapport de synthèse du projet *Shinrai*, relatif aux conséquences sociales de l'accident de Fukushima. A partir de trois études de cas menées dans la préfecture de Fukushima, et d'un important travail d'enquête mené auprès de différents acteurs et d'habitants, il analyse la perte de confiance des citoyens envers les autorités Japonaises et les problématiques de retour et de non-retour dans les villages évacués, en offrant une catégorisation des habitants en fonction de leur décision.

Il aborde également les dilemmes auxquels les responsables gouvernementaux, médecins, et experts en radioprotection ont été confrontés, et s'intéresse notamment au rôle des Maires. Le rapport conclut sur quelques pistes de réflexion sur le socle normatif des politiques post-accidentelles défini par les institutions en charge de leur gestion, et sa confrontation à l'expérience de l'accident nucléaire au Japon, ainsi qu'à la critique onusienne.

Abstract

This report summarizes the research result of the *Shinrai* project, which deals with social consequences of the Fukushima accident. Based on three case studies led in the Fukushima Prefecture, it analyses the loss of trust of citizens towards governmental authorities, and essential questions linked to return or non-return to the evacuated territories, offering a categorization of inhabitants according to their decisions.

It also deals with the dilemma to which governmental officials, medical doctors and radioprotection experts have been confronted, and focus on the role of Mayors. The report concludes by making some reflections on the normative foundations of post accidental policies, as currently defined by the institutions in charge of managing nuclear accidents, and on their confrontation to the Fukushima experience and to the international criticism made by some of the UN institutions.

Thanks （謝辞）

Warm thanks to the residents and former residents of Fukushima, government and prefectural officials, mayors and municipal officials and employees, medical doctors, experts, … who accepted to be interviewed for the field work presented.

And to Rina Kojima, PhD student, for her invaluable help for interviews.

本報告書は、東電原発事故に関して100名以上の方々に面談インタビューを行い、その結果を分析しまとめたものである。面談を快諾していただき、仕事場や時には自宅、また喫茶店などで貴重な時間を私たちとのインタビューに費やしてくださった皆さんに心より感謝の気持ちを述べたい。特に事故の大きな被害に合われ言葉にすることも苦難な状況の中、丁寧に当時の様子また現在の心境を語ってくださった福島にお住まいの方々また避難された方々に、大きな感謝と敬愛の念を表明したい。

Many thanks to Philippa Caine La Ganza and Agnès Dumas who helped skillfully for the English-proof and editing of this report. And to Hélène Faye for her kind last minute help.

Contents

1. INTRODUCTION

1.1 SCOPE

The *Shinrai* project was launched in the aftermath of the triple disaster faced by Japan in March 2011: earthquake, tsunami, and a Nuclear Power Plant (NPP) accident in Fukushima Daiichi. The authorities had to face a dramatic situation, most notably the radiological consequences of the nuclear accident for the population. This research proposes to focus on the nuclear post-accidental situation in Japan, and to examine the various social and political consequences of the nuclear accident.

The theoretical framework of this research is inscribed in the field of *disaster studies*, which are intrinsically multidisciplinary. The examination of public policies led after an accident, their inscription in international regulations and institutions, their consequences for residents, the reactions of and the decisions made by inhabitants as regards evacuation and return policies, the consideration of contaminated territories and their future, the management of waste produced, and so on, all mobilize political sciences as well as sociology and anthropology. Within such a framework, which evokes countless questions, the choice was made to focus specifically on issues of *trust*. In fact, in the aftermath of the accident, this issue appeared quite rapidly within public space, where the media soon denounced the "loss of trust" on the part of Japanese citizens towards the government in charge of dealing with the crisis. Under this main theme, this project will address various questions linked to expertise provided in crisis situations: What makes a public expert *trustworthy*? What is his/her role in situations of uncertainty and controversy? What is the *accountability* of experts in these situations? What specific role did "counter-expertise" play in post-Fukushima? And how do citizens make vital decisions after a nuclear accident (e.g. to stay or to leave their place of residence, heeding or ignoring governmental advice; to allow their children play outside or not; etc.) when confronted with divergent sources of expertise and scientific controversies (such as the risk related to ionizing radiations for children, low-dose effects, etc.)?

The issues of remediation and of compensation, and the disputes these inevitably trigger, also call for an examination of the juridical aspects. Moreover, in the case of a nuclear accident, long-lasting divides concerning evaluation of the health effects of ionizing radiations are instrumental in the difficulty of building widely accepted solutions. This is why the present analysis proposes a focus on Science, Technology and Society (STS) studies, examining the major issues related to knowledge production as concerns radiological risks, and its translation into recommendations, policies, and government decisions.

The research is based on an intensive field work led by a Franco-Japanese team, and comprises more than 120 interviews with government representatives at national and local levels, with scientists, residents of Fukushima prefecture, Non-Profit Organisation (NPOs), and others. Details on the field research are provided in the annexes.

The deliverables of the *Shinrai* project comprise:

- Report 1: « Revue de littérature sur les concepts de confiance et d'expertise », (October 2017, in French). The main theoretical elements of this report are briefly summarized in Chapter 5 when discussing the issue of trust.
- Report 2: Controversies and decision-making after the Fukushima Accident (to be published in 2020)
- Report 3: "Case studies analysis and synthesis" (the present report).

1.2 OUTLINE OF THE REPORT

This report is divided into 7 chapters, including the present introduction (Chapter 1).

- **Chapter 2** gives an overview of the government policies established in the aftermath of the nuclear accident in Fukushima Daiichi in order to deal with the consequences of the accident.

- **Chapter 3** presents their actual implementation in three towns: Kawauchi and Naraha, two evacuated villages, and Watari, a district of Fukushima city which was outside the evacuation zones. Most of the interviews with inhabitants were conducted with residents of these places.

  The chapter examines how government policy was actually implemented at this local level, the difficulties encountered, focussing more specifically on the role played by the mayors (Kawauchi and Naraha) and how they struggled to implement policy while taking into account the residents' (divergent) interests and desires.

- **Chapter 4** examines in detail the consequences of these policies for inhabitants and their decision whether or not to return to their evacuated village, after the evacuation orders were lifted. Six types of "decisions" have been identified; this categorisation allows for an account of the variety of inhabitant reactions and judgements regarding their situation after the nuclear accident.

- **Chapter 5** provides a more general analysis of the social consequences of the nuclear accident. Beyond the question of "whether to return or not", this chapter examines the main issues with which inhabitants were confronted. These issues are presented on a temporal basis: from evacuation in the immediate aftermath of the accident, to the situation six years later, when field work ended for the present research project. They combine data from this field work (interviews and observations) together with a number of analyses from scholars in the field, focusing on research projects with a strong empirical basis.

  This chapter also elaborates on the notion of trust. Based on the results of *Shinrai* report 1, it examines who (or which institutions) people trust or do not trust, after the accident, while they were being confronted with overwhelming amounts of divergent information concerning radiological risks, and decisions to be made.

- **Chapter 6** also provides a "synthesis analysis", this time more focused on political and juridical aspects. It examines - at a general level - the consequences of post-accidental Japanese policy and its debatable points. It also addresses the juridical aspects and the rising number of lawsuits where affected populations collectively brought civil actions against TEPCO[1] and the government.

[1] Tokyo Electric Power Company Holdings, Inc. owner/operator of Fukushima Daiichi nuclear power plant

- **Chapter 7** presents the conclusion of this report, drawing on lessons learned from the nuclear accident, and offers some perspectives on research questions that are still open.

- **Annexes** provide details concerning methodology and a list of interviews conducted.

It should be noted that there are inevitable repetitions throughout this report: issues presented in Chapter 3 are recalled and developed in other chapters along different lines. This is linked to the authors' choice to combine micro-level sociological analysis (nearly clinical) addressing the feelings and emotions of inhabitants, and a macro-level analysis linked to policy development and implementation. For example, the evaluation of radiation risks is addressed as a personal appreciation by individuals, but also as a (social) issue of trust: Who do you trust in order to make decisions when science is divided on the subject? And it is also addressed as a political issue, insofar as the Japanese government had to decide on a threshold for the evacuations, based on international regulations and standards.

This allows chapters to be read as stand-alone documents, for readers interested in specific topics.

2 THE POST ACCIDENTAL POLICIES LED IN JAPAN AFTER 3/11

2.1 INTRODUCTION

Following the Fukushima Daiichi Nuclear Power Plant (F1NPP) accident, the Japanese government issued a number of post-accidental policy statements related to the protection of affected population. This chapter describes some of the key responses which profoundly shaped the lives of more than 160,000 people affected by the disaster, of which the consequences will be analyzed through the following case studies. The chapter is divided into four sections: evacuation, return, decontamination, and compensation. The first section outlines the government's criteria and administrative structure for issuing evacuation orders (EOs), the changes to evacuation zones (EZs), and the number and types of residents affected by the EOs. The second section describes in detail the criteria and the procedures established by the government for the lifting of EOs, and the issues at stake for the lifting process, as well as the actual timing of the lifting in respective municipalities. The policies related to return - namely on decontamination - will also be referred to, with a view to providing a comprehensive picture of return policy. Finally, section four introduces the compensation scheme established by the Japanese government for residents affected by the accident.

2.2 EVACUATION POLICIES

2.2.1 EVACUATION POLICY PRIOR TO THE ACCIDENT

Before the F1NPP accident, nuclear emergency planning was defined in the Prevention Measures related to Nuclear Facility Emergencies (1980)[2] published by the Nuclear Safety Commission, one of the two major nuclear regulatory bodies at the time which were merged to create a Nuclear Regulation Authority (NRA) post-Fukushima. In the guidelines, the zone within the 8–10 km radius of the nuclear power stations was considered to be an Emergency Planning Zone (EPZ), targeted for nuclear disaster drills and preparations. The guidelines specified that an EPZ was defined "*based on a hypothetical scenario which is almost technically impossible*" and thus nuclear disaster preparation would be suffice to be implemented in limited areas within the EPZ and no further, by insisting that "(nuclear installations) are safe in normal circumstances and do not trouble any daily activities of residents" (p.15). According to Imai (2012), "*this, indeed, constitutes the basis of the notion in public policy that nuclear power stations were accident-free*"[3] (p. 24). The NSC's report on nuclear disaster drills implemented in 2008 in 11 prefectures, for example, shows indeed that the actual evacuation exercise was conducted only within a radius of 1–3 km from the stations (Hasegawa, 2013).[4]

In Japanese legislation, according to the Act on Special Measures Concerning Nuclear Emergency Preparedness (Act No. 156 of December 17, 1999) (referred to hereafter as

[2] NSC (1980), genshiryokushisetutou no bousaitaisaku ni tsuite (Prevention Measures related to Nuclear Facility Emergencies), June 1980.

[3] Imai, A. (2012). The Third Survey of Nuclear Evacuees (Original title: Genpatsu saigai hinansya no jittai chousa (san-ji)) (Vol. 402): The Japan Research Institute for Local Government Monthly. Translation by Reiko Hasegawa from Japanese.

[4] Hasegawa, R. (2013). Disaster Evacuation from Japan's 2011 Tsunami Disaster and the Fukushima Nuclear Accident. In S. No.5/2013 (Ed.): IDDRI.Source: NSC (http://www.nsc.go.jp/senmon/shidai/sisetubo/sisetubo019/ssiryo5.pdf). (in Japanese only)

the Act on Nuclear Emergency), Mayors of municipalities have the executive power to declare Evacuation Orders (EOs) in case of emergencies (Article 27.2) (Imai, 2014).

2.2.2 EVACUATION POLICY FOLLOWING THE ACCIDENT

On the day of the accident, the first evacuation order concerning the 2 km radius from the F1NPP was issued by the Fukushima prefectural government. Even though the prefectural governor does not usually have the authority to issue evacuation orders, according to the Act on Nuclear Emergency, the order was largely considered to be valid and official under such exceptional circumstances and in the absence of State instructions. Following the prefectural order, the Nuclear Emergency Response Headquarter (Nuclear Emergency HQ)[5] headed by Japanese Prime Minister, Naoto Kan, began issuing evacuation orders. As Imai (2014) comments, these evacuation orders were in fact the instruction for affected municipalities to issue evacuation orders for the residents, since such legal authority lay with the Mayors of municipalities.

Initially decided according to physical, radial distance from the F1NPP, Evacuation Zones (EZs) rapidly expanded beyond the envisaged EPZ: on the day after the accident, the Nuclear Emergency HQ instructed a compulsory evacuation of the area within a 20 km radius, which was then extended to the 20-30 km radius, four days later. These initial orders were thus issued without consideration of the actual radiological situation on the ground. For these distance-based evacuation orders, a total of ten towns were included: Futaba, Okuma, Namie, Tomioka, Minamisoma, Naraha, Kawauchi, Tamura, Katsurao, Hirono.

According to the NAIIC report (2013)[6], these EOs, issued by the Nuclear Emergency HQ, were not communicated directly to the concerned municipalities due to telephone line failures, with the exception of some towns (Futaba, Okuma and Tamura). As a result, the majority of the municipalities took the decision for themselves to evacuate their inhabitants. Moreover, these decisions were made even before the issuance of government EOs (Imai, 2014).

More than one month after the accident (22 April 2011), the government started to issue additional EOs based on levels of ambient radiation dose detected on the ground, using the reference dose of 20 millisievert per year (20mSv/year). Two more towns were then added to the EZs: Iitate and Kawamata.

Based on the same reference dose, the Nuclear Emergency HQ also began to designate so-called Hotspots, officially named “Specific Spots Recommended for Evacuation”, from June 2011, after having discovered areas with doses over 20mSv/year outside the designated EZs according to regular radiation monitoring data published by the MEXT (Ministry of Education, Culture, Sports, Science and Technology) on 3 June 2011[7].

[5] The Nuclear Emergency Response Headquarter was established on the first day of the accident, 11 March 2011, as the command centre for responding to the Fukushima accident, based on the Act on Special Measures Concerning Nuclear Emergency Preparedness (Act No.156 of December 17, 1999).

[6] The National Diet of Japan Fukushima Nuclear Accident Independent Investigation Commission (NAIIC) report is one of the official reports on the Fukushima accident commissioned by the National Diet of Japan (Japanese parliament).

[7] Source: the Prime Minister’s official response to the question asked by a member of the House of Representatives, Tarou Kimura, who inquired on the criteria and procedure involved in the designation of Hotspots on 22 August 2011: http://www.shugiin.go.jp/internet/itdb_shitsumon.nsf/html/shitsumon/a177412.htm

The Nuclear Emergency HQ established the procedure for designating Hotspots as follows[8] :

1) The MEXT radiation monitoring team must first conduct a detailed radiation survey in areas with a dose over 20mSv/year, according to MEXT's regular monitoring;

2) After confirmation of the dose on the ground, by the team, the government must discuss the matter first with the prefecture and concerned municipalities, before making a final decision on the recognition of Hotspots.

From internal documents declassified in December 2014 on the request of residents of Date city, in Fukushima prefecture[9], it is also evident that the initiative of the Mayors of concerned municipalities played an important role in the designation of Hotspots. For example, in Date city, the MEXT detailed radiation survey detected only 32 spots which exceeded 20 mSv/year in June 2011, but the municipality strongly requested the designation of 246 Hotspots, in view of the presence of pregnant mothers and children. As a result, a total of 117 spots were finally designated by the government. By contrast, in Fukushima city, the MEXT team detected two spots in the Watari district in August 2011 which were not designated as Hotspots by the government after discussion with Fukushima city[10]. The Hotspots were, in reality, individual houses at which ambient radiation dose over 20mSv/year is detected as an average dose between one measurement at the house's front door porch, and another in the middle of the garden[11]. Once acknowledged as a Hotspot by the government, the family living in the house was eligible for financial compensation from TEPCO if they chose to evacuate. Unlike EOs, the designation of Hotspots was a recommendation for evacuation which does not ultimately oblige the family to evacuate, thus leaving such choice to respective households. The Hotspots were officially recognized by three municipalities: Date, Minamisoma, and Kawauchi. In total, 260 Hotspots were designated by the government: 117 in Date, 142 in Minamisoma and one in Kawauchi.

During the three months following the disaster, four different types of evacuation zone were created, as shown in the map below (Map 1). In all, a total of 13 municipalities were placed under various evacuation orders and recommendations.

[8]http://www.mext.go.jp/b_menu/shingi/chousa/kaihatu/016/shiryo/__icsFiles/afieldfile/2011/06/20/1307473_3_1.pdf

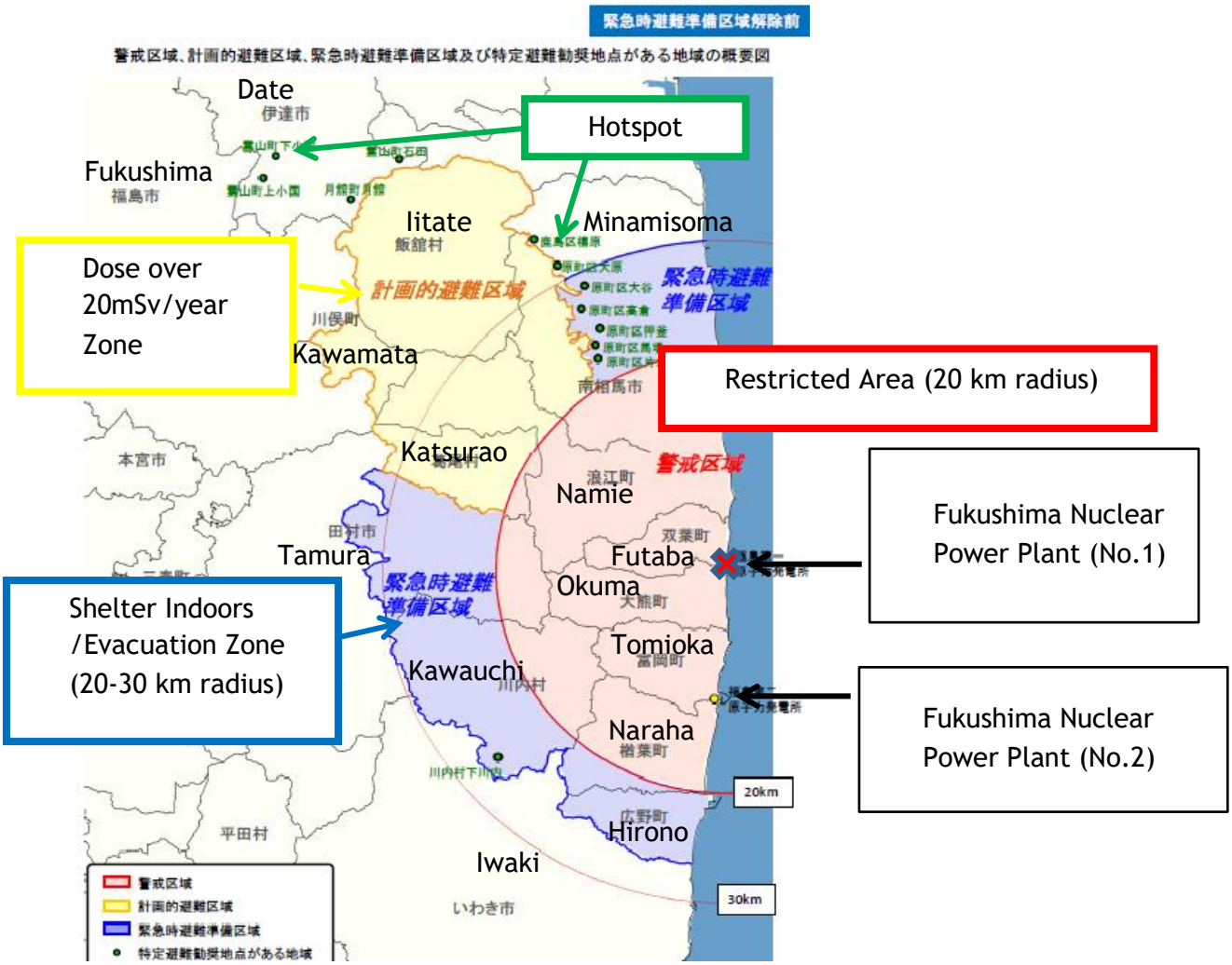
[9] Available on the website of a NPO Clearing House for Information Disclosure (only in Japanese): http://clearinghouse.main.jp/web/cao0005.pdf

[10] Mainichi Shimbun, "Hinankanshochiten" shiteikijun ni baratsuki, jumin "nattoku dekinai" (The criteria for designating the Hotspots is incoherent, residents complains) on 4 November 2011.

[11] Information obtained from interview with residents in Watari district, Fukushima city, in October 2014.

2011	*Criteria*	*Order*	*Name of the Zone*
11 March	2 km radius	Compulsory Evacuation (issued by the Fukushima prefecture)	Restricted Zone
	3 km radius	Compulsory Evacuation	Restricted Zone
12 March	10 km radius	Compulsory Evacuation	Restricted Zone
	20 km radius	Compulsory Evacuation	Restricted Zone
15 March	Between 20–30 km	Shelter indoors	Evacuation Prepared Area
22 April	Between 20–30 km	Shelter indoors or evacuation	Evacuation Prepared Area
	Areas with air radiation dose over 20 mSv/year	Evacuation within 1 month	Deliberate Evacuation Area (**over 20mSv/year**)
16 June	Spots with air radiation dose over 20 mSv/year	Recommended for Evacuation	Hotspot

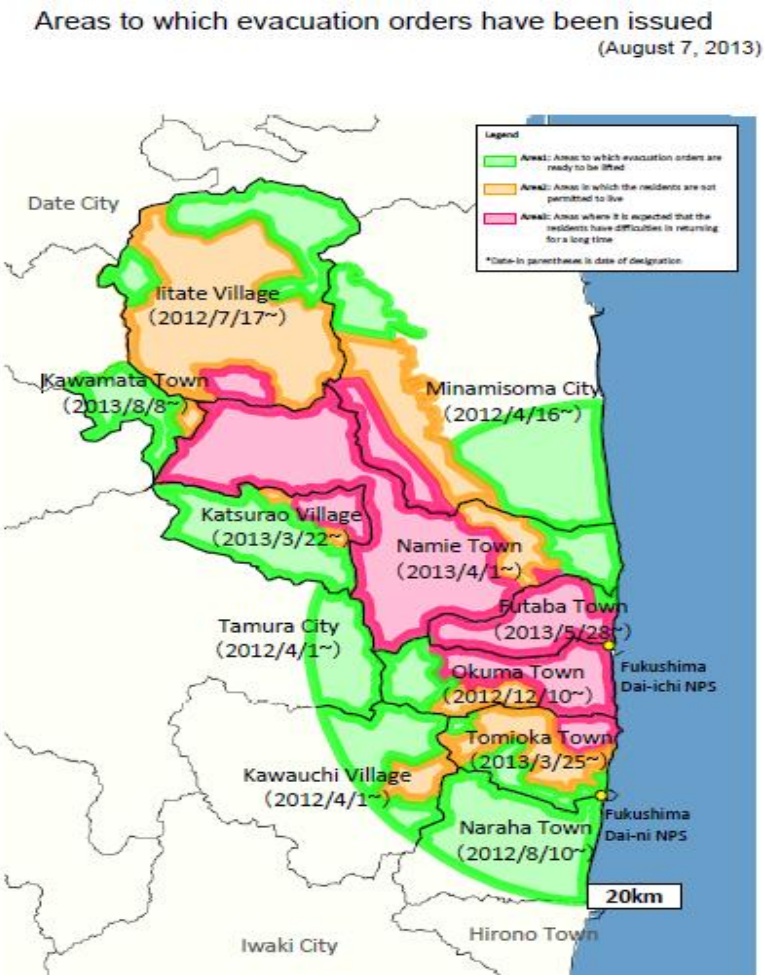
Evacuation Zones in 2011 (Source: METI)



Map 1 of initial evacuation zones (Source: METI)

One year after the accident, (30th March 2012) these EZs were reorganized into three zones[12] according to the level of ambient dose on the ground (Map 2): Red Zone (more than 50mSv/year), Yellow Zone (between 20-50mSv/year) and Green Zone (less than 20mSv/year). The evacuation order for the area between 20-30 km radius from the F1NPP (colored blue in Map 1 above) had already been lifted in September 2011 and all Hotspots were lifted in December 2012 (Minamisoma and Kawauchi municipalities) and December 2014 (Date municipality).

[12] Policy paper "Basic concept and issues to be challenged for rearranging the restricted areas to which EO have been issued. 26 Décembre 2011.



Map 2: Map of reorganized EZs in 2013 (Source: METI)

2.2.3 NUMBERS AND CHARACTERISTICS OF NUCLEAR EVACUATION

The number of evacuees from Fukushima prefecture peaked at 163,000 in June 2012[13]. Seven years after the accident (February 2018), 50,000 people were still displaced.

One of the distinctive aspects of the evacuation following the nuclear accident is that it triggered two patterns of displacement: *mandatory* evacuation under order from the government, and the *spontaneous* evacuation of residents living outside designated EZs who decided to flee of their own accord for fear of the effects of radiation, despite the government's reassurances (Hasegawa, 2015). The proportion of spontaneous evacuation within the total number of evacuees remains unclear as so-called self-evacuees are rarely counted in official statistics and are accorded little recognition and assistance by the authorities. Notwithstanding, the number can be estimated from the statistical gap in various official reports. For example, in June 2014, the Ministry of Economy, Trade and Industry (METI), which was responsible for assisting nuclear evacuees, reported the number of evacuees under its mandate as 80,000, while the Fukushima prefecture and

[13] According to Reconstruction Agency on 13 June 2011: http://www.reconstruction.go.jp/topics/120613hinansya.pdf

the Reconstruction Agency[14] counted the total number of evacuees from the prefecture as 128,000[15]. The difference of 48,000 can thus be attributed to the number of self-evacuees, with a small number of non-nuclear evacuees displaced by tsunami. In one of the rare official reports available on the subject, the Fukushima prefecture estimated the number of self-evacuees as 50,327 in September 2011 (MEXT, 2011). This lack of recognition on the status of self-evacuees by the authorities led in part to a series of group-lawsuits filed against the State and TEPCO, which surged through 2013-2014 (see Section 4.5). This phenomenon of voluntary evacuation is analyzed in detail in the section below: 3.3 The case study of Watari district (Fukushima City).

2.3 RETURN (LIFTING OF EVACUATION ORDERS)

2.3.1 THE GOVERNMENT STRUCTURES

Three years after the accident, the government started to lift Evacuation Orders (EOs). The overall policy and strategy concerning the review of EZs, the lifting of EOs, and the assistance of evacuees/affected residents were the responsibility of the Nuclear Accident Affected Residents Assistance Team, created under the Nuclear Emergency HQ on 29 March 2011; its secretarial functions were located at Cabinet Office[16]. The Assistance Team was headed by the Minister of Economy, Trade and Industry (METI) and was comprised of seconded officials from that ministry. In February 2013, the Deputy Minister of the METI was appointed Head of the Local Nuclear Emergency Response HQ in Fukushima, in charge of implementing these policies[17].

2.3.2 POLICY OF LIFTING EVACUATION ORDERS (EOS)

2.3.2.1 First policy paper

The policy of lifting EOs was initially established in the Basic Principle for Reviewing the Restricted Zone and other Evacuation Zones, issued by Nuclear Emergency HQ on 26 December 2011. In this document, the criteria (or conditions) for lifting EOs were defined as follows:

1. Ambient radiation dose in the area is less than 20mSv/year.

2. Physical infrastructure such as electricity, gas, water, sanitation, major roads, and communication, as well as social service infrastructure such as medical and nursing facilities and postal service are restored. Decontamination around children facilities is sufficiently advanced.

3. Ample consultation with stakeholders (Fukushima prefecture, municipalities and residents).

[14] The special governmental agency created in 2012 with a ten-year mandate following the Japan's 2011 disaster, dedicated to the reconstruction of the Tohoku region

[15] METI and Reconstruction Agency's website: www.meti.go.jp/earthquake/nuclear/pdf/140401.pdf; www.reconstruction.go.jp/topics/main-cat2/sub-cat2-1/20140624_hinansha.pdf

[16] METI website: http://www.meti.go.jp/earthquake/nuclear/downloadfiles/g110331b.pdf

[17] Prime Minister's Office website: https://www.kantei.go.jp/jp/topics/2013/f1.pdf

The policy also declared that, in principle, EOs were to be lifted on a municipality-by-municipality basis, which meant that the government had to consult and negotiate the lifting of any EOs with each municipality concerned. As a basic principle under Japanese legislation, municipalities have the authority to issue evacuation orders to protect their residents. In the case of the Fukushima accident, municipal Mayors were indeed the ones who decided to evacuate their residents - before and regardless of the EOs issued by the Nuclear Emergency HQ (NAIIC, 2013; Imai, 2014). Therefore, the government was obliged to negotiate and obtain an agreement from each municipality for the lifting EOs.

As for the second criteria, decontamination of children facilities, the Ministry of Environment (MoE) came up with a detailed policy only in January 2012, one month after the policy paper of Nuclear Emergency HQ on clearing EOs. In the MoE document, the government fixed a target of 60% reduction in the radiation exposure dose of children over two years (by August 2013), which would be achieved not only by decontamination but also by weathering effect. The government also declared the ambient dose must be less than 1mSv/year for schools before allowing them to reopen[18].

2.3.2.2 Second policy paper

Two years after the first policy document, the government issued another policy paper concerning evacuation zones, in December 2013, entitled *Accelerating the Fukushima Reconstruction from the Nuclear Disaster*. The document detailed the government's strategy to promote swift return of evacuees by creating additional compensation, increasing financial aid for local business and reconstruction projects, accelerating decontamination, and reinforcing risk communication. For the first time, it mentioned that the government would also help evacuees to start life over elsewhere (i.e. resettlement), especially for those from Red Zone (See Map 2), to which any prospect of return was considered slim. To support this, the government proposed a new compensation plan for house construction to those who wished to resettle elsewhere. The new document also insisted the government's intention to reduce the residents' annual individual exposure dose to less than 1mSv/year in the towns where EOs would be lifted, which was fixed as a *long-term* goal. This precision, which appeared twice in the document, reflects the difficulty that the government faced on the ground. The document came out when the authorities were negotiating the first lifting of an EO in Tamura city. Many residents judged it to be too soon; they strongly opposed the move, by demanding the ambient radiation dose in the zone to be reduced to 1mSv/year as a condition for their return. The demand for 1mSv/year was also inspired by the decontamination policy established by the MoE which had fixed the threshold of 1mSv/year as the criteria for financing the decontamination activities of the affected municipalities which were located outside EZs. This resulted in setting the *de facto* decontamination standard at 1mSv/year, which directly contradicted the conditions for lifting the EO set by the Nuclear Emergency HQ at 20mSv/year. Consequently, the evacuees from the EZs demanded the same criteria - 1mSv/year - for decontamination, as well as for a condition of return. The municipalities and the government were thus

[18] ME (2012), Josentokubetsuchiiki ni okeru josen no houshin "Josen roadmap" (Basic Policies of Decontamination in Decontamination Special Area "Decontamination Roadmap"), 26 January 2012.

obliged to achieve this *long-term* goal of 1mSv/year rather rapidly, through decontamination, in order to convince the evacuees to return.

The second policy document also fixed the duration of compensation payment for psychological damage due to evacuation, paid to evacuees by TEPCO (about 800 euros/person every month), as up to one year following the lifting of the EO. This decision triggered criticism from evacuees, who saw it as a form of pressure, to make them return against their will and by default - because this compensation for psychological suffering would constitute *de facto* the financial assistance enabling them to sustain their life in refuge. In addition to the compensation, evacuees received temporary housing assistance offered by host prefectures of their refuge, thanks to which they could live for free in prefabricated shelters or public subsidized housing, or in private apartments where rent was subsidized. The temporary housing assistance was placed under the mandate of Prefectural Governors, to be managed by respective Prefectural Offices[19]. As Hino (2015) argues, this temporary housing assistance and the psychological damage compensation constitute the two pillars of essential support upon which evacuees have relied to continue their life in refuge, or to start their new life elsewhere.

2.3.2.3 Third policy paper

Based on these policies, the authorities started to lift the first two EZs, one in Tamura city in April 2014, and the other in Kawauchi village in October. Faced with fierce opposition from the evacuees, each time the government was obliged to postpone the planned date for lifting the EZ for three to six months. When the government started to negotiate the third case in Naraha with similar difficulties, it published a revised policy document in June 2015. The novelty of the policy was to extend the compensation payment to up to seven years after the accident, until March 2018, for residents from Green and Yellow Zones (See Map 2). And this was applied to all evacuees from these two zones, regardless of whether EOs had been lifted in the respective municipalities, whether or not the individual chose to return. For the first time, the document clearly mentioned that lifting EOs did not automatically oblige evacuees to return. The new document also set the timeframe for lifting all EOs - except the Red Zone - as the sixth year following the disaster (March 2017). This change of policy, which disassociated compensation payment from the lifting of EOs, thereby ensuring equal treatment of all evacuees from Green and Yellow Zones regardless of their mobility choices, significantly helped the government to accelerate the process of lifting EOs

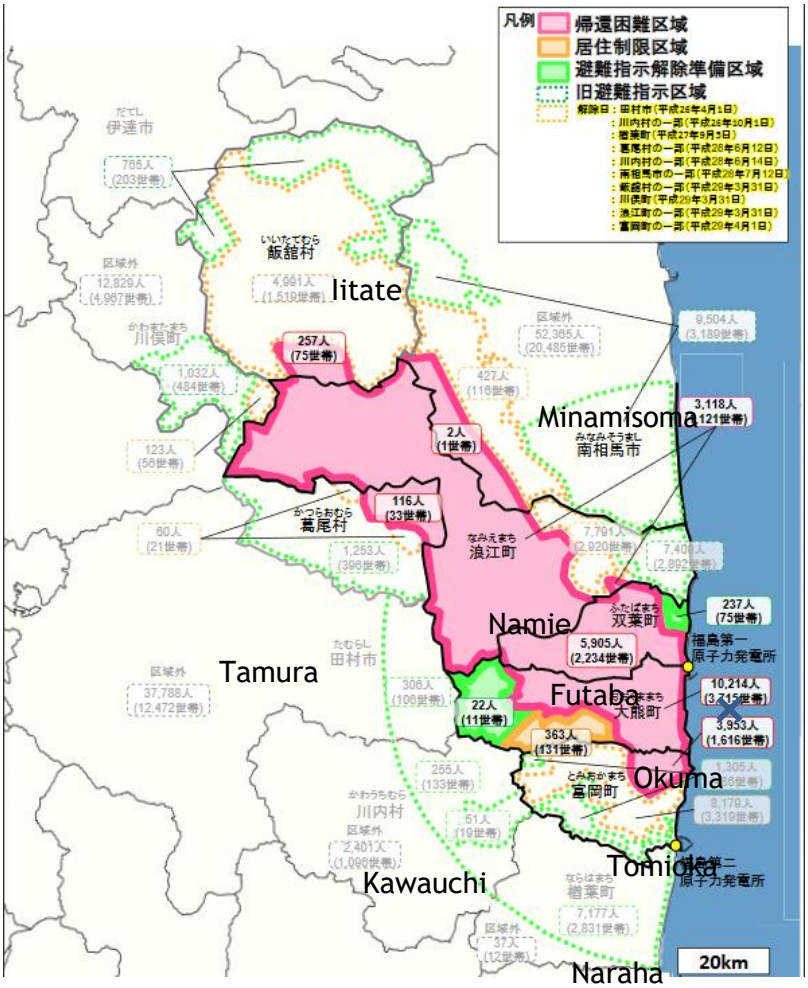
As a result, all EOs (except those in Red Zone and host towns of F1NPP - Futaba and Okuma) were lifted as planned in March-April 2017, six years after the accident (see Map 3 below).

[19] National Diet Library (2017), Oukyukasetsujutakuseido no genjo to kadai (The Status and Challenge of Temporary Housing Assistance Scheme), Issue Brief No.966, 8 June 2017.

The chronological list of lifted EOs is as follows:

Municipality	Timing
Tamura	Apr 2014
Kawauchi	Oct 2014
Naraha	Sep 2015
Katsurao	Jun 2016
Minamisoma	Jul 2016
Iitate	Mar 2017
Kawamata	Mar 2017
Namie	Mar 2017
Tomioka	Apr 2017

Table 2: List of municipalities in which EOs are lifted (Green and Yellow Zones)



Map 3: Map of EZs after April 2017 (Source: METI)

In March 2017, the government terminated the temporary housing assistance for self-evacuees (including former evacuees from the 20-30 km radius zone) and for the evacuees from the former Green Zone (except Naraha). The government also announced that such assistance would stop for those from the Red Zone and former Yellow Zone in March 2019. Considering the end of psychological compensation fixed in March 2018, many evacuees would lose both sources of financial support and be left unaided, to continue life in refuge or rebuild their new life elsewhere. If they could not find a new job and survive on their own in the place of refuge or resettlement, they would end up being obliged to return home as many job opportunities were created by State subsidies in former EZs and additional assistance scheme was made available for those who did decide to return.

2.4 DECONTAMINATION POLICY

Decontaminating the area affected by the fallout of the F1NPP accident was the policy which had been officially decided by the Nuclear Emergency HQ on 26 August 2011, five months following the disaster. From the official minutes of initial Nuclear Emergency HQ meetings, it is evident that the idea had been put on a table as early as May 2011[20], two months after the accident, to be consolidated in the following August.

On 30 August 2011, the National Diet of Japan adopted 'The Act on Special Measures Concerning the Handling of Environmental Pollution by Radioactive Materials Discharged by the Nuclear Power Station Accident Associated with the Tohoku District-Off the Pacific Ocean Earthquake that Occurred on March 11, 2011'[21]. This Act allowed the government to implement decontamination activities and designated the Ministry for the Environment (MoE) as the agency responsible for setting up policies and plans, as well as undertaking such activities.

The MoE came up with the initial concept of decontamination activities on 11 November 2011, proposing a plan to divide the target area into two categories: Special Decontamination Areas (Special Areas) and Intensive Contamination Survey Areas (Survey Areas). The Special Areas were essentially the zones under EO. The Survey Areas were defined as any areas outside the EZs where the radiation dose was found to be 1mSv/year or higher (0.23 micro Sieverts per hour [μSv/hour] according to calculations by the MoE[22]). The decontamination of Special Areas was directly undertaken by the MoE while that of Survey Areas was to be carried out by the concerned municipality, and costs subsequently reimbursed by the government. The designation of target municipalities for each Special/Survey Area was made public in January 2012; a total of 102 municipalities over eight prefectures were included in the Survey Areas. Two more municipalities were added to the Survey Area in February 2012. The goal for decontamination of the Special Areas was initially fixed at 50% reduction in public exposure dose (60% for children) over two years - which would also be achieved by natural weathering effects, and to reach the dose of less than 1 mSv/year in the long-term.

20 One of the supporting documents submitted to the 15th Nuclear Emergency Response Headquarter meeting held on 17 May 2011, available only in Japanese: https://www.kantei.go.jp/jp/singi/genshiryoku/dai15/15_05_gensai.pdf

21 http://josen.env.go.jp/en/policy_document/pdf/special_act.pdf 20130118

22 https://www.env.go.jp/press/files/jp/18437.pdf

For schools in the Special Areas, as explained earlier, the MoE fixed the radiation dose target at up to 1mSv/year before reopening, while the Ministry of Education, Culture, Sports, Science and Technology (MEXT) established a different criterion for schools located outside the EZs. On 19 April 2011, they fixed a reference dose of 20 mSv/year (equivalent in hourly dose of 3.8 μSv, according to MEXT calculations[23]) for schools in Fukushima prefecture to allow outside activities for children. According to this MEXT provisional policy, children in Fukushima prefecture could play outside in the school yard when the ambient radiation dose was less than 20mSv/year. The MEXT identified a total of 13 schools, located outside the EZs, where the dose exceeded 20mSv/year but simply recommended that outside activity for children be limited to less than one hour per day[24]. Even though the MEXT was forced to review this provisional policy on 26 August 2011, aligning the reference dose to 1mSv/year (equivalent of 0,23 μSv/hour, according to MEXT calculations[25]) following outcry from Fukushima parents[26], such a difference in protection criteria for children between EZs and non-EZs nurtured a feeling of injustice and resentment among affected residents in Fukushima prefecture.

2.5 COMPENSATION POLICY

2.5.1 JAPANESE NUCLEAR LIABILITY REGIME

Japan officially launched its civilian nuclear program in 1960 and enacted two liability laws to cover eventual nuclear damages in 1961: the Act on Compensation for Nuclear Damage (Compensation Act) and the Act on Indemnity Agreements for Compensation for Nuclear Damage (Indemnity Agreements Act). At the same period, nuclear liability regimes were adopted at the international level: the Paris Convention in 1960 and the Vienna Convention in 1963. Japan is not a party to any of these international conventions, but developed its own national liability regime. The country is also one of those States which have adopted unlimited liability, together with Germany and Switzerland (Vasquez-Maignan, 2012). In the case of the Fukushima accident, therefore, TEPCO is exclusively liable for the damage and its liability is unlimited.

The Compensation Act (Section 6) also stipulates that in any case where the operator cannot cover compensation payments, the government should intervene to provide financial assistance. Following this provision, the government set up the Nuclear Damage Compensation Facilitation Corporation in September 2001 to provide financial assistance to nuclear operators facing compensation payments of more than 120 billion Yen (880 million euros), which is the maximum amount covered by private insurance (Nomura et al., 2012).

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[23] The base assumption of the calculation is that a child spends 8 hours outside and 16 hours inside school over 365 days per year: http://www.mext.go.jp/a_menu/saigaijohou/syousai/1307458.htm

[24] http://www.mext.go.jp/a_menu/saigaijohou/syousai/1307458.htm (only available in Japanese)

[25] The base of calculation is to suppose that a child goes to school 200 days per year and spends 6.5 hours per day at school (4.5 hours inside and 2 hours outside): http://www.mext.go.jp/a_menu/saigaijohou/syousai/1310973.htm

[26] On 23 May 2011, about 650 Fukushima parents gathered and protested in front of the Ministry (MEXT) building in Tokyo demanding the cancellation of the policy to apply the reference dose of 20mSv/year to schools in Fukushima (Mainichi Shimbun, "F1NPP: 20mSv/year standard, parents demand the annulation", 23 May 2011); A coalition of five NGOs organised an online petition against the 20mSv/year threshold and collected a total of 53,193 signatures from 61 countries in April 2001(https://www.greenpeace.org/japan/Global/japan/pdf/fat4.pdf)

2.5.2 INSTITUTIONAL STRUCTURE OF FUKUSHIMA COMPENSATION SCHEME

Following the accident, TEPCO was placed under State control on 31 July 2012. Currently TEPCO's largest, controlling shareholder (50.1%), is the Nuclear Damage Compensation Facilitation Corporation, of which half is owned by the Japanese government. Since August 2014, the Corporation had also been also tasked with providing financial support to decommissioning operations, and was thus renamed the Nuclear Damage Compensation and Decommissioning Facilitation Corporation.

By December 2016, TEPCO had received a total of 8 trillion yen (62 billion euros) in financial aid from the State via the Compensation Corporation in order to pay compensation [27] . Thus, the compensation was in fact paid by the State, but administratively managed by TEPCO. In order to receive compensation, residents had to complete an application form, which initially contained 60 pages, and submit it to TEPCO with a significant number of supporting documents[28]. By 2 February 2018, TEPCO had paid a total of 62 billion euros in compensation for 2 million individual cases and 400,000 cases from corporations and business owners[29].

The policy of compensation relative to the F1NPP accident was defined by the Dispute Reconciliation Committee for Nuclear Damage Compensation (hereafter: Reconciliation Committee,) which was established under the terms of the Compensation Act, under the auspices of MEXT, in April 2011. The Reconciliation Committee consisted of 10 part-time members, appointed by the MEXT, who would have high moral and academic standing in the fields of law, medicine, and nuclear. The role of the Committee was two-fold: 1) mediate any disputes for reconciliation; 2) establish guidelines on the scope of the nuclear damage.

As regards mediation, the center of Alternative Dispute Resolution (ADR) was established in August 2011, under the Reconciliation Committee, to undertake the task and facilitate out-of-court settlements between parties in dispute. In the case of Fukushima compensation, plaintiffs could file a claim to 1) TEPCO directly, 2) the ADR, or 3) the civil courts. Under the Paris and Vienna conventions, a single court would be assigned to hear all claims arising out of a nuclear accident (Vasquez-Maignan, 2012).

2.5.3 FUKUSHIMA COMPENSATION POLICY

2.5.3.1 Establishment of the compensation policy

The Fukushima compensation policy was thus established by the Reconciliation Committee in the form of guidelines determining the scope of the operator's liability. Although the guidelines were only recommendations, thus not legally binding, they nevertheless played a decisive role in influencing judges, as the victims and the operator could invoke them before the courts (Vasquez-Maignan, 2012).

[27] The Nikkei, ToudenHD genshiryokubaishokikou ni tsuikaenjo wo shinsei (TEPCO requests additional financial assistance to the Nuclear Damage Compensation Corporation), 27 December 2016.

[28] Japan Federation of Bar Association (JFBA) President's statement made on 16 September 2011: https://www.nichibenren.or.jp/activity/document/statement/year/2011/110916.html

[29] Source: TEPCO website

The Reconciliation Committee produced Preliminary, Secondary and Interim Guidelines between 2011 and 2013, but the Interim Guideline issued on 5 August 2011 defined the overall scope of nuclear damage. The First, Second and Forth Supplements to the Interim Guideline specifically dealt with compensation pertaining to evacuees. According to these Supplements residents affected by the accident should have the right to compensation for: psychological damage, rehabilitation/reconstruction of houses, loss or reduction of property values, loss of employment/reduction in salaries due to a change of jobs, fall in sales and trading (for business owners), transportation costs between home and place of refuge, medical costs, and so on. Among these grounds for compensation, the question of psychological damage became one of the key issues at stake for the lifting of EOs in the Green and Yellow Zones, as this particular compensation was directly tied to the EO in effect. Once the EO was lifted, the compensation stopped one year after that date. This was indeed the case for residents from the former 20-30 km radius zone and Hotspots. This problem was rectified for Green and Yellow Zone residents by the June 2015 policy paper, which accelerated the lifting of EOs. For the Red Zone, as residents were not expected to return soon, they received the compensation payment equivalent of 12 years from the accident. In short, the residents from Green and Yellow Zones received in total 8,500,000 yen (65,000 euros) per person for psychological compensation, while Red Zone residents received 14,500,000 yen (111,500 euros)/person[30].

2.5.3.2 Compensation gaps

The Fukushima compensation scheme relating to the affected residents was defined along the boundaries of Evacuation Zones (Hiraoka and Yokemoto, 2015; Hasegawa et al., 2017): the zone in which a resident's house is located significantly changes the amount they receive. As such, six different categories of compensation were created for affected residents, with varying degrees of entitlement (see Table 1 below).

[30] Mainichi Shimbun, Naruhodori "Seishinteki baishou" tte, Fukushima (What is psychological compensation?), 20 January 2017: Regional version (http://mainichi.jp/articles/20170120/ddl/k07/070/056000c)

Zone	Remark	Amount (equivalent in euros)
Red Zone ('Difficult-to-Return' Area) radiation dose more than 50mSv/year	Evacuation Zone (EZ)	446,000
Yellow Zone ('Not-Permitted-to-Live' area) radiation dose between 20-50mSv/year		260,000
Green Zone ('Ready-to-Return' Area) radiation dose less than 20mSv/year		260,000
Hotspot (260 houses) radiation dose more than 20mSv/year	Outside the EZ	77,000
Evacuation Prepared Area (20-30 km radius zone) Shelter indoors and then evacuation	Former EZ (until Sep 2011)	55,400
Outside the EZ (23 designated cities)	Both self-evacuees and residents	13,000

Table 1: Amount of psychological compensation received by a family of four (two adults and two children) according to different zones

Source: Hiraoka and Yokemoto (2015); some adjustment made by the author (R. Hasegawa)

In addition to psychological damage, compensation for the loss of fixed-assets value (houses and land) and household effects (furniture, electronics, cars, etc.) was only paid to evacuees from Red, Yellow and Green Zones, which further widens the divide with those living in the former Evacuation Prepared Area (20-30 km radius) or Hotspots. For example, a family of four (two adults and two children) from Green, Yellow and Red Zones receives between 20,000-40,000 euros for the damage to their house, 38,000-50,000 euros for the damage to household effects, and around 120,000 euros for house reconstruction, while a family from the former 20-30 km radius zone or Hotspots did not receive any of these[31].

[31] Source: Reconciliation Committee. http://www.mext.go.jp/b_menu/shingi/chousa/kaihatu/016/shiryo/__icsFiles/afieldfile/2013/12/26/1342848_3_1.pdf

Self-evacuees and residents from the 23 municipalities [32] situated outside the EZs, entitled to some compensation according to the terms of the Reconciliation Committee's First Supplement to the Interim Guidelines, received one-time compensation for the psychological damage (Table 2)[33]. But the amount received was lower than for residents of Hotspots or the former 20-30 km radius zone. For example, an adult in this category received 600 euros in total.

Status	Amount (**one-time payment**)
Children and pregnant women (between 11 March and 31 Dec 2011)	Those who stayed: 3,000 euros/child or women
	Those who evacuated: 4,500 euros/child or woman
Other adults	80,000 Yen (600 euros)/person

Table 2: Compensation for self-evacuees (one-time payment)

2.5.3.3 Consequences of compensation gaps

Compensation linked solely to zoning, and not to the precise radiological situation, as well as the significant gap in amounts received according to the different categories, triggered a feeling of injustice among the affected population (Yokemoto, 2015; Hasegawa et al., 2017). It resulted in profound division and tension among residents, especially in the towns divided into two or three different EZs such as Kawauchi village (see Section 3.2: Kawauchi Case Study). In the case of Minamisoma city, for example, the municipality was divided into six different zones, of which five were under EO and thus received different compensation payments, while the remaining zone was not entitled to compensation.

Evacuation Zones were mapped out based not only on contamination level, but also according to various political, economic and administrative considerations (Fassert, 2017; Hasegawa et al. 2017). For example, the line separating an EZ from a non-EZ could be a border between two towns, or a street which separates two districts within a town. In some cases, residents on one side of a street were told to return as it was now safe to live in their home, while across the street residents were told not to return due to a high level of contamination (e.g. Tomioka, Tamura and Minamisoma). Moreover, a specific feature of radionuclide fallout from nuclear accidents is that contamination spreads unevenly in patches, like leopard spots, as the radioactive plume is pushed by winds and radionuclides fall with rain and snow. And so the EZs were felt not necessarily to represent the extent of actual contamination on the ground, and the compensation scheme based on these essentially arbitrary EZ dividing lines fueled feelings of injustice and jealousy among residents inside, outside, and in-between different EZs, leading to a surge of lawsuits against TEPCO and the State (see Chapter 6).

[32] Fukushima city, Nihonmatsu city, Date city, Motomiya city, Koori town, Kunimi town, Kawamata town, Ootama village, Kôriyama city, Sukagawa city, Tamura city, Kagamiishi town, Tenei village, Ishikawa town, Tamakawa village, Hirata village, Aasakawa town, Furudono village, Miharu town, Ono town, Soma city, Shinchi town, Iwaki city.

[33] Defined in the First Supplement to the Interim Guideline which was published on 6 December 2011

3 IMPLEMENTATION OF POST ACCIDENTAL POLICIES ON THE GROUND: THREE CASE STUDIES

3.1 INTRODUCTION

In order to analyze the consequences of the aforementioned key post-accident policies on the ground, the *Shinrai* project chose three municipalities, which are located in different zones and thus affected differently by the said policies. The focus of the present analysis is on the process of decision-making on evacuation and return, the reaction of residents, and the consequences of the decisions made. The first case is Kawauchi village, which had been divided into three different EZs: the 20-30 km radius zone, the Green Zone, and the Yellow Zone. The second case study is Naraha town, of which the entire territory, included in the Green Zone, had been evacuated. And the last case is the Watari district of Fukushima city, which was not included in any of the EZs or designated Hotspots, despite the detection of elevated radiation dose over 20mSv/year in several districts.

The choice of the first two municipalities was made very logically due to the timing of the lifting of EOs for these towns[34] and that of our field missions. One of the EOs concerning Kawauchi village had just been lifted when the first field mission for the *Shinrai* project was conducted in October 2014. The residents and the municipality were thus interviewed immediately after the lifting of the EO, and then again, six months later. When the EO in Kawauchi was lifted, Naraha town was in the midst of internal discussions on the question of return. It was ideal timing to conduct field interviews in order to observe the development and change in dynamics within the municipality. In Naraha, interviews could thus be conducted before and during the process of decision-making on return, and after the lifting of the EO. The choice of Watari district, in Fukushima city, was made with a view to see another case of affected residents, who were living outside the official EZs, and thus not assisted in the process of evacuation. These residents were either obliged to stay despite fear of radiation effects in the absence of financial aid, or had to evacuate by their own means. In examining three different cases of affected municipalities and residents, the project aimed to construct a broader view of the effects of the Japanese government's post-accident policies.

3.2 CHAPTER OUTLINE

In this chapter, the geographical, demographical characteristics of the three cases (Kawauchi, Naraha, and Watari) are presented first, before detailing how evacuation took place - or not, in the case of Watari - with specific consequences. The process that the municipalities established for lifting the EOs is examined, as well as the concerns and reactions of inhabitants. A last part focuses on the specific role played by the two Mayors of Kawauchi and Naraha: it highlights what is at stake at the municipal level,

[34] The evacuation order for the 20-30 km radius zone was lifted at the end of September 2011 by the Nuclear Emergency HQ. At that time, none of the concerned municipalities in the 20-30 km radius zone decided to return immediately, due to the unstable situation of F1NPP and the radiological contamination of their territory. Furthermore, as outlined in chapter 2, the executive authority to order evacuation, and thereby the authority to lift such an order, remained in the hands of municipalities.

where the responsibility laid for implementing governmental policy while at the same time responding to the concerns and interests of inhabitants.

3.3 KAWAUCHI VILLAGE

3.3.1 GEOGRAPHICAL SITUATION

Fukushima Prefecture comprises three regions: *Hama-dori* on the coast, most of which was placed under evacuation orders; *Naka-dori* in the middle, the political and economic center of the Prefecture; and *Aizu*, located inland to the west. Kawauchi village is situated within the 10-30 km radius south-west of the F1NPP. It is part of the *Hama-dori* region, but is a landlocked territory bordering the cities/towns of Iwaki, Naraha, Tomioka, Okuma and Tamura. It has an area of about 200 km^2, 90% of which is mountains and forest[35]. Arable land accounts for only 5% of its territory.

3.3.2 DEMOGRAPHICAL AND ECONOMIC SITUATION (BEFORE THE CATASTROPHE)

The village counted 3,028 inhabitants in 2011, of which 34% were elderly (over 65 years old)[36]. The main economic activity was forestry, production of tobacco leaves, and cattle farming.

3.3.3 THE ACCIDENT AND THE EVACUATION OF KAWAUCHI

Situated within a 10-30km radius from the F1NPP, the village of Kawauchi was divided into three different evacuation zones: a 20-30 km radius zone (former Evacuation Prepared Area), a Green Zone (less than 20mSv/year) and a Yellow Zone (between 20-50mSv/year). 90% of its residents are living in the 20-30 km radius zone, for which the EO was lifted as early as September 2011. The Green Zone EO was lifted in October 2014, while the Yellow Zone EO was only lifted in June 2016. This case study will focus on the lifting of the order from the 20-30 km radius zone and on that of the Green Zone.

The Mayor of Kawauchi, Yuko Endo was elected in 2004; at the time of writing, it is currently his third mandate as mayor. On 15 March 2011, the day after the explosion of reactor No.3 at F1NPP, in the absence of EOs from the government, Endo decided to evacuate the villagers:

"*At 6 a.m. on 12 March 2011, the day after the accident, the Mayor of Tomioka town called and asked me to temporarily host Tomioka residents fleeing from the accident. This was the first time I heard about the accident. When the first explosion occurred on the same day (12 March), we saw the explosion but a Tomioka town/TEPCO employee reassured me, telling me that there would not be any radioactivity emission. But when police officers and firefighters arrived with protective gear, I started to worry. Our own employees were working without gear. (…) On the explosion of the No.3 reactor, on*

[35] Kitamura, I. a, M., Y. (2016). Research on the relation between rate of permanent return and community activities - Case of Kawauchi Village, Fukushima Prefecture. *Journal of Center for Regional Affaires, Fukushima University, , 27* (2), 52-60.

[36] The information on the printed copy of a PPT presentation made by the Mayor in September 2016, entitled 'For phasing out from the "affected area" status: Five years and a half from the disaster, the actual situation and challenges of Kawauchi village', provided by the Mayor during the interview at the Kawauchi Municipal Office on 11 October 2016.

14 March, even the TEPCO/Tomioka employee became nervous. By that time, all the media had disappeared from the village. The Nuclear Emergency HQ issued the order for Kawauchi to shelter indoors. Orders were orders of confinement, not evacuation. People were confined, but we realized that there was not enough food for everyone. I called NISA [Nuclear and Industrial Safety Agency of Japan]. Without information from the government, we made decisions based on TV information […] On 16 March, after talking with the mayor of Tomioka, we emitted an evacuation order, well it is the mayor of Tomioka and myself who decided to evacuate the inhabitants".

As a consequence, on 16 March 2011, the whole village was evacuated and moved to Kôriyama city, one of the major cities of Fukushima prefecture, located in the Naka dori region 55 km west of the village and 70 km from F1NPP.

Time	Event
11 March 2011	F1NPP Accident
14 March 2011	Explosion of the Reactor No.3 at F1NPP
15 March 2011	Shelter Indoor Order from the government (11:00) Mayor's decision to evacuate the village (15:00)
16 March 2011	**Evacuation** to Kôriyama city, together with inhabitants of Tomioka town
22 April 2011	Evacuation Order from the government
3 August 2011	Designation of a Hotspot
30 Sept 2011	Lifting of EO for 20-30 km radius area
31 January 2012	Mayor's declaration for return
1 April 2012	**Return of the municipal offices** to the 20-30 km radius area of the village and reopening of schools
30 Sept 2012	End of psychological compensation payment for 20-30 km radius area residents
14 December 2012	Lifting of Hotspot designation
1 October 2014	Lifting of EO for Green Zone
14 June 2016	Lifting of EO for Yellow Zone
March 2018	End of psychological compensation payment for Green and Yellow Zone residents

Table 3: Chronology of events in Kawauchi village

3.3.4 LIFTING THE EVACUATION ORDER

3.3.4.1 Town Process for organizing the lifting of the evacuation order (LOE)

Kawauchi village is one of two municipalities, together with Tamura city, which declined the offer from the Reconstruction Agency to conduct resident opinion surveys before the lifting of EOs. Therefore, the village official interviewed for the *Shinrai* project in October 2014, just as the EO in Green Zone had been freshly lifted, did not know the percentage of evacuees who opposed the lifting of the EO. Instead of conducting opinion surveys, Kawauchi village organized an expert committee - a third party - to assess the feasibility of lifting the EO. The Mayor explained the reason for creating such a committee: "*instead of following the decision of the government, we need[ed] to have some bases to judge objectively the conduciveness of return*"[37].

3.3.4.2 Expert committee for return

The Kawauchi Return Assessment Committee was established in July 2014. The members were chosen by the village authority among the experts who had been engaged in assisting the village since the accident. The committee was headed by Dr/Prof. Noboru Takamura from Nagasaki University, who was also the Fukushima Radiation Risk Management Advisor appointed by the Fukushima Prefecture. As early as December 2011, Nagasaki University had been involved in assisting Kawauchi village, by measuring radioactivity in the air and soil, and providing radiological protection advice to the residents[38]. In April 2013, the University created its satellite office inside the village and placed a Public Health Nurse there - Ms. Makiko Orita, a Master's student at the time and Assistant Professor since April 2014 - on a permanent basis, to respond to the anxiety and health concerns of villagers[39].

The Committee assessed the feasibility of the return of residents to the Green Zone according to criteria established by the government: radiological situation, progress of decontamination, and sufficient infrastructure. It then produced an interim report in August 2014 which concluded that, in view of those criteria, the committee judged the situation as ready for return. Two months later, the EO was lifted in the Green Zone.

3.3.4.3 Governmental Process: Pre-return Homestay and Preparation Period[40] and Explanation Meetings

The government announced the start of the Pre-return Homestay and Preparation Period to the Green Zone of Kawauchi village in April 2014. This measure allowed evacuees to

[37] Fukushima Mimpo (local newspaper), Raigetsu 3 gatsu, Toushinkigen, Kawauchi-mura kikan ni

Muke kenshoui (The deadline of final response from the Kawauchi Return Assessment Committee at March 2015) on 11 July 2014 (http://www.minpo.jp/pub/topics/jishin2011/2014/07/post_10322.html)

[38] Website of Atomic Bomb Disease Institute, Nagasaki University (http://www-sdc.med.nagasaki-u.ac.jp/abdi/bases/kawauchi.html)

[39] Profile of Ms Orita on the website of Nagasaki University: http://www.nagasakiu.ac.jp/ja/gakusai/book/05index.html

[40] The official name in Japanese (source: METI): furusato heno kikan ni muketa junbi notameno syukuhaku

spend the night in their homes in EZs - normally prohibited under the EOs - with a view to preparing and arranging things for a possible return. The problem with this Preparation Period programme was that once it was launched by the government, the lifting of EOs followed systematically, despite opposition from evacuees [41]. According to the representative of the residents in the 8th District, situated in the Green Zone, evacuees did not understand at the time that accepting this Preparation Period would lead automatically to the lifting of the EO[42]. The decision to lift the EO was first mentioned by a government official during the first "Explanation Meeting"[43] organized by the Local Nuclear Emergency Response HQ, once the Preparation Period had begun in June 2014. Having learned through media reports that the government was intending to lift the order as early as July, evacuees voiced their opposition during the meeting[44]. Confronted with the protest, the government announced that it would postpone lifting the EO for one month. At the second Explanation Meeting, held on 17 August, evacuees and the Village Assembly made a formal request to the government and village authorities to postpone it until the end of the year so that they could have more time to prepare for return. According to the District Head who attended these meetings, the government declined request, insisting that the decontamination process had been completed and that the radiation dose had decreased to under 20mSv/year in the area, so there was no reason not to lift the EO.

3.3.4.4 Reactions of the residents

Some inhabitants were in favour of the EO to be lifted at the soonest possible date: mainly the older residents, whose concerns were considered central by the mayor (see the section 3.6.2). However, many returnees interviewed for the present study considered that the government lifted the evacuation order prematurely, without taking into account the specificities of Kawauchi and its surroundings. The area which was under the EO in Kawauchi is located at the east end of the village, surrounded by mountains and isolated from the rest of the village. 90% of the area is woods and mountains, and therefore difficult to decontaminate; many parents expressed concern about the risk of radiation exposure for their children, questioning the long-term practicability of living in the village while forbidding children to play in the surrounding environment (Doi, 2015).

Moreover, inhabitants used to grow food in their garden and eat mountain vegetables and mushrooms picked in the nearby hills. On their return after the EO was lifted, the village authority prohibited consumption of homegrown vegetables due to the risk of internal exposure to radiation. Inhabitants also discovered that they now had to drive to Tamura city, a 90-minute round trip, to do grocery shopping and see doctors because Okuma and Tomioka, the closest neighbouring towns where they had used to run daily errands, were still under evacuation orders.

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[41] Information obtained from the first interview with T.K. (male in his 60s), a returnee, conducted in his residence in Kawauchi village on 21 October 2014 (Interviewer: R. Hasegawa and C. Fassert).

[42] Idem.

[43] The term used in official documents and by governmental officials to describe a consultation meeting with residents.

[44] Many media reports described the strong opposition expressed by the evacuees in detail during the meeting (cf. Mainichi Shimbun, Toward Lifting the Evacuation Order: Kawauchi Residents' Heated Protest (Original title: Hinanshijikaijo he: Fukushima, Kawauchi mura noJumin ha mouhanpatsu) on 17 August 2014)

Many inhabitants were therefore in favour of postponing the EO to be lifted; so the arguments of the municipality were not accepted by all. The District Head, who attended the meetings where the matter was discussed, expressed his frustration[45]:

"*The scenario was exactly the same as the previous case in Tamura city (where an evacuation order was lifted in April 2014). No matter what we say, the government will lift the order anyway*".

When the EO was lifted in Tamura city - the very first lifting of an EO, the then Deputy Minister of the Minister of Economy, Trade and Industry (METI), which was responsible for matters related to EZs, was quoted as saying, 'lifting of EOs will be done based on the *government's judgement*'[46]. At the time, only 6.7 percent of Tamura evacuees expressed willingness to return; 34.5 percent were in favor of return if certain conditions were met (Tamura City et al., 2013).

Another evacuee (female, in her 60s), who returned as soon as the EO was lifted and was happy to be back home, expressed unease at the way the government operated[47]:

"*The government organized consultation meeting with evacuees only twice. Even if I was in favor of the order being lifted, I was surprised to see that the government forced it despite strong opposition from the evacuees. I was shocked to see that the government, once decided, would not listen to the concerns of residents*".

Some inhabitants did not come back to Kawauchi. From the opinion survey conducted in December 2014 after the Green Zone evacuation order was lifted, the main reasons for non-return of the residents were listed as follows[48]:

- worry over radiation risks;
- non-return of neighbors and friends;
- lack of medical and social infrastructure;
- poor access to schools (high school) and work places (those with jobs outside the village).

After the return was organised and people had been living for a few years in a still partly contaminated environment, new concerns emerged. The Mayor of Kawauchi, Yuko Endo explained:

"*In the beginning, the returned residents paid much attention to what they eat in order to avoid internal contamination. But five years after the accident, whole body counter exams started to detect radioactivity in residents' bodies, which means that the*

[45] Interview with T.K. on 21st October 2014, *Op.Cit.,* p.21

[46] Mainichi Shimbun (2014), *Hinankaijo: "Kanryou ha atamaga iindesu", hantai oshikiru, Fukushima* (Tamura city, Fukushima: Lifting the evacuation order on 1 April. (The government) pushed through its judgement), "ministry officials are clever"), 24 April 2014

[47] Interview with Ms A. conducted in her residence in Kawauchi village on 19 March 2015, Interviewers: R. Hasegawa and C. Fassert.

[48] Reconstruction Agency Website: http://www.reconstruction.go.jp/topics/main-cat1/sub-cat1-4/ikoucyousa/20150220_ikouchousa.pdf

residents started not to pay attention to contamination and to eat everything without restriction (forest mushrooms and mountain vegetables, for example[49])".

3.4 NARAHA TOWN

3.4.1 GEOGRAPHICAL SITUATION

Naraha town is located in the Hama-dori region, along the coastal line facing the Pacific Ocean. It has an area of 103 km^2 of which more than 70% is covered by mountains and forest[50]. Human habitation is concentrated on the flat plain, which represents only 20% of the territory. Kido River runs through the town and its spring, managed by Kido dam, provides drinking water for the inhabitants. In its territory, Naraha co-hosts, with the town of Tomioka, the Fukushima Daïni (No.2) Nuclear Power Plant (F2NPP), situated 10-20 km from Fukushima Daiichi (F1NPP). Naraha also co-hosts J-Village, the National Football League training facility, together with Hirono town, where Japanese professional football teams used to come for training before the accident.

3.4.2 DEMOGRAPHICAL AND ECONOMIC SITUATION (BEFORE THE CATASTROPHE)

The towns counted 7,700 inhabitants in 2010, of which 26% were elderly (over 65 years old)[51]. Main economic activity was agriculture. Since the town hosts the F2NPP, many residents worked in NPP-related jobs and businesses.

3.4.3 THE ACCIDENT AND THE EVACUATION OF NARAHA

Situated within a 10-20 km radius of the F1NPP, the town's entire territory was placed under compulsory evacuation order from March 2011 to September 2015 (four and a half years).

According to interview with municipal employees, the municipality had decided of its own accord to evacuate residents - before the official evacuation order was issued by the government on 12 March 2011 (Naraha's decision was taken at 8:00; that of the government, at 18:25), thereby confirming the analysis of the NAIIC report[52]. The town was able to take this decision in a timely manner thanks to prompt and reliable information concerning the critical condition of F1NPP from employees at another TEPCO-run F2NPP, located within the town. Naraha decided to evacuate their residents first to Iwaki, one of the major cities in the Fukushima prefecture, located 8-10 km south of the town along the coast. When the second hydrogen explosion occurred at F1NPP on 14 March 2011, the municipality decided to evacuate the residents further, to Aizu-Misato town in the Aizu region, located 170 km west of Naraha town. But as the situation at F1NPP slowly stabilized, a majority of residents chose to stay in Iwaki city. The municipality thus opened two temporary offices: one in Aizu-Misato and the other in

[49] This remark mirrors our interviews with inhabitants, mostly the seniors, of our "first category" (Returning without controlling) but it seems that the increase in positive WBC does not affect only senior people, which is more of concern.

[50] Fukushima prefecture website:
https://web.archive.org/web/20160304113022/http://www.pref.fukushima.lg.jp/sec/11055a/bunkakairou24.html

[51] Naraha Town website

[52] Op. cit. footnote 5.

Iwaki. In 2013, 76% of Naraha residents were living in Iwaki city as evacuees. The temporary offices were closed and returned to Naraha when the EO was lifted on 5 September 2015.

Following the accident, J-Village became *de facto* the TEPCO Headquarter for F1NPP cleanup activities, used essentially for workers to eat, rest, and change clothes before and after working at F1NPP, and for TEPCO employees to sleep. Some of the Naraha evacuees interviewed for the present research voiced concerns over the presence of these cleanup workers in town due to this facility - unaccompanied men in general - and feared insecurity created by their presence.

Time	Event
11 March 2011	F1NPP Accident
12 March 2011	Mayor's decision to evacuate all residents to Iwaki city (8:00) Evacuation Orders (10 km, then 20 km radius) from the government (17:39, 18:25)
14 March 2011	Explosion of Reactor No.3 at F1NPP
16 March 2011	Mayor's decision to evacuate residents further to Aizumisato Town
30 April 2012	New Mayor elected (Mr. Matsumoto)
May-July 2012	Town Consultation with residents (34 times, 1,260 participants)
Jan-March 2013	Town Consultation with residents (17 times, 537 participants)
Sep-Nov 2013	Town Consultation with residents (15 times, 431 participants)
April-May 2014	Town Consultation with residents (12 times, 539 participants)
29 May 2014	Mayor's declaration for return after April 2015
Jan-March 2015	Town Consultation with residents (27 times, 691 participants)
6 April 2015	Start of Pre-return Homestay and Preparation Period declared by the government
April-May 2015	Government Consultation with residents (12 times)
June 2015	Government-Town Consultation with residents (8 times)
5 September 2015	Lifting of EO

Table 4: Chronology of events in Naraha town

3.4.4 LIFTING THE EVACUATION ORDERS

3.4.4.1 Town process for organizing the LEOs

Unlike Kawauchi village, which relied on the expert committee to judge the 'conduciveness of return', Naraha town adapted a strategy to intensively consult and listen to the concerns and desires of its residents on the issue of return. First, the town conducted regular opinion surveys among its residents, in collaboration with Reconstruction Agency, or independently. While Kawauchi village organized surveys only after the lifting of the EO in December 2014, Naraha town conducted a total of nine surveys, of which the first was organized as early as August 2011[53]. The town's other strategy was to organize regular consultation meetings with residents. After the election of a new Mayor in April 2012, a total of five series of consultation were organised between 2012 and 2015 (the number of residents who participated varied between 431 and 1,260 per series)[54].

After intensive consultations with residents, the town office defined a Return Programme in March 2014[55]. The Plan identified two essential conditions for return: ensured safety and restoration of daily-life infrastructure, and 24 criteria were established to gauge fulfilment of these conditions. The town assessed these criteria in consultation with residents, Town Assembly, and two Expert Committees established in 2013. After a three-month period of evaluation, the Mayor finally pronounced the final assessment result on 29 May 2014: most conditions for return had been fulfilled, but the exact timing of return would be decided after April 2015.

During interview, one town official conceded that this declaration was intentionally vague with regard to the timing of return because there were still many opposing voices among the population[56]. The opinion survey conducted in January 2014, three months prior to the publication of the Return Programme, showed that only 8% of evacuees wished to return as soon as possible, while around 60% were either undecided or did not wish to return (Naraha town et al., 2014) (Figure 1).

[53] Print-out of PPT presentation provided by the Naraha town; from interview with an employee of the town on 24/03/2015 and the Reconstruction Agency website

[54] Print-out of PPT presentation provided by the Naraha town; from interview with an employee of the town on 24/03/2015

[55] http://www.town.naraha.lg.jp/information/files/%E5%B8%B0%E7%94%BA%E8%A8%88%E7%94%BB-2.pdf

[56] Interview with T.E. at Naraha Temporary Office in Iwaki city on 23 October 2014 (Interviewers: R. Hasegawa and C. Fassert)

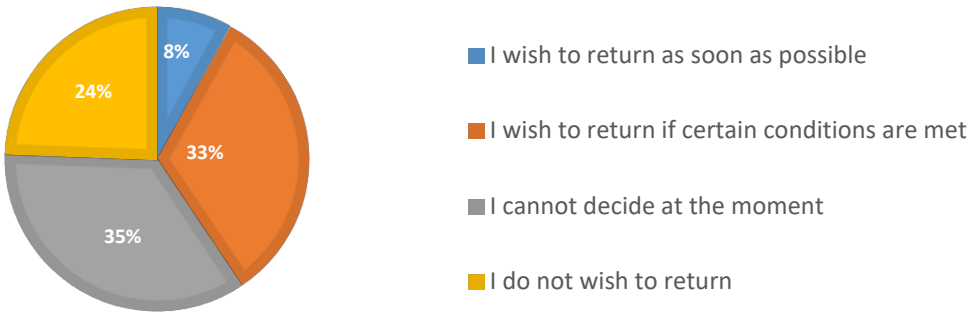

Figure 1: Result of opinion survey in Naraha (January, 2014)

Source: Naraha town et al., 2014.

During field interviews, some of the evacuees expressed satisfaction at the approach taken by the town authority. One evacuee, in charge of a temporary shelter unit in Iwaki city, said:

"*I feel that our voices have been heard by the town officials. But I fear that the government and TEPCO are creating huge pressure for the EOs to be lifted. They act as if they want to make evacuees return home as soon as possible. The town office is sandwiched between this governmental pressure and residents' concerns. Residents are asking the town administration to hold back such pressure from the government until the living conditions are genuinely met and are truly favourable for return*".[57]

3.4.4.2 Expert committee for return

Naraha town established two expert committees in 2013, with the aim to better respond to the worries and concerns of the residents, as well as to advise the town in the evaluation of criteria for return. One of them was the Decontamination Evaluation Committee, headed by Professor Tatsuhiko Kodama, Head of the Isotope Science Centre at University of Tokyo. Professor Kodama is one of the prominent figures among experts following the Fukushima accident. In July 2011, he was invited to provide his expert opinion as regards the post-Fukushima situation, at the Committee on Welfare and Labour of the Lower House of the Japanese Diet (parliament), where he gave a passionate speech and scolded politicians present in the room who, according to him, were utterly inactive and not doing much to protect children in Fukushima[58]. He said:

"*The fact that no such thing (installing semiconductor detectors everywhere to test food contamination) whatsoever has been done after three months fills my entire being with anger…what on earth is the Diet doing when 70,000 people are uprooted from their homes?*"

The video of that Diet Committee meeting circulated widely *via* social media, and he became a celebrity among the Japanese population. Having also watched the video, the

[57] Interview with M.T. (male, in his 70s) conducted in his temporary shelter in Iwaki city on 23rd March 2015 (Interviewers: R. Hasegawa and C. Fassert).

[58] The video is available from https://blogs.wsj.com/japanrealtime/2011/08/16/scientist-lambastes-lawmakers-becomes-youtube-star/; and the transcript in English is available at https://apjjf.org/2011/9/32/Kodama-Tatsuhiko/3587/article.html

Mayor of Naraha asked Professor Kodama in person to become the advisor for his town[59]. The Committee's work included conducting radiation monitoring, evaluating the radiological situation of the town, and providing radiological protection advice and risk communication. But the main focus of the Committee's activities was to ensure the safety of water taken from Kido dam. Since the Ministry of Environment's survey found 18,700Bq/kg of caesium134 and 137 contamination in the soil at the bottom of the dam, which had been conducted in July 2014 upon request from the town, the safety of drinking water was one of the biggest concerns of residents considering the question of return[60].

The other committee worked on nuclear safety surveillance of Fukushima Daiichi (No.1) and Daini (No.2) Nuclear Power Plants. As explained above, Naraha hosts F2NPP jointly with Tomioka town. In order to respond to the concerns of residents over the situation of nuclear power stations in proximity, especially that of the crippled F1NPP, the town established the committee of nuclear experts to monitor the activities of two NPPs. The Nuclear Surveillance Committee was headed by Professor Tetsuo Matsumoto (Nuclear Engineering) of Tokyo City University, who is originally from Naraha town[61]. A town official commented during interview that these committees had also been created to better reassure residents, since "*residents seem to be more reassured when experts explain things, rather than the town employees*"[62].

3.4.4.3 Governmental Process: Preparation Period for Return and Explanation Meetings

According to the declaration of the Mayor made in May 2014, Naraha town was to decide on the timing of return in or after April 2015. But on 30 March, the government unexpectedly announced the start of the Pre-return Homestay and Preparation Period in Naraha. As in Kawauchi village, the government organized "Explanation Meetings to Residents" once the Preparation Period was launched. The first series of meeting was conducted during April-May 2015, ostensibly to consult with evacuees about the timing for lifting the evacuation order. But according to a town official who attended the meetings[63], although the majority opinion of evacuees was that it was too soon to lift the EO, government officials insisted on going ahead because they considered that three conditions[64] established by the Nuclear Emergency HQ had been met in Naraha. One

[59] Interview with Mayor at Naraha Town Office in Naraha town on 13 October 2016 (Interviewers: R. Hasegawa, C. Fassert and R. Kojima)

[60] Naraha Town website: http://www.town.naraha.lg.jp/information/files/%E2%91%A226.12.10.pdf

[61] Information provided by T.E. during interview at Naraha Temporary Office in Iwaki city on 24 March 2015 (Interviewers: R. Hasegawa and C. Fassert)

[62] Interview with T.E. at Naraha Temporary Office in Iwaki city on 24 March 2015 (Interviewers: R. Hasegawa and C. Fassert)

[63] Interview with T.E., a municipal official, conducted at the Town Office in Naraha, shortly after the EO was lifted on 29 September 2015.

[64] Namely: 1) ambient radiation dose less than 20mSv/year; 2) physical and social infrastructure is rehabilitated; and 3) ample consultation with inhabitants.

evacuee who attended one of the meetings expressed her frustrations[65]:

"*I felt that there was always no answer from the government or the municipality to the questions we asked. Everybody felt that their worries or opinions were simply ignored. I am deeply disappointed in the Mayor, who blindly follows the policy set by the government*".

Another evacuee who has never attended these meetings answered when we asked him why he did not go[66]:

"*I think [these meetings] are simply a "performance" by the government, so it can put down on paper that 'it had consulted the residents'. Whatever residents say, the government would simply repeat what it had already decided. From this accident, what I've learned is that the government does not sincerely protect the population*".

As was the case in the previous EO liftings in Tamura and Kawauchi, confronted with strong opposition from evacuees and Town Assembly members, the government prolonged the Preparation Period for several months. Subsequently, it announced without consultation in July the decision to lift the evacuation order on 5 September 2015. Asked by a journalist about the remaining concern of the residents regarding the safety of drinking water, the Vice Minister of METI was famously quoted as replying, "*whether [people] consider it safe or not safe, it is their psychological problem [not a scientific one]*"[67].

3.4.4.4 Reaction of the residents

Surveys of Naraha residents conducted in 2015 and 2016 indicated the following as main reasons for non-return or hesitation to return[68]:

- worry over drinking water from Kido dam;
- long-term risk from the crippled nuclear station F1NPP (clean-up and decommissioning activities);
- radiological risks (radiation levels around their houses, exposure risk from temporary disposal sites for decontaminated soil);
- security concerns due to the presence of many clean up/decontamination workers from outside the area of Fukushima (numbers around 1,000);
- lack of sufficient medical facilities and other social and commercial infrastructures (supermarkets, pharmacies, elderly homes, etc.).

Field interviews with evacuees indeed indicate that many remained anxious about the situation in the town, and suspicious of the 'conduciveness of return'. The issue of drinking water was also often referred to by evacuees during interviews. The town

[65] Interview with Y.I. (female, in her 40s), a municipal social worker, conducted at her work place, Kami-Arakawa temporary shelter in Iwaki city on 29 September 2015. Interviewer: R. Hasegawa.

[66] Interview with M.S. (male, in his 40s), a municipal social worker, conducted at his work place, Onahama-Aikojima temporary shelter in Iwaki city on 30 September 2015. Interviewer: R. Hasegawa.

[67] Mainichi Shimbun (2015), *Naraha machi hinankaijo he: fuku-keisansou "Anshin ha kokorono mondai"* (Lifting Evacuation Order in Naraha: Vice Minister of METI 'Anshin is a matter of psychology'), 6 July 2015;

[68] Reconstruction Agency Website: http://www.reconstruction.go.jp/topics/main-cat1/sub-cat1-4/ikoucyousa/

authority had thus mobilized considerable resources - including the intervention of the State – to address this particular concern. One measure taken was the installation in April 2015 of a water monitoring system at the water purification plant, which is operational 24 hours a day and capable of measuring radioactivity every hour. The hourly measurement data was made available online in real-time[69]. A 24-hour filtration system against water turbidity - the amount of suspended material in liquid - was also set up at the plant, in order to avoid the presence of contaminated mud in the water, and a germanium semiconductor detector was placed at a community center to enable residents to verify water safety themselves. Furthermore, water testing at the site of dam, previously conducted by sampling at one spot, was now increased to 16 spots. As an ultimate gesture, the Deputy Minister of METI at the time, Mr. Takagi, visited the water purification plant on 3 April 2015 and demonstrated the safety of the drinking water by drinking a glassful taken from the plant in front of cameras and journalists[70].

Despite these significant efforts on the part of the authorities to reassure the population, mobilizing considerable financial and technical resources, residents remained suspicious. One evacuee living in the temporary shelter in Iwaki said[71]:

"*Experts say that it is safe to drink water because they are taking it from the surface of the dam. But when you know that there is the mud contaminated as much as 15,000Bq/kg at the bottom of dam, I don't feel reassured. Scientists say that it is* anzen *[safety assessed by science] but I don't have* anshin *[feeling of safety] in such a situation. What's more, the mountains surrounding the dam aren't decontaminated, which means that every time it rains and snows, contaminated water could pour into the dam*".

Another evacuee also explained why she was not convinced by the reassuring message from the municipality about the drinking water[72]:

"*Drinking that water for two or three days may be fine, but it would be different if we were to drink it for the rest of our life*".

Radiation risk was also frequently mentioned by the evacuees as a main cause of their reluctance to return. Other reasons for not returning included: the presence in front of their residences of *kariokiba* (temporary disposal sites for decontamination waste)[73], and also the change of general atmosphere in the town due to the presence of cleanup and decontamination workers living in temporary housing units built by subcontractors in town, and the related security concerns. Moreover, one element not clearly evoked in official surveys, but cited by almost all evacuees during field interviews, was the

[69] Naraha Town (2015), Naraha machi no fukkou ni muketa torikumi ni tsuite (Measures for the Reconstruction of Naraha Town), August 2015: http://www.town.naraha.lg.jp/information/files/27.9.1%E2%91%A5.pdf

[70] NHK Fukushima broadcast on 3 April 2015:
https://blogs.yahoo.co.jp/fukushima_nuclear_disaster_news/35556862.html

[71] Interview with M.T. conducted in his temporary shelter in Iwaki city on 23 March 2015 (Interviewers: R. Hasegawa and C. Fassert).

[72] Interview with M.I. (female, in her 40s), a municipal social worker, conducted at her work place, Takaku No.8 temporary shelter in Iwaki city on 28 September 2015. Interviewer: R. Hasegawa.

[73] The government plans to stock the waste from decontamination activities in the Interim Storage Facility (ISF) which is to be established in on the periphery of the F1NPP. But in January 2018, only 63.1% of private land owners have signed on the lease contract with the State, and the Facility is not yet completed (Ministry of Environment Website). As a result, the municipalities were obliged to create many *kariokiba (*Temporaryl Disposal Site*)* within their towns to stock the decontamination waste until the ISF will be completed and the waste will be transported there.

importance of former neighbors' and friends' choice to return or not: people consulted their neighbours; they did not want to return alone.

3.4.4.5 The difficulties met by the municipality

Decontamination operations ended in March 2014. After decontamination, average dose was reduced from 0.70 to 0.38μSv/hour, but in no area was average dose reduced to 0.23μSv/hour as per the Ministry of Environment's initial goal. The operation itself had provoked outrage and distrust among residents, due to cases where decontamination workers misplaced removed soil, cut trees without residents' consent, or did not follow proper decontamination procedures. From June 2014, the town conducted latest measurement campaign, which showed lower dose rates than measurements taken directly after the decontamination.

As regards radiation monitoring, Naraha town monitors radiation doses every month, independently from government measurement by fixed monitoring posts, using mobile scintillator counters over 100 spots in the town. In addition, monthly radiation monitoring around the *kariokiba*[74], conducted by MoE, is accompanied by resident volunteers who verify government measurement.

In 2014, when discussing the main concerns about lifting the evacuation orders and organizing the return of residents, Mr. Toshiyuki Endo, a municipal officer,[75] mentioned that most of the staff of nursing homes for the elderly in the town had already found jobs in other cities; it was uncertain whether those employees would come back to Naraha upon the return of the population. Another concern was that the number of children going to schools in Naraha town decreased from 686 to 160 (after the accident, public schools in Naraha were also relocated to Iwaki city, using temporary buildings). Since the majority of children had integrated local schools in Iwaki city and elsewhere, town officials worried that these children and their parents would not come back to Naraha when the town returned to its original situation. Lastly, there is still a problem with the rehabilitation of individual homes. Out of the total 2,400 houses in town, 70% were evaluated as severely damaged and in need of repairs. But due to decontamination works and other reconstruction projects, it was difficult to find masons or construction workers. It would probably take several years for individual homes to be repaired, thus delaying the actual return of the population. In addition, Mr. Endo[76] explained that in evacuee surveys, the current situation of the Fukushima Daiichi NPP and the radiation dose in town are the two greatest concerns expressed by the evacuees.

According to town officers interviewed, this was due to the fact that residents lost trust in the authorities since the accident. The current state of the damaged NPP, where many incidents - such as leakage of contaminated water and electricity blackout due to rats – were being reported by the media, does not reassure them and, in addition, the fact

[74] Temporary waste storage

[75] Interview Mr. Toshiyuki ENDO, Deputy Director, Reconstruction Promotion Division Naraha Town, 23 October 2014 Interview Interviewers: R. Hasegawa and C. Fassert.

[76] Interview Mr Toshiyuki ENDO, Deputy Director, Reconstruction Promotion Division Naraha Town (in IWAKI CITY) Mr Masahiko SAKAMOTO, Section Chief, Radiation Management Division. 23 October 2014. Interviewers: R. Hasegawa and C. Fassert.

that such a grave accident did indeed occur despite guarantees previously provided by TEPCO and the government about the safety of these installations, was also causing mistrust among residents.

3.4.4.6 The status of return of the residents since lifting of EO

In April 2017, a year and a half after the EO was lifted, Naraha town reported that 16.5% of former residents had returned and 20.9% of its registered residents (including newcomers who came to live in town for new job opportunities) were currently living in town 77.

Since the lifting of EO, new residents came and settled in town, attracted by new job opportunities related to the F1NPP cleanup or others created by State subsidies. From April 2017 onwards, the town updated only the number of residents currently living in town, including newcomers – it updated no data on the percentage of return of evacuees. As such, Naraha town reported that 33.62% of registered residents were now residing in town in February 2018, but this statistic did not indicate how much of this 33.62% comprise the former evacuees.

3.4.5 GEOGRAPHICAL SITUATION

Watari is a district located on the east side of Fukushima city, the capital of Fukushima prefecture. Fukushima city is in the Naka-dori region, the political center of the prefecture. The Naka-dori region, despite being situated between 50-70 km from the crippled F1NPP, was situated in the passage of the radioactive plume and therefore found itself with many contaminated spots in the wake of the disaster. Some of these spots had radiation levels which equaled those of the official EZs.

The Watari district is situated close to the city centre where the Fukushima Prefectural Government Office building stands. Fukushima city covers an area of 767 km^2, of which more than 66% is covered by mountains and forest[78]. It is the political capital of the prefecture, while Kôriyama city is its economic capital. In terms of population, Iwaki city has the largest number of inhabitants within the Fukushima prefecture, followed by Kôriyama city and Fukushima city.

3.4.6 DEMOGRAPHICAL AND ECONOMIC SITUATION (BEFORE THE ACCIDENT)

In the 2010 population census, Fukushima city had 292,590 inhabitants. Watari district counted 16,541 residents[79]. The main economic activity of the city is agriculture. Fukushima city is famous for peach and pear production, and had the largest agricultural output value in the prefecture.

[77] Mainichi Shimbun (2017), *The proportion of residents living in Naraha town reached 20%: reopening of a school accelerates return of residents* (Original title: Naraha machi kyojuritsu 2wari ni: gakko saikaide kikankasoku), 8 April 2017

[78] Fukushima City website:
http://www.city.fukushima.fukushima.jp/nourin-rinmu/machizukuri/hukushima_sinrin.html

[79] The number provided by a City Office employee during the interview on 22 October 2014.

3.4.7 CONSEQUENCES OF THE ACCIDENT AND NON-EVACUATION

3.4.7.1 Non Recognized Hotspots: decision-making process, issues at stake, difficulties

Despite being 60 km from F1NPP, the city was severely affected by the radioactive fallout from the crippled plant due to the passage of the radioactive plume. In June 2011 (three months after the accident), the municipality measured ambient radiation dose all over the city and found spots with 3.83 and 4.05 µSv/hour inside the Watari district, which exceeded the criteria (3.8 µSv/hour = 20 mSv/year)[80] fixed by the Nuclear Emergency HQ for issuing evacuation orders[81]. Out of six spots where the survey detected the dose over 3.4 µSv/hour, four were located within the Watari district. The same random survey found a total of 182 spots throughout the city with ambient radiation doses which exceeded 2.0 µSv/hour. But no evacuation order – or designation of Hotspots - was issued by the government.

In June 2011, the government began to designate so-called Hotspots in areas located outside the Evacuation Zones found to have radiation doses over 20 mSv/year. Once recognized, financial compensation would be paid by TEPCO for eventual evacuation if the concerned families chose to do so. As described in the Chapter 2, Hotspots were therefore not, strictly speaking, evacuation orders, but rather a recommendation for evacuation.

Despite the provisional policy of the Ministry of Education, Culture, Sports, Science and Technology (MEXT), which fixed 3.8 µSv/hour as an equivalent hourly dose of 20 mSv/year[82], municipalities set up different criteria for designating Hotspots. Date and Minamisoma cities adopted 3.0 µSv/hour at 1m above the ground as a threshold for designating the Hotspots. In addition, they created special thresholds for children and pregnant women: 2.7 µSv/hour at 1 m above in Date city, and 2.0 µSv/hour at 50 cm above the ground in Minamisoma city[83]. From the government's internal meeting minutes - declassified in 2014 at the request of Date city residents[84] - we learn that Date city had also included the area with the dose range between 1.3 - 1.7 µSv/hour in the Hotspots, taking into account the presence of children and pregnant women in the area.

[80] Source: MEXT: http://www.mext.go.jp/a_menu/saigaijohou/syousai/1307458.htm

[81] The ambient dose is measured at 1m above the ground. The data is drawn from Fukushima City website:

http://www.city.fukushima.fukushima.jp/kankyo-houshasen/bosai/bosaikiki/shinsai/hoshano/sokute/shinaisokute/documents/8901.pdf

[82] MEXT website: http://www.mext.go.jp/a_menu/saigaijohou/syousai/1307458.htm

[83] The presentation made by T. Sakaue (Representative of NGO, Fukuroo no kai), entitled Evacuation Zones and Nuclear Compensation on 5 September 2011 in a public lecture organised by NGO, Frinds of Earth (FOE).

[84] The request was made on 16 May 2013 and the document was disclosed to the public on 5 November 2013 by the authority of the Prime Minister. The documents are available at: https://clearing-house.org/?p=983 The particularly relevant document is found at: http://clearinghouse.main.jp/web/cao0012.pdf

When Date city was designated with 104 Hotspots in June 2011, Fukushima city also conducted its first radiation survey. Eight houses in Watari district were found to have doses of over 3.1 µSv/hour, the designation threshold fixed by Fukushima city[85]. Despite this result, the MEXT did not dispatch its team for a field survey until August 2011. Upon a request from inhabitants, the NGO Friends of the Earth (FOE)[86] , in cooperation with Fukurô-no-kai[87], organized radiation surveys of the air and soil in Watari and Oonami districts in September 2011, with help of Professor Tomoya Yamauchi, specialist in radiation physics at Kobe University. Their survey found spots with 2.7, 3.0 and 3.87 µSv/hour at 1 m above the ground, and 157,274 Bq/kg from the soil taken at the Yahata Shrine and 38,464 Bq/kg from a house garden within the District (FOE and Fukuro-no-kai, 2012[88]). Strong requests were made by these NGOs and Watari residents; the government and the city authority organized a meeting with residents on 8 October 2011. The meeting was reported to last five hours, and was attended by as many as 400 residents; there was heated debate between inhabitants who requested the designation of Hotspots and government and city officials who insisted on decontaminating the district rather than evacuating residents. According to reports by FOE, members of which attended the meeting, a government official explained that they had found only two spots with the dose over 3.1 µSv/hour from their own survey conducted in August 2011. The government and city authorities explained that since both houses had declined the offer of assistance for evacuation (a Buddhist temple and an old couple), they had decided not to designate them as Hotspots. Residents at the meeting, however, asked the authorities to designate the whole district as a Hotspot zone so that the inhabitants who wished to evacuate could do so (FOE and Fukuro-no-kai, 2012). They also made a special plea to make possible evacuation of families with small children, even temporarily. But requests for evacuation were rejected by the authorities present at the meeting.

During another meeting with the inhabitants organized in the Oonami district, in the east of the Watari district bordering Date city, where a high radiation dose was also found, the city official was reported to have said: "*evacuation [of inhabitants] will make the economy shrink. We'd like to implement decontamination with the cooperation of inhabitants*"[89].

[85] Fukushima City website: http://www.city.fukushima.fukushima.jp/kankyo-houshasen/bosai/bosaikiki/shinsai/hoshano/sokute/shinaisokute/documents/8901.pdf ; Sakaue, T. *op. cit.*

[86] FoE Japan was established in 1980 as a member of International NGO, Friends of the Earth International, based in Amsterdam, Netherland.

[87] It is a Japanese anti-nuclear NGO which has been working for years to stop the use of nuclear energy in Japan. After the Fukushima accident, Fukuroo-no-kai conducted measurement of radioactivity in many towns in Fukushima and informed the public as an independent source of information. Later on, they worked with the French NGO ACRO (Association pour le Contrôle de La radioactivité dans l'Ouest).

[88] Also, the report of the NGO, FOE (Friends of Earth), whose members participated in the meetings (in Japanese): F.O.E and Fukuro-no-kai, (2012). For establishing the "right for evacuation": the frontline on the issues of self-evacuation and compensation, the case of the Watari district of Fukushima city (Original title: "Hinan no kenri" kakuritsu no tameni: jishutekihinan no baishomondai to hinanmondai no saizensen). http://www.foejapan.org/energy/news/p110909.html

[89] Information provided by Professor T. Yamauchi of Kobe University during interview on 24 May 2016; Prof. Yamauchi participated in the meeting held in the Oonami district.

Professor Tomoya Yamauchi of Kobe University explained during interview[90]:

"*The choice of decontamination was thus imposed on the residents without any other options. It was a pre-selected policy, without having made any cost-benefit analysis with alternative protection measures. I basically think that this is because the government had chosen economy over protection of citizens […] in its post-accident policies […]. Fukushima city is the capital of Fukushima prefecture, where the Shinkaisen[91] runs through. The recognition of Hotspots would have had a significant symbolic impact on the Naka-dori region as a whole [the political and economic center of the prefecture]. They might have feared that the demand for evacuation would increase in other major cities of the region such as Kôriyama and Nihonmatsu if Hotspots were to be designated in Fukushima city*".

During interview, a resident who had been a member of the City Assembly for 16 years suggested similar reasons behind the authority's firm refusal to designate Hotspots[92]:

"*Fukushima city is the prefectural headquarter. So if it becomes under evacuation orders, it would give an image to the public all over Japan that the whole Fukushima prefecture is in danger. Because the Watari and Oonami districts are part of the "Fukushima city", no evacuation order was issued*".

In such circumstances, Professor Yamauchi suggests that the City Office may not have had any choice. When he met the Mayor of the city at the time, he remembers him complaining that "*the government would not pay for the evacuation of residents*"[93].

A self-evacuee from Watari reports hearing city employees giving the same response when residents asked why the city did not recognize Hotspots[94]: "*[because] there is no designation [of Hotspots] by the government*"; "*as for the Watari district, please let us decontaminate first. If radiation doesn't decrease after the decontamination, we may consider other options*".

But a number of news articles reported a different view. For example, on 4 November 2011, the *Mainichi Shimbun* (one of the major newspapers in Japan) referred to a governmental source, who was quoted as saying: "*I think the [city] authority cannot really decide for evacuation because, once Hotspots are designated in the prefecture's capital city, population drain or 'harmful rumors'[95] may occur*"[96].

From the field interviews, it was not possible to identify where responsibility ultimately lay - city authority or government - for the decision against Hotspot designation for Fukushima city. But internal meeting notes released on the same issue with regards to

[90] Professor T. Yamauchi; interview conducted at his office, Kobe University, in Kobe city on 24 May 2016 (Interviewers: R. Hasegawa and C. Fassert)

[91] High-speed train that connects Tokyo and Tohoku/Hokkaido.

[92] Interview with M.T. (male, in his 80s) conducted in his residence in Watari district, Fukushima city, on 19 September 2015, Interviewer: R. Kojima.

[93] From the interview on 24/05/2016.

[94] Interview with Y.N. (female, in her 40s) conducted in her temporary flat in Sendai city on 26 March 2015 (Interviewer: R. Kojima)

[95] 'Harmful rumors', in the context of Fukushima, pertains to ostensibly groundless rumors concerning contamination which would hurt the image of Fukushima or that of its agricultural products.

[96] Mainichi Shimbun on 4 November 2011, op. sit., p.5

Date city suggest that the initiative of municipality Mayors played an important role for the designation of Hotspots, even though the final decision remained in the hands of the government authority.

When the city authority insisted on proceeding with the decontamination of the district in October 2011, decontamination policy had not yet been established by the government. As explained in Chapter 2.2, the Ministry of Environment produced the first policy only in November 2011, and the designation of target municipalities for decontamination was not defined until January 2012. Fukushima city officials were therefore insisting on decontamination without yet knowing whether the city would be included in the decontamination activities financed by the government. Under such circumstance, it was extremely difficult for the State and City authorities to convince the Watari residents to favour decontamination. The actual decontamination of the district started in April 2012 and was completed in October 2013, two years after the first Explanation Meeting organized by the State and the City[97].

3.4.7.2 Reaction of the residents and protests

This resolute attitude of the authorities regarding the designation of Hotspots in Watari angered many residents, who considered the decision unfair, compared to the situation of residents in other cities. The Representative of Watari District Residents Council described such a feeling during interview[98]:

"The authorities discovered two spots with radiation doses that would qualify as Hotspots but did not officially designate them as such, while in the neighboring Date city, many Hotspots were recognized by the authorities. This led many Watari residents to feel that they were not treated equally as a citizen".

A resident who created an association, Save Watari Kids, with other concerned parents living in the district, expressed his frustration toward the city administration[99]:

"*I understand that it was not easy for city officials to deal with the post-accident situation, but I was very disappointed that the city office simply followed the governmental position and did not take its own initiatives to protect its citizens. […] The city officials talk only about decontamination as if it is the solution to everything, to deal with all the consequences of the accident including the protection of children, and nothing else*".

A self-evacuee (female, in her 40s) living in Sendai city with her children also described her mistrust toward the authorities[100]:

[97] Fukushima city website: http://www.city.fukushima.fukushima.jp/josensoumu/bosai/bosaikiki/shinsai/hoshano/josen/shinchokujokyo/houtai12083101.html; Fukushima Community Portal Site "Momo Link": http://www.fukushima.jp/modules/portal/html/tokusyuu/096-01.html

[98] Interview with H.K. (male, in his 70s)conducted at Fukushima City Office on 22 October 2014 (Interviewers: R. Hasegawa and C. Fassert)

[99] Interview with Y.K. (male, in his 50s) conducted in a café in Fukushima city on 22 October 2014 (Interviewers: R. Hasegawa,C. Fassert and R. Kojima).

[100] Interview with Y.N. conducted in her temporary flat in Sendai city on 26 March 2015 (Interviewer: R. Kojima)

"[By the fact that neither the government nor the city did not want to recognize Hotspots] I felt that neither the government nor the city cared about the children in the Watari district. […] The government prioritized the evacuees from Evacuation Zones over our children. […] The actual house-by-house decontamination in the district only began after two years from the accident. The authorities let Watari children be exposed to high radiation dose for two years!"

Numbered at 16,541 before the accident, the inhabitants of the Watari district decreased to 13,250 by January 2018, which means that the district lost 20% of its residents following the accident[101]. Among those who stayed, there were a number of families who chose to evacuate children - often with the mother, while the father stayed on in the city for work. These self-evacuees have often faced financial difficulties as they have tried to keep up with expenses of two-households without official financial assistance. A resident of Watari whose husband and children evacuated to Hokkaido, explained her circumstance[102]:

"*We bought our house in Watari [before the accident], so we still need to pay back loans. I cannot therefore quit my job in Fukushima city. It is even more so now that my husband and I have to support the expenses of three households: one in Watari, the second in Hokkaido, and the third as my older son just started his college study last month*".

The resident survey conducted in May 2012 by Fukushima city found that 34 per cent of the city residents still wished to evacuate from the city, of whom 89 per cent said that they were worried about the future health of their children[103]. The internet-based survey organized in October 2011 by Friends of the Earth indicated that main reasons for not choosing self-evacuation were economic concerns and occupational circumstances (FOE and Fukuro-no-kai, 2012[104]); one in three residents felt 'trapped' in the city against their wishes, and were thus experiencing psychological distress. The status of these residents was referred to as *chiiki nai hinan* ("evacuation within community") or *seikatsu nai hinan* ("evacuation within daily lives") by Imai (2014) and Yokemoto et al. (2016), a form of life in suspension or restriction, where residents live like fugitives in their own communities, avoiding consumption of certain foodstuff, avoiding going to certain places, and constantly monitoring the radiation dose, which all ends up restricting and dictating their daily lives. The Japan Federation of Bar Associations (JFBA)[105] and the Save Fukushima Children Lawyer's Network (SAFLAN), prominent lawyers associations, asserted the "right to evacuate" for these residents, urging the government to grant support for evacuation to all residents living in the area with a dose of over 5 mSv/year

[101] Fukushima City Website.

[102] Interview with A.S. (female, in her 40s) conducted in a café in Fukushima city on 18 May 2016 (Interviewer: R. Hasegawa and C. Fassert).

[103] Asahi Shimbun (2012), 34% of residents in Fukushima City currently wish to evacuate, the City's survey found (Original title: "ima demo hinan shitai", fukushima shimin no 34%: shi tyousa) on 17 September 2012.

[104] F.O.E and Fukuro-no-kai, (2012). *Op.cit.*

[105] The entity which represents all Bar Associations and registered lawyers in Japan. All lawyers must register themselves at the Bar Association of the prefecture where his/her law firm is located as well as at JFBA.

because, according to the Japanese legislation standard, any area with a dose over 5.2 mSv/year is a Radiation Control Area, to which entry is strictly controlled[106].

But those who evacuated of their own accord also suffered a form of psychological distress, caused by stigmatization within their communities. Regarded sometimes as selfish, as disloyal, or even as deserters who abandoned communities in difficulty, self-evacuees often experienced criticism and were sometimes cut off from the original community, and left feeling isolated in their place of refuge (Hasegawa, 2013; 2015). The representative of Save Watari Kids (mentioned above), of which 20 out of 25 members had evacuated of their own accord, explained that many couples separated or divorced due to these pressures, and argued that the government should have accorded some sort of financial assistance for evacuation, even just a small amount or for a limited duration. A resident interviewed, whose children evacuated to Hokkaido with her husband, expressed her puzzlement at the attitude of the authorities[107]:

"*I don't understand why the effort to protect our children [by self-evacuation], which is considered to be a good thing under normal circumstances, has to be criticized and labelled as doing something wrong after the accident. Meanwhile, hiding risks from our children is somehow regarded as a good thing to do these days*".

In July 2015, a group of 3,107 residents from Watari district filed a claim to the Alternative Dispute Resolution (ADR) demanding compensation for psychological damage from TEPCO, which would amount to a maximum of 18.3 billion yen (180 million USD)[108].

3.5 A FOCUS ON THE MAYORS' DIFFICULTIES AND DILEMMAS (KAWAUCHI AND NARAHA)

3.5.1 INTRODUCTION

This section analyses specific issues which confronted the mayors of two evacuated towns and the roles the mayors had to play; it draws upon interviews conducted with the mayors of Naraha and Kawauchi[109] and their teams, as well as interviews at central government (MoE and Nuclear Regulation Authority).

From these interviews, we observed that mayors had often been torn between two imperatives: the central government policies and the residents' needs and requests. The mayors appear to crystallize tension between centralized decisions at State level, and the local - and divergent - concerns of the villagers. The mayors struggled between the push from central government, eager to lift the evacuation orders and encourage the return of inhabitants, and the interests and desires of the villagers, which vary greatly.

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[106] JFBA's statement on 4 October 2014 (https://www.nichibenren.or.jp/activity/document/civil_liberties/year/2013/2013_2.html)

[107] Interview with A.S, Ibid.

[108] ADR was created in August 2011 by the Dispute Reconciliation Committee for Nuclear Damage Compensation, placed under the auspice of the MEXT, in order to facilitate out-of-court settlements between parties and speed up the process.; Mainichi Shimbun (2015), Living with contaminated soil in own gardens: the anger of Watari residents in Fukushima city (Original title: Niwa no osendo to kurasu: Fukushima shi watari chiku jumin no ikari) on 28 July 2015

[109] Mr Yuko Endo, mayor of Kawauchi, Interviewers: Reiko Hasegawa, Christine Fassert, and Rina Kojima, 11th October 2016. Mr Matsumoto, mayor of Naraha, Interviewers: Reiko Hasegawa, Christine Fassert, and Rina Kojima, 13th October 2016.

Some, often very senior, inhabitants could be eager to come home (see cases detailed in Chapter 4 below), whereas other inhabitants - often younger and typically parents with young children – could be worried, and want to wait for a reduction in radioactivity. (cf. Chapter 4 on "returning or not", which presents various emblematic cases).

Other signs of divergence of interests were already discernible when the zoning status was modified, as Naraha evacuee Mr. TK explained in interview[110]:

"*In Naraha, an evacuation order was issued which designed Naraha as "Restricted Area" just after the accident. Access to this town was limited, a special authorisation from Police was needed to get there, and you had to take a medical exam after the visit. One year after, the mayor of Naraha and the government issued a new order as "zones ready for the lift of the EO" (Green Zone). This order was issued as if this town did not have any serious damage. Some evacuees were pleased to see this change of zone, because they could get to Naraha as they wanted, but others were not because they were about to receive less compensation, compared to residents of a town classified "difficult for return" (Red Zone).*

According to the legislation in place, mayors were in charge of lifting the evacuation orders, and had some margins for maneuvering; these margins were somewhat limited, but each mayor would choose a particular "style" of exercising those orders. The mayors were instrumental in associating central policing with local specificities. Through the choice of consultations with population, timing for lifting the Evacuation orders, mayors entered into a - sometimes harsh - negotiation process, which they regarded as a series of hardships to be faced.

But the approach of the present analysis is not normative, it does not consider that there could be such a thing as a unique and 'right' way to proceed at local level in the aftermath of a nuclear accident; this research demonstrates, on the contrary, that there were a variety of judgements linked to specific interests and views from inhabitants. The accent is also placed on the concrete democratic processes put in place by the Mayors, and how their limits might be criticized by inhabitants. The approach here has been to take into account the mayors' point of view, and how they mobilized implicit or explicit values to respond - with more or less success - to a given conundrum: how to organize the return of inhabitants to an evacuated village after an accident, without dismissing the standpoint of inhabitants who prefer NOT to return. The reasons and values evoked by interviewees may be framed as an "accountability" process, where they make clear what counts in their eyes, and how they made decisions.

3.5.2 KAWAUCHI MAYOR

3.5.2.1 Choosing experts

When he set up an expert committee for return, the Mayor of Kawauchi, Yuko Endo asked a prominent public expert to join: "*I asked Professor Noboru Takamura of Nagasaki University, who kindly accepted to assess the soil and water contamination level in the village and to judge whether return would be feasible*". Prof. Takamura was one of the Fukushima Radiation Risk Management Advisors appointed by the Fukushima prefecture

[110] Mr TK (58 years old), Naraha evacuee, 16th March 2015, Interviewer: Rina Kojima.

in the wake of the accident, together with Professor Shunichi Yamashita of Nagasaki University.

Mayor Endo insisted that he tried to elaborate his own view on radiation risks:

I read a number of books on Fukushima and Chernobyl accidents, but I did not trust them because of their absence of concrete data. I saw these data in Moritani's book [see below].

I went to listen to Dr Takamura's conference, and I learnt that it was possible to live in Kawauchi village again, by paying attention to radiation levels. I asked him to take measurements in Kawauchi; he went to conduct measurements of soils and water, with students and researchers, and said it was not a worrying situation [in December 2011]. The other expert whom I trusted on matters related to radiation risk was Masanori Moritani[111]*, and his book, 'Spell of 1 Millisievert'.*

3.5.2.2 "The Right to Return"

"Return is a right" appears to aptly summarize the guiding principle of the Mayor of Kawauchi in the process of lifting the evacuation order for his town. From June 2011, he started official preparation for return to the village. His decision was justified first by the radiation dose, which he found to be "relatively low" in Kawauchi, and also by the situation of the crippled plant, which he considered to be "stabilized". When questioned by a journalist after this declaration, he explained, "*I also worried that the residents would lose the desire to return to the village if they had lived too long in Kôriyama city and got used to convenient city life, where there are many specialized doctors and shopping facilities*"[112]. Behind the decision, there was also the Mayor's fear of for the survival of the village.

But the primary motive the mayor emphasized was the "low level" of radiation dose in the village

"*At the Big Palette* [large business convention hall in Kôriyama which became an emergency evacuation centre for Kawauchi residents], *the radiation level in the parking lot was 0.6 µSv/hour. And at the temporary housing in the Namiki district of Kôriyama where I lived, there was more than 1 µSv/hour. So the radiation level in Kawauchi was lower […]. When I realized this, I felt that there was a possibility that we could return to Kawauchi.*"

In January 2012, the Mayor officially declared the return to village. His decision was chastised by a number of inhabitants for being a sign that the mayor was too compliant with the government push, ignoring the points of view of those who found it was too early to come back. A number of interviews convey similar judgement of the decision (cf. Chapter 4 "returning or not" for further examples). One inhabitant explained:

"*In the case of Miyakoji district, Tamura city, the government lifted the evacuation order by its executive determination in the second consultation meeting, despite strong opposition from the evacuees. I think it was the same scenario in Kawauchi. No matter*

[111] Masanori Moritani is an expert and commentator in economy and industry affairs.

[112] The Nikkei, Kawauchi village (Fukushima) declares the return of village: reopening the village office in Kawauchi in April (Original titile: Fukushima, Kawauchi mura ga kison sengen, yakuba wo shigatu saikai), on 31/01/2012

what evacuees said, the government lifted the order anyway. Like the case of Miyakoji district of Tamura, the evacuation zone in Kawauchi represent[ed] only one part of the village: the majority of the residents live[d] in 'normal' areas. So there was more political pressure – and also from the village administration - to 'normalize' the area under the evacuation zone".

During interview, Mayor Endo defended his point, by explaining that the "declaration of return" was intended first to return Village Office functions to Kawauchi and to invite residents - those who could return - to prepare for return; it was considered a necessary first step. However, Endo insisted mostly on the concern of very old inhabitants:

Some inhabitants told me before dying: "I would like to die at home". Some died before the lifting of Evacuation orders. I thus thought, as a priority, of those who wanted to return home".

Finally, the Mayor explained the significance of his visit to the area affected by the Chernobyl accident in Ukraine and Belarus, in November 2011, together with Prof. Shimizu, an Economist at Fukushima University.

I felt that the two accidents - Chernobyl, 25 years before, and Fukushima - were not comparable[113]*. The seriousness of the accident, the political system, and the vision of homeland are also different. […] There was no decontamination, they razed the houses. People moved to other towns, with a new job. Also, the type of radionuclides was different: in Kawauchi the majority of radionuclides were cesium, with little plutonium and strontium. […]. Then in June 2015, I went back to Chernobyl, I met an old couple who returned home, 14 km from the plant. They were now 80; they were 50 at the time of the accident. The husband told me: "we evacuated to Kiev after the evacuation order, and we stayed two years, but my wife became sick, so we came back. The government forbade us to live here; but we resisted and stayed here. Inhabitants who were younger than us died in Kiev. So, the secret to living a long life is to live at home*[114]*"*.

Mayor Endo raised a point which has often been neglected: Evacuation Orders are *orders*: they entail an obligation. EOs constitute both a *right* to evacuate and an *obligation* to evacuate (see Chapter 4). Mr. Endo was particularly sensitive to the "authoritarian" aspect of evacuation, and he professed himself more than upset at preventing an old person from coming back home rather than living in temporary shelters, given that the radiological risks for an elderly person, whose remaining life is rather limited, may effectively be discounted. It was a harsh point, discussed with inhabitants, but clearly Mayor Endo justified his decision on ethical grounds: for him, it was unacceptable, in such conditions, to prevent an old person from "dying at home"; it was unacceptable not to allow old people to come back to their homes, mostly family houses where some of them had been living their whole lives. His account of visits to Chernobyl illustrates how the mayor gradually cast the issue of return as a "right" for the elderly to come home, in a relatively radiologically safe situation.

[113] Interview Mr Yuko ENDO, mayor of Kawauchi, Interviewers: Reiko Hasegawa, Christine Fassert, and Rina Kojima, op.cit. 11th October 2016.

[114] Similar accounts are given in Ackerman. (2016). "*Traverser Chernobyl*". Premier Prallèle.

3.5.2.3 Return as a way to restore fairness

A main characteristic of the Kawauchi village is that the zoning scheme divided it in three zones. The evacuation zone (Green and Yellow zones) represented only a small part of the village. The majority of residents lived in the normal zone (former 20-30 km Zone, where the EO was lifted in 2011).

The compensation program, determined in line with evacuation zones, created tension within the village. One resident living in the former 20-30 km Zone described the situation succinctly[115]:

A deep division exists within the village. Returnees to the Green and Yellow Zones are not well-regarded by the rest of residents because they continue to receive compensation payments, even after their return to the village. The rest of the residents who live in the same village, and face the same risks and inconveniences, don't receive anything. This creates jealousy and feeling of injustice among the residents.

The mayor indeed made this situation one of the major issues he aimed to resolve by lifting the EO: the Lifting of Evacuation order was also a first step to reunify the villagers, by putting an end to a measure which had created feelings of unfairness amongst inhabitants. A town member explained:

"The end of compensation payment also brings advantages because it normalizes the relationship between villagers. So stopping this payment given to only one part of residents will help reconcile this difference and restore the harmony of the village[116]*".*

3.5.2.4 Arbitration between conflicting interests

The inhabitants who were eager to wait had a number of reasons for doing so, most particularly due to, what they considered, "incomplete decontamination". A resident working in the village during the day, but continuing his evacuation in Iwaki city explained[117]:

Many people protested against the decision at the time, saying that the return was too soon and that the decontamination of the village should be completed before returning, especially for the sake of children.

Mayor Endo was aware of the opposition of a number of inhabitants. When he started consultations with residents in September 2011, there was much resistance, especially among young people. He discussed the issue with most of them: "A *medical doctor who had been working in Kawauchi before the accident told me that he would not return*". Having acknowledged such opposition, the Mayor emphasized that "*those who could return should return, but the others who still worry could wait and see before making a decision to return*"[118].

[115] Interview with M.Y. (female, in her 60s) conducted in her residence in Kawauchi village on 25 September 2015 (Interviewer: R. Hasegawa).

[116] Interview M. K.T., op.cit.

[117] Interview with A.S. (male, in his 30s) conducted at his work place, Kawauchi Nursery School, in Kawauchi village on 20 May 2016 (Interviewers: R. Hasegawa and C. Fassert)

[118] The Nikkei (31/01/2012), op.Cit, p.18

Mayor Endo recognizes implicitly that, torn between inhabitants eager to return rapidly to their home and those who preferred to wait and continue evacuation for a variety of reasons, he chose the interests and arguments of the first. As Mayor, Mr. Endo justified this decision: allowing people to return would not oblige all inhabitants to come back; the "harm" in not returning, for some, would be more serious than the harm done to those who wanted to wait.

The village thus recovered its municipal function in April 2012 (one year after the accident), six months after the government officially lifted the EO for 20-30km radius zone in September 2011. Psychological compensation for these residents was thus ended in September 2012, one year after the lifting of the EO. One resident described during interview that the Mayor's decision left a "bitter taste" among the inhabitants, to that day[119]:

"*The Mayor should have taken greater account of the opinion of villagers when he decided on return. He could have also negotiated with the government to postpone the timing*".

Many residents continued their evacuation in Kôriyama city even after April 2012, because the decontamination of the village was not completed until March 2014[120].

As explained earlier, for the majority of Kawauchi residents (20-30 km radius zone), compensation payment ceased as early as October 2012 and temporary housing assistance was terminated in March 2017. It became financially difficult for many to continue evacuation, unless they bore the cost on their own. In population statistics dated 1 September 2016, Kawauchi village had 2,746 registered inhabitants, of which 67% (1,838) were reportedly "residing" in the village, while it also reports the number of evacuees as 1,952. The numbers do not match because, according to Doi (2015), in the total number of "residing" inhabitants[121], the village office also counted former residents who simply started using their old postal address again, as well as young people under 22 years old whose *parents* were residing in the village. The gap in numbers can also be explained by the phenomenon of "daytime return": some residents made the choice in-between evacuation (or resettlement) and return; in the survey of residents conducted in 2015, 22% of the residents stated having dual residency (Reconstruction Agency, 2015; Mosneaga, 2015). It means commuting and working in the village during the day, and returning every evening to temporary housing located in other cities such as Kôriyama or Tamura, continuing their evacuation for the sake of children or grandparents with specific medical needs in large hospitals. The evacuees interviewed mentioned radiation risk concerns and high school opportunities for children as main reasons for this choice. Before the accident, Kawauchi children went to the high school in Tomioka town, but (at the time of the interview) the town was under evacuation order - some of them had no choice but to continue evacuation or move to other cities for their children's education. After the village returned (to 20-30 km radius area) in April 2012, various offices and factories reopened and workers were called to return to their posts. Many residents were then obliged to go

[119] Interview with A.S. (male in his 30s) conducted at his work place, Kawauchi Nursery School, in Kawauchi village on 20 May 2016 (Interviewer: R. Hasegawa and C. Fassert)

[120] Website of ME (http://josen.env.go.jp/area/)

[121] In these affected towns, there are registered inhabitants (who are inhabitants only on paper) and residing inhabitants (who are actually living there).

back to their jobs in the village, but some of them decided to continue their evacuation. Others had no other choice but to return against their will (cf. Chapter 4 for detailed analysis).

3.5.3 NARAHA MAYOR

3.5.3.1 Choosing experts

The town created two expert committees: one to advise the town on decontamination, radiation monitoring, radiological protection of the population; the other to advise on the status of F1NPP and F2NPP, crisis management, evacuation plans in case of emergencies. The first committee on decontamination was headed by Prof. Tatsuhiko Kodama, Head of Isotope Research Centre, University of Tokyo, and included Prof. Norio Nogawa from Fukushima Future Center for Regional Revitalization (FURE), University of Fukushima. The second committee comprised three experts from the Japanese Atomic Energy Agency (JAEA) and was led by Prof. Matsumoto of Tokyo City University, who is originally from Naraha town. The experts for the first committee were chosen by Professor Kodama after the town had made a request to him and asked for his advice (see above Ch. 3.4.4.2.).

Mayor Matsumoto commented his choice of Prof. Kodama:

I chose Professor Tatsuhiko Kodama as Radiation Risk Advisor of the town because I had been deeply moved by the famous speech at the House of Senators which was shown on TV [during which he urged politicians to "protect children from radiation risks"]. I had tears during the speech. I went to meet Prof. Kodama in person at Tokyo University and directly asked him to become the radiation risk advisor for Naraha[122].

In March 2014, the town announced a Return Programme, in which they laid down 24 required conditions defined by the town after listening to inhabitants. After three months of self-evaluation conducted in consultation with residents, town assembly and expert committees, on 29 May 2014 the Mayor declared that most of these conditions had been met and that the town would make a final decision on return after the following spring (2015). A member of the township admitted that this declaration, especially with regards to the timing of the final decision, was intentionally vague ("after next spring"), because the evacuees were still expressing concerns about the current state of the infrastructure in the town, and about radiation-related risk. However, he insisted on the consultation process: *"The town also organized more than 30 consultations with residents on issues related to return, which I consider extremely important in order to maintain a trustworthy relationship with the residents"*.

3.5.3.2 Return as a negotiation (with the Government)

Mayor Matsumoto explained: "*I was elected Mayor in April 2012. My first decision was to organize roughly thirty meetings with inhabitants in order to listen to them*".

[122] Kodama's discourse got a million of views on Internet … He was awarded one of the 10 scientists of the year by NATURE in 2012. Jobin, P. (2012). Qui est protégé par la radioprotection ? *EBISU n°47*.

He also detailed the first "fight" he had to lead against government decision-making:

At the time, the pressing issue was the reorganization of evacuation zones [the government proposed to reorganize the zones at the end of March 2012]. The government told me that it wanted to change the zone of Naraha [from Restricted Zone to Ready-to-Lift-Evacuation-Order Zone (Green Zone)] because [they said] the radiation level in Naraha was relatively low. What I insisted on at the time, to the government, was that it was more logical for the government to clean [decontaminate] the town first, before changing the zone [resulting in lifting the evacuation order]. But I felt that the government was not willing to do so. What I was made to understand was that unless I accepted the zone change, the government would start neither decontamination nor reconstruction of infrastructure in Naraha town, and that I had to make that decision quickly [in order to ensure the decontamination and reconstruction of the town]. This was the biggest point, or the first biggest challenge that I had to overcome [after becoming Mayor]. If I had not accepted the zone change at the time, the current situation of Naraha town would not have been possible[123].

For the Mayor, these conditions were difficult to accept: "*Responsibility for the accident lies with TEPCO and the Government, so it is only normal that they should decontaminate the area without imposing any conditions. I deeply regret that many residents do not know that my decision [to accept the zoning revision] was taken under pressure from the Government*".

In this first step, the Mayor was criticized by a number of inhabitants, who considered that decontamination should have been conducted first, and that he should have resisted and imposed the village's views in response to government pressure. This shows how zoning became a critical issue in this context, for a government eager to "turn the page" and to normalize the situation. In the government's plan for zone reshuffle, Naraha was effectively classified as "ready to lift evacuation orders" before the decontamination work started, even though experience indicates that in certain ways decontamination was not as efficient as foreseen. From the point of view of the Mayor, he was asked to declare that the village was ready, even though the radiological situation was still uncertain. However, he was obliged to comply with government rule in this instance, because for decontamination operations he depended on investments decided at national level.

3.5.3.3 Return as a step-by-step process

Although not in a position to impose his views on the above point, the Mayor of Naraha was keen to establish a step-by-step process in order to organize the lifting of EO and to take into consideration the villagers' views. As explained in the previous section, the town conducted regular opinion surveys among residents, in collaboration with the Reconstruction Agency or of its own accord – nine were conducted in total, of which the first was organized as early as August 2011[124] - and they organized regular consultation

[123] Interview M. Matsumoto, Naraha mayor, led by R. Hasegawa and C. Fassert, 13th October 2016.

[124] Print-out of PPT presentation provided by the Naraha town; from the interview with an employee of the town on 24/03/2015 and the Reconstruction Agency website

meetings with residents. These processes allowed Naraha residents to take time in assessing the situation and making a matured and solid decision about their future.

3.5.3.4 Return as a possibility

This extensive consultation process highlighted that a significant proportion of the inhabitants were not willing to return or not ready to do so. Contrary to Mayor Endo who framed the possibility of return to the evacuated village as a *right*, Mayor Matsumoto framed his role as allowing the reconstruction of Naraha, and return as a *possibility* for those who wanted to come back to do so. He insisted on the difficulty of his role: "*The role of the municipality [was] to prepare the living conditions for the return of residents. But I [could not] impose the return to inhabitants, because it [was] a personal choice*".

After the lifting of EO, in 2015, another central issue stemmed from the arrival of workers from elsewhere (decontamination workers and sub-contractors for the crippled reactors). This new demographic status raised issues such as the raise of criminality. (cf. Chapter 4 on "Returning or not").

In April 2016, Mayor Matsumoto was reelected.

3.5.4 CONCLUSION

3.5.4.1 Expertise as a political stance

"*Expert committees*" were set up by the two mayors, framed by both as a means of delegating a number of issues, amongst which would be the decision on whether the situation was radiologically acceptable or not. The choice of expert at the head of these committees was instrumental in the ensuing process of lifting the Evacuation Orders. The Mayor of Kawauchi referred to a "government" scientist, whereas Mayor Matsumoto chose Professor Kodama, a scientist who expressed publicly distance with the governmental views. When Matsumoto elucidated the reasons for his choice, he mentioned spontaneously the political position taken by Kodama (a protest against government policy; criticism of the retained 20 mSv threshold), but also his own *tears* and the fact that he had been personally moved by Kodama's "famous speech"; Matsumoto did not refer so much to Kodama's scientific competence (M. Kodama is from the esteemed University of Tokyo[125]; his credentials are undisputable) as to a protest which combined a cautious position on radiological risks and reproof of government policy. This choice of an "alternative scientist", rather than one of the experts of the Fukushima Medical and Nagasaki Universities who are government experts, is a compelling example of politics *through* expertise. By contrast, the Mayor of Kawauchi called for an expert from Nagasaki University, a place where scientists are considered to be more in line with government views.

3.5.4.2 Governing reconstruction

Each of the mayors formulated his decision as a way to reconstruct the village community, and to take account of divergent interests. Each village has its own characteristics, but

[125] University of Tokyo is typically the place from where political and scientific elites are issued in Japan.

it appears also that the major issue was to lift orders under pressure from the government, in a situation where most inhabitants were still reluctant (with the notable exception of elderly persons eager to come home - and die there). Struggles that faced both mayors may be framed in terms of *rights*: the Mayor of Naraha was more inclined not to deny the "right to evacuate", or to respect the right "not to be obliged to return" whereas the Mayor of Kawauchi justified his position as maximizing the "right to return", and framed mainly evacuation as *authoritarian*, evoking the drama in Chernobyl of the *samiossoly*[126] who returned to their home in defiance of the authorities. As long as groups of inhabitants had such specific and opposed interests, it was difficult to call for a "general interest". Each of the mayors justified his decisions by making explicit what he considered important to favour: the right to come back/die at home, or the right to "buy time" and not to come back, for those not satisfied with the life that return would offer.

However, both insisted on the fact that reconstruction was also reconstruction of communities. The Mayor of Kawauchi considered the lifting of EO an important step to eliminate compensation discrepancies which led to inconsistent rights among inhabitants. Reconstructing is about reconstructing "the" former community, divided by the discrepant social status attached to zoning. The Mayor of Naraha explained that reconstruction would be about recovering the former landscapes (the rice paddies are no longer part of the Naraha surroundings), but also about reconstructing *"a"* community, even if the community after the accident is not the same as the one before the accident: *"Due to the accident, the community has been broken into pieces. I hope to recreate the community step by step. Inhabitants have been dispersed by the evacuation, the community was destroyed, we have now to enlarge this community, little by little"*.

3.5.4.3 Return as reunification

The case of Kawauchi epitomizes the conundrums of zoning[127]: in fact, zoning establishes and reifies the territorialization of a risk which is, however, intrinsically difficult to circumscribe spatially and temporally. Zoning is, at the same time, a dispositive which effectively excludes certain persons from compensation rights, even if they may be in a very similar "radiological situation" to those defined as victims under the compensation scheme. Zoning traces limits, which simultaneously includes some people and excludes others. This is portrayed in *The Land of Hope*, when filmmaker Sion Sono shows how two neighbouring families -formerly friends - are brutally separated after a nuclear accident, with a border drawn by the zoning between their homes, which defines the forbidden zone and the other where people are allowed to stay[128]. Zoning is also linked to compensation, another type of divide. The mayor considered his decision to lift the Evacuation Order to be a means to eliminate what could be felt as unfair for those who were between 20-30km radius which could result in nothing less than reunifying a divided community. However, in both cases, the lifting of Evacuation Orders also reactivated the divide between inhabitants who wanted to return and inhabitants who preferred to wait

[126] Cf. Galia Ackerman, op.cit. : The residents who come back illegally to evacuated territories, details in chapter 4.

[127] Hasegawa, R, Deves, M, Fassert, C. Kaminski, E. "Zoning: making risks (in)visible and manageable in disasters., article submitted.

[128] Living in/with contaminated territories. C. Fassert, Technoscienza. July 2017.

or not to return, making it difficult for the mayors not to be chastised for having 'chosen their side'.

3.5.4.4 Return as a normalizing process

However, reunification in the case of Kawauchi was also led at the price of "normalizing" the "still contaminated" territories. "Normalisation" is a process often denounced on a sociological basis, raising the question of *who* decides that a situation is normal/acceptable. Sezin Topçu identifies normalization as an objective reached through zoning as a tool: "*Zones have therefore been conceived of, particularly in recent times, as moving, socio-technical systems or plans of action, supposed to allow a way of managing territories, populations, and public health that is, at the same time, both authoritarian and flexible. Because their borders are not rigid, they are subject to permanent re-categorizations*[129]". Moreover, this is done in a context where uncertainty as regards the extent of contamination, instead of decreasing progressively, may actually open up new questions and worries. For example, research published in 2018[130] gives new insight into radiological contamination, whereby it appears that not only particles of gaseous radionuclides, such as cesium and iodine, released from the damaged reactors, but also small radioactive particles, termed cesium-rich micro-particles, containing smaller amounts of other radioisotopes, such as uranium and technetium[131]". Their effects on health are unknown, but could be potentially harmful, although this is still a disputable issue.

3.5.4.5 The making of politics

The objective of this section is to understand how the mayors of the two affected towns themselves formulated their role and the difficulties they faced after a nuclear accident. Their actions were sometimes castigated by villagers, and they had to account for their decisions to the inhabitants. Their cases epitomize political conundrums: How to come to a decision when faced with divergent interests? What role should be played by expertise in case of controversies over health risks?

The justifications provided by the mayors themselves allow their decisions to be linked to a broader range of concerns and visions of justice, elicited in trade-offs or, on the contrary, in clear-cut decisions which may dismiss the concerns of a certain proportion of the inhabitants.

The discourses held by mayors when they account for their decisions appear to be an interesting way of deciphering the range of issues tackled by them, and at a more general

[129] « Les zones sont donc conçues, en particulier dans la période récente, en tant que dispositifs socio-techniques mouvants, censés permettre une gestion à la fois autoritaire et flexible des territoires, des populations, et de la santé publique. Leurs frontières n'étant pas rigides, elles sont sujettes à des re-catégorisations permanentes ». in : Topçu, S. (Mai 2016). Catastrophes nucléaires et « normalisation » des zones contaminées. Enjeux politiques, économiques, sanitaires, démocratiques et éthiques. Les notes de la fondation d'Ecologie Politique.

[130] The research, which was carried out by scientists from Kyushu University, Japan, and The University of Manchester, UK, was published in Environmental Science and Technology. The paper, 'Novel Method of Quantifying Radioactive Cesium-Rich Microparticles (CsMPs) in the Environment from the Fukushima Daiichi Nuclear Power Plant' has been published in the journal Environmental Science and Technology – DOI:10.1021/acs.est.7b06693

[131] Sources: Eurekalert. (Access: June 2018) and Fukushima chronicles. ACRO web site. (access: June 2018)

level “the making of politics”. In the present study, the justifications given by the mayors were taken seriously, without dismissing the global context in which they had to conduct their role: a general push for normalization and reconstruction on the part of a government eager to recuperate (lost) territories, and to promote a view of a “manageable” nuclear accident (Anasuma Brice, 2017). The post-accident situation proved to be a conundrum of ethical and political concerns, and a considerable burden for the two mayors. Their testimonies illustrate some of the many issues local politics may be faced with after a nuclear accident.

Beyond the case of Kawauchi and Naraha, it can be understood that such struggles are central and may epitomize the political and social questions of post-accidental situations. The importance of survival for a village, the preservation of its identity, the consideration of radiological contamination, the diverging wills and desires of the inhabitants on the question of return, are key issues which often met with a number of different answers, based on different views as well as the weight placed between different divergent interests.

4 WHETHER TO RETURN OR NOT: A CATEGORISATION OF INHABITANTS' DECISIONS

4.1 INTRODUCTION

This section is based on the interviews conducted by the *Shinrai* team. It analyzes the different aspects of people's reasons for returning or not to the evacuated territories, framed within a more global view of life trajectories after the accident.

The interviews led with the inhabitants of the Fukushima prefecture show a tremendous variety in their life conditions after the accident, in their reactions, and in their feelings. Field work was led in such a way that it could grasp this variety. Conducting the interviews immediately after Evacuation Orders were lifted in Kawauchi and in Naraha allowed better understanding of how people came to a decision about whether or not to return. Other inhabitants interviewed included those who fled from territories not under Evacuation Orders (*self-evacuees*): the question of whether or not to return was determined according to similar criteria (radiological risks, infrastructures available, etc.). In each case, biographical elements of how these people had lived before the accident were collected in order to better understand the context in which they made up their minds. However, there are undoubtedly limits in the use of interviews: the interviews do not allow total comprehension of the impact on everyday lives and what it means to live "with radioactivity", beyond words. Only ethnographic work could grasp this thoroughly. It should be noted, however, that the interviews were complemented by observation of two "information sessions" led by the local authorities, as well as visits to places where evacuees were met by us during their daily activities, and attendance at NGO meetings. The types of questions raised directly by inhabitants themselves show that there is a large overlap between issues raised in interviews and those asked directly to experts. More details on the methodology are provided in the annexes.

The question of "whether to return or not" did not have to be asked explicitly in the majority of interviews. It was one of the emerging issues addressed spontaneously by inhabitants during interviews, which were based most often on narratives: "What were you doing before the accident? And after? What is your life now? And in the future? One of the questions explored was about trust with regard to government policy; the theme of trust was very often spontaneously evoked by the interviewees. It appears also that, beyond the question of trust - or the absence thereof - , people were interpreting government policy and its realization at a more local level (township) in terms of vested interests, and they assessed how much this policy was in line or not with what they considered to be their own interests. This is why in some cases, even if the precise word *trust* was not pronounced, some elements of trust/distrust were identified within the wider judgements formulated by the people interviewed.

The aim of this chapter is to profile the residents in relation to the central question of "whether to return or not", because it appears that this decision is raised in the aftermath of any nuclear accident, in the context of the related evacuations. The decision epitomizes individual people's feelings and judgements about their current and future life situations. Exploring how they make their decisions, how they give an account of their reasons, and how they describe their concerns, fears, anger, hope and expectations is a key aspect of the *Shinrai* research project.

In order to better synthesize the variety of different situations, six broad categories of inhabitants were identified from the research results. As with any form of categorization, this has its limitations.

1	*Return and forget/resist*
2	*Return and control/comply*
3	*Return and worry*
4	*Return … and commute*
5	*Not returning for the moment*
6	*Not returning ever*

Each category contains a variety of people with distinct differences; each category could always be further refined to reflect such nuances. However, this simple categorization helps comprehend the main issue for each type of inhabitants, and the consequences of their decisions on their lives. This report is based on the conviction that this helps show representative decision types behind the variety of reactions and life paths after an accident. For each category, one complete "story" was retained, as an *archetype* of that category, which allows in-depth presentation of the case of one person: their reasons for returning or not, their analysis of the situation. This case is *emblematic* insofar as, beyond each particular individual case presented, the main features can be found in other cases - in the field work, but also in cases analyzed by other researchers[132]. For each *emblematic case*, the more prominent factors are identified; the analysis provided is also completed and enriched with other cases of the same category, providing the various nuances within each category of inhabitants.

4.2 RETURN AND "FORGET"/RESIST A CULTURE OF RADIOPROTECTION

This first category groups together a number of inhabitants who decided to return relatively soon after the Lift of Evacuation Order. They insist on the fact that they want to live "as they did before the accident", while dealing with the numerous changes and losses. However, returning is principally a source of *relief* in their case.

[132] Links with field work done by other researchers are presented in Chapter 5.

Emblematic Case

Ms. KA[133], in her 60 yrs.: "I can't live without touching the soil".

Ms. KA received us in a beautiful house in the mountains of Kawauchi. She told us:

"*We evacuated after the accident; I had to abandon my dog, we were not allowed to take our pets. And my chickens, which were eaten by the foxes. I spent 3 years away from my home. During all this time, I thought of the animals that I had abandoned. I went to my daughter's, then … then I spent some months in an apartment in Kanagawa. It's terrible to live in an apartment when you have been used to living in a house …. I wanted to help collect the dead leaves in the garden of the residence where I lived, but I couldn't because an employee was appointed for this task. It was hard for me. I cannot live without touching the soil. Coming back home is like a dream come true for me. I feel alive again! … My son came back to Iwaki in 2012, and he could look after the house while we were away from home. Recent measurements taken in the garden proved that it was safe to grow some vegetables. This was something that was very important for me. I am used to growing my own vegetables, to living this way … Yes, I gather sensai [wild vegetable] in the forest. I have had two Whole Body Counters, and the results were ok. I am not worried. We can go back, but we are not supposed to eat mushrooms and sensai: it is difficult for old people. (…) My daughter-in-law and my grandchildren do not come here, my daughter-in-law does not want to bring them. For me, the real return, that will be when children will want and be able to come back.*

Concerning the way the LEO was organized, Ms. KA said:

Well, it's a consultation, but in any case, when the State decides, it does it, and that's that. The return is in line with what I wanted, but it does not suit everybody.

The State does not understand that now you have to go 70 km to do shopping. Before, the shopping zone was in towns which are now in the "difficult to return zone", where the Lift will not happen for a very long time - maybe never.

"*The company in charge did not want to decontaminate the terrace in front of the house. Officially they [are there to] decontaminate the house, and the terrace is not part of the house. We did it ourselves (my husband and I)".*

"*For me, it was absolutely necessary that I could grow my own vegetables. I test them, I feel a responsibility when I give vegetables to people.*

Q: What about your sources of information about radiation risks?

"*We do not need experts, I went once to a conference on ionizing radiation, Ms. O. explained things … Well, they are here just to reassure people*".

"*The state of the Nuclear Power Plant[134] worries me but the life of an evacuee (not being able to touch the soil, not being in my house, …) was worse. I accept this risk in order to live in my own house. I have been living better since I came back. I cannot live without touching the soil.*

With regard to her future, Ms. KA says: "*I like cooking, I would like to set up bed and breakfast here in my home. I do hope people will come*".

4.2.1 TRYING TO LIVE "LIKE BEFORE" (THE ACCIDENT)

Ms. KA epitomizes the case of residents in this first category, who speak mainly of their relief at returning, and show a form of satisfaction in (partly) retrieving their former life, thereby attempting to close (though never completely) the chapter of the accident in their lives. All of the inhabitants insisted on the drama and the hectic moments surrounding evacuation. The order and serenity of their rural life were brutally interrupted; inhabitants link evacuation with abandoning this life - sometimes leaving behind animals with whom they had spent their life. Ms. KA evokes her dog and her chickens; another interviewee, Mr. K, had dairy cows - the entire herd had to be shot after the accident when Kawauchi was evacuated. It is a painful souvenir for him. And he insisted on the fact that he wanted to return to have a job again "in touch with nature[135]", something not possible during their "suspended life" as evacuees.

This return is not, however, a return to former living conditions. Ms. KA regretted that her daughter-in-law did not want to bring the kids to Kawauchi. Mr. K and his wife interviewed described a similar situation: they returned in 2014 (just after the LEO); before the accident they had been living with one of their children, with his wife and their children, but: "[Our son] does not want to come back to Kawauchi. He now lives with his family in Miharu". This is not an isolated case: "There were 33 houses in this district; so far, 10 families have come back. They are mainly people of our age [in their 60s], coming back without children". Another inhabitant, Ms. N.[136] (a widow, in her 60s) explains that before the accident she was living with her mother, along with one of her daughters and her son-in-law, and their four children. She went back to Kawauchi alone with her mother, while her daughter's family stayed in Mie prefecture. Separated from her grandchildren, Ms. N's mother slipped into dementia, and is now living in a home for the elderly because there was no room for her in their house in Kawauchi. Ms. N. commented: "There are many of us who have experienced the collapse of families". Her daughter came back to Kawauchi recently, with her four children, to another house. While they were evacuees in Mie prefecture, one of the children had been bullied at school. Whenever he had quarrels with his friends, he was told: "Go back to Fukushima!".

4.2.2 FORGETTING RADIATION … OR "RESISTING" PRACTICAL RADIOPROTECTION?

Ms. KA declared that the soil in her garden was now safe, and that she was happy to grow her vegetables once again. Mr. K participated in research on soil contamination. He said: "The soil in the garden was very contaminated at the beginning (1000 bq/Kg). Now the soil is below the detection threshold[137]". There was a ban on growing and selling vegetables, but this order was lifted, and Mr. K started growing vegetables in his garden again. These inhabitants returned when the contamination of soils was still high; they participated in taking the proposed radioactivity measurements, but once the

[133] Ms. KA, 19th March 2015. Kawauchi. Interviewers: R. Hasegawa and C. Fassert.

[134] The NPP is at 15 km from her house.

[135] Interview Ms KA, 19th March 2015, Interviewers: R. Hasegawa and C. Fassert. Kawauchi. (first interview October 2014)

[136] Ms KN, 26th September 2015.interviewer: Rina Kojima, Kawauchi.

[137] M. KA, 19th March 2015. Kawauchi.Interviewers: R. Hasegawa and C. Fassert.

contamination levels dropped, they were happy to take care of their gardens again, and to stop any measurement procedures.

Generally, inhabitants in this category have followed a similar path as regards health monitoring. At the beginning, they wore their dosimeters, monitored food, checked their internal contamination through Whole Body Counters (WBC), and underwent medical examinations. But, at the time of interview, they had abandoned this so-called "Practical Culture of Radio Protection[138]". During interview, they all expressed some form of reluctance to engage in such measures, and appeared determined to live a life without any "monitoring", while being fully aware of not complying with the advice provided. Which is why this attitude could also be considered as showing a form of resistance to the instructions/advice given by the local authorities. These residents knew that their conduct did not strictly comply with the advice given by the radiation risk counsellor. There are of course nuances in this attitude; a number of them were still monitoring the vegetables from their gardens - especially with regard for others: "*I feel responsible when I give vegetables to others*" (Ms. KA); they were also measuring the contamination of the *sensai* or mushrooms they collected in the forest. Others were more radical, like this person who said: "mushrooms in the forest of Kawauchi are really delicious. I am aware they may be contaminated, but if you're going to be contaminated anyway, you may as well eat the delicious mushrooms[139]". (See also Chapter 5: the mayor of Kawauchi regretted the increase of positive results in WBC[140] when elderly residents stopped respecting recommendations; this is also a worry expressed by Ms. O., the radioprotection counselor.

Despite certain differences, such attitudes demonstrate a comparable will to distance themselves from the official discourse and the advice given by the radiation risk counsellors.

For example, Mr. YO:

"*I had a WBC in 2012, it was okay; I don't feel like having another one, I am too lazy to do it. I know I should have a WBC after eating this kind of mushrooms [collected in the forest], but I do not do it*".

Bearing in mind the fact that ionizing radiations are less harmful for seniors, these residents seem determined to live a "normal" life - and not, to borrow Michaël Ferrier's expression, a "half-life[141]". (Ferrier, 2012). Living normally here means, to some extent, "forgetting" or "disregarding" contamination on most occasions, and especially in daily life. People did not want to talk about or hear about these issues, and often said soberly when the interviewer insisted a little[142]: "I am not worried".

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[138] The term is based on ICRP 111, and designates all practices that allow monitoring and controlling of the amount of radioactivity received. Application of the Commission's Recommendations to the Protection of People Living in Long-term Contaminated Areas after a Nuclear Accident or a Radiation Emergency ICRP Publication 111 Ann. ICRP 39 (3), 2009. J. Lochard et al.

[139] Interview M. YO, (50-60 years old), 25th September 2015. Interviewer: Rina Kojima.

[140] WBC allows to measure internal contamination.

[141] Ferrier, M. (2012). *Fukushima, récit d'un désastre*: Gallimard.

[142] Of course, deontology demands that interviewers do not coerce those interviewed on these topics.

The attitude of these people, who are "not worried" after 3 or 4 years, raises the question of the feasibility of living in a contaminated environment in the long-term (10-20 years) while still "monitoring" daily behavior on the basis of radiological protection prescriptions intended to prevent them from "forgetting" the situation. This "model" appears to be an integral part of recommendations set up by international organizations such as the ICRP (International Commission on Radiological Protection), and the IAEA (International Atomic Energy Agency), but learning from the Japanese experience shows that it may not be acceptable for all citizens. The question will be raised again in the conclusion of this report

4.2.3 A COMMON SOCIOLOGICAL PROFILE?

In terms of demographic factors, it must be noted that this category of inhabitants presents a common profile: people in their 60s, in good health, who possess a house that has been a family home – in some cases, for generations. Evacuated after the catastrophe, some of these inhabitants moved several times, taken in by relatives, family or friends, or sheltered in dedicated houses built in the aftermath of the accident. In this case, there is undoubtedly a strong attachment on the part of these inhabitants to their former way of life: a certain rural way of living, (growing their own vegetables, taking care of their garden and animals, and so on). It is also a way of living that is attached to a community (sharing vegetable production with the neighborhood; gathering *sensai* in the forest and offering it to neighbors). The accident provoked an immense rupture, and returning is considered to be the best option, even when balanced against pending problems (such as state of the crippled NPP), and even taking into account that life will be very different (for example, living without the children and grand-children).

4.2.4 RETURNING IN ORDER TO PUT AN END TO WANDERING (OR THE BAD LIFE CONDITIONS)

In this category are people who chose - often with little hesitation - to come back. In most cases, they were looking forward to returning to their hometown, and they had been waiting impatiently for the lifting of evacuation order. With regards to their willingness to return, some of them raised the fact that they'd had to move many times (some had lived in up to eight different places between the accident and the moment of interview). Returning, in this case, would be a relief - to come back to a place which, if far from ideal, would at least allow the end of this "wandering". It also put an end to difficult living conditions (in tiny temporary shelters where, for some, they in fact ended up staying for several *years*).

4.2.5 HESITATIONS BEFORE THE RETURN (OR CONDITIONS FOR …)

Inhabitants in this category were often keen to be authorized to return. However, in some cases they could have certain reservations - for example, concerning the precise life conditions they would face upon returning. One inhabitant, Mr. K., for example, checked that his neighbors would come back before making his decision. He explained that he could not make a decision individually:

"*When the township asked us whether we would like to return or not, I couldn't answer right away. I called my neighbors in the district where I live. We come back together,*

or we do not come back. In the mountain area like here you can't live on your own, you have to help each other[143]".

One of the specificities of this district is how isolated the individual houses are; 30 minutes away from the center of Kawauchi, on a road which is very steep and winding, there are several kilometers between each of them. After interview, when this inhabitant learned that Ms. KA (emblematic case) was to be interviewed – she was a friend of his, in the same district - he insisted on taking his car in order to show the way: "You could easily get lost here!".

At a meeting for the LEO in Kawauchi, on 26 September 2015, a woman in her 70s[144] expressed her worries thus:

"*Even if there is a Lift of Evacuation Order, there will be no neighbors around my home. There will be only boars and foxes. I am 73 … I will not live long now, this is why I would like to come back home, but in this situation, it seems difficult to me, even if I do want to*"

Other misgivings are very specific to local conditions. For example, the contamination of the water reservoir in Naraha (where measurements taken in the mud had shown high levels of contamination) was a concern for many inhabitants. Ms. C.A. explained: "*it could be a problem to use the water or to drink it on a daily basis*"[145].

The efficiency of decontamination measures is one important consideration. But inhabitants considering return also contemplated future living conditions, and questioned the availability of infrastructures (hospitals, schools, shopping facilities), which was a source of worry as well. This shows that inhabitants did not consider their "village", but more globally, a broader area where adjacent towns and villages used to provide a set of services. When these towns were in the "difficult to return" zone, inhabitants realized that they would have to find other ways of living.

A last source of anxiety is the NPP itself. It was striking how much the accident (March 2011) was still considered - at the time the interviews took place (mid-late 2015) - as an *enduring* accident, and not a stabilized situation. "*Every week, we hear about new problems, new issues detected […]*[146]" said one inhabitant. This echoes the concept of the "*endless accident*" coined by Ulrich Beck when discussing the development of a "*risk society*" (Beck , 1986).

However, to conclude on this category, it may be said that these people (senior, in good health, attached to their home) seem to be the less "impacted" by the consequences of the accident, and more able to recapture their former life, albeit with certain limits and regrets (the grandchildren who do not come to visit, difficulties in daily life, such as shopping and infrastructure), but nevertheless affording them a number of positive aspects, compared to the lives of other categories.

[143] Interview M. TK. Kawauchi, 21st October 2014, interviewers: R. Hasegawa and C. Fassert.

[144] Meeting on the LOE, Kawauchi, 26 September 2015, observation led by R. Kojima.

[145] Ms. CA. Interviewer: R. Kojima, 15th March 2015

[146] Interview Mr. TK. 21st October 2014. Kawauchi. Op.cit.

At the time the interviews took place, since the accident, the village had lost more than 10% of its population[147]. Among the total registered residents (2,746), including both returnees and evacuees, nearly 40 % of them were over 65 years old in September 2016. A number of interviewees insisted on the fact that the aging of rural regions like Fukushima began before the accident at Fukushima Daiichi, and that this only accelerated the trend. Also, the long tradition of living with several generations in a single house was already declining before the accident - which, again, accelerated the tendency. However, the nuclear accident also triggered a more brutal rupture in the demographics of these villages. A returnee to the former Green Zone described life six months after the lifting of EO in March 2015[148]:

"*Currently 10 out of 33 families have returned to the district, but the composition of these families has changed. Only the grandparents' generation came back, without their children and grandchildren. I expect more families will come back to this district, but only those over 60 years old fear that life will not be the same in Kawauchi after the lifting of the EO. There will only be the older generations coming back, and young people - who usually become community leaders, and organize village festivals, and events – won't return. It was probably the trend even before the accident, but I feel the disaster has accelerated this rhythm*".

Ms. KA also explained that it would not have been possible for her to return if she had been much older, or less mobile. At the end of the interview, she murmured regretfully:

"*My daughter-in-law doesn't want to bring my grandchildren to Kawauchi due to radiation fears. So I am obliged to travel to Kanagawa prefecture [situated 300 km away, east of Tokyo] to see them. I think the evacuation order should have been lifted only when residents could have a more or less 'normal' life, where we can lead a semi self-sustainable life and our grandchildren can come and visit their grandparents without fears*[149]".

Hasegawa (Hasegawa, 2016) coined the term "unsustainable return[150]" to designate this new demographic picture, where it is mostly seniors who come back. What will happen when they get older if there is no infrastructure to ensure that they are taken care of, and if a significant number of younger inhabitants do not come back ? This issue will be developed in Chapter 6.

4.3 RETURN AND COMPLYING/CONTROLLING

Another category of inhabitants were going to return to their hometown, but would not live like before. Unlike the previous category "Return and Forget", these inhabitants complied with advice given on radioprotection by local authorities, and insisted on the *control* they could have over radioactivity. They seemed to live with a certain degree of confidence that they were in control of the situation, with an apparent feeling of safety.

[147] Kitamura & Moritomo, *op. cit.*, p.18

[148] Interview Mr TK. Kawauchi. 19th March 2015. (Second interview).

[149] Ms KA. *Op.cit.*

[150] Hasegawa, R. (2015). Returning home after Fukushima: Displacement from a nuclear disaster and international guidelines for internally displaced persons. Migration, Environment and Climate Change: Policy Brief Series, 1(4).

Emblematic Case:
Ms. KS.: "Communication with experts removes fear of radiation"

Ms. KS returned to Kawauchi in April 2012. Of her 3 teen and adult children, the eldest returned with her, and her mother. The youngest stayed in Iwaki with his father. She was interviewed twice, in March 2015 and September 2016.

Interview 1[151] - March 2015.

Ms. KS evacuated to a hotel in Ishikawa (south Fukushima prefecture) on 12 March 2011. Her husband, as a fireman in charge of evacuating people from Tomioka, heard about the nuclear accident from his colleagues. Ms. KS left her dog behind, as she could not bring it to the hotel, but went back and forth in order to look after it. On 18 March, she evacuated to a school for the disabled in Kôriyama. There was also a sport stadium to which people from Kawauchi were evacuated but there were no more available places. Ms. KS wanted to stay not too far from Kawauchi. Because she expressed the will to return in January 2012, decontamination work on her home began quickly; they were completed when she returned in April. She measured doses and found 0.2 µSv/h inside her house.

She was concerned about the waste left at a few hundred meters from her home, for one year: "*I knew the radiation dose was not so high, because [the bags] were well covered, but they were on the path to school … people were saying that the radiation dose was increasing around them. Close to my house, there were decontamination workers crushing waste in order to put it in smaller bags; I was worried about the ashes. At that time, I wondered if it was a good thing to come back to Kawauchi, when I could see directly in front of me all this decontamination work and the radiation waste bags. But now they have been moved to kariokibas [temporary storage sites], I am not worried any more […] however, I imagine people living not far from these kariokibas are not pleased ….*

I moved to Kawauchi because I thought it would be better for the children to live at home, where they feel more comfortable than in a small apartment in Kôriyama. My husband worked in Iwaki after the accident, so I had to look after the children alone, and I felt tired. I wanted to live in a familiar place without any stress.

At first, Ms. KS was worried, but then she sought out information: "*Ionizing radiation exists in nature and can be removed, like pollen, when it falls on me. I do not have any more stress to live here. I also heard about internal radiation, because there is a center in Kawauchi to conduct measurement of radiation levels in food. In spring 2012, I cooked a meal for my children with vegetables from a store which had been measured, and another one with wild vegetables collected in the village. I ate them with my mother-in-law, telling myself it was not a problem to eat them just that once". My mother-in-law collected mushrooms, I brought them to the CRMS [Citizen's Radioactivity Measuring Station]; they detected a high radiation dose. I did not eat them*".

[151] Ms KS., 30th March 2015. Kawauchi. Interviewer: Rina Kojima.

Interview 2[152] - September 2016

Ms. KS was now working for the village as one of Radiation Risk Communication Counsellors who provide information on radiation, coordinated by the Nagasaki University-Kawauchi Reconstruction Promotion HQ, led by the team of Nagasaki University researchers. The main tasks of these counsellors are to conduct radiation measurements, respond to people's anxiety on radiation risk in coordination with RP experts[153]. They also organize meetings with families. Ms. K.S. seemed to feel she had made the right decision to come back to Kawauchi.

"*Radiation levels are measured in food, but also in soil and water. Radiation is invisible and not perceivable, but through measurement it is made visible. […] Just after my return to Kawauchi, I was worried because I was living not far from the NPP; I wasn't reassured when I was told that there was no problem at the NPP. Since I am constantly measuring radiation in my job, I clearly see that contaminated place is not contaminated. As long as I got informed about radiation levels, I feel reassured and see I was right to come back to Kawauchi".*

The institute organizes meetings on Risk Communication with experts in small groups. This allows people to share their worries. This dialogue allows people to understand radiation better, and to understand how to avoid risks in daily life. Young mothers participate in these meetings with their friends, because they cannot find answers to their questions on radiation simply by discussing the subject among themselves or with their husbands. (…) The institute organized these meetings several times in Iwaki, and envisages organizing them in Kawauchi if they found a place. Ms. O.[154] made a presentation in Iwaki for Nagasaki University. With easy to understand tables and drawings, she explained the health risks of radiation, comparing them with risks linked to alcohol and tobacco: we do not see a big difference between these types of risk. So it is not worth worrying about the risk of radiation. She also explained basics on Bq and Sv and the damage to health that may occur at a certain radiation dose

When asked whether those mothers were reassured by these meetings, Ms. KS replies:

"Certainly, like that they can protect their children. When a doctor suggests having an x-ray, we accept that we will be exposed to radiation. Nobody would say "I'm afraid of radiation, it is better to be sick". So they should feel reassured by the expert's advice. Communication with experts removes fear of radiation. Before, I had never heard of "Risk Communication". I wondered what it was (…) I think people are already sure (about their life here). I think we do not really need Risk Communication. But without speaking of it, they cannot be reassured on the fact they were right".

"*During these last 5 years, my children have grown up. And I became capable of distinguishing food which is not safe. So I'm not so nervous anymore. I have evolved. As I didn't see a high dose in the vegetables grown by my mother, I don't do the [radiation] measurements anymore. I still do it on the mushrooms collected in the mountains, because their contamination depends on the soil density. And when I see a high dose, I don't eat them. Before, there were those bags for radioactive waste left on the path on the way to the school. There are no more*

> *bags around my house, they were carried to the kariokibas sites […]. Now, I do not see these bags any more*".

4.3.1 "GETTING INFORMED"- A QUESTION OF INFORMATION AND TRUST

There is a notable evolution between the two interviews, which shows the degree to which reassurance is linked in this case to information provided by local counsellors, and measurements made by the interviewee herself. Measurement activities play a role in *showing* the risks - "radiation becomes visible". Making those risks visible is part of the degree of "control" that the person feels he or she can have over this radiological situation.

The case of Ms. KS shows a specific choice: taking information from one unique source (government) and adhering to that information. Information provided in 'Risk Communication' sessions would appear to have played a major role. Her confidence in those who provide information appears also to be unquestioning. Ms. KS does not evoke "alternative scientists" who may make a different assessment of radiological risks; nor does she compare different sources of information. Risk Communication as perceived by her appears to be quite efficient in reassuring inhabitants. It would appear, moreover, that little or no room is left for sharing uncertainties, not to mention controversies: Risk Communication "removes fear of radiation".

Also, commensurability comes to play a key role - radiation is compared to alcohol or tobacco: "so there is no need to worry". It is worth remembering here that the consumption of alcohol and tobacco is normally considered, as such, to constitute "risky conduct", but they are referred to here in a way that allows experts to *reassure* their public. Commensurability of risks, in this instance, could be argued to be instrumental in taming the degree of radiological risk – the paradox being that the "comparable" risks are usually regarded to be "genuine risks". Moreover, in this comparison, the risks chosen by adults in exchange for certain pleasure are simply compared with those imposed by the third party to everyone including children without any benefit. Here, the accent appears to be placed on the *familiarity* of risks that are already well identified.

A cluster of elements - measurements made by the person herself, linked to information provided by local experts, including commensurability with other risks - appears to create in Ms. KS a sense of relative comfort in the situation, which also suggests a positive evolution in her feelings compared to the first interview ("So I am not so nervous anymore"). Moreover her children have grown up, thereby diminishing their sensitiveness to ionizing radiation.

It is also striking to see the role played by the presence and visibility of waste bags versus their subsequent "disappearance". One main difference between the first and the second interview lies in the disappearance of these waste bags from the interviewee's immediate surroundings, moved to the local *kariokibas*. She reports great relief at no

[152] Interview of Ms. KS 17th September 2016.

[153] Ministry of Environment's newsletter from the Radiation Risk Communication Counsellors Support Centre (https://www.env.go.jp/chemi/rhm/shiencenter/pdf/c_dayori004.pdf)

[154] She is the Radioprotection counsellor delegated by Nagasaki University.

longer seeing the bags near her home. For her, "radiation is invisible […] but through measurement it is made visible". The paradox, however, is that radiation made visible by measurement is "reassuring", while conspicuous contaminated waste bags are not: when the risk is "visible" – such as these big waste bags were, the impact may be distinctly upsetting. The transportation of bags to the *kariokibas* was, in this case, very important for the interviewee and inhabitants like her to regain some serenity in daily life.

Such a type of "comfort" may also depend on unreliable visions of risk ("*radiation* […] *can be removed, like pollen, when it falls on me*") and this shows that Risk Communication may also result in some partial, ill-informed perceptions. However, what can be retained here is the strong impact of recommended measurement practices, and her insistence on a "before/after", which relates "education" on radiation risks, and the disappearance of the waste bag, with a major gain in comfort of life.

4.3.2 RISK INFORMATION STRATEGIES AND DECISION

However, "strategies" on risk information may vary according to each inhabitant, within the category "return and comply". Another inhabitant, Mr. MU[155] explains on what basis he decided to return to Naraha (a few months before the LOE):

"*We can consider 1 mSv as an ideal criterion. But what is important is being well informed about radiation, then to fear it correctly*" (放射能を正しく理解して、正しく怖がることが大事だと思う。).

This is very much in line with the official discourse, and even borrows the expression used by a number of officials: "fear the radiation correctly". However, Mr. MU gave details of several sources of information. He went to listen to the symposium organized by experts from Nagasaki. He is also getting informed on the 1 mSv criteria, and on the blog of Genyû Sôkyû[156], which states that this limit is not correct. He agrees it is normal to worry about this threshold for kids, but he considers the point of view of Professor Koide[157] "too radical". In consulting several sources of information, he affirms that he has established "his own threshold":

"These days, *an expert who gives reassuring message would be labelled as goyo gakusha ("expert patronized by the government"); but an expert who says alarming things, he would win public sympathy and news articles with this point of view sell quite well*." (今は「安全」と言えば御用学者というレッテルを張られ、どちらかと言えば「不安だ」と言ったもの勝ちで、その方が新聞も売れる).

[155] M. MU township member of Naraha. 50-60. Interviewer: Rina Kojima, 23th March 2015.

[156] Genyû Sôkyû: monk and famous writer, director of a temple in Miharu.

[157] Professor Hiroaki Koide is one of the prominent scientists who criticize the government policy after the accident. He is author of several books (whose titles are emblematic): KOIDE Hiroaki & KUROBE Shin.ichi, 2011. Genpatsu hōshanō : kodomo ga abunai (*Radiation and NPP : children in danger*), Tokyo, Bungei shunjū. (*Nuclear lies*), Shiritakunai keredo, Shitteokanebanaranai Genpatsu no Shinjitsu (*What we don't want to know, what we must learn: Nuclear truths*), and Kodomo-tachi ni tsutaetai: Genpatsu ga yurusarenai riyu (*I want to tell the children: The reasons why nuclear power is unforgivable*). (non traduits).

When Mr. MU met old friends from university, they told him he should not go back to Naraha, as long as the mountains were not decontaminated. He answered: "*yes, my life is contaminated; I will go back, I want to live in Naraha*".

Commensurability of risks is also part of his assessment that living in Naraha is what suits him:

"*Even if you avoid one risk, you may fall on another one. If you leave Naraha for Okinawa prefecture, you may have typhoons; if you leave for Gunma, there are volcanos. There are risks everywhere in Japan - ionizing radiation is one of those risks*".

Risks resulting from the nuclear accident are here reframed among "natural" risks with which Japan has always been confronted. Mr. MU. epitomizes the informed, educated person (he has a university degree), able to compare various sources of information, and to conceive ideological aspects of the question of ionizing radiation. He also finds it appropriate, in his case, to balance radiological risks with other risks made commensurable.

One last case illustrates a very different attitude, when people may stay/return without - self admittedly- being able to assess the situation fully.

Mr. MT is an inhabitant of the Watari district[158]. He explained:

"*On the 13th March, I heard about the explosion of the NPP, but I did not know what the consequences would be. So I made my grandson and his friends go and rescue the victims: they worked under the radioactive fallout. We heard about the dangerous effects only much later on. In May or June, the municipality began to lend Geiger counters. I tried to take measurements at home. It was impossible, because the needle indicated the maximal dose, like 9.99 µSv/h [87 mSv/y]. And as I did not know what it meant I stayed in Watari. Anyway, there was a trend in Watari: [people said] at least it wasn't touched by the tsunami; it's good to live in your home, despite the radioactive contamination*".

This last case shows certain limitations to the notion of taking measurements, when some idea of their interpretation is not clearly articulated to the public. This is an important question, raised by non-government scientists who were keen to communicate measurements in the first place, but without providing the means for the public to interpret them[159].

The interview with Mr. MT also illustrates a sense of culpability associated with ignorance in the immediate aftermath of the accident: in this case, an attitude generally considered "right" in normal circumstances (encouraging the young to help and rescue others) may have been the wrong advice for this grandfather to give in this context, leading to feelings of guilt.

[158] Mr MT., 80 years, Watari, 19 September 2015. Interviewers: R. Kojima

[159] These aspects are detailed in a *Shinrai* future Report.

4.3.3 THE ROLE OF MEASUREMENTS, AND THEIR LIMITS

The possibility to measuring radioactivity plays a key role for this category of inhabitant. Ms. KS is herself a member of the local radiation risk communication center which provides measurement protocols to inhabitants. She expresses herself very clearly on the role played by measurements: "Since I have been taking measurements in my work, I can clearly see that contaminated place is not contaminated. However, this effort required in order to be informed (and reassured) was considered too much for some inhabitants. During an information meeting[160], one woman asked about radiation risks. The answers given by government experts were reassuring overall, but the woman concluded after a long exchange:

"*I am not convinced. I would like to return, but considering I would have to be aware of the risks by taking measurements of the radiation myself, and [I would have to] avoid going to contaminated places … I do not see the point in repairing my home, which is completely riddled with mice*" …

4.4 RETURN AND WORRY

This category shows the poignant case of people who return, but who have doubts about their choice. The main tone of their accounts is one of anxiety, and this feeling is quite instrumental in the way they envisage their life as a "returnee".

Emblematic case Ms. YI[161]: *I do not know even now whether it was the right decision (to return)*
Ms. YI is a woman in her 30's in Kawauchi. When they evacuated to Kôriyama (the designated place of evacuation for Kawauchi village), her children were 5 and 3 years old. One of her child was bullied at school. Moreover, Ms. YI found herself isolated within a group of Kawauchi mothers, with whom she did not share the same opinion about radiation. Therefore, she and her children started to suffer in Kôriyama. She returned to Kawauchi in March 2013. She was interviewed alongside her friend, who did not return, and stayed on in Kôriyama. "*When the Mayor announced the return to the village, I thought it was too soon. I wanted the village to wait until the completion of decontamination. After the official announcement, I received a telephone call from the Kawauchi Municipal Public Housing section that our house would be rented out to others if we did not return by March 2013. We thought about the option of continuing evacuation, and commuting to work from Kôriyama, but my husband and I are both municipal employees. If we commute to work while continuing evacuation, we will be criticized by returned residents and by our colleagues[162]. Since my husband is a very sensitive and kind person, I was afraid that he would get sick from psychological pressure. So we returned to our public housing unit in*

[160] Meeting on the LOE, Kawauchi, 26 September 2015, observations led by Rina Kojima

[161] Ms YI, Returnee, Kawauchi village, 22nd March 2017. Interviewers: R. Hasegawa and C. Fassert.

[162] The village's official stance is that it is safe to return to Kawauchi. Therefore, if a village employee does not return, s/he is seen as being antithesis to this official position jeopardising the credibility of the municipal office.

Kawauchi in March 2013."

At this point, Ms. YI burst into tears: "*I still don't know even now whether it was the right decision (to return)…* "

Before the accident, Kawauchi children went to a High School in Futaba or Tomioka[163] by bus everyday (as there is no High School in Kawauchi). But now her children will have to go to a boarding High School either in Hirono or Kôriyama.

4.4.1 RETURNING AND DOUBTING

Unlike the case above (Returning and Controlling/Complying), Ms. YI returned to Kawauchi, but is not sure she made the right decision[164]. The interview itself proved somewhat moving for all present (the two researchers and the two women interviewed), when Ms. YI bursts into tears, evoking the "decision" she had made. She lives with a haunting *doubt:* her children could be ill later on, because of their time living in a *contaminated* place. She worries about the residual contamination and does not feel at all comfortable with living in a place where forests still show a high level of contamination.

However, she does not give any details on the particular conduct she adopted – or not – to deal with contamination. When asked about the role of the local counsellor, Ms. YI says that she has "little contact with her" and mentions her "*reassurance* role". She insisted during the interview on the pressure to return that she had felt, because of the role of her husband, a town employee who benefits from a housing. Anxiety linked to this return is so overwhelming that it allowed no room for conduct such as was the case among the previous category of inhabitants discussed ('Return and Comply') where living with contamination is framed as an issue to be tackled through appropriate, recommended conduct and systematic measurement of radiation levels.

The director of the local school provided more information on parents living in Kawauchi with children. In interview, he gave details of the life led by these children:

"*Well, they live like before the accident … well, not exactly like before the accident. Pupils commute to school by bus and do not walk any more. They are not authorized by their parents to go into the forests, or to swim in rivers like we used to do before, as children. We were not allowed to do it, but still we did it (laughs). They do not climb*

[163] In the "difficult to return" zone.

[164] It is interesting to note that there were few interviews with inhabitants who had returned but still questioned their decision: living with such a worry may be so unbearable that most parents in this state of mind, and who could evacuate, had already done so (cf. "not returning definitively"). More generally, we could not interview many parents with young children, and even if statistics were not provided on the demographical profile of "the returnees" in Kawauchi, we were told several times that "only the old people come back". The first category (return and forget/resist) is very much constituted of this type of person. As our field work is qualitative, we cannot conclude much about it. A single indication was given in Kawauchi by the director of the school: there were 60 children in the school before the accident, there were only 20 after the accident, at the time of interview. Besides this, we asked to be put in contact with this type of inhabitant, either through the township or through Ms O, the local radiation counsellor, but this request was turned down (not successful?). We understood these types of inhabitants were not keen of being interviewed.

trees[165]*"*. Himself a commuter, he returned to Kawauchi to work, but still live in Iwaki, where his wife and two daughters also stay.

"*It is worth doing the decontamination work, considering that the level of radiation has decreased. The level was at 1μSv/h, but after decontamination it decreased to 0.2 μSv/h. But, the level of radioactivity in the mountains is still as high. It is very stressful not to be able to collect* sensei *or mushrooms, and not to let children go there. Life in the village of Kawauchi without those kinds of activities has no sense*[166]".それらができないと、川内村に生きている意味がない ».

Parents with children might decide to come back, but to a life that is quite different to the one they had before the accident. This is a significant difference with our first category - the seniors who returned and (after a period of monitoring) decided to "forget" about radiation. A number of ethical issues are raised here. Michaël Ferrier, (Ferrier, 2012), French novelist and essayist living in Tokyo, coined the term "half-life" - an echo of the half-life of radionuclides - to designate such a life of restrictions; a number of NPO reports denounced what they considered to be a part of the *normalization* of the accident, the idea according to which people can continue living "normally" in contaminated territories even after a grave accident as long as they adapt themselves to radiation protection measures (Greenpeace, 2015, IPPNW, 2013, Bournet[167], 2016). A detailed analysis of what it means to live in contaminated territories is provided in the "social analysis" (Chapter 5) of the present study, comparing these conducts with analyses by researchers who engaged in similar studies after the Chernobyl accident, and also examining a number of other related publications.

4.4.2 RETURN AS "LOYALTY" TOWARDS THE VILLAGE

A notable point in Ms. YI's testimony is that she felt she was pressurized to return. When the Evacuation Order was lifted, either in Kawauchi or in Naraha, the inhabitants' entitlement to statutory monthly compensation payments would end one year later, whether they decided to return or not. The decision to Lift the Evacuation Order was made within the framework of a strong push, on the part of the government, for "reconstruction" and the normalization of the situation. A number of inhabitants in the interviews commented that they did in fact feel "pushed" to return; they mentioned a form of pressure. The decision to return or not could be recast not only as a personal decision, but also as a manner of social and political act, by which a citizen would comply or not with the general decisions made by the government. In the particular case of Ms. YI, there was a particular incentive with regard to their housing - they would have lost their entitlement to that housing if they had chosen not to return to Kawauchi. But she also insists on the fact that, as a municipal employee, her husband is expected to be an "exemplary inhabitant" and to return: "*I was worried about criticism my husband would probably receive from villagers if he commuted to work from Kôriyama to Kawauchi every day*". Section 4.4.3 below, on "returning partially", looks at the case of inhabitants

[165] Mr. AS, Kawauchi. Interviewers: C. Fassert and R. Hasegawa. 20 may 2016. Quoted in: Fassert, C. 2017.

[166] M. AS, 25th September 2015, Kawauchi. Interviewer: Rina Kojima.

[167] See in particular in Bournet (2016) Franckushima : « échanges avec Roland Desbordes, Président de la CRIIRAD », et Asanuma Brice : « A Fukushima, la population est dans une situation inextricable ».

who choose to return to work in Kawauchi, but not to live there. But for those who choose to return, the existence of "resettlers" or "partial returnees" represents a stark reminder that "the situation is still not normal".

Cases where residents return under social or family pressure may be associated with extremely ambivalent feelings. One evacuee from Fukushima city living in Kyoto[168] set up an association for evacuees from the Fukushima Prefecture. She organized a friend-meeting trip for children who were evacuated to Kyoto to invite former school friends from Fukushima to come for a holiday in Kyoto. For her, the holiday was good for the health of Fukushima children as well:

"*Last year, a 12 year-old girl said something very shocking for me – she said: "I don't understand why my friends [who evacuated to Kyoto] do not come back to Fukushima. Now things are normal in Fukushima, even though I may get sick in the future*".

What was shocking for the interviewee was that, as well the "pressure" to return felt by families who wished to stay on in Kyoto, who were thus considered by some as disloyal to Fukushima, the enduring worries expressed by a 12-year-old who had returned - "I may get sick in the future" - showed how this return would be far from free of anxieties.

4.4.3 TOO EARLY?

When the Evacuation Order was lifted, a number of residents expressed concern that it was "too early". These people were not opposed to returning, but were upset by what they felt as a push from the authorities. The idea that the government wanted, for many reasons, to accelerate the return to the evacuated territories was felt as an additional burden. In some inhabitants, this led to a kind of fatalism – for example, the attitude that the government had decided, so the local authority had to follow suit. But in certain cases, it triggered anger towards the local authorities (the mayor and the town council), who were considered as being unable to "resist" the will of the central authority[169]. This central vs local power struggle was decoded by many as, on one side, a central government keen on stopping compensation payments and keen to prove that the accident was over, and on the other, a town authority seen as more sensitive to the desires and needs of villagers. Some judged that it was "too soon", based on a number of factors, including the radiological situation (these inhabitants considered that the decontamination was not "complete"), or that the availability of infrastructures was inadequate (the closure of hospitals in surrounding villages now included in the "difficult to return" zone).

An important criterion for family was the availability of schools. For example, as Mr. MK informed us:

"*Before, the children of Kawauchi went to the high school in Okuma. This high school is now closed. Okuma is in the "difficult to return" zone; families with teenagers or young children prefer to stay in a place where there is a possibility for their children to go to a high school*[170]".

[168] Ms YN, Kyoto, 16th October 2014. Interview led in the restaurant she set up. Minna-no-Te (Hands of Everybody). Interviewers: R. Hasegawa and C. Fassert.

[169] See Chapter 3.

[170] Interview with Mr MK, 19th March 2015. Interviewers: R. Hasegawa and C. Fassert.

These local specific situations of social and educational infrastructure, such as location of schools, seemed to have been missed or not to have been sufficiently taken into account by decision-makers when lifting the evacuation orders.

4.4.4 THIS NARAHA IS NOT THE ONE I USED TO KNOW

Returning may be associated with worries about the dangers of living in an environment that is still contaminated in Kawauchi and Naraha. But there are also local, specific types of worries. Naraha, for example, is confronted with a major change in the composition of its population after the authorization to return. Mr. AO[171] explained:

"*Today, there are more than a thousand [nuclear] workers[172] in Naraha, twice as many as people who are returning. They come from everywhere in Japan, and some of them have problems, like thieving and drunk driving. The people of Naraha who live alone talk about how worried they are*" […].

For some inhabitants, these issues are actually ignored or denied by the media: "*In the media, they don't speak of bad things or true things.* […] *For example, they don't speak about the rape of a woman working as a cook in a residence for nuclear workers*[173]". Despite measures taken -- "We asked to police to reinforce regular security surveillance, and we also asked the companies to organize surveillance of their employees" explained Mr. AO - a number of inhabitants refused to return because they consider the identity of their village to have changed dramatically: "this is not the Naraha I knew" said some inhabitants. This raises a number of questions as to what constitutes the identity of a village (nature, architecture, climate, and so on); presumably, based on this reaction, that identity depends on not only these geographical characteristics, but also the demographic aspects. In this case, then, returning does not mean coming back to a former life, but facing an entirely new situation.

4.5 RETURN AND COMMUTE

Some inhabitants come back to work in hometowns while living in the place they were evacuated to.

Emblematic case: Ms. W[174], "Kawauchi is a place for working, but not for living"
Ms. W has 3 children, aged 8, 5, and 3 at the time of the accident. She returned to Kawauchi to work, but still live in Kôriyama. Both her husband and she are the employees of Kawauchi village, so when the village function returned to Kawauchi under the initiative of the Mayor in April 2012, they had to return to Kawauchi to work. "*When we evacuated to Kôriyama city, my oldest daughter at junior high school*

[171] Mr. AO, interviewer: Rina Kojima, 21st September 2015.

[172] These workers work for decontamination and for the dismantling of the crippled plant. An account of their life is given in Vaulerin (2016) and in Jobin (2012).

[173] Mr. TN, 20 September 2016. Interviewer: Rina Kojima.

[174] Ms. KW in her 30s, Kawauchi. 22nd March 2017. Interviewers: R. Hasegawa and C. Fassert.

was bullied there. But since she entered into high school, the bullying has stopped. We decided to stay and resettle in Kôriyama mainly because of the education for children. Because there is no high school in Kawauchi. So my husband and I drive to work from Kôriyama to Kawauchi by car every day, which takes 1h20 one way, during the last six years while the grandparents of my husband take care of our children after school. My grandmother-in-law says to me: "you should make a decision that would be the best for the children". So they came to live together with us in Kôriyama although they maybe prefer to return and live in Kawauchi, their hometown. I am so grateful to them."

[She insisted that it is not for "radiological" reasons that she decided not to return, but for the possibility of a high school for her children. However, she was interviewed with her friend Mrs. YI, who returned "with doubts" on her decision.]

Ms. W. also thinks that the Mayor's declaration for return was made too soon: "*If they had waited one year or two before to ask the families to return, there would have been more families who would have return to Kawauchi. I wonder if the village policy is really geared toward protecting the children or for the children's future*".

4.5.1 DECONTAMINATION IS LIMITED

If Ms. KW did not return living to Kawauchi for practical reasons (the education of her children), other who return "partially" said it was for the radiological situation.

Mr. AS[175], who had two children aged 16 and 6, is in this situation. He is an employee of Kawauchi village (civil servant); but he lives in Iwaki with his family. Mr. AS talked of feeling pushed to return to Kawauchi, but he does not want to settle here.

"*Decontamination works were conducted in my home; the radiation level decreased from 1μSv/h to 0,2 μSv/h. But radiation in the mountains and forests are still high. It's very stressful that you cannot go there to collect mushrooms or* sensai*, and also not to let your children go there* ».

This is also a problem mentioned by the school employee, who commutes every day to Kawauchi.

4.5.2 DIVIDE BETWEEN "FULL-RETURN" AND "HALF-RETURN"

For those who returned to the village, this choice can be disagreeable.

M. SI[176], who returned to Kawauchi, explained: "Some inhabitants work in Kawauchi, but stay in Kôriyama, in free housing. For them, Kawauchi is a place for working, not for living. There is a psychological separation between these two groups of people". (川内村は「働きに来る場所」と思っている人「暮らす場所」と思っている人の間に、精神的な隔たりがある)

[175] Mr. AS, 25th September 2015. Interviewer: Rina Kojima.

[176] Mr. SI, 25th September 2015. Interviewer: Rina Kojima.

This choice, made by some of the villagers, to come back only to work but not to live, has created an idea of the village as not being a place where one would *want* to live - which is, difficult to confront for those who have in fact chosen to return "fully". This idea was evidently reinforced by inhabitants who chose not to come back to the village at all, there would be no further occasions for these two groups to meet. The uneasy cohabitation between those who returned "fully" and those who returned to work is a source of tension and disagreement within the village community.

4.5.3 "RESISTANCE" TO THE DICHOTOMY OF OPTIONS: RETURN OR RESETTLEMENT

The choice for "half-return" can be regarded as people's creative attempt to adapt their lives to a new situation and find suitable solution to their respective situations (ex. safeguarding the employment while avoiding the radiation risk for children or providing necessary care for aging parents…). The government has basically offered only two options to the evacuees after the accident: return with support to restart their lives, or resettle in other places with little or no assistance. In face of this dichotomy, some people chose an alternative, third option: Half-Return or Half-Resettlement. Mosneaga (2015) called it, "dual residency", one of the "dynamic, makeshift arrangements that fall somewhere between different settlement options[177]" But this alternative migratory choice has not been officially recognized, let alone institutionally supported by the government or local authority.

4.6 NOT RETURNING … NOW

There are quite a few cases of inhabitants who declare that they do not return for the moment, but that they plan to come back to their hometown at some point in the future: their decision is not definitive.

The decision of these residents to leave their homes after the accident is presented as a (long) parenthesis, with the underlying idea that, since contamination is supposed to decrease continuously, and that children will grow up and thus become less sensitive to radiation, return may be possible in a future.

Emblematic Case: **Ms. SA[178]: "*I fear that the Government is making the accident look as if it no longer exists*".**
When the reactor exploded on 16 March 2011, knowing this reactor of the Daiichi NPP was using MOX fuel, Ms. SA immediately left Fukushima city with her husband and daughter. Subsequently, they moved to Yamagata, then Tokyo, Hokkaido, Kitakata (west Fukushima), Okinawa, and finally settled in Kyoto in August 2011 (as her friend Ms. MY had recommended they do). Her daughter was 10 years old at the time of evacuation. Ms. SA lived in city-owned public housing with her daughter; the rent was paid by the city. Her husband lived in Fukushima city due to his job. Currently there are

[177] Mosneaga, A. (2015). *Op.cit.* (p.2).

[178] Ms. SA, 23rd May 2016. Kyoto. Interviewers: R. Hasegawa and C. Fassert.

30 evacuee families living in the same building, though in the beginning there were about 50. She is part of a Kyoto group-action lawsuit, demanding compensation for evacuation costs which, so far, the evacuees have been paying themselves.

"*I was very upset about the fact that the Japanese government does not announce policies to protect children after the accident. After Chernobyl, I heard that the Belorussian government supported and financed convalescent holiday trips for children living in the contaminated area. The Japanese government does not support any of those programs. In the recent opinion polls conducted by the Fukushima prefecture, 25% of the people who live in Fukushima would still evacuate if they could.*"

"*We came all the way from Fukushima, but the irony is that Kyoto city is situated around 40-50 km from the nuclear stations of the Fukui prefecture, while Fukushima city was situated 0 km away from the Daiichi. I feel like the nuclear power plant has followed us to Kyoto.*

[…] With the 2020 Tokyo Olympic games getting closer, I fear that the Government is making the accident look as if it no longer exists. I feel that the nuclear accident victims will be abandoned, as was the case in Hiroshima and Minamata. It is sad to say, but history repeats itself: what happened to the population after the atomic bombing in Hiroshima/Nagasaki, and after the mercury pollution in Minamata, will happen again in Fukushima."

When asked about the scientists/experts she trusts, she answered:

"*I trust Professor Koide of Kyoto University. Also, initially, Mr. Kainuma - but I was disappointed afterwards" (…)* Mr. Kainuma has become quite famous because of his book: "Fukushima theory, why was the nuclear Village Born [179]", published in 2011. He was a PhD student at Tokyo University at the time. Native of Iwaki city, Fukushima, Mr. Kainuma analysed in detail how these rural communities accepted the NPP installations in the first place, during the 60s, and how the government and industry at the time managed to silence local opposition, mainly from farmers and fishermen. But, as he became well-known and was invited for a lot of interviews in the media, he started to be vocal in criticizing anti-nuclear demonstrations, denying the increase of thyroid cancer cases among children in Fukushima, and criticizing the "over-reaction" of the people (for example, those living in Tokyo and self-evacuees from Fukushima) concerning the radiological situation in Fukushima.

A government decision planned to stop housing assistance in March 2017; Fukushima and Saitama prefectures decided to partially subsidize inhabitants' rent for two years after March 2017.

"*I hope that Kyoto would make a similar decision. I worry whether my husband and I could financially support two households (one in Fukushima and another in Kyoto) after March 2017.*

"*My daughter was bullied at local school in Kyoto because she is from Fukushima. It was difficult for her to make friends as she speaks with a different accent and in a different dialect[180]. But now she goes to another school and she is doing well. I plan to go back and join my husband in Fukushima city when my daughter goes to university. My husband is of the same opinion. He comes to Kyoto every three months, because the return ticket costs 400 euros and we cannot afford it*

[179] Kainuma, Hiroshi, "Fukushima" ron: genshiryokumura wa naze umareta no ka (Fukushima Theory: Why Was The Nuclear Village Born) (Tokyo: Seidosha, 2011)

[180] Kyoto has its specific dialect.

every month. It is very sad when he had to go back to Fukushima every time".
Note: When, during a second interview with Ms. SA, the young girl was asked how she felt about her future, she answered that she wanted to come back to Fukushima in the following years, and said she felt attached to her hometown.

4.6.1 RETURNING - WHEN MY CHILD IS GROWN UP …

At the time of interview Ms. SA typically bears a financially and emotionally difficult situation, separated from her husband who stayed in Fukushima, in order to, as she said "protect her daughter". She is very active in evacuee associations, and lives in the same public housing building as Ms. MY, another evacuee from Fukushima, interviewed in this study, who became her friend. However, unlike the last category (not returning, ever), she plans to come back to Fukushima "later". She explains that her husband has a job which he loves and to which he is deeply attached. The young daughter (who participated in discussion during a second interview with her mother) is now quite happy at her new school in Kyoto; she is also active in denunciating the consequences of the nuclear accident, and proudly shows the speech she gave to pupils during a school trip to Europe on the consequences of the accident in her life. However, she still feels attached to Fukushima and envisages returning in the future, after graduating from high school. She also misses her father's presence. For Ms. SA, the desire to reunite her family is very instrumental in the fact she envisages going back to Fukushima.

4.6.2 RETURNING TO TAKE CARE OF ELDERLY PARENTS

In the case of Mr. and Ms. NA, the project to return later was linked to a later life project of taking care of elderly parents, when required. Ms. NA and her husband were born in Fukushima, and spent their whole life there before the accident. After the accident, Ms. NA moved to the Miyagi prefecture, then to Sendai. She explained that she envisaged returning to Fukushima later, when her children would have grown up. She found life tiring in Sendai (a bigger city), and regretted the quietness of her life in Fukushima. But her main reason for returning was the aging of her parents: "My parents and parents-in-law still live in Fukushima and, considering their age, I may need to come back to care for them".

Her husband was also keen to come back, but as he had found a job in Sendai, he was not sure he could find easily a job in Fukushima now". She envisaged a return when her child had grown up, but she might have to return sooner, if her parents and parents-in-law needed her help.

It is interesting to note, in this category, the fact that these inhabitants left after the accident but do not want to "close the door" to a return. The "parenthesis" of the partial or total move of the family is linked to the idea of protecting the children during their childhood, but with the firm objective of coming back later. In both cases, attachment was linked to people (family) staying in the hometown.

4.7 NOT RETURNING … EVER

A last category concerns inhabitants who declared that they did not plan to come back, ever, to Fukushima prefecture. They had, to a certain extent, made a fresh start, and developed in most cases a deep mistrust towards the authorities. Again, the reasons for their choice were varied, as shown in the results of the survey done by the town of Naraha.

Emblematic case:
Ms. KT[181], Evacuee from Iwaki city, living in Kyoto: "*The myth of the absolute safety of NPPs disappeared after the accident, but the new safety myth of low-dose radiation exposure emerged, and it is still intact*".

Ms. KT lives in Kyoto with her two daughters. She and her husband divorced, because she refused to return to Iwaki. She was at the time of the interview a social worker for the elderly and a volunteer at the Kyoto Citizens' Radioactivity Measuring Station.

First interview: 25th May 2016.

Until 14 March 2011, Ms. KT lived life as normal in Iwaki, not knowing that the accident had occurred. Work and school continued as usual. When she talked with her husband afterwards, he had actually known about it since 12 March, but said nothing to her. She was working at a supermarket; her husband was a truck driver.

As soon as she learned about the accident on 14 March, Ms. KT called her best friend. Her friend's husband answered, and told Ms. KT that his wife had left Iwaki for Okinawa, with the children, that morning. At that point, Ms. KT decided to evacuate Iwaki.

On 17 March, she and her family left for Atsugi, Kanagawa prefecture (near Tokyo), to stay at her brother's house for 9 days; they then returned to Iwaki because of Mr. and Ms. KT's work. In April, the school started again as if everything was normal - children were doing sport outside, while cesium was detected in the water supply of Iwaki. Ms. KT's daughters were also worried about radiation; they were 1 and 12 years old at the time.

In June, the school cafeteria reopened - meaning that Ms. KT could no longer protect her children from food contamination, as school would decide which food to serve – locally produced vegetables. She reported thinking:

"I cannot handle it by myself anymore", and decided to have her daughters evacuate to Akita, together with their grandmother, and her sister with her children, while Mr. and Ms. KT stayed on in Iwaki for work. They still had to pay the bank loans for their house.

Their daughters returned to Iwaki in February 2012, as their grandmother could not take care of them alone due to her heart problem; Ms. KT mother, her sister and her sister's children stayed on in Akita.

In April 2012, when the daughters went back to school in Iwaki, their teacher

[181] Ms KT, Evacuee from Iwaki city, living in Kyoto, Volunteer, Kyoto Citizens' Radioactivity Measuring Station at Tanbabashi, 25th May 2016 and 8th October 2017. Interviewers: R. Hasegawa and C. Fassert.

effectively scolded them as if they had done something wrong:

"There were people who wanted to evacuate but couldn't, so don't say anything about your fun time in Akita to your friends". Ms. KT immediately regretted making them come back to Iwaki, and started to plan for evacuation again, for a longer period. One of her colleagues whispered to her at work: "*once we are irradiated, discrimination will begin*." When she asked the pediatrician, whom she felt she could trust, whether she should evacuate her children from Iwaki, the doctor said: "*What are you talking about? Iwaki is safe. That is why all the evacuees from evacuation zones came to Iwaki*". She was shocked by his words.

Although there are no official statistics available, Ms. KT believed that there were many self-evacuees from Iwaki. Many self-evacuees evacuated without telling anybody, and hid from others.

Her husband and parents-in-law were opposed to the idea of children being evacuated (including the first time, to Akita). They said, "there are other admirable wives who make effort to stay in Iwaki, but instead, you are abandoning it (bad wife)".

Second interview : 8th 0ctober 2017

"My husband and I divorced because he did not agree with the most important thing for me in life: the life and health of our children. After this accident, I feel like I learned many things. I finally understood what kind of country Japan was".

But after five years, she wanted to become "a normal woman [and] have a normal life again", that is to say, she wanted not to be thinking constantly about Fukushima and evacuation. She had to make a living for her and her daughters, and felt rather tired of participating in activities organised for evacuees. But when her children thanked her for having protected them from radiation exposure - in coming to Kyoto - Ms. KT was glad she made that decision.

"The government is imposing the choice to return for the evacuees. I do not understand why it invests so much money in renovating houses, decontamination in contaminated areas, when it could assist in the resettlement of residents.

I felt really hurt when other mothers in Iwaki told me 'because you are originally from Akita, you could evacuate easily'."

In other words, Ms. KT felt distressed that these mothers were accusing her of not being loyal to Fukushima, because she was not originally from there.

"*I helped with an event inviting a Hibakusha [*"the irradiated" surviving victims of the 1945 atomic bombings of Hiroshima and Nagasaki*] from Hiroshima to talk about his experience. I understood that the people who were socially vulnerable, mothers and children, are the ones who paid the biggest price after the Hiroshima atomic bomb and the Fukushima nuclear accident. The nuclear power generation has a link to atomic bombs and war.*

There is a new safety myth: the myth of the absolute safety of NPPs disappeared after the accident, but the new safety myth of low-dose radiation exposure emerged, and it is still intact".

"*Also, I went to a photo exhibition about the bombings of Hiroshima and Nagasaki. I thought that there was definitely a link between Hiroshima/Nagasaki and*

Fukushima. Nuclear issues are connected to war. I learned it after the accident by reading different things. I finally understood that the nuclear issue led to here (the war) and the characteristic of Japan has not changed [since the war]. When I first evacuated to Kyoto, I went to a war photo exhibition at the University of Kyoto for the first time in my life. I had never been to a war photo exhibition in my life. [When I saw the photos] I thought, what is this? Those who suffered the most are, again, women and children. That is it. The vulnerable population becomes the biggest victim - just like after the Fukushima nuclear accident. I thought I have to let people know about this. I was stupid; I knew nothing about our history. At the end of the exhibition, there was a photo of the explosion of the Fukushima NPP. An employee of the exhibition came up to me and asked whether I thought it was appropriate to have the photo of the Fukushima accident at the war photo exhibition. I answered, "of course it is appropriate. I think war and nuclear energy are connected". Then I met and talked with the organizer of the exhibition and decided to organize the same exhibition in the Mukaijima district of Kyoto, where I had lived for two years. I wanted people to know how much mothers worry and think about their children [when a war/accident happens]. I wanted the government to know. [When a war/accident occurs] the lives of many and children would be jeopardized. I wanted them to know. Even if I am ignorant, I thought I had to do this to let people know. The government's [post-accident] policies are horrible and we have actually been abandoned by them. Why do vulnerable people have to suffer the most? [When looking at the photo on the flyer of the exhibition, where a mother tries to give milk to her baby, whose face was burnt by the atomic bomb] I wonder how much this mother worried and thought about her baby (tears). Of course, we will not die immediately from the Fukushima nuclear accident, but many mothers are worrying and thinking about their children's future."

"*After the accident, which is itself an unfortunate event, I learned a lot about life, met many supportive people, and considered myself lucky despite the misfortune of the accident. I finally understood what kind of country Japan was. I had been also uninterested in politics before the accident. But now when I think about the future of our children, we [as victims] have to raise our voices and let people know what has happened after the nuclear accident.*"

4.7.1 PROTECTING MY CHILDREN

The case of Ms. KT epitomizes the ethical stance of "protecting my children" as the overarching principle for guiding decisions about returning/remaining after an accident. This stance led to her divorce, because her husband considered her fear inappropriate and wanted her and the children to come back. Ms. KT is from Iwaki city which is not under Evacuation Orders where shelters had been built mainly to provide housing to evacuees from Naraha and other towns under Evacuation Orders. This shows that the official zoning, the official risk assessment thereof, is not considered legitimate or trustworthy by some inhabitants who rather trust alternative risk assessment made by independent scientists and experts.

This decision to evacuate can be taken at a high cost – notably: divorce, in a great number of cases. Indeed, the media and evacuees themselves use the term "atomic divorce" to designate these cases, where a couple separated because of disagreement on decisions on whether or not to live in a contaminated area. In other cases, the family had to pay for two households. Ms. NS[182] evacuated Fukushima city with her husband and two sons, to live in Hiroshima because her husband was originally from there. Her husband had to return to Fukushima, as his job re-started soon after the accident. They had been able to get together, as a family, for about one month every year for the last five years (since the accident). They have double household expenses:

"*I am afraid of becoming part of the working poor and of jeopardizing my son's future in order to avoid radiation exposure and prevent future risks for them*".

Ms. MY was also part of this category of inhabitants who declared firmly that they would not return to their original hometown. She was a close friend of Ms. SA (see above). They moved to Kyoto together after the accident, while their husbands (also close friends) stayed in Fukushima city. Each couple had a daughter; the two girls were roughly the same age. They lived in the same social housing in Kyoto, and spend a lot of time together; in interview they said that moving together was also a means to comfort each other. During the second interview, Ms. MY declared she would not come back to Fukushima city. She added that she would not live in Fukushima city, but nor would she live in Tokyo (she is originally from Tokyo), which she considered "too contaminated", preferring to stay on in Kyoto. However, her husband was not satisfied with the situation. He works for an NGO that organizes the measurement of contamination in Fukushima city. She added that the separation of the family was not an easy thing to live with, and that, because a train ticket between Fukushima and Kyoto cost so much, the father could visit them no more than once a month.

4.7.2 CITIZENSHIP AND POLITICS AFTER THE ACCIDENT

An important characteristic of this testimony lies in the way that the disaster, evacuation in particular, radically affected and even transformed the core values and life-styles of some population, triggering the sense of citizenship, or even political engagement. Ms. KT was an employee of a supermarket in her town; she admitted in interview that, before the accident, she took no interest in politics at all. She insisted on how she became progressively interested in politics, and increasingly critical of the Japanese government.

"*After the accident, which is itself an unfortunate event, I learned a lot about life, met many supportive people, and considered myself lucky despite the misfortune of the accident. I finally understood what kind of country Japan was*[183]".

Ms. KT recast the accident as an opportunity to transform herself from an "ordinary mother" to a citizen-activist (member of the Citizens' Radioactivity Measuring Station), she recognised becoming more prone to be vocal about the government.

Another new awareness, triggered by her new situation, correlate the Hiroshima and Nagasaki bombing - "I was stupid, I knew nothing about our history" - and how she associate the military and civil nuclear aspects, which became unquestionably linked in

[182] Ms NS, Evacuee from Fukushima city, living in Hiroshima, 21st October 2016. Interviewers: R. Hasegawa and C. Fassert.

[183] Ms KT, op.cit.

her mind, through the eyes of maternal care. "*Of course, we will not die immediately from the Fukushima nuclear accident, but many mothers are worrying and thinking about their children's future*".

Another resident mentioned above, Ms. NS, who evacuated Fukushima city for Hiroshima, also recast the accident as an occasion to question how citizens were represented, and how their interests were defended. She raised the issue of central government policy seen to be imposing certain solutions on local authorities. She considered that: "*The prefecture is also a victim, but the authorities and town employees do not take the side of the affected population. The government and the Fukushima population, for whom they are working? I wish the Fukushima governor and prefecture had become genuine spokesmen for the victims and that they were on the front line supporting the lawsuit against the State and TEPCO. This would have united the victims and Fukushima residents despite divisions imposed by zoning and compensation. Instead, they are abandoning the (self-) evacuees making them look like simple re-settlers. Their attitude makes evacuees feel that they are doing something wrong*". Also Ms. NS considered that the accident changed her perception of the State: *"I used to see the local administration and the State as protecting the citizens. But now I feel that I was completely wrong*".

4.8 CONCLUSION

The presentation of six categories of inhabitants, in terms of their decision to "whether return or not" after the lifting of EOs in the evacuated territories or, more generally, their decision to stay in or leave a contaminated territory, allowed to summarize the variety of positions held by inhabitants. The issue of ionizing radiation (the dangers it presents - or not - for each type of category) was always spontaneously evoked during interview, and is a central element in decision-making. It was also a very dividing issue (Slater, 2015, Kimura, 2016). The points raised show that the decision to return or not involves balancing a whole range of reasons, (infrastructures availability, return of other villagers, …), making a *personal* and intimate decision, but that it is also a way of responding to government 'pressures' and incentives. To this extent, whether to return or not can also be framed as a *political* stance on the part of residents, which mobilizes their broad assessment of the government's post-accidental policy.

5 SOCIAL ANALYSIS OF THE CONSEQUENCES OF THE ACCIDENT

5.1 INTRODUCTION

In this section, we come back on a number of topics identified from the field study results (chapters 3 and 4) and broaden the analysis thanks to the examination of a number of literature elements from Human and Social Sciences. We explore the many questions which are beyond the questions of "whether to return or not", in order to give a better understanding of the main issues raised after the accident. This analysis is based on the interviews led with the inhabitants, but also with the persons in charge of managing its consequences, such as government representatives, radioprotection specialists, medical doctors, etc.

The topics in this chapter are classified on a temporal basis: starting with the accident and emergency evacuations, and exploring the issues as they gradually emerged: the decision to leave or not directly after the emergency situation, the time of sheltering, the perceptions and feelings of those who left, or stayed, and then life after the lifting of Evacuation Orders, for those who stayed or left.

5.2 THE IMMEDIATE AFTERMATH: EVACUATION ORDERS AND THEIR CONSEQUENCES

5.2.1 EVACUATION ORDERS AND THEIR CONSEQUENCES

When speaking about the zoning, and the long-term consequences of being evacuated or not, inhabitants spontaneously referred to emergency evacuation that took place a few days after the Nuclear accident. Those emergency evacuations and the sometimes chaotic emergency scheme although not discussed as such, within the scope of *Shinrai*[184], have certainly had long-term consequences and therefore warrant mention here. The lack of information provided by the authorities at the time, and occasional mistakes in decision-making (e.g. the evacuation of residents from Namie to Iitate, where the radiological plume had actually migrated meantime), had lasting impact on the population's appraisal of post-accidental policy.

When interviewed, Genyû Sôkyû, Head of Temple in Miharu (Fukushima prefecture) and writer, insisted on the *violence* of the evacuation and underlined its authoritarian aspect:

"*What happened to the town of Namie[185] was dramatic. Namie was hit the hardest by the tsunami in that region. While there were still many people missing, one day after the tsunami, people were obliged to evacuate. So they couldn't search for their missing family members. This bitterness that they feel, I am sure it will continue their whole lives. I heard that some people finally found the remains of their relatives later on, in a horrible state [when the "Restricted Zone" was lifted and people could enter during*

[184] Crisis management and post-accidental management are categorized as two different topics in the current institutional schemes. However, it is more and more widely recognized that these aspects cannot be handled separately, and that a number of decisions taken in the immediate aftermath of the accident, or even "during" the accident are instrumental mid- *and* long-term. People interviewed always spontaneously came back to the accident itself, or even to former times, when an accident was considered inconceivable.

[185] Namie is located on the Pacific Ocean coastline of the Prefecture of Fukushima.

the day], but many still have not found the bodies of members of their family. What is particular about this disaster is that there are still 2553 people missing, even today."[186]

Emergency evacuations also resulted in a number of deaths. Some of them were a direct result of the frantic, frightful conditions in which very sick and/or very old people had to be evacuated, during the evacuation itself - because, for example, medical apparatus had to be unplugged from a power source, or due to lack of care for weak patients who had to be evacuated in standard buses. Prof. TO[187], who led Red Cross emergency teams in the immediate aftermath of the accident, explained: "*Nothing was planned for the high dose areas with hospitals: some people died as a result of the transfer, which was conducted without any precautions.*" Other deaths were indirectly a result of evacuation, such as the suicide of inhabitants who lost their farming properties or of very old inhabitants terrified by the catastrophe and its consequences. For example, the case of one inhabitant of Futaba, aged 102, who committed suicide because he had to leave his hometown, was particularly harrowing.

The obvious conclusion is that evacuations have a high cost, in terms of deaths. But this issue merits further reflection. The organizations in charge of emergency planning could usefully study the conditions and arrangements/plans that are in place for emergency evacuation of hospitals. A recent study (Shimada and al., 2018) led by a team of Japanese researchers concluded that:

"[…] *except for a case where there is a possible direct threat to safety (e.g., lethal or harmful levels of radiation exposure), it is preferable to seek alternatives for vulnerable people other than evacuation, such as sheltering-in-place. However, given our findings, we would like to stress that the mortality risk of sheltering-in-place in a harsh environment (as articulated above) might be comparable to those in an unplanned evacuation. It is imperative that potential risks of sheltering-in-place, which are unique to the vulnerable population, are recognized in disaster preparedness policies*[188]".

The choice not to move patients who cannot survive without medical apparatus is not specific to nuclear accidents, however, it also involves a certain "sacrifice" on the part of medical staff who volunteers to stay or who organizes the move meticulously despite the risk of exposure to high level of radiation. This echoes Takahashi's analysis (2013) of nuclear energy as a "sacrificial" energy[189]. It also calls for the comparison of evacuation/non-evacuation schemes, with specifying the precise modalities and conditions.

Another aspect of the evacuation to be considered is its "compulsory/authoritarian" aspect, whereby such evacuation conditions also generated cases of "dissidence" on the part of those who considered *unethical* the consequences of a brutal departure of

[186] G. Sôkyû. Miharu, 22nd March 2017. Interviewers: R. Hasegawa and C. Fassert. More details in Fassert (à paraitre) : "Choses qui se passent après un accident nucléaire. Revue des Sciences Humaines ; Ferrier, M. (Dir.).

[187] Interview Pr TO, Nagasaki. 12th October 2017. Interviewers: R. Hasegawa and C. Fassert.

[188] Shimada Y, N. S. and Al. (2018) Balancing the risk of the evacuation and sheltering-in-place options: a survival study following Japan's 2011 Fukushima nuclear incident. BMJ Open.

[189] "A system in which the benefits accruing to some parties are made possible at the expense of others' lives (whether as biological existence, health, daily routine, property, dignity, or hope)". Takahashi, T. (2014). 'What March 11 Means to Me: Nuclear Power and the Sacrificial System'. The Asia-Pacific Journal | Japan Focus, 12 (19). doi: https://apjjf.org/-Takahashi-Tetsuya/4114/article.pdf.

humans, abandoning the animals they are responsible for. In his book, *The Last Man in Fukushima*, Antonio Pagnotta (2012) describes the life of a man who decided to stay behind (illegally) in order to take care of the cattle and domestic animals who would die without the care of humans [190]. This particular case mirrors those of numerous interviewees, who confessed how much they suffered when they had to slaughter their cattle or abandon their pets during the evacuation. Such feelings, triggered at the time of the evacuation, were to some extent revived when it came to decisions to be made later on, such as resettling inhabitants for longer periods or lifting the evacuation orders.

It is interesting to note, in Chapter 3 of this report, how this 'authoritarian' aspect is mirrored in the role that mayors played in such processes; in a sense, the lifting of Evacuation Orders may be considered to have been *authoritarian* in much the same way as the order to evacuate. Of course, inhabitants were not, strictly speaking, *obliged* to come back, but the suspension of statutory compensation payments was in many cases a strong incentive for them to return, even when they were not willing or not ready to do so. This research shows that the evacuation schemes, and the choices made, have left their mark on the minds of people, and many regret that these important aspects of their lives (e.g. caring for domestic animals) have not been taken into consideration by the authorities.

5.2.2 EVACUATION CRITERIA: PROTEST AND ANGER IN THE POPULATION

The criteria for issuing evacuation orders also triggered another type of protest. The criteria used to define evacuated zones were a combination of distance from the crippled Nuclear Power Plant and radiological factors (see Chapter 1). The Japanese authorities insisted on the fact that they chose the lowest limit of radiation dose values (20 – 100 mSv) established by the International Commission of Radiological Protection, which provides radiological protection recommendations in normal and accidental situations. This is disputable, explains David Boilley, a French NGO: when they set this threshold, in April 2011, the situation was no longer considered "an emergency situation" in terms of radiological risk. According to the evacuation order issued at the time, inhabitants could evacuate their homes within a period of one month (e.g. Iitate village); the situation could thus be qualified as an "existing situation", whereby radiation values would be chosen between 1 and 20 mSv/y (rather than 20 - 100 mSv/y)[191].

The 20 mSv/year threshold sparked vivid debate and protest, mainly within Japan, but also on the international scene. In Japan, the most spectacular protest was the resignation (30th April 2011) of Professor Toshiso Kosako, a government advisor on radiological protection, who declared that he could not accept, scientifically or morally, 20mSv/year as the threshold to be applied for babies and children. Professor Kosako burst into tears on TV, declaring: *"I cannot accept this threshold as a scientist,* […] *I would not accept it for my children …"*[192]. One of the main arguments for the 20mSv/year

[190] Pagnotta, A. (2013). *Le dernier homme de Fukushima*: Don Guichotte, Seuil.

[191] D. Boilley is President of ACRO. (Association pour le Contrôle de la Radioactivité dans l'Ouest). French non-governmental organisation that operates a laboratory for radioactivity analysis and conducts studies on nuclear issues. Interview led by R. Hasegawa and C. Fassert, Herouville Saint Clair, June 2015.

[192] His speech at the press conference, translated in English, can be read at: http://japanfocus.org/events/view/83

threshold consisted in denouncing that this threshold for the general population - including children - was the same as the one habitually in place for nuclear workers.

A number of scientists, including Prof. Shimazono of University of Tokyo and Prof. Koide of the University of Kyoto, and Dr Sakiyama, member of the parliamentary accident investigation commission (NAIIC), also publicly criticized this threshold. The NAIIC report was fairly critical of the general policy established by the government, including the 20mSv/year threshold to be applied to children. Protests also came from a number of NPOs (Greenpeace Japan, Citizens' Commission on Nuclear Energy). In the report on his mission to Fukushima in November 2012, Anand Grover, Special Rapporteur of the United Nations Human Rights Council, also directed a number of criticisms at the Japanese government for its post-accidental policies. Furthermore, Grover argued that the recommendations of the International Commission on Radiological Protection (ICRP), which include socio economic considerations in its protection policies, such as notion of "As Low As *Reasonably* Achievable[193]", were in contradiction with the concept of the universal right to health. He argued:

"*The ICRP recommendations are based on the principle of optimization and justification, according to which all actions of the Government should be based on maximizing good over harm. Such a risk-benefit analysis is not in consonance with the right to health framework, as it gives precedence to collective interests over individual rights. Under the right to health, the right of every individual has to be protected.*"

His criticism opens the way for a wider contestation of current environmental and sanitary policies. This aspect will be discussed further in the conclusion to the present analysis (Chapter 7).

The threshold of 20 mSv/year was indeed not chosen on a purely scientific basis, but also based on other considerations. Simulation tools can evaluate the scope of possible consequences for the population at any chosen threshold. Using these simulation tools, the French Institute for Nuclear Safety and Radioprotection (IRSN) calculated that at the threshold of 10 mSv/year - half the chosen dose - 70,000 more residents would have had to evacuate, which would have placed an additional financial burden on TEPCO and would have had an added economic impact on the region[194]. Furthermore, this would have produced a strong symbolic message, of a serious nuclear accident. For example, Professor Yamauchi, professor in radiation physics at Kobe University[195], estimated that such a threshold was chosen precisely in order to avoid evacuating key cities of the Fukushima prefecture: *"Fukushima city is the capital. It was symbolic, you couldn't evacuate the capital city without recognizing the significant consequences of a nuclear catastrophe"*.

Zoning as a policy implies taking a stance, more or less implicitly, on what is "safe" and what is not. In a context of uncertainties, accidents are an opportunity to "deconfine"

[193] (p.16) "Reasonnably" in ALARA means that economical and social benefits are taken into consideration. A critical appraisal of ALARA is detailed in: *Shinrai* rapport 1, and the linked issues will be further detailed in *Shinrai* future report.

[194] « L'IRSN proposerait de prendre en compte un seuil de contamination de 600 000 Bq/m^2 pour les césiums 137 et 134 (correspondant à une dose externe maximale de 10mSv pour la première année) » Si cela avait été appliqué, « 70 000 personnes » supplémentaires auraient été évacuées. Source: IRSN (2011)/Rapport DRPH/2011-10, 23 Mai 2011.

[195] Pr Yamauchi, Kobe. May 2016. Interviewers: R. Hasegawa and C. Fassert.

controversies, and may offer opportunities for "citizen science[196]" to be more visible in the public space (Kimura, 2015). In the case of the Fukushima nuclear accident, the radiation dose threshold was decided without consultation or discussion with the affected population, by authorities taking into account political, symbolic and economic interests, as well as scientific evidence (Fassert, 2016). Moreover, the global strategy based on intensive decontamination and recovery of territories was a general framework which was also not discussed with the population: a number of inhabitants castigated the financial cost of the government policy grounded in decontamination. They considered that the money could have been spent in other ways - for example by providing the possibility to evacuate or resettle elsewhere, for those who chose that solution. The question of stakeholder participation must be examined by looking at the frame, mode and scope of their "participation" in policymaking.

Lastly, the protest or the anger of the victims, against this zoning policy as well as against the 20 mSv/year threshold, was also expressed in the form of legal action. In April 2015, a group of residents in Minamisoma city took to court the governmental decision to lift evacuation orders from hotspots using the 20 mSv/year referent dose. The residents demanded the annulment of the decision, contesting the validity of this referent dose. The court proceeding of the "Against the 20 mSv/year Lawsuit" began in September 2015. Other than this case, as of 2018 there were at least 31 group-action lawsuits demanding compensation for damages filed against TEPCO and the government, involving 11,400 plaintiffs all over Japan[197]. These legal aspects are detailed in Chapter 6.

5.2.3 EVACUATION AND SHELTERS: A SUSPENDED LIFE

For most evacuees, evacuation orders marked the beginning of a long period of erring, between emergency sheltering, staying with family or relatives, or places found in shelters in the longer term. However, conditions were quite different among evacuees - some had a chance to find a more durable solution; for example, the town of Kyoto decided to accommodate some "nuclear refugees" in social housing. As discussed in Chapter 4: *whether to return or not*, some inhabitants expressed their decision to return to their home village as a relief, after years of wandering that were particularly difficult to endure because of their advanced age. Numerous testimonies mention a remarkable number of relocations after the accident, of people who variously resided with family or friends, in housing provided by municipalities, and/or in shelters built for evacuated people. One of them, Ms. AK., who returned to Kawauchi explained:[198]

"*On the 12th March, I left for Kôriyama with my sons. My husband stayed in Kawauchi. On the 14th March, with the explosion of the second reactor, I left Kawauchi to go to my brother's place, in Ibaraki, then to Seitama, to another brother's home, then, to Kanagawa, to stay with one of my sons. Then I had [free] housing in Kanagawa, where*

[196] The term "citizen science" has a plurality of meanings: from various forms of public participation in science, community actions for regulating risks, and grassroots hacking. The roles of citizens in these initiatives vary: they may be trained to collect and analyze data, or, more fundamentally, challenge the paradigms used by scientists. These aspects will be further detailed in *Shinrai* future report.

[197] Kahoku Shimpo, Genpatsu hinan: shudansosho no genkoku 11,400 nin cho ni (Nuclear Evacuation: the number of group-action plaintiffs rose more than 11,400), 9 March 2017.

[198] Mrs AK, *Kôriyama.* interviewers: R. Hasegawa and C. Fassert, Kawauchi, 19th March 2015

we stayed from April 2014 to June 2015. My husband was then transferred to Haneda. Then he retired, and we decided to come back [to Kawauchi] after the LOE".

This succession of moves has provoked not only an initial severing of original, home community links, for most of them, but has also prompted a *repeated* scheme of the rupturing of social links. Ms. YA, another evacuee, explained that after the accident she moved, from her hometown of Namie, no less than 7 more times before settling in (temporary) housing in Nihombatsu. The next step for her would be to move, this time for good, to resident housing built by the government specifically for the evacuees. She was relieved to find a final place to settle, but she had regrets: "*once again, we are going to be separated from people here in Nihombatsu with whom we have built links.*"[199]

5.3 AFTER THE ACCIDENT: FACING CONTAMINATION

5.3.1 INTRODUCTION

"Enganbou Fûkei kiroku" (*Registering of a Coastal Landscape*) is a video art work by Fujii Hikaru, displayed at the National Museum of Modern Art in Tokyo. In the words of the writer and academic Michael Ferrier, it is a fixed plan, without any music, of a sun rise in a forest of Iitate. Light is emerging progressively and slowly, the songs of birds are growing little by little, the colors are developing in the dawn. Lastly, in a corner of the screen, figures are appearing: latitude, longitude, […] and level of radioactivity (10,41 micro Sieverts/h). This final image is striking: "*We realize in an instant that the level of radioactivity is now entirely part of the essential features of the place (in the same way as its physical coordinates, longitude, latitude, altitude)* […]."[200]

It is important to consider key questions related to this experience. What does it mean to live somewhere where radioactivity level has become an integral, essential part of the distinctive information provided about that place, more or less explicitly? After the accident, people progressively started living with a variety of "tools" that allowed them to grasp, or to apprehend something essentially invisible. Geiger Counters and radiometers would provide different views of ambient radioactivity, and they would be completed with food contamination measurement stations. Moreover, other types of apparatus provided would allow more direct measurement of personal doses: dosimeters, and Whole Body Counters, and also urine tests to measure radioactivity levels, thanks to Germanium systems[201]. This raises the question of how to make sense of this information? How to articulate Becquerel, milliSievert, and in some cases, WBC results, or thyroid screening results, and so on, in order to decide whether or not the situation is "safe"?

These questions emerged after the emergency phase, when the issue of "facing" a contaminated environment arose. Assessing the dangers of living in such an environment is not an easy task, considering the lack of scientific agreement on this matter. The objective here, in the current study, is to consider the social consequences of the divide

[199] Mrs YA, 18 may 2016, Nihombatsu. Interviewers: R. Hasegawa and C. Fassert.

200 "On réalise en un instant que le niveau de radioactivité fait aujourd'hui partie des données incontournables de la région, au même titre que ses coordonnées physiques, latitude, longitude, altitude) » (…).Ferrier, M. (2014). Fukushima ou la traversée du temps : une catastrophe sans fin. ESPRIT, 405, Juin 2014.

[201] Germanium systems allow to measure internal contamination.

brought about by this issue within communities and families. However, this report will not enter into scientific debates around the dangers of ionizing radiation. *Shinrai* Report 1 (Fassert, 2017) showed that these debates have endured in the history of military and civil nuclear domains, and provide the principal elements of the dispute that still opposes "insiders" and "outsiders" of the nuclear sphere. A *Shinrai* future report will characterize more in-depth the main issues of the scientific controversies, and how the Japanese government made choices on the basis of international standards and recommendations. In this section, the focus is on the *social consequences* of the scientific debates: the divides, the disputes, and finally, how in many cases radiation came to be a taboo topic within certain communities, precisely because disagreement on the dangers became at high stakes, and linked to positions on nuclear energy or on government policy.

5.3.2 RADIATION RISKS AS A DIVISIVE TOPIC

The divisive nature of different attitudes towards the perceived dangers of ionizing radiation appeared fairly rapidly after the accident. As discussed above, contestation of the 20 mSv/year evacuation threshold was emblematic of a deep divide as regards assessment of the dangers of low doses of ionizing radiation. The testimony of Dr. TS is particularly enlightening in terms of the role of medical doctors within the affected populations. Dr. TS left Tokyo, where he was a junior Medical Doctor in a hospital, to go to Fukushima in the immediate aftermath of the accident: "*I wanted to help people*[202]". He organized the first ionizing radiation measurement trials.

"I am not specialized in radioprotection, but I know the basics, being a medical doctor specialized in the treatment of leukemia, and I know radiotherapy. I held a first seminar 3 days after the accident. But the local government wanted to run it by itself. It was very difficult for me. We had no information. There was only ONE dosimeter at the hospital. I brought it to the school, the teachers were not happy with that. With some colleagues we wanted to begin a monitoring program, but it was impossible to get the WBC, the government didn't want it. Four months after the accident, we received the first machine, a very old one. We wanted to communicate the results officially, but the government did not want it. The media pressure was stronger and stronger, however. We did 1,500 WBCs in the following months. There was a 9-month delay to get an appointment. There was no time to give the results in a consultation, which I find unsatisfactory. The results were sent by letter. At this time, information came from every side: "this is safe! This is dangerous!". It was very confusing for people. […]"

Interviewed in 2015, he expanded on what he considered to be his responsibility as a doctor, and the difficulties of responding to people's concerns after the accident: "*Currently [2015], the exposure is not as high when you live in a town.*"; "*There are 100 Medical Doctors in Minamisoma* [Note: the south and west parts of Minamisoma are in evacuation zone]*, and most of them do not want to talk about the dangers of ionizing radiation to patients. They are afraid of being accused. You may be attacked from both sides. I was. […] However, I think the role of an MD is to go on examining radiation exposure levels (of the population). There are still many uncertainties. […]. Ionizing*

[202] Interview Dr Ts, Minamisoma, March 2015. Interviewers: R. Hasegawa and C. Fassert.

radiation has quickly become an ideological topic. This is why many try just to avoid speaking about it. However, experts must recognize that it is their duty to speak about it, despite the attacks that we may receive, from both sides".

Doctor TS reference to "both sides" is enlightening, and was so "self-evident" in the context of the interview, that he did not give any precisions as to the nature of the two "sides". Essentially, he was referring to one side - a globally "reassuring" attitude as regards the dangers of ionizing radiation, and to the other side – a more "cautious" standpoint. But these two sides mirror more globally, and very clearly, the "pro governmental/pro-nuclear" versus "anti-government/anti-nuclear" divide, effectively turning a scientific point of view into a political one. In such a context, someone like Dr. TS - who could be classified as taking a rare middle-ground position: critical of the government, while not promoting self-evacuation for Minamisoma inhabitants – is, in his own bitter words, "*attacked from both sides*".

This correlation, associating assessment of radiation risks with a political position, is well illustrated in M. Yuasa's article (2013) to analyze the 20th annual meeting of the IPPNW (International Physicians for Prevention of Nuclear War) [203] held in 2012, where a plenary session dedicated to the health effects of the Fukushima accident was held with a number of Japanese panelists, chaired by JPPNW, the Japanese branch of the organization[204]. The general tone of this session was reassuring, which sparked vivid protest from a number of participants. Later on, the IPPNW wrote a letter to the MEXT (Ministry of Education, Sports, Science and Technology) regarding the 20 mSv/year standard chosen for evacuation, which expressed "deep concern" over the rise of cancer cases which could occur, mentioning the 2006 BEIR VII report[205]. But this official letter was not signed by the Japanese branch, which refused to endorse such appeal. The president of the JPPNW explained: "*I can understand that this letter represents justified concerns, including that children's exposure to the radiation should be aimed for zero. However, I did not add my signature because I think that JPPNW should not engage in anti-government activities*"[206].

5.3.3 RADIATION: FROM "CORRECT FEAR" TO "CORRECT ATTITUDE"

5.3.3.1 "Fuhyo-higai" (Harmful Rumor)

On the side of the government, the idea developed progressively that part of the population was not responding "properly" when facing a contaminated environment. Within the central and local authorities responsible for dealing with the accident, the expression, "to fear radiation correctly", came to be frequently used. Even the Science Council of Japan (equivalent to the National Academy of Science in the US) organized an emergency public lecture entitled "fear radiation correctly" in July 2011 inviting experts

[203] IPPNW was founded in 1980 and represents citizens, mainly from the medical domain, from 62 countries. JPPNW is the Japanese branch of this organization.

[204] Yuasa, M. (2013). Whistle in the Graveyard: Safety Discourse and Hiroshima/Nagasaki Authority in post Fukushima Japan. In Japan's 3/11 disaster as seen from Hiroshima: A multidisciplinary approach. Hiroshima Shiritsu Daigaku.

[205] BEIR (Biological Effects of Ionizing Radiation) VII report was published in 2006 as a synthesis on radiological issues.

[206] Yanagida, 2011, quoted by: Yuasa, op.cit.

including radiation hormesis[207] protagonists (Shirabe et al. 2015). This implied, of course, that some inhabitants were not – in the eyes of the government services - fearing radiation "correctly"; they were considered to be "overreacting" to this particular type of danger.

It was in this context that the term *Fuhyo-higai* (harmful rumors) emerged, coined in the context of decline in sales of Fukushima products thought to be contaminated with radiation, and thus avoided by consumers, to refer to the incidence of "subjectively considering food or products as unsafe, without any scientific basis[208]". More generally, the term is used to criticize an appraisal of contamination risks (ambient or internal) considered incorrect or exaggerated. It relies on the doubtful idea that there can be a "true" or "objective" risk, which could act as an undisputable reference.

In certain contexts - notably just after the accident when a limited type of measurements was available - *any* kind of measure could be accused of being *Fuhyo-higai*. As one person from the Watari district of Fukushima explained:

"*My youngest daughter was going to a private kindergarten in Watari district; it was the first one to allow Greenpeace to measure radiation at school. The news of the contamination found there was broadcasted on TV. Then, the kindergarten was put under pressure by the local community to close and move to another area. The pressure came from local business, agriculture unions, etc. They accused the kindergarten of spreading the bad image of Fukushima*"[209].

5.3.3.2 "Radiation Brain Moms"

The normative framework that progressively developed also became dismissive of attitudes which were considered to be "exaggerated". In her work on the emergence of Citizen Radiation Measuring Systems (Kimura A. H., 2016), Kimura shows how the term "radiation brains moms" was coined to characterize concerned mothers as "hysterical" and "irrational". In the introduction to her analysis, Kimura presents the case of a woman, Takeshita-San, who worked as a communications manager in a company which, after Fukushima, led advertisement campaigns to calm growing fears on food contamination. The main message was "let's continue to eat to support the cause!". Her job was essentially to counter *fuhuo-higai* in marketing campaigns. But she herself began to feel concerned about food contamination. When she raised the point, she was reprimanded by her boss. She was reluctant to do the job asked of her, and finally resigned to set up an organization providing food measurements:

"*The way Takeshita-san was chastised for worrying about food contamination illuminates the force of such a policy in which what one can sense, discuss and problematize is already defined by the existing social order. Food policing involves the normalization of a certain level of risk with food as inevitable, imposing a particular view on reality and a prescription for a right kind of conduct. People worries, concerns*

[207] Hormesis is a theory which considers that low-dose radiation exposure brings benefits to human health instead of harm.

[208] Kimura A. H., 2016. Sakiya (2011, p 86) quoted by Kimura [p 28].

[209] Ms AS. Fukushima city, R. Hasegawa and C. Fassert on 18 May 2016.

and actions to lower food risk are censored in the name of science, risk analysis and the economy[210]".

Kimura situates this sanctioning of mothers in "*a wider history of women's struggles related to scientific uncertainty and how their actions to respond to it often face social disproval*[211]".

5.3.3.3 Wife and Mother: conflicting roles

This type of conflict, such as experienced by Takeshita-San above, has on occasion been framed in terms of the roles - wife/mother - to be played by women. Just after the accident, Ms. KT explained that: "*My husband and parents-in-law opposed the idea of evacuating the children. They said: 'There are other admirable wives who make the effort to stay in Iwaki, but instead, you are abandoning this place'."*[212]. Slater, Morioka, and Danzuka (2014) discuss a comparable case of social disproval linked to the roles young mothers must play, examining their specific vulnerabilities in such a situation. He looks at how, in many cases, these mothers were struggling "[between] the support of economic recovery and what they consider as a central role: protecting their children from radiation[213]". This type of conflict did not apply solely within the frame of a decision to stay or to leave, but also, for the non-evacuated zones, when it came to questions of behavior considered appropriate – or not – for wives and mothers living in a contaminated area. The "admirable wife" who stayed instead of leaving with her children – as evoked by Ms. A's husband and in-laws - echoes other accounts, such as those discussed in Slater and al. who give a detailed analysis of the kind of tensions and pressure exerted on women who sometimes had to choose between two opposite roles, especially in farming families. Their husbands may have encouraged them not to worry too much about contamination, because the survival of their farming business was at stake. At the same time, these women may have been extremely concerned about the consequences on the health of their children. Showing this concern, Slater explains, is in this case considered as inappropriate, because reconstruction and normalization of lives in contaminated territory are at stake. A mother he interviewed in his field work explained:

"*There are times, I guess, when being a good wife and being a good mother are not always the same thing. Usually, it is a situation of young women struggling to be good at both, but now, with all of this, some of us feel we have to choose. I know that [the protective measures I take] cause problems to my husband and the family, but in the end, my real role (yakuwari) is as a mother who needs to protect her children. It's not like this is something that I am just doing by myself. It is as a mother that I worry*[214]".

[210] Kimura, op. cit.

[211] Kimura, p 28. 2016.

[212] Mrs KT, Evacuee from Iwaki city, living in Kyoto, Volunteer, Kyoto Citizens' Radioactivity Measuring Station , Interview led by R. Hasegawa and C. Fassert. 25th May 2016.

[213] Slater, D., Morioka, R., and Danzuka, H. . (2014). Micro politics of Radiation Young mothers looking for a voice in Post-3.11 . Critical Asian Studies, (46:3), pp. 485-508.

[214] D. Slater. op.cit.

The case of Ms. AS [215] is rare, where the wife stayed in Fukushima while the father and three children left for Hokkaido (the island in the north of Japan). When the accident happened, the eldest son was 18 years old and in final year at high school. In March 2012, as he was accepted at the Hokkaido University, the timing was good to evacuate all the children. The youngest daughter was 5 years old. Ms. AS grew up in Hokkaido, where her husband evacuated with the kids – but she stayed in Fukushima, because she wanted to keep a job she loved, as a pharmacist at the hospital. Here, this mother considered her choice to evacuate the children the "*right thing to do*". For her, protecting children is *always* the right thing to do - a norm that should transcend any situation, and not be called into question even after a nuclear accident. Ms. S explained further:

"*I do not understand why the effort to protect children, usually (considered by many) as a right thing to do, has to be criticized and labelled as doing something wrong, while hiding the risk for our children is considered to be a good thing*".

These ideas are not indeed aligned to or considered "appropriate" by those who put the banner of reconstruction and recovery at all cost: "*To talk about radiation in this climate was thought to be holding the recovery effort back*[216]" (Slater and al. 2014). From the perspective of economic reconstruction, inhabitants were expected to avoid expressing their concerns. Slater considers that the push for reconstruction led people to disregard a certain type of feelings:

"*It had the effect of silencing dissent through the imposition of a sort of implicit criterion of suitable and unsuitable feelings expressible in public. It was a way of coding appropriate speech. In this context, to raise the specter of radiation, to express your fear of radiation, was clearly not speaking in a way that supported the collective effort, and in a way, the collective itself, the community. To express worries about environmental risks, risks to which the whole community was subject, was seen as threatening—not supporting—the community*[217]".

Kimura reintegrates this issue in a wider frame (Kimura A. H., 2018). She shows that it's not only "appropriate fear" that is proposed, but also "appropriate attitudes", and finally "appropriate emotions". She tackles the issue of emotional registers and how certain emotional registers are considered "appropriate and desirable", while others are dismissed in such situations. She considers that this "*dominant affective regime is integral to the broader governance of risk, which is increasingly shifting risk away from the government and the industry towards general citizens*[218]".

5.3.4 CONFLICTS AND "GENPATSU RIKON"

In many cases the "correct fear of radiation" proposed by the authorities countered a more "worried/cautious" attitude, and in many families, this tension turned into disputes amongst relatives. Such tensions appeared over whether to flee from a non-

[215] Mrs AS. Resident of the Watari district, Fukushima city, 18 May 2016. Interviewers: R. Hasagawa and C. Fassert.

[216] P 493. Ibid.

[217] P 495. Ibid.

[218] P 1. Kimura, A. H. (2018). Fukushima Ethos: post disaster risk communication, Affect, and shifting risks. Science as Culture, pp. 98-117.

evacuated area[219] or not, or whether to return or not to an evacuated area once the evacuation order is lifted. The expression *genpatsu rikon* (nuclear divorce) was coined to designate cases where a couple ended up in divorce after the accident often due to difference of opinions over radiation risk, evacuation, and most often protection of children. In interviews for the present study, subjects consistently linked these disputes to differences in their appreciation of the radiological risk, which echoes results found in other studies cited, such as Slater and Kimura.

One salient example in our field work was provided in the testimony of Ms. YN which is reproduced at length in order to show the gradual decision-making process of this mother, combined with her struggle to "convince" her husband and parents of the legitimacy of her final decision *not* to come back.

"*Two days after the accident, on 13 March 2011, one of my friends sent information through a Japanese social network called Mixi, it was some advice from a medical doctor in the Kyusyu region who was recommending evacuation to Fukushima citizens, as the situation at the damaged NPP was critical. I first thought about the possibility of evacuation, but when I told my parents about it (my husband was in Tokyo for his job on that day), they were opposed to the idea; they believed what the government was saying: it was safe to stay in Fukushima city. At the time, even before the accident, many people trusted what the government was saying and believed that it was doing its best to protect the citizens. On 15 March 2011, when a big explosion occurred at the NPP, my parents changed their minds, and my mother came to the house to tell me that she now agreed to evacuate. But my husband was strongly opposed to the idea of voluntary evacuation. Therefore, I couldn't make up my mind until 16 March when I talked with my friend's husband, an organic farmer in Iitate village who had already evacuated from the village on 13 March, and advised me strongly to evacuate with my daughter far away - at least 300 km away from the NPP. And this was when I also learned about the advice the American government had given to its nationals to evacuate from the 80 km radius of the crippled NPP. That was when I decided to evacuate. On 18 March, I left Fukushima for Tokyo with my daughter. First, we moved to a flat rented by my ant in the Saitama Prefecture, for two or three months, while my parents joined us. Then I went back to Fukushima city for the Golden Week (at the end of April and beginning of May), to check the situation, and I realized that bringing up a child was very difficult there as the radiation level was still high (around 1.8μSv/hour) and children could not play outside. Then I started to look for information on assistance provided by different municipalities, and found that the Kyoto prefecture was offering public housing (normally built for public servants) for evacuees - including self-evacuees from Fukushima. So I settled in Kyoto in mid-June 2011 with my daughter, and my parents in separate housing. My parents came in support of me and my daughter; my husband didn't understand why I left and was against my decision to leave Fukushima with our daughter*[220]".

This account illustrates well the "decision-making process" of a mother, through the reconciliation of advice, measurement, and other sources of "information" - such as the

[219] The area in which evacuation order was not issued but often situated peripheric to evacuation zones and affected by radiological contamination.

[220] Ms YN., in her 50s, self-evacuee in Kyoto, on 16 October 2014. Interviewers: R. Hasegawa and C. Fassert

American government's advice to its citizens to leave. It shows how at one point these elements converge at a given moment with the *possibility* of evacuation to Kyoto; it shows also how a personal decision must be taken in a family context, which was in this case a dynamic one: the parents were progressively on the side of their daughter, while the husband stuck to his original appraisal of the situation.

5.3.5 LIVING WITH IONIZING RADIATIONS

5.3.5.1 Introduction

Having examined how the dangers of ionizing radiation developed as a very divisive topics, leading to social divides, the following final sections will examine two ways of "facing contamination" and their consequences, namely: *living with* ionizing radiation, for inhabitants who chose to stay, or to come back, or could not evacuate, and *fleeing from* the dangers of ionizing radiations, for inhabitants who chose to do so. These issues are evoked above, in Chapter 3: "whether to return or not", where "emblematic cases" describe feelings and judgements of inhabitants who stayed in/returned to contaminated areas, and those who left those areas. In this section, the issues will be broadened and discussed alongside relevant elements in the literature of Human and Social Sciences.

5.3.5.2 Chernobyl: elements of comparison

When considering what it means to *live with* ionizing radiations, it is of interest to broaden the scope and to bring in elements of comparison between the situations in Japan and in Chernobyl, which seems highly relevant here. In the literature on the Japanese situation, there are few explicit references made to Chernobyl (types of contamination, types of policies put in place, etc.), and no systematic comparison. It is not the intention of this report to carry out a systematic comparison, which is beyond the *Shinrai* project limits. However, some research carried out on the consequences of what happened in Chernobyl for the affected populations in Belarus and Ukraine provides a constructive framework of analysis.

This is particularly the case of research by a team of researchers who did intensive field work in the region after the arrival of Alexander Lukashenko (see chapter 7.3). Bocéno and al.[221] examined how inhabitants living in a contaminated territory construct "*a social and symbolic engagement with contamination, danger, space and time, with the necessity to conciliate the many contradictions linked to their situation*[222]". From their empirical work, led in the period 1997 -1998[223], they identified two main categories of reaction to the situation: *resignation* and *denial*. They also underlined the loss of *trust* on the part of inhabitants, towards the discourses of the authorities, including health control, which appeared not to be independent from the authorities. *Resignation* is associated with a feelings of powerlessness (powerlessness to move from the

[221] Bocéno, L., Dupont, Y., Grandazzi, G., & Lemarchand, F. (2006). Vivre en zone contaminée ou les paradoxes de la gestion du risque. In G. Ackerman (Ed.), Les silences de Tchernobyl (pp. 114-125). Paris: Autrement.

[222] Op.cit. p 117.

[223] 10 years after the accident, a time scale very different to that of the *Shinrai* project, which was led in the near-immediate aftermath of the accident.

contaminated territories; powerlessness to actually act on the situation), which may result in a form of fatalism; diminution of stress appears possible only at the price of *denial* of the dangers of contamination. However, these two categories do not account for the variety of individual situations; these can be better accounted for in further consideration of the following factors:

- *Rational resigned behavior*: inhabitants who behave as having a form of "risk culture" of a rational type, linked to the measurement of contamination. However, this remains ambivalent, considering that they demonstrate "a moderate but necessary degree of trust in the contamination measurement methods provided by the authorities". Risk reduction is conducted through the implementation of the prescribed rules designed to decrease contamination, and experienced as constraints - all the more difficult to accept since they consist in forbidding the consumption of delicious foods traditionally collected in nature (mushrooms, fish, etc.), and pleasant activities in the open air (walks in forests, swimming in river, etc.).
- *An attitude of denial*: these inhabitants behave more or less as they did before the accident, and do not take any particular protection measures. This "return to normality", "like before the accident", echoes the political project of rehabilitation aimed at in governmental policy. "Life 'as before' consists for many in acting as if nothing has happened". But when the dangers of contamination are still felt, but linked to a feeling of powerlessness, denial is also linked to a form of fatalism.
- *Confident resignation*: for these inhabitants, protection measures come into direct contradiction with the economic difficulties for them and their families: abandoning the protection measures is not a choice, but an economic necessity. In this case, the measures were gradually considered as "unnecessary". Notably, this is a position taken mainly in places where contamination levels are high, where these inhabitants have chosen to stay.
- *Desperate resignation*, on the contrary, is linked to the idea that the authorities are unable to "liquidate the consequences of the accident and that individual protection measures are useless".

Our own categorization was based on the decision to return or not, and the social and symbolic engagement with contamination was examined only as one of the elements of the decision. However, because this element of decision appeared to be a central one for deciding or not the return, it is interesting to examine how the categories established by Boceno and his colleagues echo our own categories.

In the case of Chernobyl, different territories are concerned, which were contaminated to a greater or lesser extent; also the evacuation scheme was quite different (with an exclusion zone, to which some inhabitants returned), and the criterion for evacuation was set at 5 mSv/y. And last but not least, economic conditions in Chernobyl were quite different. Certain similarities can be easily identified: a "push" for reconstruction; the measurements experienced as a constraint by a number of inhabitants; a certain mistrust of the authorities. Some categories are similar, to a degree: *rational resigned behavior* has points in common with "returning and complying", though "emblematic case" (see Chapter 4.3.); the interviewee seemed fairly trustful of the local authorities, unlike the type of inhabitant categorized here as rational and resigned. Also, the *attitude of denial*

category partially mirrors that of "return and forget/resist" (see Chapter.4.2), but Fukushima inhabitants did not manifest the same fatalism mentioned in relation to the people of Chernobyl. In conclusion, it may be at a more "intimate", clinical level, that a correspondence can be found: the loss of the pleasures of rural life (recast as risky conduct), the burden of radioprotection rest on the shoulder of inhabitants. The authors mention interviews with medical doctors who, starting from the observation that people no longer take health protection measures, conclude that these people are "guilty" of subsequent contamination if they do not respect their doctor's advice and recommendations. Also interesting is the fact that behavior classed as *rational resigned* corresponds with behavior promoted by the authorities, to a greater extent than the other categories. This is the same for our corresponding category (Return and complying/measuring; see Chapter 4.3.) which is in line with *the "ideal"* proposed by the authorities, *and* in line with "reconstruction".

5.3.5.3 Living a half-life

By analogy with the "half-life" of radionuclides, French writer, novelist and essayist, living in Japan, Michael Ferrier, refers to a kind of "half-life" for the inhabitants of Fukushima. He points out the ethical dimensions linked to such a life – the situation should not be claimed as "normal" or "nearly normal" by its promoters.

"*It's not because you get used to it that it becomes normal. It is not normal to walk around with iodine pills in your pocket. It is not normal to ask whether you take a risk when eating a vegetable. It is not normal that rain suddenly becomes your enemy*[224]".

This topic became quite central in the public space, bringing together the "normalization process" of the post-Fukushima situation with the political will of the Japanese government to restart reactors[225] (Sato & Tagushi, 2017). A number of researchers and essayists have, since the accident, analyzed and denounced - sometimes radically (Ribault, 2014) - the life implicitly offered to those who return or stay in the contaminated territories by policymakers in Japan. Asanuma-Brice (2017) denounces the process of normalization established by the Japanese government, which redefines living with contamination as part of a "normal" life. A number of NPO reports adapted the same line to describe the life proposed to returnees. For a number of residents, living in the country side no longer has meaning, appeal or interest when "half-life" restrictions are imposed. Kazuhiro Yoshida, chairman of the town assembly of Namie, said: "*Country life is appealing because we can drink good water, and eat wild foods from the mountains. If you place restrictions on that, you're not living, you're surviving*[226]". This type of return – to a 'limited' way of life – leads to general reflection, to ethical considerations of living conditions after an accident, of "normality", and of how people

[224]Qu'on ne présente pas cette situation comme « normale » ou à peu près normale. Ce n'est pas parce qu'on s'y habitue qu'elle devient normale. Il n'est pas normal de se promener avec une pastille d'iode dans sa poche. Il n'est pas normal de se demander si on prend un risque en mangeant un légume vert. Il n'est pas normal que la pluie devienne soudain notre ennemie. M. Ferrier. Fukushima, récit d'un désastre. Gallimard.

[225] Sato Y and Tagushi T, Philosophie pour sortir du nucléaire. Non traduit.

[226] Van der putte, J., Shaun, B. & Ulrich, K. (2014). The IAEA Fukushima Daiichi Accident Summary Report: A preliminary analysis.

can have very different evaluations of what they will accept to lose in order to stay in or return to their homes.

5.3.5.4 Accounting for lives lived with contamination

In her analysis of post-accidental management policies, Topçu (2016) makes the point that people who stay but "doubt" are made invisible to outside world; her assertion echoes the findings of the present study. More precisely, Topçu denounces the fact that "*the focus made on evacuees' trauma, with large budgets devoted to study this phenomena since the 90's, allows for deliberatively silencing the suffering of those, in not less significant number, who did not or could not evacuate, and who are condemned to live in a contaminated environment*[227]". This would appear to merit the attention of long-term studies, which could examine the situation of such 'silenced' inhabitants, for example through ethnographic field work. This point will be considered again in the conclusion to the present report (see Chapter 7).

5.3.6 "FLEEING FROM" IONIZING RADIATION

5.3.6.1 The unbearable weight of "suspended time"

During interview, one father in the Watari district of Fukushima city talked of how he hesitated to evacuate the Watari district, an area where measurements showed hot spots but which was not officially evacuated by the authorities. Some parents left and became "self-evacuees". He did not, and confessed soberly: "*the difficult thing is that we have to wait for years to know whether we made the right decision for our children*[6]". His words echoe those of Mrs. Yi, "emblematic case" who "*[did] not know even now whether she made the right decision*" (Chapter 4.4).

Time will indeed be one of the judges for such decisions because most health effects, and principally cancers[228], develop decades after radiation exposure. New demands for recognition of the health effects from the bombings in Hiroshima and Nagasaki are still being made, by people in their 80s now declaring they have cancer (Sato K. , 2018)[229]. Parents, and specially mothers, had to make decisions on whether to stay, to leave, to return - or not. One of the most poignant dimensions to their decisions lies in the "suspended time[230]", to use Henri Couchot's expression, that stretches between the decision itself and the eventual onset of negative consequences for health. In many life circumstances, a person can know quickly whether or not they have made the "right"

[227] « La seule focalisation sur le traumatisme des évacués, moyennant de très gros budgets consacrés à l'étude du phénomène depuis les années 1990, sert quant à elle à rendre inaudible, et de manière délibérée, la souffrance non moins significative de ceux qui ne sont pas, ou n'ont pas pu, être évacués, et qui restent ainsi condamnés à vivre dans un monde contaminé ». S. Topcu. Catastrophes nucléaires et « normalisation » des zones contaminées. Enjeux politiques, économiques, sanitaires, démocratiques et éthiques. Fondation de l'Ecologie Politique. 2016.

[228] Except for thyroid cancers which may develop in the years following exposition to ionizing radiations.

[229] Sato, K. (2018). Surviving the bomb: diverging visions and Japan nuclear's governance. Paper presented at the Revisiting the nuclear order Conf., Paris.

[230] Couchot, H. (2016). Penser le temps avec Fukushima : chronique du temps suspendu Penser avec Fukushima: C. Doumet et M. Ferrier.

decisions; because of the slow onset of illnesses due to ionizing radiation, that answer is postponed for years, whereby "suspended" even for decades.

In her 2014 research on the consequences of the Chernobyl accident, Kuchinskaya (Kuchinskaya, 2014) describes what she terms "the politics of invisibility", i.e., the way governmental and international infrastructures established after the Chernobyl accident have effectively made most health effects "invisible". For Kuchinskaya, one of the key aspects of this process of "invisibilisation" is the focus on a certain type of standardized data on health and the "*exclusion of more local, situated, intimately involved perspectives*[231]". Basically, she says, the data and knowledge produced by local medical doctors were frequently disregarded. In her field work, Kuchinskaya interviews one of these local doctors, Dr. Belookaia, who regrets that her own data and appraisal of the health effects on children were not taken seriously, but concludes: *"Time will show everything and teach everybody*[232]*"*.

However, some parents could not bear the idea of waiting in order to know whether their decision was right and chose to "flee" ionizing radiations. In the emblematic case of Mrs. Su (Chapter 4) it is evident that she considered the idea of waiting intolerable: "*Of course, we will not die immediately from the Fukushima nuclear accident, but many mothers are worrying and thinking about their children's future"*.

5.3.6.2 (Un)acceptable risk

Another characteristic of parents - especially mothers - who chose to leave, is that they refused to balance, or to commensurate the *pro* and *cons* of staying or leaving. Once they equated staying in/returning to a contaminated area with increasing the risk of their children developing cancer, they refused to run that risk. Leaving was cast as the only solution by which to protect their children. Moreover, radiation damage was here framed more as a danger (not calculable, not comparable), than as a risk (calculable and comparable). Any quantified approach utilized to foster the idea that such a risk might be acceptable was dismissed. One mother said in interview:

"*An expert told us that the risk was very, very low … something like 1% … so, a negligible risk to run … I answered, well if I had a gun with 100 holes and one bullet, I would not give it to my kid*".

This example epitomizes the gap between the discourses of "rationality" and "commensurability" adopted by the Japanese authorities, and this kind of radical ethical stance adopted by these inhabitants, these mothers. This tension - between, on one side, modalities of post-accidental management which foster "rational" approaches and, on the other, this radical ethical stance – cast a shadow over the effectiveness or relevance of the comparative risk analysis approach undertaken by the authorities which promotes the idea that "non-radiological" risks are commensurable with radiological risks to health. This point will be discussed again in the conclusion to this report (see Chapter 7).

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[231] Kuchinskaya, O. (2014). The politics of invisibility. Public knowledge about radiation health effects after Chernobyl: PIT Press.

[232] Ibid.

5.3.6.3 *Choosing* to stay or to leave?

Lastly, the nuclear accident also revealed social divisions between those who could afford to leave for a "safer" place, at least for some time, and those who could not. This could trigger jealousy in the community. When interviewed, Mrs. KT[233] explained that she temporarily evacuated her daughters in June 2011. When they came back to Iwaki in April 2012, their teacher scolded them at school by saying, "*there were people who wanted to evacuate but they couldn't. So don't tell anything about your fun time in Akita to your friends*" as if they did something wrong. Mrs. KT regretted immediately to make them come back to Iwaki and started to plan for evacuation again for a longer period.

The 3/11 accident also revealed what was referred to in a Greenpeace report[234] as "unequal impact" on people who were not equal in financial and family situations and thus in the capacity and means to choose evacuation if they wished to do so. Notably, women were and have been particularly affected by the consequences of the Fukushima nuclear accident in a traditional family setting where household income is mainly earned by their husbands; indeed, Kimura (2016) calls for an explicitly gendered approach to analyze the impact of this type of accident.

K. Kawasaki, K. Fukuda and K. Suganami, the founders of Save Fukushima Children Lawyers' Network (SAFLAN), which supports and defends "voluntary" evacuees who fled from the area which was not included in the officially designated evacuation zones, proposed a new concept 'the right to evacuation' in the context of nuclear disasters (Kawasaki et al. 2012). According to the authors, the right to evacuation is not simply the right to freedom of movement or choice of movement, but to receiving assistance necessary to realize that choice under the threat to life or health. As for the legal basis, they referred specifically to the concept of precautionary principles in environmental law, Article 13 & 25 of the Japanese Constitution, the Convention on the Rights of the Child, and Economic, Social, and Cultural Rights in human rights law. The concept of the right to evacuation finds an echo in the debate around 'trapped' populations in the context of environmental migration (Foresight 2011). It indeed proposes a paradigm shift in the existing normative frameworks on displacement which has traditionally centred around the right not to be arbitrarily displaced, and calls for an adjustment to address these new concerns.

5.4 COMPENSATION: SOCIAL CONSEQUENCES AND LIMITS

The complexity of compensation payments, and the amount of money delivered for different cases were detailed in Chapter 2 of this report; Chapter 6 will examine critically the overarching consequences of compensation. This section focuses on the social divides brought about by the compensation scheme, as expressed by inhabitants themselves.

One of the forms of social division that was articulated lies in jealousy, on the part of some residents, towards the evacuees in their town. The typical case is Iwaki city which

[233] Mrs KT, Evacuee from Iwaki city, living in Kyoto, Volunteer, Kyoto Citizens' Radioactivity Measuring Station at Tanbabashi, Interviewers: R. Hasegawa and C. Fassert. 25th May 2016.

[234] "Unequal impact". Kendra Ulrich, Greenpeace Japan. Edited by Ai Kashiwagi and Kazue Suzuki, Greenpeace Japan. March 2017.

is situated 10 km south from the official evacuation zone. Most evacuees from Naraha went to Iwaki, where they are accommodated in temporary shelters. One resident explained:[235] "*Iwaki residents think that the evacuees from Naraha live a rich, pleasant life. At the supermarket, Iwaki inhabitants can distinguish between residents of Iwaki and evacuees from Naraha, just by looking in their trolleys. The evacuees choose expensive types of food. Although there are a few Iwaki residents who say a few kind words to the evacuees, I prefer to go shopping during the evening, when there are less people*".

Evacuee status and the associated compensation payments could, in some cases, also be a burden; it could give rise to a manner of assigned identity not easily assumed by some inhabitants, like Ms. A: "I don't want to be an "evacuee" in my heart although the fact that I receive compensation makes me one[236] ". Also, the very notion of being "compensated" was called into question by evacuees. Ms. A. insisted on this point:

"I *had to abandon the fields and the graves of my ancestors. The compensation payments cannot compensate this loss.*"

Finally, among the feelings unique to the situation after the nuclear accident, there was a particular type of relationship and of feelings that developed between TEPCO employees and residents who received compensation payments. The notion of "forgiveness" (tsugunai) came up several times in interviews. Some inhabitants insisted on the fact that the people in charge at TEPCO did not ask for forgiveness from the victims of the accident. One of the interviewees, Ms. TK[237], explained: "*They did not ask the inhabitants of Naraha for forgiveness, though they did so in other towns*". He added: "*before speaking about compensation, it is important that they ask for forgiveness*". Another interviewee, Ms. YH, explained her feelings[238]: "*when I go to the administrative office at TEPCO, they give me information, with great kindness. Before, they just explained to me how to fill in the papers, but now they help me to fill them in, we do it together. […] I feel some pity towards the young employees when they ask sincerely for forgiveness*".

Such issues, concerning the symbolic aspects of compensation, will be discussed in detail in the conclusion to this report (see Chapter 7).

5.5 THREE YEARS AFTER: THE PUSH FOR RECONSTRUCTION

After a period of shock and disorder, from summer 2011, the notion of reconstruction and the idea that it was time to "turn the page" became apparent in Fukushima, under the banner of *Ganbaru Nippon* ("Let's go Japan") (Slater & Haruka, 2014). *Ganbaru Nippon* and *Fukko* (recovery, restoration, or revival) became buzz words. For most people, this official discourse was closely linked to the government's determination to prepare the next step: the lifting of Evacuation Orders, and the "reconquest" of the contaminated territories. Jacques Repussard, the General Director of the IRSN, made a somewhat blunt

[235] Ms YY, 25 March 2015, interviewer: Rina Kojima.

[236] Ms CA, 25 March 2015, interviewer: Rina Kojima

[237] M. TK, 24th March 2015, interviewer: Rina Kojima.

[238] Ms YY, 25th March 2015, interviewer: Rina Kojima.

remark in 2012: "*A nuclear accident is like a war, you may lose some territories*[239]". For the Japanese government, it was of utmost importance to prove that (most) territories were not "lost" and could indeed be "reconquered". Notably, the most contaminated area immediately around the crippled nuclear reactors was named the "difficult-to-return zone" - *difficult* (but not *impossible*) -, which was considered by a number of Japanese citizens to be a hypocritical stance. Kojima (2016) investigated the notion of reconstruction specifically from the point of view of inhabitants -not from the point of view of the authorities. She noticed that understanding of the term "reconstruction" varied according to residents' situations, and that for some "reconstruction" encompassed certain conditions that were, at that time, far from being attained - for one elderly woman, for example, "reconstruction is when families with kids have returned.[240]".

The determined discourse of the government, however, may not be in line with the feelings, judgements, and desires of the whole population, in the different places concerned. "Reconstruction" and "turning the page" were certainly motivations for those willing and eager to return to their original villages; but they were not for those who were still worried, or who simply had doubts about the health consequences of the radiological situation. Nor were they motivations for those who considered that life in the evacuated villages had become difficult, due to lack of infrastructures or because the wider territory around had changed (i.e., in some cases, the area surrounding their former home was now a "difficult-to-return zone").

The following section will explore different cases where "reconstruction push" echoed – or not – the desires and feelings of the people concerned.

Reconstruction is linked to measures following the end of disaster phase. A nuclear accident raises much the same questions as any "disaster" or "crisis situation", but with greater acuity. The question here is: Who decides that the situation is "over", or "back to normal"? A number of issues seem to have stemmed from the divergence between what government and local authorities considered to be "normal", and what inhabitants considered as such. In this vein, ACRO, a French NPO that strives to provide accessible information in this field, gave an apropos title to their 2015 report (Boilley, 2014): "Fukushima, Retour à l'anormal ("Fukushima: Back to an (Ab)normal Situation")[241]".

As such, a nuclear accident may uncover previously implicit positions on what a "normal" acceptable life is, and, to what should be taken into account: it defines to a certain extent what is a "good life", but it is also linked to a life style that people used to have in such rural areas. One elderly woman explained: "*The compensation payments will be stopped after the Lift of Evacuation Order. There are inhabitants who will have difficulty living with only a retirement pension if they can't grow their own vegetables because of the ionizing radiation in the fields. If you can't have a self-sufficient life, returning to Naraha may be difficult*[242]".

[239] Journal interne IRSN.

[240] Ibid.

[241] « Retour à l'anormal ». David Boilley. The plays on words in the title and means: "Back to an (ab)normal situation", although in French it reads phonetically: "Back to a normal situation").

[242] Ms AO, ibid.

This is especially true for the most vulnerable people, who may rely on some sort of self-sufficiency to survive. Another woman, in her 80s, explained: "*I lived through a difficult period during the Second World War. But at the end of the war, I could live a self-sufficient type of life in Naraha. Even if I didn't have any money, I could live by growing rice and vegetables, and getting sensai in the forest. But after a nuclear accident, I can't do that anymore. I'm worried about what to do after I go back to Naraha*[243]".

5.6 TRUST AND TRUSTWORTHINESS

5.6.1 INTRODUCTION

This section provides the conclusion to one of the main theoretical angles of the *Shinrai* project: the issue of trust. In such exceptional contexts, where residents must make life-changing decisions, it appears that trust may play an important role, because the context is far from being "fully known and transparent" (see Simmel's definition of trust below). Indeed, in the aftermath of a nuclear accident, a veritable mass of communication on the situations and the risks came from government, from local authorities, from expertise systems and appointed experts, and scientists at national and international levels, while alternative views and advice were also provided by NPOs, scientists, etc.

5.6.2 THEORETICAL ELEMENTS

The *Shinrai* project Task One Report[244] provided a detailed account (in French) of the literature review on the concept of *trust*. Those elements will be summarized here; this does not constitute a detailed account of the literature review, but aims at better understanding the analysis provided through the prism of *trust*.

5.6.2.1 Trust: a multi-faceted notion

Trust is a multi-faceted notion, used in everyday language, and also a subject of research theorized in Economics, in Sociology, and in the Political sciences. The German sociologist Georg Simmel developed an extended reflection on *trust* - its role in society, its links with belief and faith. He defended his view that *trust* has a link with knowledge, without restricting it to a cognitive issue: "Trust is an intermediary state between knowing and not knowing. He who knows nothing cannot reasonably trust, he who knows everything does not need to trust".

Most reflections on *trust* begin with its fundamental and extended character: "*in many situations, man has the choice to trust or not, but without a basic trust he could not even leave his bed in the morning*[245]" said Luhman. (Luhman, 2006). He was the first to bring together *trust* and *risk*. He made a now classical distinction between two notions: *trust* and *confidence*. This distinction does not exist in every language; French, for example, has only one word: *confiance*. Confidence refers to the general expectations that we have towards our general world and environment. We all have general

[243] Ms CA, 80 years, 15th March 2015 interviewer: Rina Kojima.

[244] *Shinrai* Rapport 1, revue bibliographique sur les concepts de confiance et d'expertise. En ligne. www.Irsn.fr . (In French).

[245] Luhmann, N. (2006). La confiance, un mécanisme de réduction de la complexité sociale: Economica.

expectations that we can take into account - or not. But in this case, we are not in a logic of alternatives or of choosing: "*The alternative would be a state of permanent uncertainty, and to renounce your expectations without having anything to put in their place*[246]".

Trust is quite different: one "decides" whether to trust or not; trust is linked to some kind of risk-taking (in a very general sense of the word 'risk'). One can of course refuse to take a risk, but that entails relinquishing the potential advantages. When we can decide, or choose one situation over another, it is a matter of trust.

5.6.2.2 Trust in Modernity: specificities

The role of "active trust" (and not only of confidence) is more and more important in our modern society, according to sociologist Anthony Giddens:

"We have no choice but to make choices."; "This society, nevertheless, is not only a "risk society". It is one where mechanisms of trust shift - in interesting and important ways. What can be called active trust becomes increasingly significant to the degree to which post-traditional social relations emerge[247]*."*

In our modern lives, the role of trust may be broader, but also more "abstract" than in traditional lives. Giddens says:

"*Trust in a multiplicity of abstract systems is a necessary part of everyday life today, whether or not this is consciously acknowledged by the individuals concerned. Traditional systems of trust were nearly always based on Facework; because of having special access to the esoteric qualities of tradition, the guardian was tradition made flesh. The disembodied characteristics of abstract systems mean constant interaction with "absent others" – people one never sees or meets but whose actions directly affect features of one's own life.*[248]*"*

In radiological risks, expertise systems set up before and after the accident, at international level (such as the ICRP), or at national level (such as the National Institute of Radiological Science [NIRS], or the Working Group on Radiation Risks[249] in Japan), epitomize the "abstract systems" mentioned by Giddens. However, in the aftermath of the accident, experts found themselves in direct contact with the public; the relationship between experts and public became a "face-to-face relation": expertise made flesh.

5.6.2.3 Trust and Reliability

Reliance is common to all the variations of trust: I can rely on a person as I can rely on a machine. But where reliance can be applied both to tools and to humans, trust can only apply to humans. This is developed by sociologist Louis Quéré (Quéré, 2006) with the following example: *reliance* with regard to a tool means that if I use it, with a certain set of expectations, those expectations remain tacit, and I do not focus on them while I

[246] *Ibid.* (p.13)

[247] Anthony Giddens, *in* Ulrich Beck, Anthony Giddens, Scott Lash, *Living in a post traditional society. Reflexive modernization,* Polity Press, 1994. (p.89)

[248] Ibid.

[249] The expertise systems and their role will be detailed in a future *Shinrai* report.

use that tool. This is the case when I use a computer as a routine; I feel a kind of "quiet assurance" (*assurance tranquille*) which allows me to focus on the finality of the use, not on the functioning[250]. This operates the same way for a person: s/he executes his/her tasks, holds his/her engagements, etc. …

British philosopher Katherine Hawley (Hawley, 2013) formulates a supplementary nuance: the difference between *trusting* someone, and just mechanically *relying* upon them, depends on one's heightened expectations in the process of trusting, and one's reaction if the trustee disappoints you. You cannot "trust" a chair not to break when you sit on it, and the chair does not "commit" itself not to break. In the spirit of Hawley's argument, only people may demonstrate "commitment[251]".

Trust involves expectations about skill, and expectations about intentions to help; turning this around, *trustworthiness* requires both having skill and having good intentions. Trust is a form of *abandon*: "(it) demands something else, which is linked to the absence of doubt in the loyalty of the other towards you, in a situation where you abandon the care of something to the other, which you consider to be of great value."[252] And trust is a *commitment*: when we trust someone, we rely upon them to meet their commitments. Reliance can be *disappointed*; trust can be *betrayed*.

5.6.2.4 Trustworthiness

The notion of *trust*, as the absence of any doubt in the loyalty of the trustee, paves the way to the notion of *trustworthiness*. For certain scholars, issues linked to *trust* can be reformulated in questions about *trustworthiness*: if the trustee is *intrinsically worthy* of trust, trust is appropriate. By contrast, if trust is *requested*, solicited, it could be with bad intentions**.** Many of us remember the "*Trust In Me*" of the Python, Kaa to his young 'prey' Mowgli in *The Jungle Book* (the snake is not *trustworthy* at all…). So the rationale for *trusting* someone – whether trust is "rightly placed" or not - is closely linked to characteristics and intentions of the trustee. To the questions: who merits trust? Which institution deserves to be trusted? Perhaps the answer must be that it depends on how *trustworthy* is the *trustee*.

Luhmann (Luhman, 2006) discusses a number of generic criteria for *trustworthiness*: to be trustworthy, an institution must be competent, and must take into account the interests and, more demandingly, the vulnerability of the truster. Hawley makes a very similar definition: "a mix of skills and good intentions[253]". Giddens (Giddens, 1994) comments that: "*Trust is equipped with the integrity of others*[254]". This leads to an understanding of trust as a dynamic that *engages* the trustee, which is "engaged"

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[250] Quéré, L. (2006). La confiance. Confiance et engagement. In Quéré, L. et Ogien, O. (Ed.), Les moments de la confiance. Connaissance, affects, et engagements. Economica.

[251] Hawley, C. (2013). Trust: A Very Short Introduction: Oxford University Press.

[252] « (elle) exige quelque chose d'autre, qui est de l'ordre de l'absence de doute sur la loyauté de l'autre vis-à-vis de soi, dans une situation où l'on s'en remet à lui du soin de quelque chose à quoi on attache une plus ou moins grande valeur ». Quéré, L. *ibid.*

[252] Cf Report 1 *Shinrai* on the notion of expertise.

[253] Hawley, *op. cit.*

[254] Giddens, *op.cit.*

because of the trust placed in it or in him/her. Trust and being trusted is a moral sentiment that can be neither *demanded* nor manipulated (Quéré, 2006).

5.6.2.4.1 Trustworthiness in the aftermath of Fukushima

In terms of this theoretical framework, considering the trustworthiness of institutions in charge of managing the post accidental situation in Fukushima would mean taking in to account (1) their competency and (2) their consideration of the interests and specific vulnerability of the populations. After the accident, people lost trust not because they thought that the experts and authorities were not competent, but rather because they thought that the experts and authorities did not take into account their interests and vulnerability. When, in its communication campaign, the government adopted the slogan "almost no risks below 100 mSv" (Cabinet Secretariat 2011), they did not appear to be incompetent, but rather did not consider what population really needed or wanted to know.

Shinrai Report 1, on the subject of expertise in radioprotection, discusses the persistence of a divide between, on the one hand, nuclear institutions, which more or less affirm the harmlessness of low doses, and on the other hand, "alternative scientists" who declare their danger[255]. Historical analysis in this domain is highly developed; to quote a few prominent researchers[256]: (Thebaud Mony, 2014), (Brown, 2017), (Shrader-Frechette & Persson, 2002), (Sato Y., 2018), (Takahashi, 2018).

In spite of recurring uncertainties and controversies, the discourse held by the Japanese government in the aftermath of Fukushima was an unequivocal one: no mention of uncertainties, no mention of controversies, and one principal maxim – "almost no risks below 100 mSv/y". It turned out that loss of citizens' trust in the Japanese authorities was very much linked to the government's initial discourse of reassurance with regard to radiological risks. Subsequent discourses (See Slater hereafter), still cohabitating with the first, could be more complex and more cautious, but were not easier for inhabitants; the gist of government communication to the people was that risk implies an assessment of how much radiation represents a danger, and they had to decide for themselves how much they accept.

The main critiques were aimed at the choice of threshold (20 mSv) by which to designate the zones. As discussed above, this threshold was considered inappropriate by a number of scientists, international organizations (for example, the UN/the Anand Grover Report), and NPOs[257]. It was not considered precautionary enough, especially in view of the sensitivity of children to ionizing radiation.

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[255] This s is a bit caricatural, and does not account for forms of dissidence within the nuclearist institutions, or subtile recent evolutions. But our interviews show that this divide makes sense as a main framework, for both "sides".

[256] Thebaud Mony, A. (2014). La science asservie: La Découverte. Brown, K. (2017). Chernobyl's hidden legacy. Physics world. (April). Shrader-Frechette, K., & Persson, L. . (2002). Ethical, logical and scientific problems with the new ICRP proposals. Journal of radiological protection, 22. Sato, Y. (2016). Les faibles doses d'irradiation et le pouvoir de sécurité : du point de vue foucaldien sur le « pouvoir-savoir » In C. Doumet & M. Ferrier (Eds.), Penser avec Fukushima: Cecile Defaut ed. Takahashi, H. (2018). Continuing nuclear tests and ending tuna inspections: politics, Science, and the lucky dragon accident in 1954. Revisiting nuclear orders. Paper presented at the Paris Stanford project.

[257] Grover, A. (2013). Report of the Special Rapporteur on the right of everyone to the enjoyment of the highest attainable standard of physical and mental health, Mission to Japan (15-16 November 2012),. (A/HRC/23/41/Add.3). United Nations.

Trustworthiness, in this case, is linked also, beyond precautionary attitudes, to proposing residents a plurality of choices considering various situations of the affected population, in addition to the choice of decontamination and return. Inhabitants had felt "pressure to return" and a lack of democratic involvement in the decisions for lifting of the evacuation orders. They felt that the government wanted, through this pressure, to show that the accident was over, and the affected territories were back to "normal"; their feeling was (and still is) much to the contrary.

In this context, emerging counter experts with a divergent, more cautious view, were considered by many to be more trustworthy, because they were taking more evidently into account the "vulnerabilities" of the population. Trustworthiness is linked to "vulnerability": when science is controversial, people who feel vulnerable can consider trustworthy the most precautionary attitude with regards to risks. It is interesting to note, for example, that in the 2017 IRSN Barometer - a yearly survey designed to understand how the French population perceives risk - 80 % of French citizens think that when dealing with risks, it is normal to take every possible precaution, even when expert scientists have only expressed doubts[258].

5.6.2.4.2 Who trusts whom?

Who do you trust? The question was sometimes answered spontaneously by interviewees, with regard to principle information source on the dangers of ionizing radiation. It was interesting to observe spontaneous expressions of distrust. Moreover, the question of whom to trust, in some cases, proved irrelevant, when evaluation of the risks was no longer a central issue for the persons.

This section will address the question of which people, which institutions were to be trusted by which type of inhabitant – bearing in mind the categories discussed in Chapter 4 above. Who trusts whom?

First, the issue of whom to trust was not particularly relevant for our first category of people, who decided to return and "forget about" ionizing radiation and - to a certain extent - to "resist" a practical radioprotection culture. After having checked contamination levels with local counsellors, and as long as gardening was possible, they did not actively continue to collect or consult information on ionizing radiation. They wanted to live "normally", and discussing the dangers of ionizing radiation in one's environment (and who to trust on that matter, or not) was, for them, definitely not part of a normal life.

For the second category, those who "come back and control contamination", the issue was more variable. Ms. SA (emblematic case, see Chapter 4) trusted the local counsellor and the team from Nagasaki University, and did not seek any alternative information; she was enthusiastic about the effects of measurements and found a form of comfort in her measurement and control activities. In other cases, however, Mr. MU accorded trust only after seeking different sources of information concerning the use of nuclear energy and on the dangers of radiation. Mr. MU went to the symposiums organized by experts from Nagasaki University. He sought out information on the 1 mSv dose limit, and consulted the blog of Genyû Sôkyû- which states that this limit is inacceptable because

[258] 80% des français approuvent la proposition : « en matière de risques, il est normal de prendre toutes les précautions, même lorsque les experts scientifiques n'ont que des doutes ». Baromètre IRSN 2017. www.baromètreIrsn.fr

it encourages people to evacuate to places that might be not less contaminated (see Chapter 7). Mr. MU agreed it was normal to worry about 20mSv/year threshold for kids, but he also said that he considered the point of view of Prof. Koide[259] "too radical". By consulting several sources of information, he felt that he had *established his own* threshold, which allowed him to decide for himself that he could return to Naraha. In this case, trust in an expert (or a set of experts) was attributed after careful consideration of different views, and analysis at a "meta" level, linked to the position of the expert: Prof. Koide was dismissed because of his radical anti-nuclear stance, but positions of government representatives (who may have vested interests) were not blindly adopted either, and Mr. MU trusted in his own, informed opinion: "20 mSv is too high for kids".

The question of who is to be trusted in relation to the third category of inhabitant - "returning and worry" (emblematic case: Ms. YI; see Ch.4.4) is more difficult to grasp. Ms. YI did not talk about the issue of information and being informed. Her testimony focused on the fact that she felt pushed to return after the LEO despite her worry over radiological risk. So the issue of radiological risks is her primal concern but she did not develop much on how she came to form her assessment of the risk. Interestingly, Ms. YI appeared not to be interested in listening to (trusting) Mrs. O., the local authority Radioprotection Counsellor, but nor did she mention trusting or not any prominent figure of the "prudent position", mainly held by alternative scientists or anti-nuclear movements.

Lastly, our last category of inhabitants ("not returning, ever") also presented a trust which is "one-sided". Mrs. KT, our "emblematic case" easily listed the people she trusted: Dr Sakiyama (Takagi School), Professor Yamauchi (Kobe University), Ms. Mitsuta (Friends of Earth) and Mr. Sakaue (Save Children from Radiation). Like Mr. MU (returning to Naraha), Ms. KT demonstrated a "meta" level of analysis, of the link between radiological risk assessment and political position (pro/anti-governmental vs pro/anti-nuclear). Dr Sakiyama is a prominent researcher on radiological risks, who launched her career at the National Institute of Radiological Science (NIRS), and so on the "side" of institutional expertise. But she later joined the Takagi School, a major anti-nuclear organisation; she was also part of the NAIIC parliamentary committee. Prof. Yamauchi is a professor in radiation physics, known for having conducted "alternative" measurements in Watari. Friends of the Earth and Save Children from Radiation are among numerous NPOs that protested against the 20 mSv threshold. Clearly, Ms. KT related the people she trusted and the decision she made: "*I trust them probably because I wanted to evacuate my children*". She also firmly calls for pluralism of positions for trust and for evacuation, which she linked to freedom of thought:

"*Those who wish to stay are trusting other experts. Human being trust whoever they want to trust*".

As said above, trust is a form of engagement, linked to adherence to values and ideas, and cannot be *demanded* (Quéré, 2006).

[259][259] Pr Koide is one of the prominent scientists who criticizes the governmental policy after the accident.

5.6.3 RISKS COMMUNICATION AND ITS LOCAL EFFECTS

5.6.3.1 A general assessment

Critical assessments of Japanese post-accidental policy - whether institutional, NGO, or academic - have evoked citizens' loss of trust in the authorities and expert bodies, for example, in the NAIIC report[260] (2012) and the report made by the French NPO ACRO[261] (2012), as well as GREENPEACE [262] and IPPNW reports [263] (2013). Governmental shortcomings and public loss of trust were also widely commented in the academic field – see for example Jobin (2012) and Samuel [264](Samuel, 2013) to quote just a few. This loss of trust in the government was staged as a consequence of a number of limits and errors in their activities, including positions taken on radiological risks.

This criticism has been valuable; one academic article produced within the scope of the *Shinrai* project examines contestation of the 20 mSv threshold for evacuation and explains why and how this value was condemned on an ethical level. This opened the way to a more fundamental criticism of the principles of radioprotection.

This section will focus on another prism: the assessment, several years later, by the experts themselves or by their peers, of the communication they led at the time of the accident, and their own judgement of what happened at that time.

Very shortly after the accident, the report of the NAIIC (*Nuclear Accident Independent Investigation Commission) (2012)* gave a detailed critique of the Japanese authorities' reactions when dealing with the consequences of the nuclear accident. One of the major points of criticism was directed at the lack of information provided to the population by the authorities, which developed into a lack of health protection.

"*While exposure levels are set as a threshold against acute radiation disorder, there is no widely accepted threshold for long-term radiation damage caused by low doses. The international consensus, however, is that the risk does increase in proportion to the dose. The impact of radiation on health may vary from one person to another depending on age, sensitivity to radiation and other factors, some unknown. After the accident, the government unilaterally announced a benchmark on dosage without giving the specific information that residents needed, including answers to questions like: What is a tolerable level of exposure in light of long-term health effects? How do health implications differ for individuals? How can people protect themselves from radioactive substances? The government has not seriously undertaken programs to help people understand the situation well enough to make their own behavioral judgments. They failed to explain, for example, the risks of radiation exposure to different segments of*

[260] Op.cit.

[261] Op.cit.

[262] Ulrich Kendra. (2017). "Unequal impact": Women's & Children's Human Rights Violations and the Fukushima Daiichi Nuclear Disaster. In A. Kashiwagi & Kazue Suzuki (Eds.). Japan: Greenpeace Japan.

[263] Dr. Angelika Claußen, & Dr. Alex Rosen. (2016). Vivre 5 ans avec Fukushima: IPPNW.

[264] Samuel, R. J. (2013). *3.11 Disaster and change after Fukushima*: Cornell University Press.

the population, such as infants and youths, expecting mothers, or people particularly susceptible to the effects of radiation[265]".

The lack of information, and systematically reassuring communication on radiation risks from government experts, effectively underpinned the Japanese citizens' loss of trust. This was the main conclusion of the initial scoping field work for the *Shinrai* project. Some of prominent examples of paucity of information are now part of collective memory for inhabitants of Tohoku, such as the declaration of the government spokesman at the time, Yukio Edano, who declared that radiation would not "cause any immediate harm", and the even more famous declaration of radiation risk management adviser, appointed by the Fukushima prefecture, Shunichi Yamashita:

"*As long as you smile, radiation will not come to you. Radiation will come to people who worry. This fact has been clearly proven by animal testing. People who drink alcohol thus have less impact from radiation*[266]".

The same expert gave the advice not to distribute iodine pills, in order to avoid panic in the population (Hasegawa 2013).

As such, communication from the beginning adhered to a very "reassuring" pattern, precluding the expression of any uncertainty on the dangers of ionizing radiation, and mentioning a "threshold" of 100 mSv, below which there were no discernable effects (Cabinet Secretariat 2011).

Three years later, the Agency for Natural Resources and Energy, attached to the Ministry of Economy, Trade and Industry (METI), admitted its shortcomings in communication. In a memo entitled "For Regaining Trust on Nuclear Energy Policy", it recognized that: "*The government and nuclear operators have always been asked questions in a dichotomy between safe and unsafe, and we have always answered 'safe'. We should not repeat the mistake of continuing to say 'safe' for matters which have risks….. As long as trust in the government and nuclear operators is lost, the risk analysis of experts would not be listened to [by the population]*[267]".

Mr. S. was in charge of government policy at the time of the accident. During the interview[268], he declared that risk communication at this time was a more global failure on the part of the State, and concluded that: "the errors we made in Fukushima were similar to the Minamata affair". Minamata is the name for a health crisis in Japan in the 1950s, where the Chisso firm had leaked mercury into sea waters, consequently contaminating numerous inhabitants who were eating the local fish. The firm, and then the State, were late to recognize the problem and the victims, who - including heavily handicapped or still-born babies - can be counted in their thousands[269] (Jobin, 2004). It

[265] NAIIC (2012). Report: The Fukushima Nuclear Accident Independent Investigation Commission. The National Diet of Japan: http://warp.da.ndl.go.jp/info:ndljp/pid/3856371/naiic.go.jp/en/

[266] https://www.youtube.com/watch?v=g0i7BgwNtiQ

[267] METI's presentation in November 2013 (p.4), found at (only in Japanese):

http://www.enecho.meti.go.jp/committee/council/basic_policy_subcommittee/011/pdf/011_003.pdf Translated by Reiko Hasegawa.

[268] Interview Mr S, in MEXT, Tokyo, on 15 September 2015. Reiko Hasegawa et Christine Fassert.

[269] Jobin, P. (2006). Maladies industrielles et renouveau syndical au Japon Editions de l'Ecole des hautes études en sciences sociales.

was impressive to hear a comparison of Fukushima "errors" with this archetypical environmental and health scandal, coming directly from the mouth of a person who was in charge of the crisis and post-accident policies.

5.6.3.2 Communication and *reassurance*

The links between communication, trust, and reassurance merit further analysis. During fieldwork, it appeared that "reassurance" constituted a large part of the Japanese government's post-accident communication strategy. A number of our interviewees mentioned Edano's declaration as a "trigger" for their distrust of the authorities. The construction of the sentence is negative, if turned positively – such as, "radiation may cause slow onset health effects", it would surely have been considered more sincere and straightforward.

Reassurance is not usually articulated in what a person say *per se*: it is often insinuated and lies in the intentions of the communicator. These intentions and "insinuations" of governmental communications have been detected by a number of scholars who formulate this hypothesis with serious arguments, often analyzing it in a larger political context which aims at protecting nuclear industry interests and continuation (Ribault, (2012), Yuasa, (2013), Hirakawa (2013).

It is thus extremely interesting to hear from those experts who communicated on radiological risk at the time of the accident after several years. It is also enlightening to analyze its purpose from the point of view of those who communicated at the time.

In an interview in October 2017, Mr. A., one of the prominent radioprotection experts in charge of government communication after the accident, looked back on his actions at the time of the accident:

"Trust is an important aspect. I was in (…) at the time of the accident. I came back to Tokyo with my family. Was it ok? Even for us experts, it was difficult, information was limited. For lay-people, it was even more difficult.

In September, I joined a committee on risk communication set up by the municipality. It was the beginning of my involvement. […]. I talked to (…) villagers. I went to the ICRP Dialogues[270], ten times.

I wrote answers posted on the website or on academic societies. People could write questions on this website, and we wrote answers. We had 1800 questions in 2 years, I was the chair of the steering committee during those years. In 2013, the site closed. […]. I learned a lot of things, and I realized we were not trusted. Sometimes we had arrogant and aggressive questions, such as: Do you get money from TEPCO?

Government institutes were not considered reliable. Later on, when I looked at the answers, I realized I found them unsatisfactory. Most of them were immature or misleading. The experts used to say: it is ok. It is natural for experts to calm people down; as a general rule, people do not appreciate radiation. Experts, on their side, always say: "no problem"; it is ingrained in their minds[271]".

[270] ICRP dialogues were jointly organised by AEN (OECD), ICRP and IRSN.

[271] Mr B., 2 October 2017, Tokyo. Interviewers: R. Hasegawa and C. Fassert.

Coming back to one of the main points in the government communication of the time, he admitted: "*Many experts said: there are no effects below 100 mSv. It was misleading*".

In Mr. A's testimony, it is interesting to what extent the "reassuring" facet to expert communication was considered to be "natural", and to constitute an appropriate response to the - equally "natural" - concerns of lay-people. Mr. A understood to a large extent the loss of trust on the part of citizens, although he was often shocked by some attacks he received at this time (such as the accusation of being paid by TEPCO to calm residents' anxiety). He was surely considered a *goyo gakusha*, a term coined for designating experts subservient to the government. However, years after he was ready to correct what he considered an error: "*I wrote a book because I wanted to correct some of the answers I had given at the time*".

At the end of the interview, Mr. A insisted on moral aspects he had dismissed when he was an expert in the aftermath of the accident, and concluded that: "we should have shown more empathy."

5.6.3.3 Reassurance: a domain of relevance?

Where Mr. B presented reassurance as having been inadequate in the context of his work, other discourses may find a "domain of relevance" for it. During interview, Professor Tomonaga (Nagasaki University) came back to the question of official communication in the immediate aftermath of Fukushima ("As long as you smile, radiation will not come to you. […]" see Ch.5.6.3.1), and more precisely to his widely denounced extremely reassuring" attitude[272]. Professor Tomonaga nuanced this view:

"*The government was very satisfied with Yamashita's activities. It was very thankful to him, because this communication scheme worked well. If 5 or 10 mSv/y had been considered as dangerous, even Tokyo would have had to be evacuated. At this time, the Cabinet office had to prepare, in secrecy, an evacuation plan for Tokyo. If I had been in his position I would have said the same, such large-scale evacuation could have been even more dangerous. Yamashita intended to control the population, and this was compatible with government policy*".

Professor Tomonaga defended the reassuring nature of Yamashita's attitude as *apposite* - not because it was intrinsically right, but because the communication of this information could cause harm. In the aftermath of the Fukushima accident, Andy Stirling, a prominent SHS researcher, offered the same kind of nuanced analysis, discussing the appropriateness of reassurance according to *who* aims at reassuring, and according to the *intentions* of it. On a blog-post, dated 16/03/2011[273], he denounces "a narrative of reassurance" in the media about the still unfolding accident. He gives some examples of the terms and expressions used at this time (for example: highly radioactive plumes are qualified as only "*potentially* dangerous"). But he insists on a point particularly interesting, by making the following nuance:

[272] Of course, Yamashita's "smile" statement is more than merely "reassuring": it is incongruous, to say the least. However, the focus here is on Yamashita's overall communication (style/strategy?), at this time.

[273] Stirling, A. The crossing. Japan neglected nuclear lessons. https://stepscentre-thecrossing.blogspot.com. 16-th March 2011.

"*With a grim responsibility for preventing the consequences of panic in an already traumatised population, it might at least be understood (if not condoned) that the Japanese Government be circumspect in its readiness to acknowledge the full gravity of the possibilities now faced. But there is no such excuse for media commentators on other continents, many of whom seem explicitly to see their principal responsibility to lie in 'reassuring' what is clearly feared to be an inconveniently-skeptical public*".

Stirling evokes the same type of arguments than Pr Tomonaga when nuancing the appropriateness of reassurance, although the general theme of his post is rather to castigate the "*biased and incomplete understatements of the severity of the present situation and of future possibilities*", *reassurance* may be considered apposite only in some specific circumstances.

Besides, a number of nuances are to be brought here.

- First, the very notion of panic is quite a controversial one. In a synthesis on this theme, Lee Clarke and Caron Chess (Clarke & Chess, 2008) retain that panic is rare. Though, disaster plans of policy makers and emergency management personnel assume it is likely (Birkland 2006, quoted by Clarke and Chess). There are number of pending complex questions on the definition itself of panic: notably, it implies a normative judgement on what is an appropriate reaction in case of a threat. The authors insist mainly on the fact that panic can be also attributed to elite; they coined the term "elite panic" in contradiction with a classical view which attributes panic to public, but not to people in position of authority.
- Second, reassurance schemes may be inappropriate, even in emergency situations. Some evacuations (e.g. Iitate) showed that reassuring schemes led to situations where people would be needlessly exposed to radiations.
- Third, reassurance may be apposite in very specific circumstances very limited in time. The most interesting point in Professor Tomonaga's comments is the link he makes between the *timing* and *context* of the communication and the relevance of the information provided:

"*This type of communication worked well at the beginning, but at longer term, controversy developed. Yamashita was in a difficult situation. They [the people in charge of communication on radiological risks] did not explain the LNT [linear no-threshold] model as a complement, which states that risk exists at low doses, even if that risk is very small. Yamashita and his colleagues repeated "daijobu" (it's all right) again and again. This was wrong.*"

The switch from a crisis situation, where radiological risk is balanced against other risks, to long-term communication is complex; as underlined by Pr Tomonaga, a reassuring communication scheme may lose its validity when the situation is no more an emergency one. This reduces very much the appropriateness of reassurance.

5.6.3.4 The limits of expertise on radiation risks

In the last part of the interview, Mr. A expanded on his own conduct as an expert:

"*When you say something as an expert, you have to go beyond your expertise. The so-called radioprotection can speak about measurements, but not radiation risks: they are not experts on radiation risks*".

Of note is that Mr. NB quotes, here, one of the now 'classical' thoughts on expertise, first proposed by Philippe Roqueplo[274] in his seminal reflection on the subject, one of the first attempts to show the limits of framing expertise in terms of "objectivity" and "neutrality". Roqueplo said that the expert will always exceed the limits of his own expertise (*L'expert dépasse toujours les limites de son expertise*[275]).

Also striking is Mr. A's declaration that: "there are no experts on radiation risks". He developed this assertion:

"*We must be aware of the situation of the person; each time it is a specific situation. We need to explain what is known and what is not known. [In the aftermath of the accident] we were not prepared for this situation, we lost people's trust*".

The context is important:

"*Radiation exposure has to be seen in the context in which it occurs, the context in which people are exposed. One of the most difficult questions is with regard to CT scans: when you've had several CT scans, the dose is not low. I receive 10 mSv/y in the context of a simple check-up*[276]*: is that okay? There's no direct evidence; I can explain the doses and the possible consequences and effects, but I cannot answer [that question: is it okay?] because of uncertainties. My son had a number of CT scans because of convulsions*[277]*. These exams were necessary; if they hadn't been done, I may have had another regret. This part is not scientific but emotional. On the question of whether to return or not, there was no correct answer. If you're upset about radiation risks, then don't go back. If you love your home, and you think it's valuable to live there, then you should go back. The government wants to solve this as a general issue, not a particular one. At a municipal level [however], it can be more 'customized'.*"

In this way, Mr. A formulates one of the central issues linked to radiological assessment: all forms of exposure are not "equal"; some forms may be perceived as more "legitimate" than others, especially in the case of medical exposure. During an ICRP working meeting, one ICRP expert explained:

""*For many inhabitants, it is not a matter of how important or not the supplementary radioactivity is; they cannot consider additional dose [on top of natural background radiation] as acceptable, however little this additional dose is*[278]".

As a consequence, for Mr. A, it appeared difficult - perhaps impossible - to give a *general* statement on just 'how risky' it is from a strictly "scientific" point of view.

[274] Cf deliverable 1 Shinrai on the notion of expertise.

[275] Roqueplo, P. (1997.). Entre savoir et décision, l'expertise scientifique: INRA.

[276] Note: CT scans for check -ups are current practice in Japan, unlike in France, where a CT scan is prescribed only in case of clinical signs.

[277] At the time of the interviews, (2017) results were published of John Matthews' research on the link between CT scans received during childhood and cancer; for Matthews the correlation is clear.

[278] Working Group ICRP, May 2018. JF Lecomte (IRSN and ICRP expert).

In their discussion of the 'micro-politics of radiation', Slater et al[279] (2014) provide a striking piece of field work where this issue is brought to the fore. The work is quoted at length, providing the whole context in order to fully comprehend the point:

Each community, school, cooperative, virtually every group was organizing info sessions and talk events, often with outside speakers, usually from the government or other groups outside of the community.

"Usually it was not clear who these people were — 'someone from the government' was often all we knew, so we did not know if they even understood radiation."

When a real scientist came, the situation was often worse. The scientists would come with data that they were unable to explain or that was often unanalyzed and in formats that local residents could not understand.

"Of course, we could not understand it all" and "our question was always this same, at every meeting: is it safe?"

At a meeting David Slater attended, one scientist explained, "Well, that is hard to say. What exactly is safe? I think that maybe each of us has our own understanding of safe, and I do not want to force my ideas on you"

Amidst the furrowed brows and pained expressions of confused and disappointed mothers, one "noisy" (urusai) activist mother shot up from the audience to say, "We have no idea if it is safe—that is why we are here. You are the scientist. You have to tell us." An old woman nearby sighed and said to her friend, "Let's go home. This is another 'scientist beholden to the government' (goyogakusha)." When asked how she could tell, she replied: "What sort of scientist has ever said he does 'not know what safe means'? He is too stupid to help us or is really probably lying."[280]

Slater also analyses how this type of answer had a negative impact on trust:

"We are sure that the refusal of some scientists to make pronouncements based on incomplete data with little historical precedent to guide them was understood by them as the only responsible option. But whatever the motive, often the information that was provided was so unintelligible as to be useless, or worse, confusing and misleading. Some local residents accepted this as a function of their own lack of understanding, but after two or three of these meetings, more saw this as incompetence or neglect on the part of the scientists. In either case, it continued to break down the faith locals had in the expert advice on offer"[281].

5.6.3.5 From Reassurance to "Reassurism"

5.6.3.5.1 Reassurance as an objective: ethical limits

An expert at the IRSN health-related crisis unit set up after the Fukushima accident, who had to answer phone calls from worried people, made the following comments:

[279] David H. Slater, Rika Morioka & Haruka Danzuka (2014) MICRO-POLITICS OF RADIATION, Critical Asian Studies, 46:3, 485-508, DOI: 10.1080/14672715.2014.935138

[280] Slater, Morioka, Danzuka, op.cit. See Yamaguchi 2013 for the ways in which "safety" is discussed, in this case, relative to food policy.

[281] P 12, op.cit.

"*I must say … when you can say something reassuring … it's so gratifying! Like a doctor who can give medical results saying: "nothing serious"! … People are relieved. (…) However, it's important not to reassure when it is not appropriate. Myself, I would hate to be falsely reassured. So, as experts, we must be aware of that. Our job is not to reassure, it's to say what we know, and if it is reassuring, that's good*".

In her account, this expert conveys an ethical position, sensing that reassurance might, in other cases, be an *objective* in itself, and that in this case – when there is no certainty associated with the purpose of worry - it could be a dishonest, unacceptable attitude.

However, reassurance was integral to official discourses and writings after the accident. The term can be found for example in an IRSN report on decontamination[282], a conference led by the IAEA on communication. Reassuring people about the dangers of ionizing radiation seems to have been one of the objectives of communication policy after the nuclear accident. This has precedence, with the communication held in France after the Chernobyl accident. (Kalmbach, 2014).

Lastly, and perhaps more perniciously, reassurance communication was not limited to discourse. Head of Reconstruction Division at Kawauchi Village Office suggested during the interview[283]: '*by the fact that a young woman in her twenties such as O. was posted (as a radiation risk councillor from the University of Nagasaki) and live in the village, her existence itself becomes the risk communication, providing a sign that it is safe to live in Kawauchi'*. Some inhabitants also mentioned during interview that they believed that she stayed there only to reassure population.

Such "proof by presence" has a notable precedent, as illustrated by the case of Russian radiobiologist Mikhail Balonov, after the Chernobyl disaster, in 1986: "*to try to convince the inhabitants living in the area, which had been exposed to radiation from the nuclear power-plant explosion, that the situation was not hopeless, [his] strategy was to present the crowd with a government scientist, who, along with his pregnant wife, would be living and working in the contaminated area*"[284].

5.6.3.5.2 The excess of reassurance: "Reassurism"

The above observations - on the ethics of reassuring, on communication for reassurance - invite conclusion on what could be considered as *excesses* of reassurance, a question which appears to be raised in one form or another by experts themselves (see for example the testimonies of Mr. B, here above), by inhabitants, and also by the government itself in its admission of guilt. Are there "excesses" of reassurance? When is it unacceptable to reassure?

In legal proceedings after the earthquake of l'Aquila in 2009, which killed 300 people, the experts who composed the Committee for Major Risks (CMR) were put on trial and

[282] Statégie de décontamination et de gestion des déchets. Rapport IRSN. RT/PRP-DGE/2015 00015.

[283] Mr A., 20 October 2014, at Kawauchi Village Office. Interview led by R. Hasegawa and C. Fassert.

[284] Samuel Loewenberg, 'Mikhail Balonov: understanding the legacy of Chernobyl' in The Lancet, Volume 367, Issue 9519, (April 2006) Quoted by: Yves Lenoir, Reporterre, 11 Mars 2017.

condemned for their "reassuring statement", having insisted that there would not be any serious earthquake[285].

Their reassuring statement was in contradiction with the emic perspective of risk - risk as perceived in a given culture. In the case of l'Aquila, most people were ready to evacuate, and felt they should,[286] but because the experts of the CMR were so reassuring, inhabitants did not do so, and as a result some of them lost their lives.

In this context, anthropologist Antonello Ciccozzi (Ciccozzi, 2016), who was a technical adviser in the l'Aquila legal proceedings, developed the central tenets of his notion of "reassurism":

"if "failure to warn" means "not predicting a disastrous event," then "predicting that a disastrous event will not occur" means providing a reassurance that proves to be disastrous when the event in question does actually occur. Since not providing information is quite different from providing incorrect information, not predicting an earthquake (failure to warn) is quite different from predicting a non-earthquake (disastrous reassurance)". The signifier "reassurism" might therefore be useful in understanding that, in L'Aquila, it was not simply that a lack of alarmism led to a failure to warn but that, going so far as to engage in reassurance-ism, institutional representatives produced a disastrous reassurance whose persuasiveness stemmed from the manifest scientific authority of its source"[287].

It is not the objective of this study to establish whether the elements of "reassurism" in the discourses of authority will, in future decades, produce "disastrous consequences" or not in Japan: on this issue, as with any other linked to radiological consequences, the divide between institutional expertise and alternative/counter expertise is wide, and will anticipate different situations[288]. Besides, unlike an earthquake, which is a "visible" event with more straightforward, immediate dramatic consequences, the identification of radiological consequences requires the existence of "infrastructures" (Kuchinskaya, 2014) that allow health-related after-effects to be deciphered, where the link between death or sickness and its causes remains a complex issue. This is evident, for example, in the many trials relating to the recognition of a "causal link" between exposition and sickness[289] (Barthe Y. , 2014). And a number of scholars in environmental health have

[285] The case is complex and epitomizes a number of stringent issues on the responsibility of experts, legal responsibility, limits of predictability, decision-making in uncertainty, and so forth. We focus here on the notion of *reassurism*, and propose in conclusion to explore such issues further in a follow up to the *Shinrai* project. For detailed presentation of the case of l'Aquila, see the articles by Antonello Ciccurro and Mara Benadusi. Parola di scienza - Il terremoto dell'Aquila e la Commissione Grandi Rischi: un'analisi antropologica, DeriveApprodi, Roma, pp. 192. Maltese, G., Tecnoscienza - Italian Journal of Science & Technology Studies, vol 4 n°2 2013, Padova, Dipartimento FISPPA (Section of Sociology).

[286] "Forms of truth in the trial against the Commission for Major Risks- Anthropological notes", in Archivio Antropologico Mediterraneo online, a cura di, M. Benadusi e S. Revert, anno XIX, no. 18 (2), pp. 16.

[287] *Ibid.*

[288] Moreover, the assessment of what constitutes « disastrous consequences » is itself a moral judgment. (cf Kennedy for the ban of nuclear tests). "*The loss of even one human life, or the malformation of even one baby—who may be born long after we are gone—should be of concern to us all. Our children and grandchildren are not merely statistics toward which we can be indifferent*." John F. Kennedy, July 26th, 1963

[289] For example, see Yannick Barthe for his research on the recognition of the consequences of nuclear tests in France. Other research focused on recognition of link between irradiation and sickness (Barbier and Fassert, 2017). Barbier, L., & Fassert, C. (2017). The Life Span Study and its criticisms, a socio-historical perspective. Paper presented at the Making the world nuclear after Hiroshima. May 2017, Stanford University.

explored the "invisibility" of such effects. (Frickel, 2007). (Kuchinskaya, 2014) speaks of "the politics of invisibility" and (Dupuy, 2008) proposes an ethical reflection (*l'invisibilité du Mal*) on the deaths "not counted" by the institutions of the nuclear sphere. Despite differences between Fukushima and l'Aquila, the notion of *reassurism* remains relevant, a notion which shows the entanglement of the political and the emotional stakes inherent in experts' assessments of risks.

5.6.4 CONCLUSION

It can be said that there were undoubtedly intentions *to reassure* on the part of experts in post-accident Fukushima. In some cases, their reasons may be considered morally acceptable from the point of view of a colleague in the short term, but more disputable in the longer term (testimony of Professor Tomonaga with reference to Professor Yamashita). One expert in a counselling role may consider that "intentional reassurance" is inappropriate, in an ethical reflection on her practice, and may frame her job as "not a *reassuring* one". By contrast, another expert in Japan recognized that at the time he framed his job as "calming" people fears, but recognized later that it was not an acceptable attitude, considering the uncertainty of the risks.

One can therefore conclude that there were different "regimes of prudence" on the part of the experts, and that these regimes were evaluated by the citizens in an ethical frame, in terms of the consequences they experienced or anticipated.

The example of l'Aquila and of its "reassurist" experts is a striking case, where most inhabitants listened to experts – at great personal cost - because of the "persuasiveness that stemmed from their scientific authority"[290]. The case was different in Fukushima, where alternative experts/alternative science was sufficiently vocal to contradict institutional expertise - not to mention the lack of agreement internally, among institutional experts, which caused a stir in the public domain (notably, the resignation of Professor Toshiso Kosako).

This leads to various attitudes, where citizens present different forms of engagement according to whom they decided to trust, or not. But trust also recast behaviours, in terms of choice and of active engagement, and in Fukushima this was not central for two types of inhabitants: firstly, the seniors who wanted to "forget" radiological risks and enjoy their rural lives, dismissing the tenets of a "culture of radioprotection" as well as the concerns of "alternative scientists"; and lastly, those who chose to, or had to, "return and worry", and whose testimonies attested to some kind of endless doubt. We can make the hypothesis that, in this case, there is a tension between an implicit trust given to the "cautious" side (which leads to the worries on the radiation risks) which is in opposition with the return. In this case, the "push for return" is felt as blockage to "trust who you want" (the words of our interviewee who chose to leave) and act accordingly.

[290] There has been also an alternative voice in the case of l'Aquila, but the CMR communication took a strong lead and silenced it.

6 SYNTHESIS: LIMITATIONS OF POST-ACCIDENTAL POLICY IN JAPAN

6.1 INTRODUCTION

While Chapter 5 examined the social consequences for the inhabitants, Chapter 6 focuses more on the political issues linked to the nuclear accident management and its consequences on residents in these territories. It also examines the legal and financial aspects (compensation) of the consequences of the catastrophe. Lastly, it explores alternative solutions (such as the concept of the "transitional town") which have *not* been implemented by the Japanese government, although they could be considered as relevant solutions.

6.2 FEW AND UNSUSTAINABLE RETURN AFTER A NUCLEAR ACCIDENT

One major characteristic of the post-accidental situation lies in the relatively limited number of inhabitants who returned to the evacuated territories after Evacuation Orders were lifted. In March 2018, the average rate of return of residents to the former Evacuation Zones (Green and Yellow zones) over nine towns stood at 15%[291]. Besides the exceptional case of Tamura city, which recorded 80.1%, Kawauchi village's return rate was 28.5% and that of Naraha town as 31.8%. And in two towns, where EOs were partially lifted in March 2017 (Tomioka, Namie), the ratio was as low as 4%, according to the same survey.

The rate of return for children is even lower. Figures from the same time (March 2018) show the average school enrolment rate in these nine municipalities representing only 8.6% of the total enrolment rate before the accident[292]. The Reconstruction Agency's opinion surveys of the affected residents clearly illustrate the trend: the younger the person is, the less likely it is that he or she will return. This was also confirmed by field studies for the present report. Many of those interviewed, including municipal officials, talked of families with small children that would probably not be coming back.

The *Shinrai* field research suggests, as follows, a typical profile of returnees to the former Evacuation Zones: a person over 50 or 60 years of age,[293] in good health, autonomous, mobile and thus able to stay in touch with the community, whose children are already adult and live elsewhere. Yokemoto (2015), who conducted a field study in Kawauchi, also described typical returnees as "*those who are relatively older, have a job or have already retired, without health problems, and able to drive a car*[294]". But the same generation *with* health problems were more likely choose resettlement in a city, with their children, in order to have access to specialized medical treatment and help from their children.

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[291] Kahoku Shimpo (regional newspaper), genpatsujiko kyuhinanshijikuikikikanritsu 15% Fukushima9shichoson, zenikikaijokara 1nen (The rate of return to former evacuation zones 15%, of nine municipalities, at one year from lifting the EOs, on 4 March 2018.

[292] Yomiuri Shimbun (English), Weak recovery of school enrollment in Fukushima Prefecture, on 1 March 2018

[293] "Over 50" was suggested by the Mayor of Kawauchi village, while "over 60" was mentioned by many evacuees/returnees interviewed both in Kawauchi and Naraha.

[294] Yokemoto, M. (2015). What is imbalanced reconstruction? (In Japanese: Fukintou na fukko toha nanika). In: M. Yokemoto and T. Watanabe, (Eds). Why does nuclear disaster induce imbalanced reconstruction? : Toward "Reconstruction of Human Life" and Community Revival from Fukushima Accident: Minerva Shobo. (p.14).

In this context, one wonders what these towns will look like in 10 to 20 years. What does a community look like when most residents are over 60, and there are very few people of a working age, or children? How long does such a town survive? When these returnees fall sick or need nursing at home, they will have to leave the town again in search of suitable care because there will probably not be sufficient medical and nursing personnel in their town – doctors and nurses are typically of the generation that chooses not to return. During the interviews, some municipality officials hinted at what they considered to be the realistic prospect of return of residents: for example, a Naraha official suggested that 50% of former inhabitants would return and not more.

In 1991, sociologist Akira Ono famously coined the term *marginal villages* (*genkai shuraku* in Japanese) to describe communities where more than half of the inhabitants are over 65 years old and at risk of eventual "extinction" (Yamashita, 2017). Are the former evacuation zones heading toward becoming *marginal villages*? How did this situation come to be?

Professor Yusuke Yamashita of Tokyo Metropolitan University, interviewed in March 2017, suggested some answers to the above question[295]:

"[When EOs were lifted] the local situation did not meet the conditions for return. As a principle, lifting the EO or not should be decided by the concerned municipality, who knows the local situation best, not the State. […] Most municipalities opposed the lifting of EOs but had no choice but to accept the government's decision because the municipal budget was totally dependent on State subsidies after the accident. […] These municipalities cannot simply survive without State subventions and therefore have, in a sense, lost their autonomy as municipalities".

6.3 ATTACHEMENT TO TERRITORIES?

With regard to the return of residents after a nuclear accident, the International Commission on Radiological Protection (ICRP) suggested in its Publication 111 (2009) that "worldwide experience following nuclear and non-nuclear accidents shows that neither nations nor individuals are very willing to leave affected areas", (p.26) and that "most inhabitants generally prefer to stay in their homes rather than to be relocated (voluntarily or not) to non-contaminated areas" (p.30). The case studies for the present study in Kawauchi, Naraha and Watari district show the contrary. A majority of evacuees hesitated and often chose *not* to return, despite considerable effort and investment on the part of the State and local authorities. For example, according data published by METI in December 2016, the government was expecting to spend 6 trillion yen (46 billion euros) for decontamination, even though the return rate of inhabitants remained at just 15% in the former Evacuation Zones[296]. Naraha town mobilized tremendous technical resources to dissipate the fears of residents over drinking water, but the return rate (or residing rate) remained at 31.8%, two and a half years after the lifting of EO. The case of Watari district showed that most residents wished to evacuate even though no evacuation order or recommendation had been issued by the government. People left

[295] Interview conducted in his office at Tokyo Metropolitan University, in Tokyo, on 20 March 2017

[296] Source: The data published by METI on 9 December 2016 (http://www.meti.go.jp/committee/kenkyukai/energy_environment/touden_1f/pdf/006_01_00.pdf); Kahoku Shimpo on 4 March 2018, op. cit, p. 40.

the city by their own means or adapted to a life of separate households in order at least to evacuate their children. Our field study thus suggested a different picture from the one described by the above mentioned ICRP Publication 111 concerning the mobility choice of affected inhabitants after nuclear disaster.

6.4 REASONS FOR NON-RETURN

From official opinion surveys and *Shinrai* field research, the following main reasons for the evacuees' decision not to return home can be identified: risk from radiation exposure (especially children), risk from the crippled F1NPP, lack of sufficient medical facilities, lack of social and commercial infrastructure, lack of other infrastructure (road, transportation, communication, etc.), the presence of *kariokiba*, the presence of cleanup/decontamination workers, non-return of friends and neighbors (former communities no longer existed), lack of high schools, limited educational opportunities for children.

In order to dispel the worries of residents over radiation risk, the local and central authorities adapted a strategy of promoting risk communication by experts. They created a number of expert committees, both at government and municipal levels, to advise them on policies and reassure the population. However, *Shinrai* field research revealed a number of limitations to that strategy, also partially confirmed by low return rates of the population. As mentioned during interview by both the Mayor of Kawauchi village and a Nagasaki University expert, residents did not change opinion, despite risk communication put into effect by experts[297]. In the words of the Mayor of Kawauchi:

"Once the residents learn a wrong information, no matter how much risk communication we do afterwards, that information is stuck in their minds and cannot be changed[298]!"

Yamashita et al. (2016) and Yokemoto (2013) consider "loss of community[299]" to be an important aspect behind the phenomenon of non-return. In rural communities such as those affected by the nuclear accident, social relationships had long provided a safety net of mutual support in difficult times. Without the existence of "community", therefore, it would be difficult for some evacuees to imagine returning. (cf. Chapter 4: Return and Forget/resist).

"*Nobody wants to return alone*". Naraha evacuees interviewed often mentioned the return of other neighbors and friends as an important condition for their return. Some evacuees literally called all their former neighbors and friends to ask them about their decisions before making their own.

Yamashita's (2017) study also suggests another important aspect: the question of autonomy. When the residents were not allowed to decide for themselves what was "safe" for them, but were subjected to decisions made by the government, they ultimately lost

[297] Interview with Mr. Yuko Endo, the Mayor of Kawauchi, at Village Office in Kawauchi village on 11 October 2016 (Interviewer: R. Hasegawa, C. Fassert and R. Kojima); Interview with Ms Orita, op.cit.

[298] Interview M. Endo, op.cit.

[299] Yamashita, Y., Ichimura, T. and Sato, A. (2016). Reconstruction without Humans (Inhabitants): Nuclear Evacuation and People's "Lack of Understanding" (In Japanese: Ningen naki Fukko: Genpatsu hinan to kokumin no "furikai" wo megutte), Chikuma Bunko.

the sense of control over their own lives[300]. As a result, many residents opted *not* to return, in order to somehow keep a sense of autonomy, while municipalities had no choice, but to return, and thus become completely dependent on government decisions. As Langer's study (1983) after Three Mile Island accident has also shown the lack of perceived control over their lives significantly affects a population's mobility choice, as well as their level of trust toward experts after a nuclear disaster.

6.5 IMPOSED DICHOTOMY BETWEEN RETURN AND RESETTLEMENT

During the interviews, many evacuees expressed that they were not comfortable with either of the choices proposed by the government, and that they often felt "forced" to make decisions of which they were not completely convinced. Many said that the timing for making such a decision was inadequate, and it was imposed too soon - before they had sufficient elements with which to make a sound judgement, and feel confident about restarting their life, back home or elsewhere.

The choice of return versus non-return also created tension and division within the evacuee community. Previously united, in the solidarity of being in the same plight, evacuee communities began to split over the question of whether to return. Often those reluctant to go back were stigmatized, since such a choice was perceived by some as abandoning the community. After conducting several opinion surveys among these communities, Fukushima University professor Akira Imai (2012) concluded that forcing evacuees to choose between return and non-return should be avoided (as a policy) because this transformed the status of 'not being able to return' into that of 'not wanting to return', thus exposing those who opted for the latter to condemnation and judgement from the rest of the community.

But a simple dichotomy between return and resettlement cannot fully grasp or encompass the actual needs or desires of the evacuees, because the decision 'not to return' often coexisted with the wish to return home one day (Yokemoto, 2015; *Shinrai* field interviews). During *Shinrai* field interviews, most evacuees who had made a decision not to return also said that they did not want to give up the idea of returning one day. Evacuees in their thirties and forties, with children, said: "I don't feel safe to go back now or during the next few years. But I want to go back when my children grow up and leave our house."; and: "we want to return at retirement age"; or: "we cannot go back now, but I hope that our children or grandchildren will return".

6.6 THE "THIRD OPTION" AND ALTERNATIVE CHOICES

6.6.1 INTRODUCTION

In Kawauchi, some residents adjusted to an alternative solution, in-between return and evacuation/resettlement. This alternative was half-return, or "dual residency" (Mosneaga, 2015), allowing families to keep their jobs in the village while avoiding the risk of radiation exposure for children, or providing necessary care for aging parents elsewhere. In Watari, some people opted for a form of self-evacuation that created a *dual household*, where typically a father would stay in Fukushima city to work and earn

[300] Yamashita, Y. (2017). The Future of Communities Taken Away by the "Reconstruction". (In Japanese: "Fukko" ga ubau chiiki no mirai), Iwanami Shoten.

an income, while a mother with children would evacuate and live elsewhere. But these adaptive, *ad hoc* measures undertaken by many families were, at the time of interview, under threat since temporary housing assistance and compensation were due to terminate in 2017-2018. These families interviewed all voiced fear of becoming *de facto* working poor, who would struggle to make ends meet every month in order to support the loads of maintaining two or more households.

The current post-accident policy is based on the residents' choice to return, and somewhat less on resettlement, largely ignoring alternative choices made by the affected population, as seen above. Considering the low rate of returnees, it is reasonable to say that the policy is in need of readjustment, in order to enable evacuees to find workable solutions for rehabilitating their lives, offering options other than return and resettlement.

6.6.2 THE CONCEPT OF "TRANSITIONAL TOWN"

Some scholars promoted the concept of *transitional town* or *virtual town* as a third option for evacuees, thereby creating an alternative solution to the dichotomy between return and resettlement (Imai, 2014; Yokemoto, 2015; Yamashita, 2017). One evacuee from Naraha (male in his 40s) said during interview[301]: "*If the government evacuated a whole town due to a nuclear accident, it is its responsibility to resettle the whole community in another place permanently, so that the community can stay together rather than dividing the community by pushing people to return*".

During interviews, many evacuees in their 30s and 40s expressed a desire to return home in the future, once they genuinely feel safe to go back or when their children grow up. This "long-term refuge" - rather than permanent resettlement - is considered by many within a time span of 30 to 40 years (Yamashita et al., 2016); it is the time frame that these evacuees consider necessary for a realistic return, taking into account the half-life of caesium137 (about 30 years) and the decommissioning of the F1NPP (40 years, according to government estimate). In order to make "long-term refuge" a viable option, Akira Imai, professor in governance studies at Fukushima University, proposed the concept of *transitional town* or *virtual town* (also called, *second town* by Yamashita and Kainuma, 2012). The idea is to create a sort of "enclave" within another city/town where an evacuee community can live together and receive the sane municipal services until they can finally go back. The Mayor of Iitate village, which was included in Green, Yellow and Red Zones, had already suggested in 2011 the creation of a dual-residence registry for its residents. In Japan, you must declare and register in the town where you live, otherwise you cannot benefit from any municipal services, including school education for children. Therefore, the proposal of the Mayor of Iitate was an important step towards materializing the concept of *transitional town,* whereby residents could be registered in two municipalities, just like dual citizenship, both in the original town and in the town of long-term refuge. In this way, residents who choose long-term refuge could still send their children to school in the original town in order to keep the connection with their original community.

[301] Interview with M.S., a municipal social worker, conducted at his work place, Onahama-Aikojima temporary shelter in Iwaki city on 30 September 2015 (Interviewer: R. Hasegawa).

In addition to Iitate village, municipalities in Red Zones (Futaba, Ookuma, Namie and Tomioka) also expressed interest in this concept, and the Reconstruction Agency even started a consultation process between applicants and target host municipalities in 2012, under the name of "Out-of-Town Community" (Machida, 2015). But it faced resistance from some target host cities, such as Iwaki city. Confronted with this opposition, the concept did not materialize, but discussion continued on a case-by-case basis, coordinated by the Reconstruction Agency[302]. Iitate village created a *de facto* Iitate "bis" community within Fukushima city, though it has not been officially recognized as such. For the academic year 2018-2019, 75 children, representing 14.1% of the students from before the accident, registered to attend the school in Iitate, with 90% of them commuting from other cities, notably from Fukushima city[303].

6.6.3 "STAKEHOLDER INVOLVEMENT" AS A FORMALITY?

The case studies show that both government and municipal authorities have made efforts, at varying degrees, to consult with residents on important issues which directly concern their lives following the serious nuclear accident. Meanwhile, during interviews, many residents expressed dissatisfaction and frustration toward these consultations, especially the ones organized by the government, and felt that their concerns and opinions were not taken into account in the post-accident policies. The government-inhabitant direct consultations were often called "explanation meetings" by the government, *setsumei-kai* in Japanese, which literally means "meetings to explain". Mosneaga (2015) called these meetings, "the decide–announce–defend model of policymaking" where consultations appear to have been geared toward setting in motion policies predetermined by the government rather than adjusting proposed policies in line with the will of the evacuees. Moreover, the meetings are organized behind closed doors without any presence of media, NGOs, legal or independent experts (Hasegawa, 2015). During the interview with the Nuclear Accident Affected Residents Assistance Team, the governmental team which defines the policy of lifting EOs, an officer seconded by METI affirmed that NGOs were not considered as stakeholders and thus not included in these Explanation Meetings[304]. Without the presence of third parties, the power balance tends to work in favour of policymakers with financial means and executive capacities, leaving evacuees often with no alternatives, but to accept the decision imposed (Hasegawa, 2015). According to Komendantova and Battagli (2016), such model of policymaking where solutions developed by "educated experts", project developers or government are simply communicated to the public, is often destined to fail, leading to social conflicts, delays and even cancellations of the original project. Mosneaga calls for a more inclusive approach, moving away from "top-down policies that ignore local voices", that promotes true local ownership of recovery solutions.

[302] Reconstruction Agency Website: http://www.reconstruction.go.jp/topics/main-cat1/sub-cat1-4/20131129194216.html

[303] Yomiuri Shimbun on 1 March 2018, op. cit., p.39

[304] Interview with N.A., a counsellor, Nuclear Disaster Victim Assistance Team, Cabinet Office, on 15 October 2014.

6.6.4 THE "PUSH" FOR RECONSTRUCTION BUT FOR WHOM?

When asked in interview what the word "reconstruction" meant for them, most evacuees answered either that it would mean retrieving their former/"normal" life, or that it meant all children and young people being able to return home. But when asked the same question, representatives of the municipality answered slightly differently. The most frequent responses included that "reconstruction" meant decontaminating the town and then making it attractive, by bringing in new industry and job opportunities. Yusuke Yamashita, one of the authors of *Reconstruction Without Inhabitants* (2016), argues that there is an enormous gap between the actual reconstruction policy and the real needs of the affected population, which results in damaging the prospect of genuine recovery of people's lives. According to him, evacuees are in need of policies addressing their health concerns, helping them rebuild their lives in their original place or elsewhere, and guaranteeing the continued existence of their municipalities. But government policy consists of decontamination in order to promote return, compensation payments to help evacuees rebuild their lives, attracting new industry to create jobs, and a campaign of risk communication to dispel radiation fears.

Another problem of the current reconstruction policy is that, because it was designed for returning residents, those who do not return cannot benefit from the scheme. Under the current policy, evacuees are supposed to rebuild their lives with compensation paid by TEPCO. Since such payment ended in March 2018, evacuees are left alone to rebuild their lives elsewhere. By the same token, anybody who comes to settle even if not originally from the town would benefit from the reconstruction scheme in the same way as returnees. The author of *Reconstruction without Inhabitants* then asks a question: So whom is the reconstruction really for?

Despite the observably timid return of evacuees, large-scale infrastructure reconstruction projects are in full bloom in the empty former EZs; reconstruction is seeming going ahead regardless of the choice of (former) inhabitants. One evacuee from Naraha town (female in her 40s) murmured during interview[305]:

I don't understand the concept of reconstruction in a town where more clean-up workers are living than actual residents.

In other interviews, municipal officers from both Naraha and Kawauchi hinted at what they consider a realistic outlook regarding the return of residents and the future of their towns: basically, after a certain point, no more residents will come back. But inviting new business investment and installation by means of reconstruction subsidies will create new job opportunities and attract new people to settle in the town.

Professor Yusuke Yamashita, however, argued that this strategy, though it appears pragmatic, would end up making these towns even more fragile and dependent on the State in the near future. For Yamashita, the profile of someone prepared to settle in a town, solely attracted by job opportunities and despite risks, is typically a person who is already socially and financially vulnerable, who will need some kind of assistance in the long run. If the municipality ends up populated by such newcomers, he warns, it will become even more dependent on State subsidies and may one day become a *marginal*

[305] Interview with Y.Y., a municipal social worker, conducted at her work place, a temporary shelter in Iwaki city on 24 March 2015 (Interviewer: R. Kojima).

municipality, threatened with extinction, compelled to accept more potentially hazardous and pollutant industrial facilities (e.g. nuclear waste management).

Reconstruction is also dividing affected communities between those who benefit – namely, the stayers and returnees- and the others who don't – the evacuees and those who have resettled elsewhere. Like the compensation scheme which categorizes and divides the affected communities according to different evacuation zones, the current reconstruction policy result in including some and excluding others according to individual mobility choices.

6.7 THE RISE OF GROUP LAWSUITS AS A CONTESTATION

Shinrai field research found that Fukushima post-accidental policies often resulted in dividing families, friends and communities along various lines, including different perceptions of radiological risk, migratory choices and, most of all, compensation payments of which the amount would differ significantly from one zone to another. Feelings of injustice smolder among communities - within, in-between, and outside different zones. During interview, many expressed feelings of abandonment and injustice, indignation, and mistrust toward the government and its post-accident policies.

These indignation and feelings of injustice among affected population led to numerous legal actions. By March 2016, five years after the accident, a total of 31 group lawsuits involving 12,000 plaintiffs from evacuees and affected residents had been filed against TEPCO and the government all over Japan, demanding a total amount of 1 billion USD as compensation for various forms of damage[306]. In addition to these civil suits, a criminal action procedure against TEPCO former executives (the ex-CEO and two former vice-presidents) was filed by 14,000 plaintiffs in July 2015. The first hearing of the trial took place at Tokyo district court in June 2017 where the accused pleaded not guilty of charges [307] . The protest of affected populations against the reference dose of 20 mSv/year has also taken the form of a lawsuit. A total of 534 residents in Minamisoma city filed a complaint in April 2015 against the governmental decision to revoke the designation of Hotspots, using the 20 mSv/year criteria[308]. The group demands the withdrawal of this decision, contesting the validity of this reference dose. This is the first court case specifically brought against the reference dose of 20 mSv/year set by the government as part of Fukushima post-accident policy. The court proceeding began at Tokyo district court in September 2015 and is still ongoing. Another proceeding related to the reference dose is a lawsuit against radiation exposure of children, filed by 201 parents in Fukushima city in June 2015, questioning the legality of applying the reference dose of 20 mSv/year to children, in view of Japanese legislation related to public exposure dose limit of only 1 mSv/year, and the designation of what is known as Radiation Controlled Area at the dose of 5.2 mSv/year[309]. The court hearings are still ongoing at Fukushima district court.

[306] Mainichi Shimbun (2016), Daishinsai 5nen: genpatsujikogenkoku 12,539, soshou zenkoku 31ken (Five year from Great Disaster: 12,539 nuclear accident plaintiffs and 31 Group Actions all over the country) on 06 March 2016

[307] The Guardian (2017), Fukushima nuclear disaster: former TEPCO executives go on trial, on 30 June 2017

[308] 20 mSv/year Group Action website: http://minamisouma.blogspot.fr/

[309] Group Action Against Radiation Exposure of Children website: http://fukusima-sokaisaiban.blogspot.fr/

25% of plaintiffs of all group lawsuits are evacuees from various Evacuation Zones, while the remaining 75% are self-evacuees from outside official EZs[310].

Among 31 group lawsuits, rulings were given on seven by the respective courts in March 2018. For the first, a group lawsuit filed at Maebashi district court by 137 Fukushima evacuees living in Gunma prefecture, the court recognized the responsibility of both the government and TEPCO, stating that 'the accident could have been avoided since TEPCO had already predicted the risk of exceptional tsunami'[311]. The court ordered TEPCO to pay a total of 350,000 USD to 62 plaintiffs in March 2017. The second ruling was given at Chiba district court for the group action brought by 45 evacuees from Fukushima living in Chiba prefecture. The court recognized, for the first time, psychological damage due to "loss of hometown" and ordered TEPCO to pay a total of 3 million USD in September 2017[312]. Unlike the Maebashi ruling, however, the Chiba court recognized only the responsibility of TEPCO and not that of the government. The third ruling was at Fukushima district court, for the largest group lawsuit, filed by about 3,800 Fukushima residents who did not or could not evacuate. The court concluded that both the government and TEPCO were to blame for failing to prepare for the tsunami risk, which they could predict from the 2002 risk assessment. TEPCO was ordered to pay a total of 4.4 million USD to about 2,900 plaintiffs[313]. In February 2018, the fourth ruling, at Tokyo district court, ordered TEPCO to pay the largest amount so far: 10 million USD, to 321 former residents of Minamisoma city for psychological damage due to loss of hometown. In the following month, Kyoto district, Tokyo district and Iwaki district courts gave rulings which ordered TEPCO to pay a total of 7.5 million USD to 365 plaintiffs. The ruling for the other group actions and at courts of appeal is due to follow during the next several years.

Behind these numerous group actions, we can identify three key elements of government's post-accident policy which may have been the cause for much of the agitation and controversy (Yamamoto et al., 2015; Hasegawa et al., 2017; Fassert, 2017):

1) The reference dose of 20 mSv/year;

2) The emphasis on return over resettlement for the evacuees from official EZs, and thereby on staying over evacuation for the residents outside of EZs (e.g. the case of Watari);

3) The differences in financial compensation awarded according to different EZs.

On the issue of the 20 mSv/year criteria, despite a vigorous risk communication campaign carried out by the authorities, many remain skeptical as to the validity of such a reference dose, as seen above in the group action of the Minamisoma residents. The dose was initially contested by a then governmental advisor, Tokyo University professor Toshiso Kosako, who resigned from his post in April 2011 in protest against the

[310] Mainichi Shimbun 06/03/2016, op.cit., p.47

[311] Mainichi Shimbun (2017). Nuclear Accident: Responsibility for the State and TEPCO, Maebashi district court ordered to pay compensation for evacuees (Original title: Genpatsujiko, kuni toden ni kashitsu, Maebashichisai hinansha heno baishomeirei) on 18 March 2017

[312] Mainichi Shimbun (English version) (2017). Chiba court recognizes nuke disaster evacuees' 'loss of hometown' for first time on 23 September 2017.

[313] The Japan Times (2017). Government, Tepco ordered to pay 500 million yen in damages for Fukushima disaster, on 10 October 2017

governmental decision to apply 20 mSv/year reference level for children in Fukushima, declaring that 'I cannot possibly accept such a level to be applied to babies, infants and primary school students, not only from my scholarly viewpoint but also from my humanistic beliefs'.[314] This resignation remained in the minds of many evacuees.

The second cause of division can be found in the current reconstruction policy. As explained in the previous section above, it offers various assistance and opportunities for those who return but largely ignores others, who resettle elsewhere. An evacuee who chooses to resettle can receive compensation for house construction in his/her place of choice, but otherwise very little aid is available.

Thirdly, the current compensation scheme, which adheres to boundaries of EZs, ends up categorizing residents and treating them unequally since the EZs do not necessarily correspond with the actual level of contamination on the ground, as shown in the case of Watari (Fassert, 2017; Hasegawa et al., 2017). As a result, some residents are facing similar radiological situations, but receiving very different levels of financial compensation. For example, a family of four from the Green Zone receive a total of approximately 160,000 euros in psychological damage compensation, while another family from the 20-30km radius Zone receives only 60,000 euros (the case of Kawauchi). Similarly, a family from a non-evacuation zone such as Watari is paid only 14,000 euros, while the family from the designated Hotspot receives 60,000 euros in compensation (see the Chapter 1.3: Compensation). This considerable gap in compensation payment, which is in reality the financial assistance for evacuation, has triggered jealousy, tension and division among the affected residents, leaving profound scars in the communities.

6.8 THE FRAMEWORK OF INTERNATIONAL LAW

The Japanese government has insisted, on a number of occasions, that its post-accident policies were formed based on the international guidance and recommendations established by international nuclear related organizations such as IAEA, UNSCEAR and ICRP[315]. However, among international norms, there is another set of international legal framework related to the protection of displaced persons in disasters, which is based on human rights principles. A nuclear accident evokes a "conflict of legitimacies" between international institutions linked to the nuclear sphere and human-rights/humanitarian field (Fassert, 2015).

In November 2012, the UN Special Rapporteur on the Rights to Health visited Fukushima. The report of his mission specifically recommended that evacuees should "return only when the radiation dose has been reduced as far as possible and to levels below 1 mSv/year […] as the possibility of adverse health effects exists in low-dose radiation" (UN, 2013: p.17). In its Working Group document for the Universal Periodic Review, the United Nations Human Rights Council also raised concerns about the Japanese government's handling of the post-accident situation in Fukushima, referring specifically to their criteria for lifting EOs, stating that "the plans to lift the designation of contaminated areas with radiation exposure levels under 20 milliSieverts per year as

[314] Translated from Japanese by Tanaka Izumi (http://japanfocus.org/events/view/83)

[315] International Atomic Energy Agency (IAEA), United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), International Commission on Radiological Protection (ICRP)

evacuation zones threatened the health of women and girls", and urging the government to adopt a "human rights-based approach" in its disaster responses (UN, 2017).

Furthermore, the Guiding Principles on Internal Displacement (UN, 1998) advocate the protection of Internally Displaced Persons (IDPs). These Guiding Principles are the most well-known and respected international set of guidelines related to the protection of IDPs within the international community; nuclear evacuees, whether they were under evacuation orders or not, plainly fit the definition of IDP as set out therein and shall thus be protected under that framework (Hasegawa, 2015)[316]. Also of note are the complementary guidelines, the Framework on Durable Solutions for IDPs, which specify that all policies and decisions related to IDPs ought to be made based on their rights, needs and legitimate interests and "under no circumstances should IDPs be encouraged or compelled to return or relocate to areas where their life, safety, liberty or health would be at risk." (UN, 2009: p.3). Shimizu (2015) uses the framework of "human security", protection-based principle initially proposed by UNDP in 1990s, to analyze post-Fukushima society and suggests that:

"*Human insecurity was caused by the dysfunction of the State after the nuclear accident, and the rights of nuclear victims were compromised by controversial and insufficient post-accident measures as well as sacrificed for the interest of the 'majority*'. She bases her argument on the work of a renowned philosophy professor at University of Tokyo, Tetsuya Takahashi, who famously described nuclear energy as 'sacrificial system' where "the benefit of some is produced and maintained at the expense of others' lives, health, properties, dignities, hopes and so on", and these sacrifices are *"often either made invisible or praised as "noble sacrifice" for the sake of common interests such as that of the State, the population, the society or the economy*" (Takahashi 2012: 42).

Despite these calls, Fukushima post-accident management related to the protection of affected population was largely treated as part of nuclear matters which would need highly expertise-intensive response and specific knowledge. As a result, the issue has been handled exclusively by nuclear regulatory institutions and radiation experts without referring to the other relevant international regime: the human rights-based framework to protect those affected by disasters. Consequently, certain post-accident measures established on the basis of recommendations made by nuclear regulatory/radiological protection institutions came in conflict with protection principles of the other international regime. For example, UN Special Rapporteur on the Rights to Health, Anand Grover, specifically mentions in his report that radiological protection principles such as "do no harm" or a risk-benefit analysis are "not in consonance with the right to health framework, as it gives precedence to collective interests over individual rights" and recommends the Japanese government to formulate policies "based on human rights rather than on a risk-benefit analysis" (United Nations 2013: 16, 23). As Chapter 4 showed, we identified at least six categories of choices on the question of return, largely dependent on individual situations related to family compositions, age of children,

[316] "Persons or groups of persons who have been forced or obliged to flee or to leave their homes or places of habitual residence, in particular as a result of or in order to avoid the effects of armed conflict, situations of generalized violence, violations of human rights or natural or **human-made disasters**, and who have not crossed an internationally recognized State border." (UN, 1998: *Introduction*)

health status of elderly, feeling of attachment, work and financial situations, notion of values, disagreement within a family…etc. Fukushima post-accident "collective" measures indeed resulted in in dividing families and communities as they catered only to those who chose the "right" decision (i.e. people of the category 2: "return and control"), leaving behind others who did not or could not accept that solution.

6.9 CONCLUSION

This section proposed to address the consequences of the accident of Fukushima, on the basis of a number of critiques addressed from the fields of political science and international law. It shows that a post-accident management has certain gaps with the international norms related to the protection of disaster victims. The disaster is also quite particular in a sense that all post-disaster issues are handled exclusively by the authorities on the basis of radiological protection experts and nuclear-related institutions advice, and not by the agencies which regularly manage disasters and assist victims. The event of a nuclear accident evokes a conflict of legitimacies in both national and international institutions, and international regimes. A nuclear accident, once it occurs, triggers immeasurable human and environmental consequences, often across borders, for decades and over generations due to radiological contamination. If we focus our attention specifically on the protection and assistance of affected population, the regime based on human rights and humanitarian principles should be applied in addition to specific radiological protection measures as the disaster consequence touches on all aspects of our lives.

7 CONCLUSION AND PERSPECTIVES

7.1 MAIN POINTS OF THIS REPORT

The objective of this conclusion is to present the main results of the *Shinrai* project with regards to the case studies analysed throughout an extensive period of fieldwork, carried out during eight missions to Japan, comprising around 120 interviews with different actors. The present synthesis of principal results from this field work gives the reader prompt and direct access to details from throughout the report.

After a comprehensive overview of the post-accidental policy, the fieldwork led in Kawauchi, Naraha, and Watari allowed **six categories of inhabitants** to be identified in relation to their decision to return - or not - to their home village after the Lift of Evacuation Orders, namely: 1. “Return and resist to CRP”; 2. “Return and control/comply”; 3. “Return and doubt”; 4. “Between return and resettlement”; 5. “Not returning now”; 6. “Not returning ever”. Without ignoring the disputable, potentially reductive nature of any form of categorisation, this classification provides a broad view of the choices, feelings and judgements underlying decisions in such circumstances. The issues raised by inhabitants were numerous and encompass the assessment of the dangers associated with ionizing radiation, the economical burdens associated with evacuation of those who wish to do so, the consideration of what constitutes “a good life”, the attachment to village community and territory, and so on. In addition, the results show that “whether to return or not” was also a way of responding to government pressures and incentives. To this extent, returning or not can also be framed as a political stance on the part of the residents who mobilized their broad assessment of the government’s post-accidental policy. (cf. 4.7.2).

A focus on the role and responsibility of the mayors in charge of implementing the policy defined by the government at their local level shows concretely what limited margins for maneuver they had in organizing the Lifting of Evacuation Orders and the return of inhabitants. Of particular interest was the way the mayors accounted for their decisions. The overall context in which they had to conduct their role was constraining – as it could be interpreted as a general push for normalization and reconstruction promoted by a government eager to reconquest (lost) territories (Anasuma-Brice, 2016). The choice was made to take seriously the mayors’ justifications, when they spoke of facing the divergent individual interests of residents of their districts. As long as particular groups of inhabitants (e.g.: seniors versus families with young children) had specific and opposed interests, it became difficult to act in the name of “general interest”. Each of the mayors justified his decisions by expressing what he considered most important: the right to return to, and eventually to die in one’s own home, or the right to “buy time” and *not* to come back, for those not satisfied with the life that coming back would offer.

Beyond the cases of Kawauchi and Naraha, **such struggles epitomize the political and social questions of post-accidental situations**. Notably, “*Expert committees*” were set up by the mayors and framed by both of them as a means of delegating a number of issues, including the decision as to whether the situation was radiologically acceptable or not. Their different choices - “state” scientist versus “alternative” scientist - constitute a compelling example of politics *through* expertise. (cf. 3.5).

With regards to trust, examining the question of **"who trusts whom?"** not surprisingly shows a deep divide between people who trust the "official/governmental" scientists and experts, and those who trust scientists not linked to governmental or nuclear institutions. The scientific divide is also a politicized one: an "optimistic" view of the effects that ionizing radiation can have on health is linked to a pro-nuclear/pro-government position, while a more "pessimistic" view of radiation's effects is associated with anti-nuclear/anti-governmental views. Such a divide effectively renders "taboo" the very question of ionizing radiations consequences on health, because of the potential divisive effects the question can have on communities. For example, one Medical Doctor explained that many MDs actually avoided discussing such topics with their patients (cf. 5.3.2).

Risk communication was considered by the authorities to be a *solution,* in this context; however, the results of this study suggest that citizens also felt that communication was as a *strategy* on the part of the authorities. A focus on the reflexivity of actors who were in charge of communication activities illustrates how the intention to "reassure" could be critically analyzed by citizens and by the experts themselves, when they were offered the opportunity to look back on their actions at the time of the accident. The notion of "reassurism[317]", coined by Ciccozzi (Ciccozzi, 2016) in the context of the catastrophe in l'Aquila in 2009, is a useful notion to interpret the ethical issues underlying experts' positions and responsibilities. (cf. 5.6.3.5).

When it comes to elaborating on the question of **"living with" versus "fleeing from" radioactive contamination,** the SHS literature proved a rich resource, allowing deeper consideration of the results of the *Shinrai* interviews. Aya Kimura (Kimura A. H., 2016) explores the development of "Citizen Radiation Measurements Organisations" and the involvement of women in food contamination measurement, in a context where a progressively normative framework also came to dismiss attitudes deemed "exaggerated" as regarded fear for contamination. In her Foucaldian critique, Kimura maintains that "*Food policing involves the normalization of a certain level of risk with food as inevitable, imposing a particular view on reality and a prescription for a right kind of conduct[318]*". For Kimura, in a context where government authorities were pushing for "reconstruction", only "appropriate" fear was articulated, as were "appropriate attitudes", and finally "appropriate emotions", so that other reactions (fear, anger, …), were effectively dismissed in such situations. Slater (Slater, Morioka, and Danzuka, 2014) shows the tension between "wife" and "mother" roles for women who stayed in contaminated territories , as "good wives", stoically stay with husbands and parents who don't wish to leave and support reconstruction efforts, yet worry about the health effects for their children - concerns which may, again, be dismissed by the official discourse. Slater's research results mirror those of fieldwork for the present report. (cf. 5.3.3.3)

Political appraisal of the Japanese government actions offers accounts of the relatively low return rate and gives a number of reasons for this. It also explores "alternatives

317 "if "failure to warn" means "not predicting a disastrous event," then "predicting that a disastrous event will not occur" means providing a reassurance that proves to be disastrous when the event in question does actually occur. Since not providing information is quite different from providing incorrect information, not predicting an earthquake (failure to warn) is quite different from predicting a non-earthquake (disastrous reassurance.)".

318 P 10, op. cit.

options" proposed by a number of scholars, but not implemented (Imai, 2014; Yokemoto, 2015; Yamashita, 2017). This opens the way for addressing the issue of "reconstruction" and the question of "for whom" this reconstruction was promoted, as exposed in "*Reconstruction Without Inhabitants"* by Yamashita et al. Last but not least, the human rights framework, such as the concept of human dignity, for example, also provides a critical perspective for examining the policies established post-Fukushima. (cf. 6.8).

Finally, number of frustrations and angers turned into **legal proceedings** led by a number of citizens against the authorities: at the time of writing, 31 group lawsuits, involving 12,000 plaintiffs from among evacuees and affected residents, have been filed against TEPCO and the government all over Japan, demanding a total amount of 1 billion USD as compensation for various damages [319]. In addition to these civil suits, criminal responsibility charges against TEPCO former executives (ex-CEO and two former vice-presidents) were also filed by 14,000 plaintiffs in July 2015. (cf. 6.7).

7.2 IMPLICIT NORMATIVE FRAMEWORK OF THE JAPANESE POLICY

This report – like many others, including studies and research done in Japanese – develops a critical perspective as regards Japan's post-accidental policy. But it does not aim to assert that any other country would have done better (if "better" were even to be defined). Some of the other studies focused on Japanese cultural specificities which could have played a role in their disaster management; this is not the perspective adopted in this report. For this report, it was considered more fruitful to take up a global view and to examine what constituted the "implicit grounds" on which Japanese post nuclear accident policy was established. By exploring these implicit motives, it was possible to analyze the extent to which they are shared and recurrent within a certain "epistemic community"; if this is the case, any other country would make similar decisions in the face of a nuclear accident, which would then be challenged again by citizens on a similar basis.

What is meant by "implicit grounds" is a set of common assumptions, elements not discussed or taken for granted, which were subsequently challenged by citizens and by the affected population. It is also of some interest to examine what constitutes the contour of this epistemic community, and the extent to which this epistemic community is attached to an international institutional framework which defines norms and values, leading to these "taken for granted" facts and norms. The different "implicit grounds" of Japanese policy will be examined and discussed below, presenting how that policy was called into question by inhabitants' positions, reactions or judgements.

7.2.1 ATTACHMENT TO TERRITORY (VS ATTACHMENT IS NOT ABSOLUTE RULE)

7.2.1.1 Attachment to territory is the (absolute) rule

The post-accident policy put in place by the Japanese government was largely based on the idea that contaminated territories had to be "reconquered" through an intensive decontamination program; they led an aggressive communication campaign on

[319] Mainichi Shimbun (2016), Daishinsai 5nen: genpatsujikogenkoku 12,539, soshou zenkoku 31ken (Five year from Great Disaster: 12,539 nuclear accident plaintiffs and 31 Group Actions all over the country) on 06 March 2016

"reconstruction" (Kimura, 2016). A number of reports and institutional recommendations that claimed to "learn from the Fukushima accident" insisted on the risks associated with evacuation - supposedly as great as "the dangers of contamination" - and on the need to foster "remediation strategies", aimed at helping people to recover after the nuclear accident. The attachment of inhabitants to their hometown was essentialized, almost to the point of becoming dogma. For example, Publication 111 of ICRP (2009) states: "*Worldwide experience following nuclear and non-nuclear accidents shows that neither nations nor individuals are very willing to leave affected areas*", and "*most inhabitants generally prefer to stay in their homes rather than to be relocated (voluntarily or not) to non-contaminated areas*[320]"

Linked to the notion of attachment, reference to *resilience* passed into the discourse of Fukushima's post-accidental "management". In this case, resilience was linked to the idea that returning to the evacuated areas demonstrated the proper, loyal attitude. Revet summarizes what is at stake in "resilience" discourses: "*Living with danger –the risk of radioactive contamination- grounded on your own competence, without expecting too much from public authorities nor looking for the causes and responsibilities, would be at the heart of resilience, publicized in Japan after the triple disaster both as a cultural characteristic and a national objective*[321]". In fact, this "implicit ground" (people would accept to live in a territory not entirely decontaminated, on the basis of a culture of Radioprotection) underlies the Japanese policy and its choice to foster public spending on decontamination activities by large construction companies. For example, according to data published by METI in December 2016, the government expected to spend 6 trillion yen (46 billion euros) for decontamination, even though the return rate of inhabitants remained at 15% in the former Evacuation Zones[322].

7.2.1.2 Versus: attachment is one element

However, these discourses, formulated with a number of strong assumptions, must be examined in the light of concrete situations in order to see a more complex reality than this straightforward, unconditional "attachment" notion. First, the case of "self-evacuees" shows that attachment was far from unconditional. And even if it actually existed, attachment came with mixed, contradictory feelings in these nuclear accident victims: resentment against the nuclear operator, feelings of loss, anger, and fear for the future, and anxiety about health, claims for justice, a desire to "turn the page", and so forth. No large-scale inquiry has yet been conducted that would allow us to grasp the extent and the solidity of people's "attachment" to their living area. Such an inquiry would allow us to examine, for example, to what extent attachment to one's home town may, after a nuclear accident, resist negative effects, such as durable radioactive pollution, the need to manage one's own contamination levels through a set of "appropriate behaviors", the loss of services, or the loss of employment.

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[320] (p.30). ICRP (2009), Publication 111: Application of the Commission's Recommendations to the Protection of People Living in Long-Term Contaminated Areas after a Nuclear Accident or a Radiation Emergency, Volume 39, No.3.

[321] P 198. Revet, S. (2018). Les coulisses du monde des catastrophes "naturelles". Le Bien commun.

[322] Source: The data published by METI on 9 December 2016 (http://www.meti.go.jp/committee/kenkyukai/energy_environment/touden_1f/pdf/006_01_00.pdf); Kahoku Shimpo on 4 March 2018, op. cit, p.40.

The question that Sezin Topcu (2016) raises bluntly merits careful examination:

"Considering these stakes, would French people prefer, at any cost, to stay in their hometown in case of a permanent radioactive contamination, in order to avoid the stress of displacement and/or in order to ensure that their property does not lose its value, and this even if detrimental to their health? Nuclearist managers may pretend that it's the case, and official experts may have made of this a hypothesis, as implicit as it is romantic (being removed from one's roots would be the most unbearable thing that could happen to someone), but no opinion poll organized by the decision-making bodies, no panel of experts on social psychology, and no IRSN barometer [public risk perception survey] have considered this question worthy of interest[323]".

In fact, the field work carried out by *Shinrai*, as well as a quantity of research examined in this report (Hasegawa, 2016), (Sugita & Augendre, 2012), and a number of NPO reports, all show that a number of people would prefer to leave a contaminated place. And this is true even for what experts could consider "minor", residual contamination, after decontamination work or after the natural decrease of radioactivity. It is also the case for places that experts would classify as "safe": those not under evacuation orders. The case of "self-evacuees" designates these very people, examples of whom were met and interviewed during Shinrai fieldwork; the DILEMME project is currently examining them more comprehensively[324].

Attachment to the place where you live depends on multiple factors (such as age); it can be challenged by other, stronger determinants - such as the urge to protect children from a harmful environment, as discussed in Section 1 (*Whether to return or not*).

7.2.2 COMMENSURABILITY OF RISKS (VS PARENTAL "ABSOLUTE" CARE)

7.2.2.1 Risks are commensurable

A second, underlying, normative idea entered the discourse of a number of institutions; it concerns the idea that radiological risks can/should be compared to other risks in order to make a "rational" decision, based on pros and cons. In various speeches and statements by scientists and experts from the government, they insisted on this commensurability in their risk communication process. Commensurability was staged as a "rational" process for dealing with risks. Radiation risks were commonly presented as one of the many risks you may run in the course of your life. "*People must fear radiation correctly*" became one of the mottos of risk underlying this discourse. Commensurability was sometimes addressed through quantified "risks assessments", which looked like absolute facts based on careful calculation. At one seminar in Fukushima, the presenter

[323] Op. cit. Elle s'interroge : « Au vu de ces enjeux, les Français préféreraient-ils vraiment, à tout prix, rester dans leur commune/ville/village d'habitation en cas d'une contamination radioactive permanente, afin d'éviter le stress du déplacement, et/ou assurer que leur propriété ne perde pas trop de valeur, et ce au détriment de leur santé ? Si les responsables nucléaires ont beau affirmer que oui, et que les experts officiels en ont fait leur hypothèse tout aussi implicite que romantique (le déracinement serait le plus insoutenable de tout ce qui peut arriver à un individu), aucune enquête d'opinion commanditée par les instances décisionnelles, aucun groupe d'experts chargé de s'occuper de la psychologie sociale, aucun baromètre IRSN, n'a jugé la question digne d'intérêt ».

[324] DILEMME Project, led by M. Augendre and K. Sugita. University of Lyon 2.

concluded by saying that: "*Living in a slightly contaminated environment is no more dangerous than NOT eating 5 portions of fruit and vegetables a day*[325]".

In other cases, commensurability was more difficult to frame as a quantified process, as it related "risks" of different type, nature, and temporality. With regards to the mothers who chose to evacuate with their kids, leaving the father behind in the Fukushima Prefecture, a manager from the Reconstruction agency commented during an interview: "*Living without the father is more risky than living in a slightly contaminated environment*[326]".

Commensurability of risks is one of the epistemic pillars which sustains the rationale of comparison. This rationale was linked to the idea that the radiological risks have to be compared/balanced with other risks, an idea which was recurrent in the discourses of radiological protection. For example, our "emblematic case", Mrs. KS (see Chapter 4.3), explained how she was reassured by the statement of the local health counsellor, Mrs. O., who compared radiological risks to alcohol and tobacco. In this case, radiological risks were effectively tempered, by being situated at the level of familiar risks which adults engage in, for pleasure and by choice.

Lastly, commensurability was also a way of staging radiological risk as now being one among other specifically "Japanese" risks. In a striking example, one resident of Naraha explained how he decided that he would return to his hometown: "*Even if you avoid one risk, you may fall on another one. If you leave Naraha for Okinawa prefecture, you may have typhoons; if you leave for Gunma, there are volcanos. There are risks everywhere in Japan, ionizing radiation is one of these risks*[327]".

In conclusion, commensurability of risks was both part of the communication scheme proposed by experts after the accident, and a practice of making decisions, framed by the inhabitants as choosing the "lesser of two evils", or as a common-sense routine. Commensurability of risks is also part of a wider framework which considers that risks can be compared, balanced, and even monetarized in order to allow their comparison.

7.2.2.2 *Versus*: "Risks are not commensurable"

However, commensurability of risks could also be radically dismissed. A number of parents, aware of the specific sensitivity of children to ionizing radiation, formulated the problem along the lines: "I cannot put in balance the health of my children with "something else", because the health of my children is not commensurable to anything else". This comparison would be all the more unthinkable in that there would be "suspended time" (before possible onset or development of cancer) during which they would not know. A parent of two young children said in interview[328] :

"*On radiation risk, I heard from a friend who had consulted a doctor in Iwaki city, that the effect from radiation exposure could appear 10 years or even 30 years after the exposure. Therefore, even if there is no health problem today, it doesn't mean that*

[325] Conference of Fukushima mayors, Fukushima city, March 2015.

[326] Interview with Mr D Reconstruction Agency. May 2015.

[327] M.MU, township member of Naraha. 50-60, interview led by Rina Kojima, March 2015.

[328] Interview Ms AO, October 2015.Interviewer: Rina Kojima

there won't be in the future. When I understood this, I decided not to return to Naraha town. Because if one of my children gets sick in the future, I don't want to be in a situation where I wouldn't be able to answer their question: Mum, why did you choose to return to Naraha when you knew the possible risk?"

That anticipated question is essentially one of "accountability": what could a parent answer their child in such a situation, to account for their decision? Are "uncertainty" or "controversy" about risks legitimate reasons to give your child? Yoneyana evokes the notion of "radical accountability" in relation to certain kinds of environmental issues (Yoneyana, 2016); the notion is particularly relevant, and poignant, at this more personal, individual level, where it conflicts with the rationalizing discourse of the government.

Rationalization may be linked to quantification, supposedly helping people to recognize that this risk is "small" … However, in this case again, a parent may dismiss the argument: "small" is not at all "small" when risk is not acceptable. One mother expressed this powerfully:

"*An expert told us that the risk was very, very low … something like 1% … so, a negligible risk to run. I answered, well if I had a gun with 100 holes and one bullet, I would not give it to my kid*".

There is a large gap between the discourses of "rationality" and "commensurability" adopted by the Japanese authorities, and this kind of ethical/accountable stance, adopted mostly by parents who chose to leave contaminated territories.

Framing risks as commensurable is thus confronted with an entirely different stance, linked to parental ethics, or more generally parental care. Parents, in this case, would not accept any kind of "balanced" approach, and refused to accept this "balanced" approach; for these parents, it was a matter not of relative risk, but of categorical danger - not calculable, not comparable. A number of mothers interviewed during the field work, who left or did not return to the evacuated territories, considered this to be the only solution they could imagine to *protect* their children.

The position adopted by these worried parents was difficult to hold in affected communities where public communication on radiological risks was based on an entirely different schema, where risks were framed as "tamable" and reconstruction was promoted, along with the idea of "appropriate fear" which considered "excessive worries" inappropriate, as seen above (Kimura A. H., 2016). Kimura discusses how mothers who worried about radiation risks for their children, and did not comply with the official assessments of "safety", instead of being praised for their concerns on their children health, were scolded and faced social sanctions, considered as irrational and accused of rumor-spreading. These women were marginalized, and came to be known as "radiation brain moms" within the community (see Chapter 0).

Parental care associated with these decisions was, in some cases, subjected to questionable judgements. For example, Kurokawa (Kurokawa, 2017) reports a really quite dismaying declaration, quoting the words of the mayor of Date, who said:

"*Due to late marriages and low birth rate, there is a problem of "excessive love" for their children. In one meeting, there was a woman around 50 years old who asked me, "I had my child when I was over 40 years old and so he/she is my only child. I worry what if something happens to her/him. Is it really ok for a child to live in this environment?*

I wanted to tell her that there was no problem with this level of radiation. But it wouldn't change anything. She probably wouldn't understand[329]".

In conclusion, commensurability of risks, which underlies policies and discourses, may stand at odds with parental positions, which rest on very different – very strong - ethical views.

7.2.3 CONTAMINATION IS WHERE THE "ZONE" IS (VS … CONTAMINATION IS EVERYWHERE)

7.2.3.1 Contamination is inside the zones …

The last "implicit" factor in the normative framework that underlies post accidental policy decisions concerns zoning. It is a disaster management tool which allows division of the affected area into "safe" and "unsafe" zones. Designating certain zones as "unsafe" (because "contaminated") allowed everything "outside" the circumscribed places to be defined, by extrapolation, as "safe". Zoning effectively territorializes risk, as being "here" - and not "there". More striking, it also restricts the temporality of risk, making it also "now" (and not before) the accident.

The designation of zones, in several steps, (described in Chapter 2) is another of the pillars of Japanese post-accidental policy, based on the international regulation and recommendation framework established by ICRP and IAEA. Topçu (2016) provides an interesting historical insight into how the zoning "instrument" progressively became the mainstay of nuclear accident management during the 1960s. Such historical analysis allows the "denaturalization" of certain aspects of policies, often considered to be incontrovertible and inescapable solutions to problems raised by a nuclear accident. Since the 1950s, the expert committee of Atomic Energy Commission (AEC) in the United States, aware of the possible consequences of a severe accident, has proposed the establishment of a (permanent) *exclusion zone* around nuclear sites; the dimensions of the zone depends on the size of reactors: for a reactor of 1000 MW, for example, the AEC recommended a permanent exclusion zone with a radius of up to 30 km[330]. This was proposed on the basis of the Brookhaven report. But in the face of reluctance on the part of the nuclear industry, which feared public anxiety about and rejection of nuclear energy, the AEC finally adopted a different strategy: the designation of evacuation zones in case of an accident, instead of *a priori* exclusion zones. According to Topçu (Topçu S. , Mai 2016), this zoning "instrument" is conceptualized based on the following rationale:

"*Total evacuation from contaminated territories in case of major accident is impossible (from technical, economic and social acceptance points of view), and it is also impossible to compensate for all the damage caused to persons and assets*"[331]. She argues that this

[329] Shoko Kurokawa (2017), The Invention of "Decontamination of the Mind": why the advanced decontamination city stopped to decontaminate, Shueisha International.

[330] Topcu refers here the PhD thesis of C. Foasso (2003), Histoire de la sûreté de l'énergie nucléaire en France (1945-2000) : Technique d'ingénieur, processus d'expertise, question de société. PhD Thesis in History. Université Lumière Lyon II.

[331] Translated from : Topçu, S. Catastrophes nucléaires et « normalisation » des zones contaminées. Enjeux politiques, économiques, sanitaires, démocratiques et éthiques. Les notes de la fondation d'Ecologie Politique. N° 8. Mai 2016. (p.3)

progressively led nuclear experts towards a doctrine of "optimization" in post-disaster management, preferring methods such as evacuation and compensation, and as a result the zoning "instrument" constitutes a major disaster management tool. These historical accounts suggest that the concept of zoning is profoundly embedded in the development of civil nuclear energy.

At a more symbolic level, zoning allows the *re-territorialisation of a risk* (Fassert, Living in/with contaminated territories : an STS perspective, 2017) which is, however, inherently difficult to circumscribe spatially and temporally. Radiological contamination is elusive: that is to say, it is *enduring*, largely *unpredictable* - given the uncertainties linked to the radioecological models that predict evaluation of long-term contamination in rural areas, it *spreads* without borders, and it is *undetectable* by human senses. And the intrinsically elusive nature of radiological contamination is 'tamed' through mapping. Once the maps are established, they enact a new reality where risky zones are demarcated from "safe" zones, which seem increasingly solid and legitimate, no matter how uncertain they may be at the outset: danger is turned into risk. As depicted by Topçu, with zoning, the threat is localized and encircled, so as to appear to be under control (Topçu, 2015).

7.2.3.2 *Versus* … Contamination is everywhere and *was* already there

This implicit framework which uses zoning as a tool for managing post-accidental conditions was challenged in two ways, at geographical and temporal levels.

At the geographical level, zoning "reifies" and territorializes radiological risks, even though important areas of contamination were found outside of the "zones". Amongst them, the Watari district of Fukushima city, together with the Oonami district, were said to be the area most contaminated by radioactive fall-out within the city[332] (Yamauchi, Septembre 2011). However, there was no case of evacuation assisted by the government from the Watari district nor from Fukushima city as a whole, situated outside the evacuated zone. Besides, if the name of "Fukushima" is now associated with the consequences of the nuclear accident, a number of its inhabitants deplore that this assigns contamination to a specific prefecture, although neighboring prefectures have been also contaminated[333].

As a consequence, some inhabitants, outside the "risky zone", may have felt they were in danger: around 60 000 inhabitants evacuated the area, even though they were not living in the designated evacuated zones (Hasegawa, 2015). These voluntary evacuees,

[332] The survey conducted by Professor Tomoya Yamauchi (specialist in radiation physics, radioactivity measurement and ion tracks) of Kobe University in September 2011 found that the level of radiation dose in the soil sample collected beside a temple exceeded 40,000Bq/kg and the air-born radiation level was recorded at over 20 μSv/hour at 1cm above the ground and 2.68 μSv/hour at 1m above. (Tomoya Yamauchi (Kobe University), Report on the level of radioactive contamination – limit of decontamination in the Watari district, commissioned by Friends of the Earth (NGO), Fukuro-no-kai (NGO) and residents of the Watari district, 20 September 2011). In October 2011, Fukushima city and the government's Nuclear Emergency Response Headquarters organized a meeting with Watari residents who were demanding that "radiation hot spots" be designated within the district thereby assisting the families living in the elevated radiation environment to evacuate from the area.

[333] In the Ministry of Environment's plan, the total of 68 municipalities located in seven prefectures, outside of the Fukushima prefecture, were found with the radiation dose which exceeded 1mSv/year and thus included in decontamination assistance (http://josen.env.go.jp/zone/)

or "self-evacuees", made the decision to leave their home village principally because they felt worried about the radiological situation.

Second, zoning also conveys the idea that the contamination is "now": a consequence of the nuclear accident being cast as the starting point of a new, measurable situation of contamination, which is effectively "tamed" through the use of instruments (radiometers) and models that predict the future of contamination. This temporal taming is also challenged though the experiences of Chernobyl and Fukushima. Brian Wynne described how contamination attributed to the Chernobyl accident was in fact partly dued to the formed nuclear tests and to accident of Windscale-Sellafield in 1957. (Wynne,)

Galia Ackerman (Ackerman, 2016) gives a compelling account of this in her book "Traverser Tchernobyl" where she comes back on her decades of ethnographical visits in the region of Chernobyl. "Zone", she explains, has a specific meaning in this part of the world[334]. For Soviets, the term "zone" was linked to a lexis of prison: *zone* designates the place where prisoners stay, where they work, whatever the situation, a camp, or mines or cutting down trees. "*For a Soviet, a zone is a place of violence and suffering.*"[335]. The zoning policy after the Chernobyl accident was quite different to the one chosen by the Japanese government[336], and consisted - amongst other aspects - in defining an "exclusion zone" from which residents were permanently evacuated.

This paradigm of permanent "exclusion zones" engendered realities quite different to those observed in the Japanese case. Ackerman interviewed a number of *samiossoly* (the name given to people who come back illegally to the evacuated town of Chernobyl). Nicolai and Valentina Koukharenko, a *samiossoly* couple, explained to the author that just after the catastrophe, the director and a few management employees evacuated their children. Valentina was not evacuated: it was the day before the first of May, and, because she worked at this time as a seamstress, she had to go on sewing the costumes for the celebration. Some of the other seamstresses were crying at their sewing machines. *"A person from the municipality came and asked them: Why are you crying? There is no more radiation than before. If you want to check it, go downstairs and check the level of contamination in sorrel. And that was true: the level was very high. […] Believe me, I work with women, and the rate of abnormal babies was quite high before the accident.*" It seems, from such accounts, that the "normal operations" of the Nuclear Power Plant had produced such a high level of contamination that the place was already significantly contaminated: in this case, the accident did not bring about any kind of disruption that would merit quitting. Valentina's husband, Nicolaï added that when sand was brought (10 km from the plant) to cover the surroundings of the crippled Chernobyl plant, they realized that this sand was more contaminated than the soil around the plant[337]. The couple explained to Galia Ackerman that they decided to stay in the forbidden zone

[334] The Chernobyl accident took place in Ukrainia, but most of its consequences and sanitary effects have impacted Belarus.

[335] P 14. Traverser Tchernobyl. Galia Ackerman. Premier Parallèle. 2016.

[336] The *Shinrai* project does not aim at analyzing in details the Chernobyl policies; only details linked to elements of comparison with the post- Fukushima accident policies are provided here. A comparison of these policies and their consequences might be a follow up of the *Shinrai* project.

[337] The author does not mention it, but this second exemple could be dued to a hotspot fallout after the accident.

because their own perception was that their territory was contaminated *before* the accident.

Their account is particularly poignant when Valentina tells of the conditions at the time of the (forced) evacuation, where people were assigned to places of evacuation:

"My daughter and her husband were sent to Dniepropetrovsk, my parents and sisters at Krementchoug, Nicolaï's mother to Tetiev, our son to Konotop, ourselves to Smela. How can you live this way? Far from your home and family[338] *?"*

In 1987, when they left to visit Valentina's mother, their house was buried during their absence, with all their personal belongings. *"Many accepted it, but not me. I sent long telegrams to Gorbatchev. […] I wrote to him that a sick man has to be cured, not killed. This is how we should act with our Chernobyl"* [339]*!* In another story of resistance, entitled "Zvizdal[340]", the artistic group "Berlin" shows the poignant case of a very elderly *samiossoly* couple who returned to their home, to live alone in an empty, evacuated zone, resisting evacuation. (BERLIN).

The case of forced evacuation also raises the issue of the *place* or destination proposed for evacuation. Unlike the Japanese case, Chernobyl were assigned to specific evacuation destinations. One interviewee told Galia Ackerman the case of the little girl Maria, born in Chernobyl just after the catastrophe, when her mother stayed there despite that fact that children were not permitted to stay in the zone.

He explained "*I think that if they had proposed to Lydia (the mother) to move to Kiev, to live in public housing, she might have accepted. But they offered her housing in her native town, Jeltyïe Vody, in the Dniepropetrovsk region. Uranium mines are exploited there. Compared to Jeltyïe Vody where Radon concentrations are very high*[341]*, Chernobyl is a place for holidays!" …*[342]. (Ackerman, 2016).

In Japan also, the nuclear accident, and the infrastructure that developed as a consequence, allowed former, forgotten contamination to be revealed. Writer, and monk of the Miharu temple, Genyû Sôkyû evokes the case of inhabitants of the town of Miharu[343] . *"They left and settled in the Gifu prefecture (…) In 1980s, the place which had the highest radiation level in Japan was in Gifu prefecture because there had been an uranium mine before. But 20 years later, in 2002, the highest spot was found in Toyama prefecture and the second in Ishikawa prefecture. There were 11 prefectures which had more than 1mSv/year. Many prefectures in Hokuriku region (Toyama, Ishikawa…) had increasing levels of radiation. This is without a doubt due to the atomic bomb testing in Uyghur region of China conducted by the Chinese government*. He concludes: *so, these residents, fleeing from what they felt to be a contaminated area, in fact arrived in a place which is more contaminated*[344]*".*

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[338] P 72. Traverser Tchernobyl. Galia Ackerman. Premier Parallèle. 2016.

[339] Ibid. P 74.

[340] Zvizdal. Chernobyl so far, so close. BERLIN. Le 104. Décembre 2016. www.berlinberlin.be.

[341] Ibid. Ackerman explains further that during the Soviet regime, only prisoners sentenced to the death penalty or a very severe penalty were sent to these mines, where they would often die before the end of their sentence. P 78.

[342] P 79. Ibid.

[343] Miharu town, *about 60 km from the Fukushima Daiishi NPP,* is not part of the evacuated zone.

[344] Gonyû Sôkyû. Interview led in Miharu, 22nd March 2017. Interviewers: R. Hasegawa and C. Fassert.

For Genyû Sôkyû, this situation makes it preferable for people to stay in Miharu, a preference which he openly defends:

"*In 2002, there was a survey conducted all over Japan to measure radiation levels, by installing 149,000 radiation detection devices. I managed to get the data from this survey, and I was shocked. In the 1980s, the place with the highest radiation level in Japan was in Gifu prefecture because there had been a uranium mine there before. But 20 years later, in 2002, the highest spot was found in Toyama prefecture and the second in Ishikawa prefecture. There were 11 prefectures which had more than 1 mSv/year. Many prefectures in Hokuriku region (Toyama, Ishikawa) showed increasing levels of radiation. This is without a doubt due to the atomic bomb testing in the Uyghur region of China, conducted by the Chinese government. The total radiation dose from this testing is reported to amount to 5 million times more than what was released from Chernobyl. This was then pushed and moved by yellow sand phenomenon [dust carried on high winds from China]. Maybe if they showed such results to the public it would affect the business sales of Hokuriku Shinkansen [the bullet train which runs from Tokyo to Hokuriku region], but for the 'anshin' [feeling of reassurance] of the Fukushima people, it would be greatly appreciated*[345]*."*

It's nothing less than appalling that a nuclear accident - because it triggers a series of measurements and screenings - may reveal not only the contamination due to that accident, but also former sources of contamination that have been forgotten, or obscured, and that this can give rise to such complex and tragic situations as the one under discussion, in Japan. A nuclear accident may also create the opportunity to reveal the extent of long-term nuclear contamination (produced by military, or mining activities …). It also reveals the extent to which the identification of contamination (of any kind) depends on the infrastructures that allow the situation to be made *visible* (Kuchinskaia, 2012). By revealing prior –forgotten or unknown – contamination, it may also raise awareness that, in the words of historian and sociologist Soraya Boudia, we are living in a "toxic world" (Boudia, 2010).

7.2.3.3 Conclusion on "implicit"/normative framework

Examining the implicit normative framework used by the Japanese government when dealing with 3/11 event contributes to a process of "learning from an accident". In fact, the Japanese government's implicit framework was also challenged in many ways by what happened afterwards. Therefore, in order to learn from what happened in Fukushima, the deep-seated, "invisible" aspects effectively revealed after the accident must be taken into consideration.

The choice was made to focus on the following three narratives: "attachment to territories", "commensurability of risks", and "contained contamination". In the current discussions on post-accident management, these implicit aspects still appear to be insufficiently identified, and have not been called into question. A constructive follow up of *Shinrai* could be to examine the extent to which current policies in France (CODIRPA), or at the international level (ICRP, IAEA), integrate the "lessons" of Fukushima, and with which limitations.

[345] Ibid.

7.3 PERSPECTIVES AND FUTURE RESEARCH: COMPENSATION AND REMEDIATION AFTER A NUCLEAR ACCIDENT

A number of questions need further elaboration and research. The focus here is on certain questions which have emerged from the *Shinrai* project, and which could constitute future axes of research. One of them concerns issues linked to justice, reparation, and victims.

7.3.1 LIMITED COMPENSATION

Financial compensation for the consequences of a nuclear accident depends on a set of specific Conventions (e.g. Price Anderson Act, Paris Convention), as well as more recent attempts (modification of Paris Convention in 2004), to better compensate damage by increasing the level of responsibility and the amounts awarded. However, there is still a discrepancy between the actual costs of a major nuclear accident and the possibility to compensate its subsequent consequences in the different Conventions. This is regularly discussed by a number of scholars and also by anti-nuclear associations. Topçu (2014) denounces "*the construction and maintenance of a historical gap that is as discrete as it is exceptional, between the politico-legal costs and the actual costs*[346]". This aspect is not developed in the *Shinrai* project, but it is of course an underlying scheme which is of major significance when it comes to reflecting on the mechanisms of justice and compensation after a nuclear accident[347].

7.3.2 DIFFERENT COMPENSATIONS

Feed-back on experience of the two major nuclear accidents (in Chernobyl and Fukushima[348]) shows that compensation payments for environmental damage and its health-related consequences depend very much on national parameters, despite international regulations. Legal, regulatory, political, and cultural aspects may play a role in shaping each particular situation - the very different management of the accident in the cases of Fukushima and Chernobyl is proof of this. A nuclear accident may have consequences which expand to several countries: in this case, national characteristics may result in different rights and different compensation schemes for each nation's victims. With regards to the Chernobyl accident, its consequences were particularly serious for Ukraine, Belarus, and Russia, but the post-accidental policy was quite different in each nation. Petryna[349] (Petryna, 2003) discusses the differences between Ukraine and Belarus: both were contaminated as a result of the accident, but both responded in quite opposite ways, given their contrasting political and social contexts.

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[346] Topçu, (2014). […] « La construction et le maintien d'un fossé historique, aussi discret qu'exceptionnel, entre les coûts politico-juridiques et les coûts réels ». p 114). Organiser l'irresponsabilité ? La gestion (inter)nationale des dégâts d'un accident nucléaire comme régime discursif. Ecologie et politique, pp. 95-114.

[347] For more details on these aspects, see Topçu, (2014), and the IRSN report (2013), *Méthodologie appliquée par l'IRSN pour l'estimation des coûts d'accidents nucléaires en France*. (On line on IRSN Website).

[348] Another significant nuclear disaster occurred in Mayak (Kychtym, Russia, 1957); very little information is available on what happened in Mayak, of which the consequences were long denied by the Soviet authorities. One book is available, by the biologist Jaurès Medvedev, and a GREENPEACE report was published for the 60th anniversary of the accident. Natalia Kupetova, a lawyer who defended the victims of this accident, had to leave her country and is now a political refugee in France.

[349] Petryna, Adriana. 2002. *Life exposed: Biological citizens after Chernobyl.* Princeton, NJ: Princeton Univ. Press. (p. 6).

These disaster recovery processes unfolded in the particular political circumstances of the collapse of the Soviet Union. In a context of poverty following the collapse of the former political regime, the new Ukrainian government strived to show that it was much more generous towards its victims than the Soviet Union had been. In 1991, when Ukraine declared independence from the Soviet Union, it condemned the Soviet administration for the Chernobyl aftermath, and claimed that it *"[not only] failed in its obligation to protect citizen's lives during Chernobyl, but that in its denial of the accident and its effort to restart the nuclear program, it had exacerbated patterns of morbidity by delaying intervention*[350]**"**. The Ukrainian government designed a recovery process and a mechanism for compensation that created "biological citizens": citizens eligible for financial compensation on the basis of narratives that account for their illness. Biological citizenship is defined more precisely by Petryna (2003) as the *"a massive demand for but selective access to a form of social welfare based on medical, scientific, and legal criteria that both acknowledge biological injury and compensate for it*[351]**"**.

This mechanism of compensation was based on a statewide Chernobyl tax. Confronted with a hash market transition, Ukraine set up a new compensation program "[which combined] *humanism with strategies of governance and state building, market strategies with forms of economic and political corruption*[352]**"**. This strategy was also a key asset in the country's foreign policy, attracting technical assistance, loans and trading partnerships from western countries.

In Belarus, when President Lukashenko was elected in 1994, the situation became quite different. Their global policy established a limitation on the rights; they fostered "reconstruction" and the limitation of compensation payments. On the 10th anniversary of the catastrophe, Lukashenko wanted to "*turn the page"* and promoted reconstruction and a normalization of the contaminated territories. *"Populations were requested not to go on with self-pity, but, on the contrary, to envisage the future on a new basis, which relegated Chernobyl to a lower priority* [353]» (Ackerman, 2016). This "turn" was framed within broader political change, and the reduction of civil rights.

The case of the Fukushima accident and the Japanese government's post-accidental policies, surveyed in Chapters 1 and 2, (see Chapter 0) constitute another case of how to face a nuclear accident: that of a democratic advanced economy able to spend large amounts of money for compensation payments, which led however to numerous lawsuits.

These three examples provide insight into the way political and economic aspects can shape post-accidental policies.

In the event of a nuclear accident in Europe, where contamination would reach a number of countries, victims could compare the way they were treated and the amount they received in compensation payment. This is a real challenge for each nation, which would have to account for citizens as well as for European and international norms based on environmental and human rights laws (such as the notion of dignity in the concept of Human Security promoted at the UN level. Shimizu (2015), for example, showed the

350 Ibid. P 23. Note: the same criticism was directed at the Japanese government by a number of scientists.

351 Ibid. (p. 6).

352 Petryna, op.cit. P 5.

356 op.cit

limits of the Japanese post accidental policy when assessed with these rights-based UN frameworks).

The *Shinrai* project has endeavored to examine the consequences of the post-accidental policies in their multiple dimensions: from the national policies to their implementation at the local (municipal) level, with the limited margins of manoeuver of the mayors. New research perspectives are needed, which would combine moral sociology and (what can be considered as real and fair reparation "justice" after a nuclear accident?) with political science and legal studies, which would examine how an international and national law framework could answer this question.

7.3.3 COMPENSATION AND REPARATION ISSUES AFTER A NUCLEAR ACCIDENT

7.3.3.1 Victims and victimisation

This categorization/labeling of citizens to create a clear-cut limit between those who are "victims" and those who are not is a recurrent issue when it comes to dealing with the consequences of disasters in general.

The status of "victim" after an environmental accident tightly associates several elements. Firstly, the recognition of "victim" status, and the difficulty a victim may have *proving* that status, for example, in linking exposure to pollutants, and/or proving the direct negative effects on health. Secondly, there is the question of compensation payments. And thirdly, there is the representation of the place where the inhabitant lived before the accident or before damage recognition as a "polluted", now uninhabitable territory. These interrelations may turn into very different patterns of victimization, whereby the term "victimization" denotes, not a moral judgement but, as Barthe defines it (Barthe Y. , 2017) "*the process by which a person defines himself as a victim and is defined by others as a victim. It does not say anything of the legitimacy or illegitimacy of this definition*[354]"; Several victimization processes may developed, in addition to the "official" notion of victims, which was defined along the zoning lines in the case of Fukushima.

A striking example of this is provided by on the SEVESO accident[355], where Cementeri[356] (Cementeri, 2004) shows how inhabitants resisted the assigned status of victim, because it was closely linked to acknowledgement of the contamination, and the imperative to leave their home territory. It occurred in a particular context, where a politically left-wing committee (CTSP) was very willing to frame the Seveso accident as a "capitalist accident". In order to join their cause, inhabitants would have to assume the role in public sphere of "victims" of irreparable damage – damage that of which they would have to declare themselves fully aware. Their approach was based on intensive counter-expertise activity, aiming to prove the negative health-effects of the contamination

[354] « Le mot victimisation sera utilisé ici pour qualifier le processus par lequel un individu se définit et est défini par d'autres comme victime ; il ne dit rien, par conséquent, de la légitimité ou de l'illégitimité de cette définition ». p 10. Barthe, Y. (2017). Les retombées du passé. Le paradoxe de la victime: SEUIL.

[355] This chemical accident in the town of Seveso, Italy occurred in 1976 and led to the development of a set of regulations for chemical industries: directives SEVESO.

[356] Centemeri, L. (2011). Retour à Seveso, la complexité morale et politique du dommage à l'environnement. Annales, histoire, Sciences sociales. Armand Colin, 213-240.

provoked by the accident. On the other side, a movement made up of local committees linked to the Catholic world asked public authorities to safeguard the link of people to their territory, because evacuation would break this tight-knit community. Cementeri shows how the inhabitants adhered to the latter movement, and discusses the relative failure, on the part of the Left-wing activists, to mobilize the inhabitants on the themes of collective outcry and victimization.

The above section has given some elements with regards to the role of each specific, national context, including one accident which had consequences in several different countries, like the Chernobyl accident. Moreover, in a democracy like Japan, post-accident policies based on a number of international recommendations, zoning measures, and compensation mechanisms, were (and still are) confronted with citizens calling for other (wider) types of victim recognition. The Fukushima case shows an extension of the notion of victim not strictly based on zoning schemas. And self-evacuees are a representative case of citizens claiming the illegitimacy of zoning and its limits.

Other questions of utmost importance concern the role played by the *victimisator*: "there are no victims without *victimisators*" explains Barthe in his research on the victims of the nuclear tests carried out by the French State. "Victimisators" may be - in the case he studies, as in many environmental cases - institutions or individuals, medical doctors, activists, social workers, and so forth. As with the notion of victimization, Barthe insists that the term has no negative moral connotation; it is not a sophisticated way of "negating" the existence of victims, or the reality of their problems. The important point raised here relies on the collective dimension of victimization, notably with an accent on the important role played by victimisators in this process. In the case reported by Centemeri, the victimisators who wanted to link the SEVESO accident to a more general criticism of capitalism failed to bring the inhabitants into their victimization process. The consequences of this victimization were not in line with the deeper concerns of the inhabitants, and their strong attachment to a community and a territory, also framed as a catholic community.

In Japan, the complex *victimisator* schema is linked, notably, to anti-nuclear movements and to the reactivation of deep-seated denunciation of the health-related consequences of the Hiroshima and Nagasaki bombings. The victimisators include a number of scientists who call into question the general paradigm of a "threshold" for radiation harm[357]. Moreover, this victimization process is challenging for the authorities - notably because, through the "self-evacuees", it calls into question the limits imposed by zoning measures, which, by designating certain areas "unsafe", effectively label any others as "safe".

Lastly, victimization is a complex process; it meets the needs and concerns of a number of people in some places, while it fails in other cases. The evacuation of a community linked to a Buddhist temple, in Miharu, is a powerful example of a victimization process confronted with its consequences. The role and personality of Genyû Sôkyû the monk who is the head of the temple, were instrumental in rejecting those consequences. Sôkyû advocated *not* evacuating, basing his argument on the relative harmlessness of low-dose radiation and the will to preserve that community, but also on the fact that measurements proved that some places in Japan were more contaminated than Miharu,

[357] These aspects, evoked in this report (Chapter 5), will be re-examined in a next *Shinrai* report.

due to Nuclear testing in China (as discussed above). However, he could not prevent some Miharu residents choosing to evacuate.

7.3.3.2 The "myth of community"?

These questions also interrogate the very notion of *community*, used in this report. The fieldwork carried out in the villages of Kawauchi and Naraha showed clearly that people could have divergent interests and desires with regards to solutions proposed, specifically concerning the divide between evacuation and stay-on solutions (cf. Chapter 3, comparing Kawauchi and Naraha mayors, and Chapter 4). As seen above, it cannot be presumed that the general underlying feeling will be one of "attachment to territory" in the case of a nuclear accident. And more widely, reference to "a" or "the" community is also questionable. In fact, this notion downplays not only the divergences amongst inhabitants with regards their motivations and inclinations, and their perception of radiation risk, but also the divergences in their assessment of the post-accidental situation and, more generally, the differences in their political appraisal of government reactions to the accident. During the interviews, the "community" was often portrayed as a micro-level entity, a group of neighbors who knew each other, which works as social safety net at times but also exercises pressure to align one's opinion/decision to the majority members.

Indeed, the notion of "community" has raised a number of criticisms in Disasters Studies literature. Revet (2018) shows that "the community", conceptualized as a homogenous set of persons to whom one could speak by the intermediary of a few local leaders, is a delusion. And certain development actors have in fact integrated this critical assessment in their approach, as shown in the title of Chapter 4 of the International Red Cross 2014 Annual Report: "The myth of community?", which discusses how the term is intended to legitimate the organization and the work of institutions. For this organization, there are two main hidden objectives in utilizing this notion of "community":

"*The first is the confirmation that [the help provided] is being done with real people at the local scale and is not 'top-down'. The second is to suggest that there is a collective, possibly structured and cohesive entity that will be an asset to the Disaster Risk Reduction and Climate change Adaptation process, once it can be mobilized through participatory activities*[358]". An additional set of research questions could usefully explore this complex question of the way to address the inhabitants' needs and desires in a post-accidental situation and how this process can be mediated.

7.3.3.3 Environmental justice and the limits of compensation

Lastly, the questions linked to justice, compensation, reparation after a nuclear accident can be framed within the wider context of environmental justice. A number of scholars

[358] Op.cit.

have explored these issues in the nuclear domain (Takahashi[359], Mitchell[360], Hecht[361],) or in non-nuclear domains - notably, the chemical field (Centemeri, Jobin), as well as in relation to natural catastrophes (Revet, 2017).

It is important to note that the issue of compensation is confronted with a critique of the notion itself, of ever truly being able to compensate this type of damage, and of the limitations inherent in objectifying and monetarizing it. The research of Martinez Allier (2002) was instrumental in wider criticism of the possibility of ever compensating environmental damage. With the notion of "environmentalism of the poor", she insists on the incommensurability of environmental damage, and calls for a "language of valuation" that would resist the (western) idea that money can compensate a loss of environment. Moreover, the term "environment" may denote "nature" and "wilderness" or "place of dwelling"; in the latter case, Centemeri considers that through dwelling, the "*relationship is crucial or "constitutive" to the consistency of the person*[362]", and in this case, there is a constitutive or radical incommensurability. Compensation for "the loss of enjoyment" does not mean much for a person in this case.

In recent research on two cases of industrial pollution in Taiwan, Jobin (2018) insists on the range of expectations of plaintiffs confronted with legal mechanisms which often neglect the symbolic dimension of their demands. "*These mechanisms are really not concerned with questions like apologies and memory, which are essential to fully atone [damage done to] the victims and their environment*". In fact, "*commensurability and incommensurability of the damage are entangled, shaping a web of motivations and expectations among the victims of environmental damage*[363]". In his analysis of soldiers who participated in nuclear bomb testing, Barthe concludes that "*the fights led by a number of collective associations may be oriented at least as much toward a recognition of social esteem as toward monetary compensation*[364]". (Barthe Y. , 2017).

7.3.3.4 Conclusion

As for all accidents which have a significant impact on environment and people, nuclear accidents raise the issues of reparation and compensation. What may be considered specific to the nuclear field, however, is the time-scale of contamination, which can be counted in centuries and millennia. The complex relations between victims and victimisators, the reflexivity of victims, the process of "*secondary victimisation*" proposed

[359] Takahashi, H. (2009). One minute after the detonation of atomic bomb: the erased effects of residual radiation. International journal of the history of science society of Japan, 19(2);

[360] Mitchell, M. (28 Septembre 2018). The Cosmology of Evidence: Citizenship, Law, and Biological Knowledge after Three Mile Island Paper presented at the Repairing Environments: Post-Disaster Mobilisations, Experiences & Tensions, Ecole Normale Supérieure, Paris.

[361] Hecht, G. (2012). Being Nuclear Africans and the Global Uranium Trade: The MIT Press.

[362] Op.cit.

[363] Jobin, P., & Tsai, Y.-Y. (2018). How much compensation is fair enough for repairing a toxic environment? A view from two class actions in Taiwan. Paper presented at the Repairing Environments: Post-Disaster Mobilisations, Experiences & Tensions, ENS, Paris.

[364] Il se pourrait que les luttes menées par certains collectifs de victimes soient au moins autant orientées par la perspective d'une reconnaissance en termes d'estime sociale que par celle d'une réparation sous la forme d'indemnités financières. P 238. Op.cit.

by Barthe (when a victim is not recognized as a victim), all constitute important future research perspectives which could usefully be developed on a comparative basis (notably, comparing nuclear accidents with other industrial pollution). This calls for research exploring the complex nexus of reparation and compensation (financial and symbolic), and the links to territories and "communities" or individuals. It also calls for research aiming to combine anthropological, historical and sociological approaches with the fields of Law and economics.

8 GENERAL CONCLUSION

This report aims at presenting the main results of the *Shinrai* project regarding the case studies analysed throughout an extensive fieldwork, led during eight missions in Japan, and comprising more than 120 interviews with different actors. Our main objective was –to quote the words of Michaël Ferrier speaking on the situation in the aftermath of Fukushima- "to enunciate, and not to denunciate[365]". A comprehensive and detailed account of the consequences of the nuclear accident and of its "management" by the authorities allows to account for the many different and sometimes very opposite views on what happened –and is still happening- for affected residents. One of its specificities is to have listened to a number of persons who have been or are still in charge of dealing with the consequences of the accident (medical doctors, responsible of the ministries, Mayors, …) in order to understand how they have made sense of the situation, including the ethical stakes they had to face.

Some of the main findings from this field research can be summarized as follows:

- **Six categories of inhabitants were identified in relation to their decision to return - or not - to their home village after the Lift of Evacuation Orders**, namely: 1. "Return and resist to a Culture of Radioprotection"; 2. "Return and control/comply"; 3. "Return and doubt"; 4. "Between return and resettlement"; 5. "Not returning now"; 6. "Not returning ever". While recognizing the limit and potentially reductive nature of any form of categorization, this classification helps us grasp a panoramic view of the choices, feelings and judgements underlying decisions made by the population after a nuclear accident..
- **Mayors play a crucial role in implementing the policy defined by the government at the local level.** They have limited margins for maneuver in organizing the Lifting of Evacuation Orders and the return of inhabitants. As long as particular groups of inhabitants (e.g.: seniors versus families with young children) had specific and opposed interests, it became difficult to act in the name of "general interest". Each of the mayors justified his decisions by expressing what he considered most important: the right to return to, and eventually to die in one's own home, or the right to "buy time" and *not* to come back, for those not satisfied with the life that coming back would offer.
- **Examining the question of "who trusts whom?" not surprisingly shows a deep divide between people who trust the "official/governmental" scientists and experts, and those who trust scientists not linked to governmental or nuclear institutions.** Such a divide effectively renders "taboo" the question of ionizing radiations consequences on health, because of the potential divisive effects the question can have on communities.
- Risk communication was considered by the authorities to be a *solution* (to dissipate fear toward radiation among the population) while citizen considered it as a *strategy* employed by the authorities. The reflexivity of actors who were in charge of communication activities illustrates how **the intention to "reassure" could be critically analyzed by citizens and by the experts themselves**, when

[365] Interview on France Culture.

they were offered the opportunity to look back on their actions at the time of the accident.

- **Appraisal of the Japanese government actions offers accounts of the relatively low return rate and gives a number of reasons for this**. This opens the way for addressing the issue of "reconstruction" and the question of "for whom" this reconstruction was promoted, as exposed in "*Reconstruction Without Inhabitants"* by Yamashita et al.
- **Examining the implicit normative framework used by the Japanese government when dealing with 3/11 event contributes to a process of "learning from an accident".** In fact, the Japanese government's implicit framework was challenged in many ways by what happened afterwards. Therefore, in order to learn from what happened in Fukushima, the deep-seated, "invisible" aspects effectively revealed after the accident must be taken into consideration. The choice was made to focus on the following three narratives: "attachment to territories", "commensurability of risks", and "contained contamination". In the current discussions on post-accident management, these implicit aspects still appear to be insufficiently identified, and have not been called into question.
- **Finally, frustrations and angers toward post-accident policies turned into legal proceedings led by a number of citizens against the authorities.** At the time of writing, 31 group lawsuits, involving 12,000 plaintiffs from among evacuees and affected residents, have been filed against TEPCO and the government all over Japan. But these legal actions only play a partial role in repairing one's life from the damage incurred by a nuclear accident. As in other cases of environmental damages compensation, symbolic aspects of these actions such as demand for apology and social recognition shall also be taken into account in the process of reparation.

A long-term opposition between experts and scientists of the nuclear sphere and non-institutional experts who have been opposing to them was abruptly "deconfined" after the nuclear accident. Its combination with a conflict of legitimacies –between nuclear-related institutions like ICRP and IAEA, and United Nations institutions - opens questions and challenges for the political and scientific spheres, as well as for SHS researchers.

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10 ANNEX: FIELD WORK

Before the official launch of the *Shinrai* project, there had been a two-year preparatory period where five feasibility study missions had been implemented in Japan (2 x F; 3 x CF+RH). The below is the statistical data of all field interviews conducted during both preparatory and research missions of the *Shinrai* project, which was used for this report.

Number of Interviews

The total number of interviews conducted from October 2013 until October 2017 amounts to 118, of which 62 interviews were with evacuees/residents, 9 interviews with government agencies, 13 interviews with municipal and prefectural officials, 26 interviews with experts/researchers and 10 interviews with NGOs. As for the number of persons interviewed, it is counted as 117 (see Table 1). The interviews have been conducted by three researchers: Christine Fassert (coordinator of the project; IRSN), Reiko Hasegawa (project partner; Sciences Po Médialab) and Rina Kojima (project partner; LATTS). Reiko Hasegawa has organised and/or conducted interviews with/out C. Fassert with a total of 94 out of 117 persons.

Table 1: Number of persons interviewed by 20 February 2018

Category	**Number**
Evacuees/Affected Residents	62
Government officials	13
Local authority	19
Experts/Academics	26
NGOs/civil associations	10
Total	**118**

Profiles of Interviewees

Evacuees/residents

Among 50 evacuees/residents whom we interviewed, 16 persons are from Naraha, another 17 are from Kawauchi, 8 from Watari district of Fukushima city, 4 from the other parts of Fukushima city, 2 from Iitate, 1 from Kooriyama, 1 from Iwaki, and 1 from Miharu town (Figure 2). Of the total, 28 are evacuees, 19 are residents/returnees and 3 are those who are between evacuation and return. We have conducted follow-up interviews for a total of 10 evacuees/residents.

Table 2: Evacuees/residents: the place of residence at the time of the accident

Municipality	Number
Naraha	16
Kawauchi	17
Watari district of Fukushima city	8
Other towns of Fukushima prefecture	9
Total	50

Governmental officials

We interviewed government officials at the following ministries/agencies: Nuclear Regulation Authority (NRA), Reconstruction Agency, Japan Atomic Energy Commission (Cabinet Office), Nuclear Disaster Victims' Assistance Team (Cabinet Office), Ministry of Education, Culture, Sports, Science and Technology (MEXT), Ministry of Environment (ME)

Local authority

The interviewed local authorities include officials from Fukushima Prefectural Office, Fukushima City Office, Naraha Town Office, and Kawauchi Town Office as well as members of city/town assemblies in Naraha, Kawauchi, and Fukushima City, and Mayors of Naraha town and Kawauchi village.

Experts/academics

The experts and academics whom we interviewed are from the disciplines of nuclear engineering, urban/environmental engineering, medicine, biology, physics, philosophy, environmental sociology, and STS. They are from University of Tokyo, University of Kyoto, Tokyo Institute of Technology, University of Osaka, University of Kobe, Fukushima University, Meiji University, Sophia University, Nagasaki Medical University, Nagasaki University, Kyoto Seika University, Tokyo Metropolitan University, University of Eastern Finland, and Takagi School.

NGOs/civil associations

The NGOs that we have interviewed are NOW, SAFECAST, ACRO, Fukushima Save Children from Radiation, Save Watari Kids, Chikurin-sha, Minna no te, Hidanren, and Hiroshima Group Action. The activities of these organisations include measuring ambient radiation dose and mapping, measuring radioactivity in food, assisting parents to protect children from radiation exposure, and assisting victims in lawsuits against TEPCO/government.

Conferences and town meetings

During the field missions to Japan, the project team has participated several conferences, symposiums and town meetings organised around the themes of the project as shown in the table below:

Table 3: Conferences and town meetings participated by the project team

Title	Organizer	Date	Place
The 3rd Citizen-Scientist International Symposium on Radiation Protection (CSRP)	CSRP	Oct 2013	Tokyo
Symposium « Protéger et soumettre à Fukushima »	Maison franco-japonaise	Oct 2013	Tokyo
International Symosium on Legal-Medical aspects of Nuclear Disaster and Human Rights	International Centre of Environmental Comparative Law(Michel Prieur)	Oct 2014	Tokyo (Waseda University)
UNWCDRR side events	UNWCDRR	Mar 2015	Sendai
The 4th Citizen-Scientist Intl Symposium*	CSRP	Sep 2015	Tokyo
The 5th International Expert Symposium on Radiation and Health*	Japan Foundation	Sep 2016	Fukushima Medical University
The 6th Citizen-Scientist Intl Symposium	CSRP	Oct 2016	Nihonmatsu (Fukushima)
Women's Meeting*	Women's association of Kawauchi	Sep 2016	Kawauchi village
Meeting of Naraha evacuees in Tokyo*	Naraha town	Oct 2016	Tokyo

*The event was participated by Rina Kojima (LATTS).

List of interviews

Evacuees/Residents

Municipality	No.	Name	Age	Interviewer	Mission	Evacuee or Resident/ Returnee
Naraha	1	Mr. MT	70-80	RH et CF	Oct-14	E (Iwaki)
	1 (followup)				Mar-15	
	2	Mr. MA	20-30	RH et CF	Mar-15	E (Iwaki)
	3	Ms. WA	30-40	RH et CF	Mar-15	E (Iwaki)
	4	Mr. N	40-50	RH et CF	Mar-15	E (Iwaki)
	5	Mr. MA	60-70	RK	Mar-15	E (Iwaki)
	5 (followup)		60-70	RK	Sep-16	R
	6	Mr. TK	50-60	RK	Mar-15	E (Iwaki)
	7	Ms. CA	80-90	RK	Mar-15	E (Iwaki)
	8	Ms. YY	40-50	RK	Mar-15	E (Iwaki)
	8 (follow-up)		40-50	RH	Sep-15	
	9	Mr. MU	50-60	RK	Mar-15	E (Iwaki)
	10	Ms. MI	30-40	RH	Sep-15	E (Iwaki)
	11	Ms. YI	40-50	RH	Sep-15	E (Iwaki)
	12	Mr. MS	40-50	RH	Sep-15	E (Iwaki)
	13	Ms. YY	60-70	RK	Sep-15	E (Iwaki)
	14	Mr. HA	60-70	RK	Sep-15	E (Iwaki)
	15	Mr. MY	60-70	RK	Sep-15	E (Iwaki)
	16	Mr. TN	60-70	RK	Sep-15	E (Iwaki)
	16 (followup)		60-70	RK	Sep-16	
Kawauchi	1	Mr. KT	60-70	RH et CF	Oct-14	R
	1 (followup)		60-70	RH et CF	Mar-15	
	2	Ms. AKIMOTO	60-70	RH et CF	Mar-15	R
	3	Mr. AS	50-60	RK	Mar-15	E (Kôriyama)
	4	Ms. NS	50-60	RK	Mar-15	E (Kôriyama)
	4 (followup)		50-60	RK	Sep-16	
	5	Ms. KS	40-50	RK	Mar-15	R
	6	Mr. SI	50-60	RK	Mar-15	R
	7	Mr. YE	20-30	RK	Mar-15	E (Kôriyama)
	8	Ms. MY	60-70	RH	Sep-15	R
	9	Mr. YY	59	RK	Sep-15	R

	10	Mr. MY	50-60	RK	Sep-15	R
	11	Ms. KW	60-70	RK	Sep-15	R
	12	Ms. KN	60-70	RK	Sep-15	R
	13	Ms. KS	40-50	RK	Sep-16	R
	14	Mr. YE	30-40	RK	Sep-16	E (Kôriyama)
	15	Ms. KW	60-70	RK	Sep-16	R
	16	Ms. YI	30-40	RH et CF	Mar-17	R
	17	Ms. W	40-50	RH et CF	Mar-17	E/R
Watari	1	Mr. YK	50-60	RH, CF et RK	Oct-14	R
	2	Mme. YN	30-40	RK	Mar-15	E (Sendai)
	2 (follow up)		30-40	RK	Sep-16	
	3	M. TA	40-50	RK	Sep-15	E/R (Niigata)
	3 (follow up)		40-50	RK	Oct-16	
	4	M. MT	80-90	RK	Sep-15	R
	5	M. TO	60-70	RK	Oct-15	R
	6	Mme KT	40-50	RK	Oct-15	R
	7	Mme AS	40-50	RH et CF	May-16	R
	8	M. TO	60-70	RK	Oct-16	R
Iitate	1	Mme YK	60-70	RK	Oct-15	E (Fukushima)
	1 (followup)		60-70	RK	Sep-16	
	2	M YO	70-80	RH et CF	May-16	E (Fukushima)
Fukushima city	1	Ms. SA	40-50	RH et CF	May-16	E (Kyoto)
	1 (followup)		40-50	RH et CF	Oct-17	
	2	Ms. MY	40-50	RH et CF	May-16	E (Kyoto)
	2 (followup)		40-50	RH et CF	Oct-17	
	3	Ms. MW	40-50	RH	Oct-16	E (Hiroshima)
	4	Ms. NS	40-50	RH	Oct-16	E (Hiroshima)
Kôriyama city	1	Mr. II	40-50	RH	Oct-16	E (Hiroshima)
Iwaki	1	Ms. KT	40-50	RH et CF	May-16	E (Kyoto)
	1 (follow up)		40-50	RH et CF	Oct-17	
Miharu	1	M Genyû Sôkyû	50-60	RH et CF	Mar-17	R
TOTAL (# person)	**50**					

Government Authorities

Agency	Name	Title	Department	Mission
Japan Atomic Energy Commission (JAEC)	Mr. KONDO, Syunsuke	Chairman		Oct-13
	Mr. SUZUKI, Tatsujiro	Vice Chairman		Oct-13
MEXT	Mr. KAWAMURA, Masayuki			Oct-13
	Mr. KITAGAKI, Kunihiko			Oct-13
	Mr. SAITO, Daichi		Environment and Energy division, R&D Bureau	Sep-15
Reconstruction Agency	Mr. SUGIMOTO		Also belong to Cabinet Office's Nuclear Disaster Victim Assistance Team	Oct-13
Nuclear Regulation Authority (NRA)	Mr. ISSE, Masatsugu	Expert	Radiation Protection	Oct-14
	Mr. NAKAGOMI, Shota	Deputy Director	Radiation Protection	Oct-14
	Mr. BAN, Nobuhiko	Commissioner	NRA Commission	Oct-17
National Institute of Radiological Sciences (NIRS)	Mr. SAGARA, Masashi	Expert	RAMAT (Radiation Emergency Medical Assistance Team)	Oct-14
Cabinet Office	Mr. ARIMA, Nobuaki	Counsellor	Nuclear Disaster Victim Assistance Team	Oct-14
	Mr. TAKETOMI, Hironori	Deputy Director	Nuclear Disaster Victim Assistance Team	Oct-14
Ministry of the Environment	Mr. SEKIYA, Takeshi	Director	Fukuishima Office for Environemental Restoration	Oct-14
Total (# persons)	**13**			

Local Authorities

Municipality	Name	Title	Department	Mission
Kawauchi	Mr. Hideo AKIMOTO	Director	Reconstruction Management	Oct-14
	M. Azuma SHIGA	Director of Village Nursery School	Village Nursery School	Sep-15 May-16
	Mr. Yuko ENDO	Mayor	Mayor	Oct-16
Naraha	M Endo, Toshiyuki	Deputy Director	Reconstruction Promotion	Oct 2014 Mar 2015 Sep 2015
	M Sakamoto, Masahiko	Chief	Radiation Management	Oct-14
	M Matsumoto	Maire	Maire	Oct-16
Fukushima city	M Abe, Kazunori	Manager	Decontamination Planning	Oct-14
	M Minamizawa, Hiroshi	Section Chief	Decontamination Planning	Oct-14
	M Watanabe, Yuichi	Section Chief	Crisis Manaement	Oct-14
	M Hanzawa, Kazutaka	Assistant Section Chief	Fukushima City Assembly Office	Oct-14
	Mr. Abe, Mr. Ise, Mr. Matsuda, Mr. Hanzawa, Mr. Kuwajima		Different sections	Oct-13
	M Sanada, Hiroshi	Elu local	Chairperson, Committee on decontamination	Oct-16
Fukushima Pref.	M Endo		Decontamination	Oct-13
	M TAZAWA		Evacuee Assistance	Oct-13
	M SHOJI			Oct-13
Total (# Persons)	**19**			

Experts/Researchers

University	Name	Title	Department	Mission
Tokyo Tech	Mr. SHIRABE, Masashi	Assoc.Prof		
	Mr. MAKINO, Junichiro	Professor		Mar-15
Tokyo Univ.	Ms. FUJIGAKE, Yuko	Professor		Oct-13
	Mr. MORIGUCHI, Yuichi	Professor		Mar-15
	Mr. KODAMA, Tatsuhiko	Professor		Mar-15
	Mr. TSUBOKURA, Masaharu	Doctor		Mar-15
	Mr. TAKAHASHI, Tetsuya	Professor	Philosophy	Mar-17
Fukushima Univ.	Mr. ISHII, Hideki	Associate Prof		Oct-14
	Mr. TANBA, Noriyuki	Professor	Institute of Env. Radioactivity	Oct-13
	MrTAKAHASHI, Takayuki	Professor	Institute of Env. Radioactivity	Oct-13
	Mr. GOTO, Shinobu	Associate Prof	Environmental planning	Oct-13
Osaka City Univ.	MrYOKEMOTO, Masafumi	Professor	Environmental Policy/Economics	Oct-17
Osaka Univ.	Mr. HIRAKAWA, Hideyuki	Professor	STS	Oct-14
Nagasaki Medical Univ.	Ms. ORITA, Makiko	Assistant Prof/Nurse		Mar-15
Nagasaki Univ.	Mr. TOMONAGA, Masao	Prof Emeritus/Medical Doctor	Director Emeritus of Nagasaki Red Cross Hospital	Oct-17
Meiji Univ.	Mr. KIKUCHI, Masao	Assoc. Prof	Public Policy	Oct-13
University of Eastern Finland	Mr. BAVERSTOCK, Keith	Professor		Oct-14
Kyoto Univ.	Mr. KOIDE, Hiroaki	Former Assist Prof	Research Reactor Institute	Sep-15
	Mr. IMANAKA, Tetsuji	Former Assist Prof	Research Reactor Institute	Oct-17
Takagi School	Ms. SAKIYAMA, Hisako	Former NIRS Scientist		May-16
	Mr. SEGAWA, Yoshiyuki	Expert	Low-Dose Radiation Effect	Oct-17
Sophia University	Mr. SHIMAZONO, Susumu	Professor	Theology, philosophy	May-16
Kobe University	Mr. YAMAUCHI, Tomoya	Professor	Ion track	May-16
Kyoto Seika	Mr. HOSOKAWA, Komei	Professor	Environment	Oct-16
Univ.	Mr. SON, Wonchoru	Professor		
Tokyo Metropolitan Univ	Mr. Yusuke YAMASHITA	Assoc Prof	Sociology	Mar-17
Total (# persons)	**26**			

Citizen Associations/NGOs

NGO	Name	Title	Mission	Place
NOW	Mrs. Mariko Tomatsu	Member	Oct-12	Tokyo
Fukushima Save Children from Radiation	Mr. Hiroyuki YOSHINO	Member	Oct-13	Fukushima city
SAFECAST	Mr. Brown AZBY	Member	Oct-14	Tokyo
Minna no Te	Ms. NISHIYAMA, Yuko	Representative	Oct-14	Kyoto city
Chikurin-sha	Mr. HAMADA, Kazunori	Secretary General	Oct-13	Tokyo
	Mr. AOKI, Kazumasa	Vice Sec Gen	Sep-15	
ACRO	Mr. BOILLEY, David	President	Jun-15	Normandy, France
Hidanren	Ms. MUTO, Ruiko	Representative	Oct-16	Nihonmatsu (Fukushima)
	Ms. OOGAWARA, Saki	Staff		
Group Action Hiroshima	Mr. Yuichiro ISHIMORI	Lawyer	Oct-16	Hiroshima
Total (# persons)	**10**			