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Co-Constructing a Narrative of 'Never Give Up' in Preparing for a Mega-Tsunami: An Exemplar of 'All-Of-Society Engagement'?

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Abstract: This paper discusses the 'all-of-society engagement' concept promoted in the Sendai Framework for Disaster Risk Reduction (DRR) 2015–2030, drawing on the case of Kuroshio Town, Kochi Prefecture in Japan. The framework does not offer a clear definition of 'all-of-society engagement'. The paper suggests the case of Kuroshio Town could help us envisage what 'all-of-society engagement' might look like. The people in the town were shocked to receive the official revised prediction of a forthcoming mega earthquake and tsunami in March 2012, which suggested that the Nankai Trough Earthquake could reach the seismic intensity of seven, and the subsequent tsunami could be as high as 34.4 m in a certain part of Kuroshio Town. Pessimism spread, and an attitude of 'giving up' prevailed. Kuroshio Town Hall had to come up with a drastic measure to unite the whole town, which was to present a clear philosophy, rather than technical measures. The narrative of 'never give up' was thus constructed, which was gradually appreciated and shared by the residents of the town. The paper teases out this whole-town preparedness project with the use of the four priorities of actions in the Sendai Framework as an analytical tool. The analysis brings certain mechanisms deployed in the town to the fore, which enabled the co-construction of the narrative of 'never give up', contributing to motivating the residents to engage in preparedness activities.

Keywords: all-of-society engagement; co-construction; Nankai Trough Earthquake and Tsunami; tsunami preparedness; disaster risk reduction; Japan

1. Introduction

The purpose of this paper is to discuss the 'all-of-society engagement' concept promoted in the Sendai Framework for Disaster Risk Reduction (DRR) 2015–2030 [1], drawing on the case of Kuroshio Town, Kochi Prefecture in Japan. According to UNISDR, DRR refers to 'preventing new and reducing existing disaster risk' to 'contribute to strengthening resilience and therefore to the achievement of sustainable development' [2]. DRR is 'the policy objective of disaster risk management', addressing the whole disaster cycle of prevention, preparedness, response, and recovery. Compared with the previous Hyogo Framework for Action (HFA) 2005–2015: Building the Resilience of Nations and Communities to Disasters, the major shift in the Sendai Framework was the emphasis on disaster risk management as opposed to disaster management [3].

Despite being a voluntary agreement, the Sendai Framework, which is known for its 'all hazards approach' [4], is becoming increasingly significant because of the frequency and severity of the natural hazards occurring worldwide. The Asian continent, for example, has experienced hazards of all types in the past 20 years. For geophysical disasters such as earthquakes and tsunamis, Asia accounts for the majority of all recorded impacts. This includes 85% of all affected people and 78% of reported economic damage, as well as 62% of all occurrences and 69% of deaths [5]. Specifically in Japan, the

number of earthquakes with a magnitude of 6.0 or greater amounts to nearly 20 per cent of the total world occurrences [6]. Besides, as global systems become more and more 'interconnected', 'cascading effects' of disasters result in a greater impact in wider areas [7–9]. The 2010 eruption of Eyjafjallajökull Volcano in Iceland, which closed many European airports and the 2011 Great Japan East Earthquake and Tsunami which subsequently destroyed a nuclear power plant are typical examples of cascading disasters [10]. In preparing for future large-scale hazards which could prompt cascading effects, the Sendai Framework stipulates that 'all-of-society engagement' is necessary. The Framework does emphasise that:

International, regional, subregional and transboundary cooperation remains pivotal in supporting the efforts of States, their national and local authorities, as well as communities and businesses, to reduce disaster risk. Existing mechanisms may require strengthening in order to provide effective support and achieve better implementation [1].

Nevertheless, the Framework neither provides a clear definition of 'all-of-society engagement', nor explains 'how to foster more meaningful engagement among communities' [11]. This paper aims to illustrate what 'all-of-society engagement' might look like through the analysis of Kuroshio Town's DRR policy and practice.

Kuroshio Town came to be known as the place of 'the worst-case scenario' of the probable Nankai Trough Earthquake. On 31 March 2012, the Central Disaster Management Council announced the predictions of forthcoming large-scale hazards, which were revised after the 2011 Tohoku disaster. An earthquake expected in the Nankai Trough region could be as big as the seismic intensity of seven, and within two minutes, a tsunami as high as 34.4 metres could reach a certain area of Kuroshio Town [12]. There was an 80 per cent probability for this to happen within the coming 30 years. The people in Kuroshio Town were astounded when they received this terrifying forecast. According to the Kochi Prefectural government's estimate, the number of fatalities in Kuroshio Town would rise to 2300, of which 2100 (91.3 per cent) would be the victims of the tsunami [13]. Pessimism and an attitude of 'giving up' prevailed amongst many who had fatalistic views suggesting that 'we would be dead anyway, so what is the point of trying to evacuate?' Some left the town, and others insisted on not evacuating even if a tsunami came. 'Depopulation prior to the disaster (*shinzen kaso*)' was the term coined to denote such hopelessness in the town. Media gathered to report the town facing the worst-case scenario [14]. The senior management had to come up with a drastic measure to unite the whole town, which was to present a clear philosophy, rather than technical measures. The narrative of 'never give up evacuation' was thus constructed [12]. In the first instance, the senior management of the municipality took the initiative. This paper probes the co-construction process in which the narrative was developed and shared in the town as the centre of the whole-town preparedness project.

The paper first discusses its treatment of Kuroshio Town's experience as a case study. The paper goes on to describe the analytical framework for the purpose of discussing the case, drawing on the four 'priorities for action' points in the Sendai Framework. This is followed by an explanation of the methodology of the study. The paper then presents the findings, i.e., the analysis of the key policies and initiatives of Kuroshio Town and discusses further what contributes to a co-construction model. The paper concludes by revisiting and unpacking the conception of 'all-of-society engagement'. The paper's intention is to analyse how 'all-of-society engagement' has been developed, rather than treating Kuroshio Town's case as 'the best practice' or a 'success' story.

2. Materials and Methods

2.1. Case Study Approach

This paper examines the case of Kuroshio Town. Qualitative case study approaches are empirical enquiries that enable an investigation of a phenomenon within its real-life context with the use of multiple datasets [15]. Taking an interpretivist position, this study supports the idea that stakeholders co-construct their own knowledge through interactions amongst themselves. The meanings that

individual stakeholders construct relate to their understanding and enactment of DRR in their contexts [16].

Kuroshio Town (Figure 1) has a population of about 12,000, with 41 per cent of them aged 65 or over (as of 2017) [12]. Its geography is a combination of a long and complex coastline and inland mountains. Fishery and agriculture are the major industries. Facing the Pacific Ocean, the town has experienced a tsunami in its history due to the Nankai Earthquake occurring every 90 to 150 years. The last one was the magnitude 8 earthquake in 1946, which was followed by a four to a six-metre tsunami. 679 people lost lives, 4846 houses collapsed or were washed away [17]. Hence, the town had a certain degree of tsunami preparedness before the 2012 revised announcement. With the harsh probability of a 34-metre tsunami, however, the town has had to redevelop their DRR plans including risk communication tools.

Figure 1. Location of Kuroshio Town.

The map on the left of Figure 2 is Kuroshio Town's overall tsunami inundation estimate revised by the Kochi Prefectural government in December 2012 [18]. The hazard map on the right is that of the coastal region which would be severely affected by the 20 plus-metre tsunamis. It is number seven of the nine hazard maps created. Each regional map contains information such as the estimated tsunami travel time to the designated evacuation areas and a list of designated evacuation centres in the region. These official maps are available only in Japanese. From the town's website (https://www.town.kuroshio.lg.jp/pb/cont/bousai-map/501), by clicking the number, the detailed hazard map of each region is obtainable.

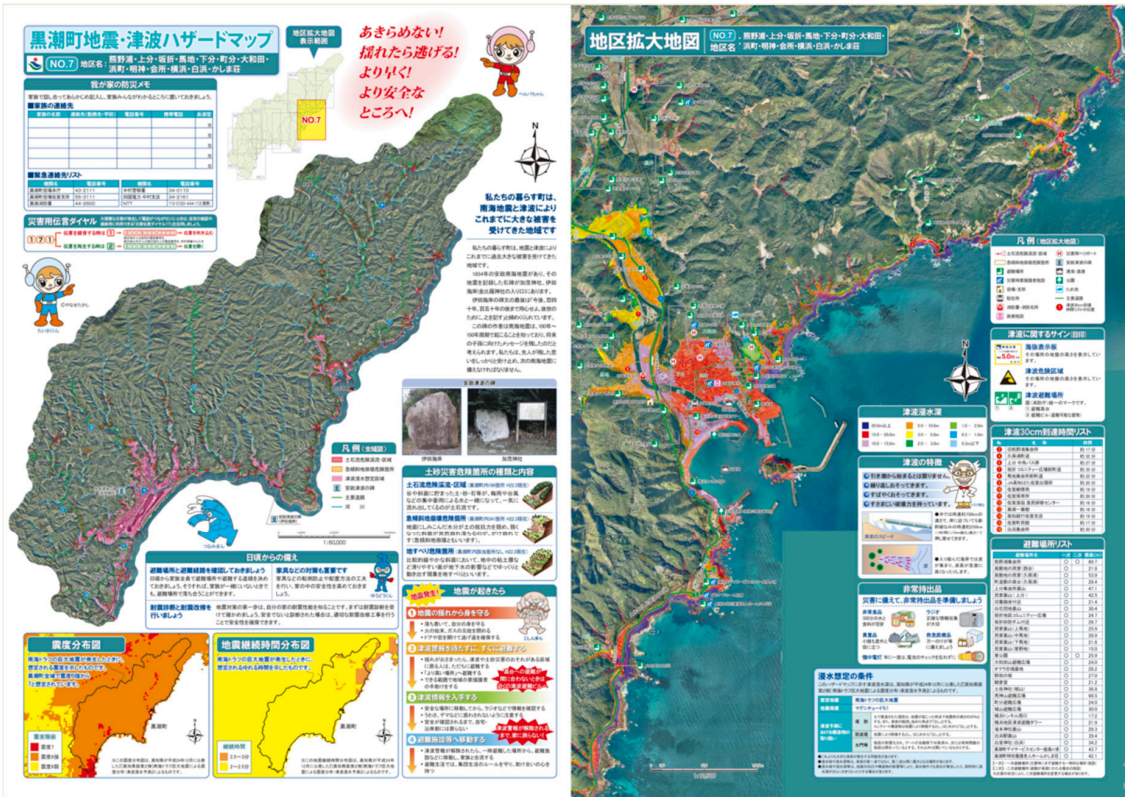

Figure 2. The tsunami inundation estimate of Kuroshio Town and the hazard map of the region which would be severely affected.

For emergency warnings, Kuroshio Town follows the standardised Earthquake Early Warning System (incorporating prediction of tremors measuring 6-lower or more on Japan Meteorological Agency's seismic intensity scale) and Tsunami Warning System (an emergency warning issued for over 3-metre tsunamis) managed by the Japan Meteorological Agency [19]. For information distribution, Kuroshio Town uses municipality-level as well as prefectural-level radio communication systems as the main channel [13]. As a countermeasure against the isolation of communities in mountainous rural areas, the town plans use satellite cell phones [20]. There is an idea being considered for the mayor to directly issue a caution reminder when another prefecture experiences a large-scale earthquake [13].

The rationale for the choice of Kuroshio Town as a case derives from the fact that this study is a theory-practice integration exercise. Furthering understanding of the concept 'all-of-society engagement' stressed in the Sendai Framework—theory—could be developed by teasing out the thorough approach taken by Kuroshio Town in preparing for a mega-tsunami—practice. The other reason for the choice of the town was that I came to be interested in the work of a research team. The team comprises Professor Katsuya Yamori and his researchers from the Disaster Prevention Research Institute of Kyoto University, whose field was Kuroshio Town. I aimed to understand their epistemology and methodology. I will elaborate on this point later in the Results and Discussion sections. To clarify, this study is independent of the research team's research, and when referring to 'the research team', I am not part of that team. The empirical data collection of this small-scale study was separate from that of the research team.

2.2. Data Collection and Analysis Methods

This small-scale study was guided by the following three research questions in analysing the co-construction of the narrative of 'never give up' in Kuroshio Town:

(1) How was the philosophy of 'never give up' developed in Kuroshio Town?

(2) Who are the major actors in the development of the philosophy?
(3) How can the philosophy be related to the Sendai Framework?

The information was collected using a combination of documentary analysis and an empirical investigation. The analysed official sources include Kuroshio Town's official website and publications, and the materials from the conferences in which their officials participated. The town had been studied by some Japanese researchers, including the aforementioned research team, whose papers and reports have been investigated as well. I employed a mixture of qualitative approaches when visiting six communities in Kuroshio Town in March 2017. I use the term 'community' to refer to the smallest administrative and geographical unit in a municipality. For observation, I joined the Community-based DRR Course offered by the Japan International Co-operation Agency. They run a series of courses in support of low-/middle-income countries. In this particular course, representatives from 15 countries travelled across Japan to learn about community-based DRR, which included a visit to Kuroshio Town. The course comprised observing facilities (e.g., stockpiling warehouse) and technologies (e.g., quake-generating car), participating in drills (e.g., tsunami evacuation drill), and also policy-makers' and experts' seminars. I also joined two community meetings. At all events, I took notes to record what was happening, who was involved and what kinds of interactions were noticeable. I also had informal conversations with several residents and officials during the observations, which are treated as part of the observation data and used in the analysis below. They are referred to as 'Informal'.

As for interviews, to obtain a fair understanding of Kuroshio Town's approach, I interviewed a range of stakeholders from the following categories, in a total of seven persons. I asked the abovementioned research team's help in approaching stakeholders. The sample was small in size but served the purpose of gaining a balanced view of the town:

(1) A town official who has been central to the policy-making of DRR (Official 1);
(2) A town official whose initial responsibility is not DRR but engages in DRR through the staff-in-charge system (to be explained later) (Official 2);
(3) Three community leaders who have a leading role in the community's DRR (Leader 1, 2, 3);
(4) Three community members who do not necessarily have a leading role but proactively engages in the community's DRR (Member 1, 2).

I took notes during the interviews, which were recorded. The notes were later checked against the recordings and elaborated. The transcripts were not verbatim, except for some key quotes which were directly related to the research questions. I also utilised the written materials offered by some interviewees in the analysis. I analysed the collected data thematically to identify the key themes related to 'all-of-society engagement' addressed in the Sendai Framework. I then triangulated my analysis through the discussions with three DRR academic experts. Consents were obtained from all interviewees and Kuroshio Town Hall.

2.3. Analytical Framework

Before discussing an analytical tool for this study, the logic as to why the Sendai Framework stresses 'all-of-society engagement' should be illuminated here. The outcome of the framework is set out as 'the substantial reduction of disaster risk and losses' in every aspect of human lives from socio-economic to environmental assets [1]. To realise this, the following goal has to be pursued:

Prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience [1].

As an assessment tool for the outcome and goal, seven global targets have been agreed upon, which include, 'Substantially reduce global disaster mortality by 2030, aiming to lower the average per 100,000 global mortality rate in the decade 2020–2030 compared to the period 2005–2015' [1]. The targets are to 'provide a starting point for measuring progress' [21], and are not legally binding.

The framework provides 13 guiding principles to help governments develop their own DRR structures and governance, taking resource implications and relations with other global agendas such as sustainable development into consideration. One of the guiding principles emphasises 'all-of-society engagement': 'Disaster risk reduction requires all-of-society engagement and partnership. It also requires empowerment and inclusive, accessible and non-discriminatory participation . . . ' [1].

The framework then lays out the four priorities for action, which this paper utilises as an analytical device. Below is a summary of what the priorities intend to achieve.

Priority 1: Understanding disaster risk

This priority aims to establish 'evidence-based policy making' [21]. All 'dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics and the environment' of disaster risk have to be understood for the policy-making of DRR. Such 'pre-disaster risk assessment' then informs strategic decisions for the actions against each disaster cycle [1].

Priority 2: Strengthening disaster risk governance to manage disaster risk

Priority 2 intends to 'integrate governance issues across the disaster cycle' [21]. Governance at all levels—whether local or global—needs to be based on 'clear vision, plans, competence, guidance and coordination within and across sectors' and 'stakeholders'. One of the significant components of strong disaster risk governance is 'collaboration and partnership' across systems and organisations [1].

Priority 3: Investing in disaster risk reduction for resilience

Health resilience is addressed here [21]. To increase 'economic, social, health and cultural resilience', 'public and private investment' in both 'structural and non-structural' DRR measures are critical. Investment is a 'cost-effective and instrumental' way to 'prevent and reduce losses and ensure effective recovery' [1].

Priority 4: Enhancing disaster preparedness for effective response and to 'Build Back Better' in recovery, rehabilitation and reconstruction

Capacity building for every disaster cycle is an emphasis on Priority 4 [21]. 'Equitable and universally accessible response, recovery, rehabilitation and reconstruction approaches' are the 'key'. In parallel, integrating DRR into development plans to 'Build Back Better' is strongly promoted [1].

The Framework does indicate 'there is a need for focused action within and across sectors by States at local, national, regional and global levels' in these four priorities [1]. Each priority entails some separate but inter-related guidance to both the 'national and local levels' and the 'global and regional levels'. The scope of this paper is to focus on the former, particularly at the local community level, to discuss 'what has been done' in achieving all-of-society engagement, rather than laying out the mechanism as to how it could be achieved through cross-level co-ordination. For the purpose of the analysis, the statements in each priority that are most relevant to the context of Kuroshio Town are selected in discussing how the philosophy of 'never give up' has been constructed, disseminated and implemented.

3. Results

3.1. Priority 1: Understanding Disaster Risk

Kuroshio Town received the announcement of the serious 'disaster risk' of the Nankai Trough Earthquake and Tsunami. The announcement has been referred to as 'the 3.31 shock'. Instead of analytically 'understanding' the risk, fear and hopelessness occupied the town. Officials perceived no 'countermeasure' could prevent the 34-metre tsunami and the town might be washed away completely [12]. The town mayor was certainly devastated by the prediction, but as the leader of the town, he knew he had to react quickly to change the negative mood of the town [22]. What he did was to give a commencement address to the town hall staff in embarking on the all-of-town DRR reinforcement project aiming to protect the population against the mega-tsunami. 'I prohibit any comments to suggest giving up and nothing can be done. Our tsunami measures hereafter will be the

whole-town project to tackle our crisis situation. I will request all staff members to rise up [22].' These words raised the morale of the staff.

The next step was to reach out to the residents in the town. In removing pessimism and reuniting the town, the senior management realised a need for a clear DRR philosophy, not technical policies and measures [12]. The goal 'not to give up evacuation' was thus introduced in the initial planning document in preparing for the Nankai Trough Earthquake. At the same time, there was a need to implement 'visible' projects such as the arrangements of evacuation routes, given philosophies and goals themselves would not erase the residents' sense of despair. In order to do so, a risk assessment had to be carried out. Dividing the town into 61 divisions, the senior management organised a series of workshops bringing residents and officials together to identify risks and discuss what initiatives were required [12]. Such a method allowed 'the use of traditional, indigenous and local knowledge and practices' [12] in building 'the knowledge of government officials at all levels, civil society, communities and volunteers, as well as the private sector, through sharing experiences, lessons learned, good practices on DRR' [7,15]. The whole budget of the required projects amounted to 33 billion Yen (approximately £30,000,000), which was far beyond the town's DRR budget. The senior management, therefore, commuted to Tokyo to obtain an increase in the national DRR budget for the town. With additional financial subsidies, visible structural projects began. One community leader indicated, 'when we saw the evacuation tower being built, we started to feel relieved (Leader 1)'. Such visual impacts contributed to the easing of people's sense of despair, and their readiness to prepare and evacuate grew [22].

Under such unique circumstances, Kuroshio Town has received attention from DRR researchers. The town has promoted and improved 'dialogue and cooperation among scientific and technological communities' [1], particularly with one research team. They have been undertaking a three-year DRR project to help the town develop its Community Disaster Management Plan [23]. The 2013 revised Disaster Countermeasures Basic Act introduced a new system promoting every community to create their own Community Disaster Management Plan. The system intends to enable communities' participation in the process of developing a plan. Since the 2011 Tohoku disaster, policy-makers and experts have emphasised the balancing of public help (*kojo*), self-help (*jijo*) and collaborative help (*kyojo*). One of the key measures under '*kyojo*' is the system of Community Disaster Management Plans. The government has offered subsidies and expertise to support communities in creating plans [24]. The research team's collaborative practice methodology differs from conventional approaches taken by the majority of DRR experts [25]. The two principles for the methodology are 'agency (*shutaisei*)' and 'engagement (*kanyosei*)' [26]. A lack of agency and engagement resulted in passive attitudes without the ownership of the DRR activity [27]. In contrast, the research team's methods of inquiry took the forms of action research and ethnography to realise collaborative practice [26,27]. What this means is the researchers immersed themselves in the communities in Kuroshio Town, spending time with their members to form relationships. Some community members stated that 'he (the researcher) is really trying to help us (Member 1)', 'I feel him like part of my family' (Member 2)' and 'he is like a chap next door (Informal)'. What the research team is doing is to redefine the boundary between 'experts' and 'laypersons' through collaborative and ethnographic approaches to make real changes in the communities [25]. It could be suggested that 'a science-policy interface for effective decision-making in disaster risk management' [1] has been facilitated through the relational practices used by the research team.

One of the team's developments to enhance communities' understanding of tsunami risks is a smartphone application 'Nige-Tore' (meaning 'training to escape') [28,29]. Allowing the visualisation of both the 'human behaviour (evacuation)' and the 'natural phenomenon (tsunami)', the app provides the user with a more quasi-tsunami experience than conventional mass evacuation drills [28]. After the initial setup, the user obtains the local hazard map and the lead time up to the arrival of a tsunami and experiences an evacuation. The GPS-equipped smartphone records the route and pace of the evacuation and assesses whether the user managed to reach a safe place in time. Nige-Tore then analyses the

evacuation—successful with more than 5 minutes' allowance, just in time or fail. The personalised tool also offers an opportunity to reflect on the evacuation experience by watching the recording of the user's own evacuation action in tandem with the tsunami inundation situation. Nige-Tore received some positive feedback from Kuroshio Town's users. The research team has implemented the single-person drilling using Nige-Tore with more than 1000 people in various parts of Japan, including Kochi, Osaka and Wakayama Prefectures. Sugiyama and Yamori [28] suggest the effectiveness of Nige-Tore stems from its capability to synergise people's mindsets of 'commitment' and 'contingency'. The former refers to the adherence to one scenario (e.g., evacuation route), while the latter considers other possibilities 'relativising' the present scenario. The research team argues that it is this synergy that helps people develop a coping capacity in an unexpected emergency scenario [28]. The use of Nige-Tore is one of the means 'to build the knowledge of communities through sharing experiences, lessons learned, good practices and training and education on DRR' [1].

3.2. Priority 2: Strengthening Disaster Risk Governance to Manage Disaster Risk

DRR for the Nankai Trough Earthquake and Tsunami has been the town hall's priority agenda since the 3.31 shock. Clearly, their disaster management section alone would not be able to achieve the goal of no one giving up on evacuating. What is referred to as 'the staff-in-charge system (*chiku tanto sei*)' was thus developed. The aforementioned 61 divisions were created as follows; the town has one fire brigade, which is divided into 14 branches, which are then responsible for 61 communities in total [12]. For all 61 communities, one official was allocated and made responsible for DRR of the community. Every official—except the mayor and the deputy mayor—employed by the town was allocated. Basic DRR training was provided to them in undertaking this role. The system assigned 'clear roles and tasks to community representatives' [1], i.e., town officials, so that they go to communities, engage with members and discuss together how to develop preparedness.

Being a staff in charge is added to daily duties. One official commented: 'It isn't a burden to me at all. The town's whole existence is endangered! No surprise staff members' awareness is quite high (Official 2).' Where possible, officials are allocated to the communities in which they grew up or live in. In doing so, officials can have a deeper engagement with the communities. The same official went on to say: 'I literally know everybody in this community. I even know which part of the house one sleeps! (Official 2)' Such a piece of information is crucial in planning safety and evacuation. Besides logistical knowledge, what motivates both parties' engagement in DRR actions derives from 'strong feelings (*omoi*) towards our communities' (Official 1). The officials' sincere attitude aiming to preserve the town and protect its population is appreciated by residents. They indicated: 'The official in charge works hard for us. She comes to see us regularly to help us (Member 2).' The relationship is mutual as the official commented: 'I feel I am nurtured by this community. It is a both-way relationship (Official 2).'

'Not to give up evacuation' is a goal, not 'laws and regulations', but the staff-in-charge system is a means to 'undertake comprehensive public and community consultations' [1], and a support mechanism to achieve the goal. As indicated by seven interviewees, the system had helped the building of trust through increased face-to-face communications between staff members and community members (Official 1, 2; Leader 1, 2, 3; Member 1, 2).

In 2013, the second planning document in preparing for the Nankai Trough Earthquake was issued, in which the basic goal was raised to 'zero victims' from 'not to give up evacuation' [22]. The town hall's strong determination was summarised as 17 concrete measures to achieve 'zero victims', combining 'hard' measures—building public facilities and tsunami evacuation towers—and 'soft' measures—educational activities and evacuation drills [12]. The document also introduced another preparedness activity utilising the staff-in-charge system—individual households' 'evacuation files' [12]. A family and the staff in charge discussed how the family would evacuate, taking the needs of each family member into consideration, and drew a clear evacuation plan. This exercise was more than a risk assessment, enabling communications between officials and residents to develop trusting relationships, as well as evacuation plans [30]. The files gave residents confidence that they would be

safe by following the plan [22]. The files also provided the town hall with an accurate and up-to-date overview of households' evacuation plans. By the time all 3791 households' files were completed in January 2014, the philosophy of not giving up was appreciated across the town and optimism began to grow [30].

The town hall has developed and strengthened the mechanisms 'to follow up, periodically assess and publicly report on progress' on DRR developments. The nature of the communities has helped that process, as one resident indicated: 'We can say anything we want to our leader and the staff in charge. We don't do this [DRR activities] because we are told by the top (Informal).' By involving all town officials in DRR, Kuroshio Town seems to have been able to 'promote public scrutiny and encourage institutional debates, including by parliamentarians and other relevant officials, on progress reports of local plans for DRR' [1].

3.3. Priority 3: Investing in Disaster Risk Reduction for Resilience

The key outcomes of the series of discussions undertaken through the staff-in-charge system included the investment in structural hard measures. The rearrangement and construction of 250 tsunami evacuation routes, evacuation signs, lighting systems and six tsunami evacuation towers were mostly completed by 2017 [31]. Kochi Prefecture chose evacuation towers, rather than seawalls widely seen in the Tohoku coastal region. This point will be elaborated on further in the Discussion section in relation to 'Seaside Gallery'. Figure 3 is the sixth tower, which had just been completed when the author visited Hamamachi Ward. If the Nankai Trough Earthquake occurs, the first 18-metre wave will hit the ward within 19 minutes, but their nearest high-ground is 25 minutes away. The community therefore requested the construction of the 22-metre tower, which is the tallest tsunami evacuation tower in Japan [32]. Many residents expressed relief once the towers were built (Informal).

Figure 3. 22-metre high tsunami evacuation tower in Hamamachi Ward in Kuroshio Town.

Besides such apparent DRR measures, Kuroshio Town also invested on '34M We Can Project'—a public-private joint venture, which puts disaster preparedness at the heart of the business. Kuroshio Town had already been experiencing a decrease in gross products by 20 per cent between 1999 and 2009 [14]. Workforces migrating from the town looking for jobs were already a structural issue. The 2012 announcement exacerbated this socio-economic phenomenon. The existence of the town itself was challenged. 'The economy stagnated. Developing businesses was the priority policy agenda

(Official 1).' The town hall's decision was to 'fight back', capitalising on 'local resources' and developing a unique DRR activity [14].

In 2014, in collaboration with a local university, the town hall set up a cannery company, taking the advantage of abundant local products such as skipjack tuna, while generating employment by making canning process as a business. Naming the company '34M' was a declaration from the town for fighting back against the predicted 34-metre tsunami. 'Without businesses in the town, the only investor was the town hall (Official 1).' 75 per cent of the initial fund was invested by Kuroshio Town Hall. The company's aim was 'to strengthen the sustainable use and management of ecosystems and implement integrated environmental and natural resource management approaches [1]'. The business incorporates DRR in two ways. First, it uses the canned food as stockpiles—not ordinary stockpiles, but as 'rolling stocks' [30]. Unlike usual emergency food, the recipes of canned food are tasty, trendy and health-conscious without seven major allergens. The ready-made food is intended for daily use so that the cans are consumed and bought again regularly. There are elements of social responsibility as well. The stockpiling will be offered to other towns and cities when they face emergency situations and are in need of support. This nature of the business allows an increase in 'business resilience and protection of livelihoods and productive assets throughout the supply chains', ensuring a continuity of services' [1].

By turning the negativity of the tsunami prediction of the mega-tsunami into the positive projection of the future, the revitalisation project 34M is intended to be a 'durable solution' 'in the post-disaster phase and to empower and assist people disproportionately affected by disasters' [1]. 34M is a business model and practice, which increases and integrates disaster risk management [1].

3.4. Priority 4: Enhancing Disaster Preparedness for Effective Response and to 'Build Back Better' in Recovery, Rehabilitation and Reconstruction

Priority 4 does not necessarily refer to ageing populations, but they should be part of the consideration for 'universally accessible response, recovery, rehabilitation and reconstruction approaches', particularly in rapidly ageing societies like Japan. Here, the practice in Kumanoura Ward is referenced. Kumanoura is a rural village in Kuroshio Town comprising both coastal and mountainous areas with a small population of 48 that has an average age of 70, with no one being under 65 (Member 2). The 2012 announcement indicated the tsunami that would hit the ward could be 34-metres high [23]. The first measure taken in the ward was to move the community centre, which was also the designated evacuation shelter, to higher ground. A new access road called 'the road for survival' leading to the other side of the mountain was constructed as well (Member 2). Establishing the community centre has contributed to 'the promotion of public awareness' (Leader 3). In subsequent regular community meetings, community residents have discussed 'the stockpiling of necessary materials to implement rescue and relief activities' [1].

The new community centre is the only public space where residents can get together in Kumanoura. The residents have organised a monthly forum for regular gathering at the centre, which has multiple purposes. One is a regular health checkup by a nurse sent from the Health and Welfare Section of the town hall [33]. The regular health examination is particularly helpful to the residents because there are no hospitals close to Kumanoura (Member 2). Another is a social occasion to see each other and to spend some time together—having lunch together, making handicrafts, exercising and discussing matters arising (Member 2). Social activities give them enjoyment and reassure solidarity. They also make collective decisions concerning the community at the meeting. Their main agenda at the time of the author's visit was to prepare the stockpile in the shed attached to the centre.

Attending the regular meeting also provides the residents with an evacuation drilling opportunity, as one member says, 'when I walk here, I am checking whether I am fit enough to evacuate by myself (Member 2)'. The ways from the residents' houses to the centre are the designated evacuation routes. Their monthly walk to the centre is, therefore, an evacuation drill, as one member indicates, 'we have familiarised ourselves with the new evacuation routes (Leader 3).' The monthly forum thus promotes

'regular disaster preparedness, response and recovery exercises, including evacuation drills, training and the establishment of area-based support systems' [1]. Having a monthly meeting ensures that there is a 'rapid and effective response' to the forthcoming tsunami, and preparing stockpiles at the centre provides a 'safe shelter' that accommodates 'essential food and non-food relief supplies' [1].

In this small community, 'cooperation' [1] is the key. Since they learned about the new prediction of the forthcoming tsunami, they have become more aware of a need to develop their preparedness. 'First, we need to be responsible for our own safety, and then, we look after others (Member 2).' Those who live on their own have a bell that they ring when they need help (Member 2). The small size has also helped in bonding the community: 'We get on very well. We know how others behave. We have always helped each other (Member 2).' 'There is an established community here', which can be attributed to 'the countryside culture' (Official 2).

The analysis above depicts some of the key initiatives and approaches that have promoted all-of-society engagement in preparing for a likely mega earthquake and tsunami in Kuroshio Town. It can be proposed that the four priority for actions of the Sendai Framework has broadly been implemented in the town. In parallel, the analysis brought to the fore that Kuroshio Town's DRR decisions have been underpinned by shared values and thought-through tactics, which are the focus of the following discussion.

4. Discussion

Prior to *Understanding disaster risk*, the population in Kuroshio Town—both town officials and residents—needed to deal with their psychological turmoil against the new prediction of the 34-metre tsunami. A focused and straightforward philosophy on DRR—not to give up—has helped reinforce the self-esteem of the population, prompting them to engage in DRR thinking and activities. This is what Ferdinand et al. [34] refer to as a 'people first' approach, as opposed to a 'disaster first' initiative. One town official did admit, 'being pushed into the corner, the whole population was prone to face the same direction (Official 1)'. He went on to say: 'had we not experienced the 3.31 shock, the town hall would have still continued DRR missions on our own, without being able to turn it into a whole-town project. We the population have learned to cooperate and developed a unity amongst us, owing to the 3.31 shock (Official 1)'. A mutual relationship seems to have been formed as residents indicated: 'We do have trust towards the town hall (Leader 1; Leader 2)'; 'We have a sincere mayor, who does get things done (Informal)'. Nowadays in Kuroshio Town, hardly any resident mentions giving up. Many believe giving up evacuation is 'a shame' [14]. Bottom-up community-based DRR activities are on the rise, and schools are also proactive in providing disaster education and conducting evacuation drills [14].

The staff-in-charge system and the research team's methodology have evidently contributed to *Strengthening disaster risk governance to manage disaster risk*. The system enables officials to reach out every single resident in town, create individual household files and discuss community resilience together. This form of co-construction has helped individual residents to be more responsible for their own evacuation and safety (Leader 1; Leader 2; Member 2). Besides, what promotes engagement is the research team's methodology [35]. The researchers are also assigned to support communities, attending meetings and events [23]. Such an approach is referred to as 'deep outreach' in which responsibilities are shared between researchers and community members, as opposed to 'shallow outreach' in which researchers instruct community members what to do [26]. In other words, the research team is also a part of this particular co-construction model of all-of-society engagement.

Behind the 34M project, which was a decision for *Investing in DRR for resilience*, the senior management of Kuroshio Town knew they had to create something 'positive' for the town. The phrase used by the official who led the project was: 'People respond if the idea "looks fun" and/or "makes money" (Official 1).' He wanted to revitalise the town to make it an attractive place so that people would not move out despite the tsunami threat (Official 1). Kuroshio Town, however, has a history of coming up with creative approaches to town development. They have a strong identity based

on the view of 'being proud of our community and making the most of the community's distinctive characteristics' [36]. For example, tourism has been strongly promoted, benefiting from a well-known 'single-fished skipjack tuna' and 'Seaside Gallery'. Instead of pursuing costly options such as building community centres and organising grand events, the idea of the beach itself being a gallery was introduced in 1989 [36]. 'There is no Art Gallery building in our town. But the beautiful beach is our Art Gallery' [37]—this motto represents how proud the people of Kuroshio Town are of their beach, the sea and the town. As an official interviewed mentioned, people's solid will to sustain and vitalise their town derives from their 'strong feelings (*omoi*)' towards the town (Official 1).

In Enhancing disaster preparedness for effective response and to 'Build Back Better' in recovery, rehabilitation and reconstruction, Kuroshio Town has taken a 'gentle DRR' approach [14]. It is challenging to live in an environment where a large earthquake and tsunami could hit at any time. Nevertheless, that is the condition of the town. 'That is what it means to live in Kuroshio Town. For us, disaster preparedness is an etiquette (Official 1).' People's 'strong feelings' wanting to protect the town in which they were born (Member 1) and preserve the nature have led to accept such a condition of the town—being prone to earthquakes and tsunamis. Kuroshio Town, however, does not always wish to be associated with disaster. They prefer to be referred to as 'the town which also has strong disaster preparedness', not 'the town which has strong disaster preparedness' [23]. Gentle DRR thus is about learning 'to live with disaster risks', perceiving them as one component in life, rather than confronting or trying to overcome them [14].

What these specific features and methods in Kuroshio Town signify is that the execution of priority actions may not be sufficient in obtaining all-of-society engagement in preparing a population for a forthcoming mega-disaster. Mechanisms for co-construction to engage all of society need to be strategically developed, as demonstrated in the staff-in-charge system and the research team's methodology. Tozier de la Poterie and Baudoin argue that the Sendai Framework's references to community and engagement are 'passing' and 'vague' [11]. 'Rather than valuing local understandings, the emphasis is on providing support to the most vulnerable ... in the form of information or other kinds of external, often technology-based, expertise [11].'

The Sendai Framework is 'the seemingly backward trajectory of the discourse surrounding participation', as a result of different political interests during the negotiation process, in comparison with the Yokohama Strategy and HFA [11]. It is probably unrealistic for an international framework to address 'context-specific means of engaging local communities' [11]. Nevertheless, as critiqued by Pearson and Pelling, the priority for actions are 'overwhelmingly top-down with very little emphasis on governance mechanisms to place communities in the decision-making seat' [21].

Engaging all members of society in enhancing preparedness and resilience is one of the core themes in the Sendai Framework. The absence of the discussion as to how it could be elaborated means its interpretations and implementations are left to municipalities and communities. If so, it is even more meaningful to learn from a variety of local practices. This paper has discussed one example referred to as a co-construction model. The conclusion highlights its major characteristics, unpacking the two conceptions, 'all-of-society' and 'engagement'.

5. Conclusions

Who 'all' are is taken for granted in the Sendai Framework, and how 'experts'—policy-makers and academics—and 'laypersons'—local residents—could work together in building preparedness and resilience is a missing link. As Tozier de la Poterie and Baudoin point out, the framework's underlying principle is to 'integrate local people into top-down plans', rather than to enhance 'partnerships and cross-scale collaborations that are necessary for improved DRR' [11]. In Kuroshio Town, there was strong leadership from the municipality shortly after the 3.31 shock, but they were aware that a mechanism like the staff-in-charge system was necessary to reach 'all' in achieving the 'zero victim' goal of the town. The staff-in-charge system functions as a glue to bring every member of the town together in preparing for the predicted tsunami. A need for such bridging has already been argued

for by researchers who question conventional 'knowledge-transmission' models of preparedness and resilience building [25,38–40]. Some suggestions have been put forward: for example, the use of volunteers as a mediator (glue) between seismologists (experts) and school pupils (laypersons) in a museum setting [41].

This point leads to the discussion on 'engagement'. Society members' attending DRR events, which may appear as 'a participatory approach' and 'community engagement', does not necessarily lead to the acquisition of intended knowledge and skills. There is some evidence to demonstrate this [42]. For people to engage in DRR activities, they need to be proactive exercising agency and to hold the ownership of the activities [26,27,35]. Kuroshio Town's starting point was even more challenging having a large proportion of the population given up evacuation and hometown. In such circumstances, DRR seminars and workshops would not have engaged the population. First and foremost, a philosophical principle to unite people and rebuild their hope had to be disseminated. And then, community-based bespoke DRR was built in collaboration with the research team. In rural communities such as Kumanoura, DRR engagement was very much embedded in their usual life through participating in the monthly forum. Engagement is a complex process of human action, and therefore, how to engage people needs to be based around their conditions. This paper has illustrated the ways in which Kuroshio Town deals with such challenges.

The next question then is whether Kuroshio Town's model is applicable in other towns and cities that are prone to earthquakes and tsunamis. As emphasised earlier, this paper does not intend to position Kuroshio Town's case as the best practice or a successful exemplar. There is a danger in blindly copying their policy and practice to other contexts. As comparativists have warned, cautious considerations of the differences of the contexts are the prerequisite of policy-borrowing (e.g., [43–45]). One feature specific to Kuroshio Town is their strong attachment to the town and a high degree of social capital probably stemming from the fact that many officials, including the town mayor and the members of the senior management, as well as the residents are originally from the town. Their model has made the most of this feature. The town mayor was highly aware of it and commented: 'Our methods work for us because of Kuroshio Town being Kuroshio Town. If I was a mayor in a big city like London, I would have to do differently, probably using pubs to engage people.' His words suggest that appreciating context is the key to all-of-society engagement.

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