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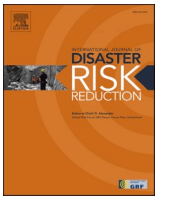

Unsustainable development, disasters and displacement: Revisiting the governance challenge

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A B S T R A C T

The increasing frequency and magnitude of disasters – many of which are considered to reflect intensifying climate change – are leading to more collisions between environmental hazards and unsustainable and/or irresponsible development practices that trigger displacement. Displacement in the context of disasters and climate change has been attracting much attention in recent years, while the complexities of development-induced displacement are well-documented in the forced migration field. Yet, the intersection between unsustainable development, disasters and displacement remains inadequately examined. The context that enables the nexus between unsustainable development and disasters to form, and the implications it carries for addressing displacement raises complex governance challenges.

This article aims to promote greater reflections on such context and some of these challenges by examining the case of 2021 Atami mudslide disaster in Japan, where the collapse of inappropriately constructed landfill located on top of the affected area has been identified as a major factor. The analysis considers the underlying circumstances within which this disaster occurred by examining relevant legacies from Japan's post-war developmentalist era. It also reviews relevant policy and regulatory frameworks pertaining to territorial development and disaster risk reduction and management, revealing how fragmentation between these policy domains impact on the ability to address displacement in multi-hazard situations. The conclusion highlights the policy implications that this case raises about the feasibility of existing administrative and regulatory set-ups to supervise and enforce corrective measures when it comes to unsustainable and/or irresponsible development practices and projects that magnify existing risks of disasters and displacement.

1. Introduction

Displacement in the context of disasters and climate change has been attracting increasing policy attention over the recent years (eg. Refs. [1–3]. Meanwhile, how development projects could lead to displacement is well-documented in the forced migration field [4–6]. The link between unsustainable development model pursued since the industrial revolution, which resulted in massive amounts of greenhouse gas emissions, and acceleration of climate change is now established as scientifically 'unequivocal' [7]; p.5). In this context, it has been observed that 'development activities globally are recognized as being in need of 'climate proofing' to ensure they are sustainable' [8]; p.18). Nonetheless, this recognition is not necessarily promoting greater awareness that more frequent and intense disasters – often exacerbated by the adverse effects of climate change – also increasingly collide with unsustainable and/or irresponsible development practices in triggering displacement [9]. Intensification of natural hazards pressures the sustainability of previous and on-going development practices and projects, including the very structural measures implemented to reduce the risks of disasters [10]. It means that 'current regulations and design levels for structural measures may be inadequate under conditions of

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climate change' [11]; p.293). Likewise, measures intended to mitigate or address disaster risk, including the adverse effects of climate change could, also result in the transfer of risk in time, or across geographical locations, policy sectors and/or population groups thereby creating new or exacerbating existing development challenges [12]. Effectively, the risk of disasters resulting from a combination of environmental hazards and unsustainable/irresponsible development practices and projects and consequently triggering complex displacement situations is on the rise. Such risk is not solely a concern for low-income countries with weak institutions and regulatory frameworks. It is also present in high-income countries with well-established regulatory frameworks for disaster risk reduction and management (DRRM), and territorial development, including urban planning and land use [13]. The context that enables the nexus between unsustainable development and disasters to form, and the implications this context carries for addressing displacement raises complex governance challenges.

This article aims to promote greater reflections on such context and some of these challenges by examining the case of 2021 Atami mudslide disaster in Japan and its underlying circumstances. The collapse of the inappropriately constructed, massive landfill site located above the affected area has been identified as the major factor in this disaster. While the scale of resulting displacement has been relatively limited, the recovery process is likely to be complex and protracted. Examining this case primarily from a political and governance perspective, this article exemplifies how the nexus between unsustainable development and disasters is enabled by the historical trajectories and processes, gaps in policy and regulatory frameworks and their on-the-ground compliance, and complicate the process of resolving displacement that occurs at this nexus. Through this analysis, it seeks to contribute to the literature that critically considers the broader 'hazard and disaster environment' [14]; p.17) and the governance challenges that it reveals. In this respect, particular attention is paid to the combined effects of different socio-political processes that set the overall context within which disasters take place and within which responses to their consequences, including displacement, evolve [15]. The analysis draws on Japanese and English language sources including policy and legal documents, official records and reports, media releases, as well as academic literature. It is based on a review of sources covering a diverse range of topics including DRRM, territorial development and land use, urban planning, public administration reform, as well as human mobility and displacement in the context of environmental change. In the process of identifying relevant legal and policy documents in Japan, the author also consulted with two experts knowledgeable about regulatory frameworks pertaining to territorial development, land use and urban planning in the country, who pointed to some of the most relevant instruments to review.

This article is organised as follows: after reviewing literature on the key concepts for understanding the intersection between development, disasters and displacement, section 3 outlines the relevant sequence of events in the Atami mudslide disaster. Next, section 4 positions these events within the wider analysis of the legacies from Japan's post-war developmentalist era that provide the underlying context for this disaster. Expanding on this analysis, section 5 reviews relevant regulatory frameworks pertaining to DRRM, and territorial development in Japan, and the extent to which these are equipped to address multi-hazard disasters and displacement. The last section 6 concludes by considering the implications of Atami's case for promoting further reflections on the nexus between unsustainable development, disasters and displacement more broadly.

2. Development, disasters and displacement: review of key concepts

Despite the widespread, uncritical usage of the term 'natural' disaster in most popular and policy discourses, existing research from across social sciences clearly showcases that there is nothing 'natural' about disasters (eg. Refs. [16–19]. Reviewing the evolution of how disasters have been conceptualised, Perry notes that 'it is now generally acknowledged that […] humans "cause" virtually all forms of occasions we label as "disasters"' (2018, p.17). In this context, exposure and vulnerability are seen to define who is impacted and how badly by processes of environmental change (including disasters and climate change), while resilience is considered indispensable for adapting and/or recovering from shocks. Both of these ends are understood to be shaped by a complex interplay of social, economic, political and environmental factors [12,20–22]. Considering the evolution of disaster and development paradigms, Collins argues that the impact of and responses to disasters and how these affect wider development trajectories have to be situated within the context of 'multileveled […] societal relations and systems of meaning' (2019, p.489) that encompass relations from international to household level, as well as beliefs, values, attitudes of individuals and societies more broadly. This underscores the need to consider the embeddedness of disasters by focusing on the context within which such disasters occur and their consequences take shape. Noting the varying degree of integration of these conceptual developments into different academic and policy discourses, it has been observed that:

> '[…] a majority of disasters have come to be considered closely linked to development. That linkage is viewed conversely in two manners. In one, it is seen as having enhanced people's resilience, particularly through augmented technology. On the other, processes linked with or driven by development have also been found to result in increased vulnerability and exposure.' [23]; p. 10)

Studies that also include an explicit focus on displacement engendered by the negative side of this link between disasters and development, however, are hard to find. Within discussions on the nexus between environmental change, including climate change, and human mobility, there is a tendency to view migration as an adaptation strategy that enhances resilience, whereas displacement is associated with lack of resilience and failure to adapt [24,25]. At the same time, displacement that has hitherto been dealt with as a primarily humanitarian issue is being increasingly perceived as an issue of longer-term resilience and development (eg. Refs. [1,2]. Specifically, there is an emerging realisation that preventing, mitigating and addressing displacement in the context of environmental factors has to be done through cross-sectoral efforts across humanitarian, DRRM, climate change adaptation, and sustainable development fields [26–28]. Hereunder, displacement is also being recognized as an urban development and spatial planning challenge, and

recent policy processes such as UN Secretary-General's High-Level Panel on Internal Displacement have highlighted the importance of supporting local authorities and other municipal actors to cater for the needs of displaced people living in cities [2,29]. However, such discussions have been mostly informed by analyses from cities in developing countries that attract displaced populations, driven primarily by conflict or violence, albeit such drivers are often exacerbated by environmental factors [30,31]. In the contexts of disasters and climate change it has been noted that 'urban disaster displacement risk is largely determined by the way cities are planned, developed and built' [32]; p.83) and by patterns of exposure and vulnerabilities that are often segregated within cities.

At the same time, being the sites for large scale infrastructural and/or urban renewal initiatives, the development and upgrading of cities is often accompanied by displacements, whether in the explicit form of evictions or through more tacit processes of gentrification [32–34]. Towards this end, recent studies have examined the deployment of resilience narratives in urban and spatial interventions and documented how interventions to promote resilience to disasters and climate change could result in development that exacerbate pre-existing and/or create new forms of vulnerabilities. For example, a study of climate actions plans of Copenhagen and New York notes the prominence of a 'infrastructure-first' approach which 'assumes that if buildings and other physical assets are kept safe, then residents themselves will be kept safe as a result' [35]; p.85). This simplistic approach promotes an apolitical understanding of resilience, which instead of addressing complex root causes of vulnerability at the level of lived realities, promotes fortification of built environment that serves the neoliberal interests of urban elites [35]). Similarly, an analysis of post-Hurricane Katrina New Orleans observed that top-down recovery plans 'assumed that communities would take care of their own survival and be self-resilient, but these assumptions only reinforced pre-existing, pre-disaster inequalities' [36]; p. 83). However, in localities where strong civil society and social capital existed this hands-off approach taken by the authorities have prompted 'bottom-up resilience, as neighborhoods mobilized in the recovery period by outflanking city and federal policy' [36]; p. 83). Revealing the inherently contested nature of resilience narratives, these studies illustrate how such narratives could be (mis)used to promote urban development/recovery initiatives that advance the interests of the powerful, while reinforcing the susceptibility to disasters and displacement among the vulnerable.

Combined, existing academic literature and policy discussions provide valuable insights into the different conceptualisations of vulnerability, resilience, (urban) development and displacement in the context of disasters and climate change and their governance implications. However, the underlying context that shapes the nexus between unsustainable development and disasters, and its

Fig. 1. Map of Japan indicating locations of Atami and Shizuoka prefecture. Created by the author.

implications for addressing displacement triggered by the intersection of these phenomena appears to be inadequately examined. The article seeks to promote more explicit focus on the factors underlying the intersection between unsustainable development, disasters and displacement through the case study of the 2021 Atami mudslide disaster in Japan. As detailed in the next sections, this case provides ample scope to examine the historical trajectories and socio-political processes that paved the way for unsustainable and/or irresponsible development practices, and for these practices to increasingly collide with intensifying natural hazards, and to trigger disasters and displacements with complex governance implications.

3. The 2021 atami mudslide disaster

Atami is a well-known coastal resort city famous for its hot springs located in the northern end of Shizuoka prefecture, about 100 km south-west from Tokyo, as shown in Fig. 1. Its districts are spread across steep slopes and narrow valleys facing the Pacific Ocean and as of July 2021 the city had a registered population of 35,472 people [37,38]. The mudslides occurred in Atami city's Izusan District on July 3, 2021 following several days of intense rain. Between June 30 and the time of disaster's occurrence in the morning of July 3, rainfall recorded in the area reached 400 mm, which is 1.5 times more than the average rainfall for the whole month of July known to be the rainiest month in this part of Japan [39]. Within several days after the disaster, it was pointed out that the collapse of inappropriately constructed, massive landfill site located above the affected area was the major aggravating factor in the mudslides [40]. The disaster wiped out parts of the neighbourhood on its way causing 27 deaths, with one person still declared missing as of March 31, 2022 [41]. Owing to the topography of the Izusan district built on a steep mountain slope, the area that was hit by several waves of mudslides was relatively narrow in width (120 m at most), but almost 2 km in length, running all the way from the top of the mountain and into the ocean.

Approximately 600 people were in evacuation facilities immediately after the disaster but by October 21, 2021 all such facilities were closed, with most displaced residents resettled into public housing or rented flats appropriated as temporary housing [42]. As of March 2022, 144 persons continued to reside in temporary housing, while 42 persons were living with relatives or friends [41]. Although the scale of displacement caused by the mudslides ended up being relatively limited, the recovery of the affected area is likely to take years, posing a particularly lengthy process for the displaced residents. In fact, the impact of the disaster has been highly heterogeneous with some houses standing intact, while their next-door neighbours' houses swallowed by the mudslides without a trace, and still others only being considered to be partially damaged, albeit the extent of such damage varies greatly. In addition, the Atami city's designation of the affected area as a restricted zone, which prevents residents from returning to existing houses or rebuilding damaged houses located there at least until the construction of sediment control facilities above the area will be completed, is feared to exacerbate the differentiated pace of recovery across the district and disrupt the local community [43,44]. Towards this end, experiences from other disasters in Japan has shown that the more heterogeneous the damage that different people and communities suffer, the greater tends to be the difference in applicable policy measures. These differences in turn lead to disparities in the post-disaster/displacement trajectories of individuals, thus often also giving rise to lasting intra- and inter-community divisions [45–50]. Given the relatively recent nature of the Atami disaster, its displacement outcomes are not yet entirely clear. However, existing reports of post-disaster experiences of displaced residents already reveal significant differences: some households returned relatively quickly, others had to move to temporary housing in other districts or even municipalities, and in some cases members of the same household had to move into separate accommodation [51]. Moreover, the survey of displaced residents conducted by Atami city in November 2021 revealed that while 76% of residents over 70 years of age wished to rebuild locally, 69% of residents in the active age group between 20 and 69 years preferred to relocate [38]. This also suggests that the disaster and displacement experience may have lasting impact on local community composition. Thus, despite the relatively limited scale of displacement caused by the mudslides, the complexity that such displacement adds to the individual and community recovery processes should not be underestimated. Furthermore, the fact that the landfill site above the district has played a major role in the mudslides adds a particularly contentious dimension that calls for identifying the locus of responsibility for this deadly disaster [52].

In Japan, as in many other countries with well-developed bureaucratic systems of public administration, local governments are charged with primary responsibilities to ensure that development projects taking place on their territories comply with relevant laws and regulations [53]. Atami city received the construction plan for the landfill site in question from the real estate development company in 2007. The company obtained ownership of the land in 2006 and initially filed an application for a residential development, but later changed this to a landfill site for leftover soil from other construction projects in 2008 [54]. Soon after the construction began, however, it became clear that the scale of the development was much larger than indicated in the plan submitted to the city [55]. In response to this, local authorities issued an 'administrative directive' to the developer company stating that it was violating relevant regulations [54]. In 2010, the city administration also requested the company to remove the industrial waste which was found to be mixed into the soil that was used to construct the landfill [55]. These requests from the local authorities were not heeded, and in 2011 the company sold the site to another owner, who claims to have known nothing about the oversized landfill [52,54]. After the mudslides, it became clear that the landfill site had a height of at least 50 m, instead of 15 m that was indicated in the original construction application, and contained about 74,000 cubic metres of sand and dirt, instead of the originally indicated 36,000 cubic metres [56]. The calculations done by the prefectural authorities following the disaster have shown that a landfill of the parameters indicated in the application submitted by the developer would be capable of containing between 6000 and 8500 cubic metres of soil at most [54]. This indicates that the authorities have originally overlooked grave inconsistencies in the application, which clearly underlined the highly unsound nature of this development project.

Official investigations are still on-going. From the materials revealed so far, however, it has become clear that local authorities were aware of the potential danger posed by the landfill site as early as in 2009, and that several officials were concerned that the city 'could

be held liable for damages caused should the landfill collapse' [57]. Realising this, Atami city continued to issue administrative directives requesting the developer to implement disaster prevention measures, but these were ignored. In 2011, local authorities were preparing to scale these up and issue an 'administrative order', but before this was done, the company agreed to implement the measures to stop the soil loss and to ensure drainage of the groundwater from the landfill site [54]. However, the construction works for these measures stopped before they were completed without local authorities following up. After the mudslide disaster, a third-party committee was appointed to examine whether the local authorities' actions at that time were sufficient and appropriate [58]. The Committee's report, released in May 2022, concluded that there were systemic failures in how this development project was handled both at the level of Atami city and Shizuoka prefecture and noted that the disaster could have been prevented or at least mitigated if appropriate steps were taken by the authorities. Hereunder, the report found that by initially overlooking the highly unsound nature of this development project, the authorities subsequently became hesitant to take more decisive actions towards the developer. At the same time, it revealed lack of cooperation between the city and the prefecture, which prevented the two governance levels from actively exchanging information and seeking mutual support [41].

After the Atami mudslides, the central government allocated a special budget to inspect over 36,000 similar landfill sites across Japan for their potential to be in violation of existing regulations and/or to pose disaster risks [59]. The express inspections conducted so far revealed that nearly 1100 sites were problematic in at least one of the above aspects, and the government announced further budgetary measures to support local authorities with conducting more detailed investigations and taking necessary DRRM measures [60]. These are likely to take years to complete. At the same time, a legislative amendment was passed in May 2022 by the House of Representatives, the lower house of National Diet in Japan, introducing common standards for regulating landfill sites above certain proportions across Japan. The details of operationalising this amendment are still being decided, and it is first expected to come into effect around May 2023 [61]. Meanwhile, a group of residents affected by the mudslide filed a lawsuit demanding compensation from the developer company that constructed the landfill site and the site's present owner in September 2021 [62]. Furthermore, a group of people who lost relatives in this disaster filed a homicide complaint against the same company and the site's owner in December 2021 [63].

In the light of these developments, the Atami mudslides have been increasingly framed as a 'human-made disaster' [58,62,64]. In essence, however, this is yet another disaster that has shown that local governments in Japan lack both financial and human resources to monitor, supervise and most importantly enforce relevant regulations when it comes to development projects. The same resource shortages also pose significant challenges for local authorities' abilities to perform their DRRM responsibilities, especially in disaster response and recovery processes [65]. In fact, despite being relatively localised, the mudslide disaster quickly overwhelmed the city administration of Atami, and additional staff members were sent in from other municipalities to support the response and recovery activities [42]. The complexities of dealing with a disaster where an unsustainable/irresponsible development project played a major role, and where the responsibility of local authorities is being questioned further adds to the overall recovery challenge. In particular, the fact that the local government failed to enforce relevant regulations and stop construction of the oversized landfill, while having been aware of the risks posed by this project, raises serious issues of trust and accountability [58,64,66].

4. The underlying context: the legacies of post-war developmentalist era

Sediment disasters such as mudslides and landslides are essentially endemic in Japan given its mountainous terrain and location in a seismically active part of the globe. In recent years, however, the occurrence of such disasters is becoming far more frequent owing to the unprecedented levels of torrential rains that many parts of Japan have been experiencing [67]. In this respect, the 2021 Atami mudslides are also yet another disaster illustrating that the risk of sediment disasters has been aggravated by Japan's history of urbanisation and territorial development. Growing population and housing needs in the post-war decades of modernisation and rapid economic growth spurred often uncontrolled, or at best poorly regulated urban and territorial development projects in many parts of the country [68]. During this period the central government took a leading role in designing and funding territorial development plans that centred on infrastructural and industrial development using massive public investments [69]. This top-down developmentalist approach to modernisation is said to have:

> 'nurtured and fostered a particular mentality among local government officials, where they came to think of "regional development" as something that they can achieve by incorporating themselves into national projects.' [70]; p.19)

In other words, this mentality discouraged local governments to take their own initiative and promoted dependency on public work investments from the central government thus crystalising Japan's orientation as a 'construction state' that heavily favoured grandiose infrastructure development projects [71,72,73]. This development model led to various forms of population displacements and relocations in many parts of the country although their exact numbers are not known, given that research is scarce and primarily focused on communities relocated by dam projects (e.g. Refs. [74–76]. During the post-war decades the country underwent significant transformation which also carried heavy toll on its environment as described below:

> 'Japan has been crisscrossed by roads and expressways; rivers have been concreted, dammed, and straightened; mountains have been leveled, tunneled, sculpted, denuded, and concreted; wetlands have been paved over; and bridges have spanned rivers, lakes, estuaries, and seas in an archipelago that has the highest per capita cement consumption in the world' [72]; p.39).

Even after the oil crisis of the 1970's ended the post-war high-growth era, and the collapse of the bubble economy in the early 1990's marked the beginning of Japan's long-term economic stagnation, massive construction projects continued to be justified as an end in themselves [71]. According to Kingston, the presence of powerful vested interests attached to such projects means that 'the logic

of the construction state does not rest on need and its benefits are enjoyed most by a select few' (2005, p.39), primarily from the construction industry and its political patrons. In this context, the fact that Japan is intrinsically disaster-prone has often been side-lined [77].

Massive public investments into infrastructural projects finally slowed down after neoliberal administrative reforms took hold in 2000's. Following the enactment of the Omnibus Decentralisation Act in 2000 many of the territorial development activities and responsibilities were delegated to local governments at prefectural and municipal levels [69]. In principle, this enabled local authorities to introduce policies, regulations and bylaws suited to their respective circumstances. However, more autonomy came with strings attached as the subsequent fiscal reform obliged local administrations to cover greater share of costs in implementing projects across all sectors and demanded greater efficiency [78]. This left many local authorities cash-stripped and short-staffed: an issue that continues to constrain their ability to properly implement and/or supervise both DRRM and territorial development activities as discussed in section 3.

Around the same time, another legacy of Japan's 'construction state' era became increasingly visible: namely, the shortage of dumping sites for surplus soil that is an inevitable by-product of construction projects [79,80]. During the developmentalist era much of this soil was reused in land reclamation projects, for example by building artificial islands in port areas, but such projects are rare today [79]. In fact, surplus soil is not considered as waste under the current legislation and is thus not covered by Japan's industrial waste regulations. Instead, it is left to be regulated by local bylaws, but even where such bylaws are enacted, their enforcement remains a challenge [79,80]. Thus, it is not unusual that soil excavated from construction projects, and often mixed with other types of industrial waste, is dumped illegally or covered up in poorly constructed landfill sites that disregard safety standards [80].

Towards this end, the legislative amendment to the Act on Regulation of Residential Land Development (Act No. 191 of 1961) passed after the Atami disaster, as mentioned in section 3, sets the common standards for regulating such landfill sites. Given that landfill sites have been hitherto only regulated by local bylaws with great disparities, this is an important step. However, it leaves the question of surplus soil – the root cause for many of the dangerous landfill sites – out of its scope [81]. According to the government, the issue of surplus soil is under consideration to be regulated separately through an amendment to an Act on the Promotion of Effective Utilization of Resources (Act No. 48 of April 26, 1991). However, the government has also voiced caution with regulating this area since 'it should not lead to overregulation of economic activities' [82]: n. p.). Regulating the questions of surplus soil and landfill constructions through amendments to different bodies of law will make them fall under mandates of separate ministries, thus laying the ground for fragmented governance of an essentially interconnected issue.

5. Addressing disaster displacement in the context of fragmented governance

The state of regulatory frameworks and the degree of fragmentation across them is another important aspect to consider when it comes to the intersection between unsustainable development practice and disasters. In Japan, as in many other parts of the world, 'institutional specialization of policies for specific sectors has resulted in a lack of consideration of environmental impacts' [83]; p.233). In effect, territorial development and DRRM continue to be largely siloed policy domains both at national and local levels [84], with the issue of disaster displacement remaining poorly addressed in both of these areas.

The regulatory framework governing Japan's urban and land use planning is comprised of multiple land use regulations and zoning codes introduced through a series of piecemeal adjustments and revisions in the post-war decades. According to Akashi, the state of this framework can be compared to 'an old house that has been repaired, rebuilt, units added whenever problems arose without a clear-cut concept or total plan' (2007, preface). While this framework is heavy on the regulatory side, its visionary part outlining overall policy directions and strategies for their implementation is considered to be less developed [53]. The existing City Planning Act (Act No. 100 of June 15, 1968) only covers the so-called 'City Planning Areas', which are designated by prefectural authorities [68], and does not specify any measures pertaining to disaster prevention and recovery, which are left to be specified in the laws comprising the DRRM framework. Essentially, this creates a fragmented approach to DRRM on the one hand, and urban planning, land use and development on the other, and explains why DRRM measures have for long been side-lined in many of Japan's territorial development projects [84].

Some steps have been taken to reconcile the divide between territorial development and DRRM policy areas during the last two decades, and Japan's experience with recurring sediment disasters played a role in this respect. During the decades of rapid urbanisation, DRRM in this area concentrated on the construction of structural measures in the form of sediment control facilities in areas prone to mudslides and landsides. However, the construction of these facilities has not been able to keep up with the pace of urban sprawl and rapid conversion of hillsides and steep slopes into residential neighbourhoods. In fact, it was not until the enactment of the Act on Sediment Disaster Countermeasures for Sediment Disaster Prone Areas (Act No.157 of 2000), following deadly landslides in Hiroshima city in 1999, that certain DRRM elements were introduced into land use and development controls [84,85]. Specifically, the Act tasks local governments to identify and designate high-risk and special high-risk zones for sediment disasters, to inform the residents about such designations through hazard maps, and to establish early disaster and evacuation warning systems for such areas [86]. In special high-risk zones, the law also provides for licensing of residential development, application of enhanced building codes, and some limited support measures for promoting relocation of buildings that are deemed to be particularly vulnerable to damage from sediment disasters [85,86]. The zoning designation on which this law is premised, however, has been progressing slowly. In risk-prone urban areas, designations under this law are often met with resistance from local residents, who fear that it would result in significant drop in land and properly prices in their areas [84]. Following the 2014 landslides and debris flows in Hiroshima, which claimed 75 lives, the zoning has speeded up somewhat, and as of September 30, 2021 there were 565,305 areas designated as special high-risk zones across Japan [87]. However, promoting relocation remains extremely difficult, not least because subsidies foreseen by the Act only cover a miniscule part of the costs associated with this process. Existing research suggests that as of August 1, 2015, only 76

households have been relocated using this scheme across Japan [88].

It should be noted, however, that the Act on Sediment Disaster Countermeasures only addresses the risks of sediment disasters of natural origin, while the risks posed by artificially constructed soil mounds and landfills falls outside its scope. In fact, during the six years that it took local authorities to complete assessment and designation of Atami's Izusan district according to this law, the massive soil mound that played a major role in the 2021 mudslides, was being constructed right above the designated high-risk zones [41]. While the legislative amendment passed after the Atami disaster, explained in section 4, seeks to addresses the risks posed by such landfills, whether it could actually ensure comprehensive prevention of similar disasters will depend on its implementation. Towards this end, as mentioned in section 3, the investigations into Atami disaster showed the deadly side-effect of existing regulatory compartmentalisation by revealing how relevant authorities at city and prefectural levels failed to cooperate in regulating the land development project posing a significant disaster risk.

Policy and regulatory compartmentalisation are also endemic in Japan's DRRM framework with significant implications for addressing disaster displacement. The regulatory backbone of Japan's DRRM framework consists of the Basic Act on Disaster Control Measures (Act No. 223 of November 15, 1961) and the Act on Special Financial Support to Deal with the Designated Disaster of Extreme Severity (Act No. 150 of 1962). Reflecting the legacy of the 'construction state' era discussed in section 4, these instruments fixate the focus of disaster risk reduction and recovery activities on upgrading and/or reconstructing physical infrastructure by stipulating provision of large subsidies from the central government to affected local governments for that purpose. In turn, the Disaster Relief Act (Act No. 118 of October 18, 1947) stipulates short-term provision of relief items in the immediate post-disaster phase. In effect, the existing displacement-related provisions primarily concern disaster evacuations, reflecting the deep-seated assumption that disaster displacement is a short-term phenomenon that can be prevented through upgrading infrastructure and resolved through providing affected individuals with limited material assistance to restore housing. Such an approach essentially overlooks that resolving one's housing situation, while critical, is not enough to indicate that displaced people have found sustainable solutions to their situations. As experience from other disaster displacement situations in Japan has indicated, the search for such solutions, among other things, also requires restoration of livelihoods and communities, both of which are indispensable for enabling individuals to regain a sense of security, belonging and self-worth and to achieve longer-term well-being [46,47,50,89]. By not paying sufficient attention to these aspects, Japan's DRRM framework does not posit the needs of disaster-affected people nor the search for solutions to their situations at the centre [47,90]. The lack of people-centred focus is also evident from the fact that legislative measures aiming to provide support for the disaster affected populations, including the displaced, have been introduced in piecemeal manner, most often at the initiative of National Diet members in the aftermath of major disasters, rather than being comprehensively proposed by ruling administrations holding the office [91]. Such measures, however, are essentially ill-suited for dealing with protracted displacement situations, especially in complex, multi-hazard situations [13,47] and, as discussed in section 3, displacement caused by Atami mudslides falls into this category.

Currently, long-term needs of disaster-affected populations that fall through the cracks of the regulatory systems are only partially met by the civil society and/or by the private sector service providers. The involvement of such actors has significantly increased over the past decade and particularly since the March 2011 earthquake, tsunami and nuclear disasters that clearly illustrated the limitations of the roles local authorities could realistically assume in response to large-scale, complex disasters [91]. Ironically, the unprecedented amounts of subsidies that were provided to affected municipalities in the aftermath of the 2011 triple disasters led to excessive infrastructural reconstruction and upgrading projects in communities suffering from rapid ageing and depopulation without questioning long-term sustainability of such projects [47,73]. Local recovery plans had to be hastily prepared, leaving local authorities with little time for foresight, deliberations and meaningful engagement with the affected people and communities [46,90]. Overall, this model of recovery resulted in multiple secondary consequences revealing how vulnerabilities triggered by the disasters and displacement eventually became intertwined with deep-rooted structural issues such as regional inequalities, economic marginalisation and social alienation [47,92].

In Atami, residents affected by the mudslide disaster have been asking the city not to repeat such mistakes and requesting it to systematically include their voices into recovery plans and provide support to those remaining displaced [44]. In response, the city has taken steps to enhance representation of affected residents in the recovery planning committee and has promised to consult with displaced residents as well as other residents of the affected district more broadly in navigating the recovery process. Towards this end, the proposed recovery plan also aims at restoring community ties and providing tailored support to the most vulnerable households, besides implementing structural risk reduction measures and rebuilding the physical infrastructure [93]. However, given that the city authorities are essentially reliant on the prefectural authorities and the central government to fund their recovery, how the recovery process would actually evolve and whether it could avoid falling into recovery pitfalls revealed by earlier disasters remains to be seen. More broadly, however, the follow-up policy responses and discussions since the Atami disaster, as outlined in sections 3 and 4, have primarily focused on regulating disaster risks of development activities, and seem to boil down to some partial legislative amendments. Essentially, the complexities of displacement resulting from combined effects of development activities and disasters continue to be overlooked in such discussions. In this sense, vital opportunity to promote critical reflections on displacement implications at the intersection between unsustainable development and disasters is being lost.

6. Conclusion

The unsustainability of past as well as ongoing development practices and projects, and the deficiency of the relevant policy and regulatory frameworks are becoming increasingly evident in the context of more frequent disasters and intensification of the climate change. Towards this end, it has been pointed out that 'development and disasters have become increasingly difficult to disentangle as

causes of displacement' [9]; p.46). The case of Atami mudslides disaster clearly exemplifies the context in which intensification of environmental hazards combines with unsustainable/irresponsible development practices and projects to trigger disasters that in turn result in displacement situations with complex consequences. This article has explored the underlying factors shaping such context by examining the legacies from Japan's post-war developmentalist era, and by considering the state of its regulatory frameworks pertaining to territorial development and DRRM, and the implications this carries for addressing displacement in multi-hazard situations. The tradition of large-scale public investments into grand infrastructural projects have set the trajectory of Japan's post-war development at the same time as it has shaped Japan's orientation in territorial development and DRRM domains. While the country's rapid post-war economic growth has fuelled often uncontrolled urban sprawl characterised by the development of areas highly susceptible to natural hazards, including sediment disasters, the methods to reduce such risks have primarily relied on structural measures, such as building sediment control facilities. Even after a development model reliant on massive public spending has become unviable due to decades of economic stagnation, institutional inertia at both central and local government levels continued to fuel policies that favoured physical infrastructural development as the method for driving both disaster prevention and recovery.

Japan's territorial development and DRRM frameworks are therefore well-developed when it comes to hard, structural measures, but are short on soft, non-structural measures that are needed to swiftly and flexibly respond to disasters and displacements in multi-hazard situations. Furthermore, existing silos between these two frameworks mean that many development practices and projects are unchecked for their ability to withstand the increasing pressure of natural hazards, which are becoming more frequent and intense in recent years. The fact that resource-constrained local governments are charged with leading DRRM activities and overseeing regulatory compliance of territorial development projects also turns implementation and enforcement of existing regulations in these areas into an aspirational goal, that is hardly achievable in practice. The combination of these factors creates a situation in which DRRM as well as territorial development set-ups at both national and local levels are not fit to deal with intensifying risks of disasters and displacements heightening in the context of the climate change. Even if Japan has experienced many disasters over the past decade that should have led to awakening moments, opportunities for learning important lessons and introducing concrete mechanisms for cross-policy coordination have been missed. Unfortunately, thus far Atami mudslides seem to be no exception in this respect.

Japan's post-war developmental trajectory may have been unique in many ways. However, the disasters it has been experiencing during the recent decade, including the case of Atami mudslides, should nonetheless serve as a cautionary tale prompting policy makers at both domestic and international levels across the world to reflect on the governance challenges posed by the nexus between unsustainable development, disasters and displacement. First, the Atami disaster highlights the need to review whether existing governance structures are realistically fit to deal with situations where effects of unsustainable development collide with natural hazards and increase the risk of multi-hazard disasters. This review must consider whether sufficient institutional links exist between different governance levels but also between regulatory frameworks that are often compartmentalised across different policy domains. Second, the Atami disaster exemplifies the limitations of local administrations' abilities to audit developers, assess the soundness and risks posed by their activities, require compliance, and deal with complex consequences of disasters and displacements, where such development projects are implicated. Towards this end, it illustrates the need for administrative set-ups that enable different governance actors, not just to oversee, but jointly collaborate in the review of development projects and their DRRM implications before and after these are approved. At the same time, key checkpoints should be established integrating stakeholders beyond the government to properly evaluate the extent to which such projects are able to withstand intensifying environmental pressures. Finally, the Atami mudslide disaster should also serve as an important reminder for industrialised and industrialising countries alike that displacement situations that occur at the intersection of unsustainable development and disasters inevitably raise fundamental questions about trust and accountability. Recent international policy discussions on displacement have highlighted that genuine political will and whole-of-government approach to positioning the voices and needs of affected people at the centre could go a long way to address these questions [2]. Yet, while acknowledging the contribution of disasters and development projects as respective drivers of displacement, such policy discussions have not explicitly addressed the nexus between unsustainable development, disasters and displacement. Going forward, more research examining the context underlying this nexus is needed to identify systemic barriers that inhibit comprehensive approaches to addressing this issue and to promote discussions on how to overcome these barriers both domestically and internationally.

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References

[1] Internal Displacement Monitoring Centre (IDMC), Global Report on Internal Displacement 2021, IDMC, Geneva, 2021. https://www.internal-displacement.org/sites/default/files/publications/documents/grid2021_idmc.pdf. (Accessed 3 February 2022). accessed on.

[2] United Nations Secretary General's High-Level Panel on Internal Displacement (UNSG's HLP), Shining a Light on Internal Displacement: A Vision for the Future. Report of the United Nations Secretary General's High-Level Panel on Internal Displacement, 2021. United Nations. September 2021, https://www.internaldisplacement-panel.org/wp-content/uploads/2021/09/HLP-report-WEB.pdf. (Accessed 30 September 2021).

[3] M. Chazalnoel, A. Randall, Migration and the slow-onset impacts of climate change: taking stock and taking action, in: M. McAuliffe, A. Triandafyllidou (Eds.), World Migration Report 2022, International Organization for Migration (IOM), Geneva, 2021, pp. 233–252. https://publications.iom.int/books/world-migration-report-2022. (Accessed 3 February 2022). accessed on.

[4] C. de Wet, Improving outcomes in development-induced displacement and resettlement projects, Forced Migr. Rev. 12 (January 2002) (2002) 6–9.

[5] B. Wilmsen, M. Webber, What can we learn from the practice of development-forced displacement and resettlement for organised resettlements in response to climate change? Geoforum 58 (2015) 76–85, https://doi.org/10.1016/j.geoforum.2014.10.016.

[6] M. Cernea, J. Maldonado, Challenging the prevailing paradigm of displacement and resettlement, in: M. Cernea, J. Maldonado (Eds.), Challenging the Prevailing Paradigm of Displacement and Resettlement, Routledge, London and New York, 2018, pp. 1–42.

[7] Intergovernmental Panel on Climate Change (IPCC), Summary for policymakers, in: Climate Change 2021: the Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, 2021.

[8] O. Dun, C. McMichael, K. McNamara, C. Farbotko, Investing in Home: Development Outcomes and Climate Change Adaptation for Seasonal Workers Living between Solomon Islands and Australia, Migration and Development, 2020, https://doi.org/10.1080/21632324.2020.1837535.

[9] K. Hoshour, Multiplying displacement impacts: development as usual in a changing global climate, in: S. Price, J. Singer (Eds.), Global Implications of Development, Disasters and Climate Change: Responses to Displacement from Asia Pacific, Routledge, London & New York, 2016, pp. 41–58.

[10] Intergovernmental Panel on Climate Change (IPCC), Summary for policymakers, in: Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, 2022.

[11] S. Cutter, B. Osman-Elasha, J. Campbell, S. Cheong, S. Mccormick, R. Pulwarty, S. Supratid, G. Ziervogel, Managing the risks from climate extremes at the local level, in: C. Field, V. Barros, T. Stocker, D. Qin, D. Dokken, K. Ebi, M. Mastrandrea, K. Mach, K. Plattner, S. Allen, M. Tignor, P. Midgley (Eds.), Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change (IPCC), Cambridge University Press, Cambridge, 2012, pp. 291–338.

[12] I. Kelman, J.C. Gaillard, J. Mercer, Climate change's role in disaster risk reduction's future: beyond vulnerability and resilience, International Journal of Disaster Risk Science 6 (2015) 21–27, https://doi.org/10.1007/s13753-015-0038-5.

[13] A. Mosneaga, 'Turning the narrative on disaster displacement in the global north'. RLI blog on refugee law and forced migration, in: Refugee Law Initiative, School of Advanced Study, University of London, 2021. February 21, 2021, https://rli.blogs.sas.ac.uk/2021/02/11/turning-the-narrative-on-disaster-displacement-in-the-global-north/. (Accessed 21 July 2021).

[14] R. Perry, Defining disaster: an evolving concept, in: H. Rodríguez, W. Donner, J. Trainor (Eds.), Handbook of Disaster Research, second ed., Springer, 2018, pp. 3–22.

[15] A. Boin, P. 't Hart, S. Kuipers, The crisis approach, in: H. Rodríguez, W. Donner, J. Trainor (Eds.), Handbook of Disaster Research, second ed., Springer, 2018, pp. 23–38.

[16] P. O'Keefe, K. Westgate, B. Wisner, Taking the naturalness out of natural disasters, Nature 260 (15) (1976) 566–567. (Accessed April 1976).

[17] A. Esnard, A. Sapat, Displaced by Disasters: Recovery and Resilience in a Globalizing World, Routledge, New York, 2014.

[18] K. Chmutina, J. von Meding, A dilemma of language: "natural disasters" in academic discourse, International Journal of Disaster Risk Science 10 (2019) 283–292, https://doi.org/10.1007/s13753-019-00232-2.

[19] M. Scott, A. Salamanca, Internal displacement in the context of disasters and climate change in Asia and the Pacific: introduction to the volume, in: M. Scott, A. Salamanca (Eds.), Climate Change, Disasters, and Internal Displacement in Asia and the Pacific: A Human Rights-Based Approach, Routledge, London, 2021, pp. 1–17.

[20] B. Wisner, P. Blaikie, T. Cannon, I. Davis, At Risk: Natural Hazards, People's Vulnerability and Disasters, second ed., Routledge, 2003.

[21] J. Ribot, Cause and response: vulnerability and climate in the Anthropocene, J. Peasant Stud. 41 (5) (2014) 667–705, https://doi.org/10.1080/03066150.2014.894911.

[22] K. Hore, I. Kelman, Mercer, J.C. Gaillard, Climate change and disasters, in: H. Rodríguez, W. Donner, J. Trainor (Eds.), Handbook of Disaster Research, *second ed.*, Springer, 2018, pp. 145–159.

[23] S. Hoffman, A. Oliver-Smith, Introduction to the second edition of the angry earth, in: A. Oliver-Smith, S. Hoffman (Eds.), The Angry Earth: Disaster in Anthropological Perspective, second ed., Routledge, London & New York, 2020.

[24] K. Vinke, J. Bergmann, J. Blocher, H. Upadhyay, R. Hoffmann, Migration as adaptation? Migration Studies 8 (4) (2020) 626–634, https://doi.org/10.1093/migration/mnaa029.

[25] W. Kalin, Migration, in: L. Rajamani, J. Peel (Eds.), The Oxford Handbook of International Environmental Law, second ed., Oxford University Press, 2021.

[26] M. Yonetani, Positioned for Action: Displacement in the Sendai Framework for Disaster Risk Reduction, Briefing Paper, IDMC, Geneva, 2017. https://www.internal-displacement.org/sites/default/files/publications/documents/20170216-idmc-briefing-paper-drr.pdf. (Accessed 20 February 2020).

[27] United Nations Office for Disaster Risk Reduction (UNDRR), Words into Action Guidelines - Disaster Displacement: How to Reduce Risk, Address Impacts and Strengthen Resilience, UNDRR, Geneva, 2019. https://www.preventionweb.net/files/58821_wiadisasterdisplacement190511webeng.pdf. (Accessed 20 July 2021).

[28] W. Kaelin, Internal displacement in the context of disasters and the adverse effects of climate change, in: Submission to the UN Secretary-General's High-Level Panel on Internal Displacement by the Envoy of the Chair of the Platform on Disaster Displacement, 2020. https://www.un.org/internal-displacement-panel/sites/www.un.org.internal-displacement-panel/files/27052020_hlp_submission_screen_compressed.pdf. (Accessed 20 July 2021).

[29] IIED, JIPS & UN-Habitat, The Case for Treating Long-Term Urban IDPs as City Residents, IIED Briefing, 2021. http://pubs.iied.org/20431IIED. (Accessed 20 February 2022).

[30] I. Nunez Ferrera, D. Aubrey, L. Earle, S. Loose, IDPs in Towns and Cities – Working with the Realities of Internal Displacement in an Urban World, Submission to the UN Secretary-General's High-Level Panel on Internal Displacement by IIED, JIPS and UN-Habitat, 2020. https://www.un.org/internal-displacement-panel/sites/www.un.org.internal-displacement-panel/files/published_iied_jips_unh_submission.pdf. (Accessed 20 July 2021).

[31] L. Earle, D. Aubrey, I. Nunez Ferrera, S. Loose, When internal displacement meets urbanisation: making cities work for internally displaced people, Refug. Surv. Q. 39 (4) (2020) 494–506, https://doi.org/10.1093/rsq/hdaa028.

[32] Internal Displacement Monitoring Centre (IDMC), Global Report on Internal Displacement 2019, IDMC, Geneva, 2019. https://www.internal-displacement.org/sites/default/files/publications/documents/2019-IDMC-GRID.pdf. (Accessed 20 February 2022). accessed on.

[33] M. Zuk, A. Bierbaum, K. Chapple, K. Gorska, A. Loukaitou-Sideris, Gentrification, displacement, and the role of public investment, J. Plann. Lit. 33 (1) (2018) 31–44, https://doi.org/10.1177/0885412217716439.

[34] H. Bedi, J. Levitt Cea, Women and development-forced evictions: realities, responses and solidarity, Dev. Pract. 29 (8) (2019) 1040–1052, https://doi.org/10.1080/09614524.2019.1615036.

[35] C. Camponeshi, Narratives of vulnerability and resilience: an investigation of the climate action plans of New York City and Copenhagen, Geoforum 123 (2021) 78–88, https://doi.org/10.1016/j.geoforum.2021.05.001.

[36] G. DeVerteuil, O. Golubchikov, Z. Sheridand, Disaster and the lived politics of the resilient city, Geoforum 125 (2021) 78–86, https://doi.org/10.1016/j.geoforum.2021.07.004.

[37] Atami City 熱海市, Population and Household Figures 2021 by Month and District (2021年地区・月別人口及び世帯, 2022. January 18, 2022, https://www.city.atami.lg.jp/shisei/toukei/1001267/1009771.html. (Accessed 17 February 2022).

[38] Atami City 熱海市, Intentions survey of affected residents from Atami city izusan district (熱海市伊豆山地区生活再建意向調査結果). Conducted in novermber 2021, in: Material 3-1 for the 1st Meeting of Atami City Izusan District Recovery Planning Committee, 2022. February 25, 2022, https://www.city.atami.lg.jp/_res/projects/default_project/_page_/001/012/130/saikenikou.pdf. (Accessed 27 May 2022).

[39] Y. Taketomo 武友優歩, 'The city was struck by mudslides for more than two hours: inspecting the Atami mudslide disaster' (街は2時間土砂に襲われた~検証・熱海土石流~), NHK (2021). August 18, 2021, https://www3.nhk.or.jp/news/html/20210818/k10013207691000.html. (Accessed 20 September 2021).

[40] T. Kamata, Atami Mudslide: Landfill Soil May Have Triggered the Disaster, NHK World, 2021. July 9, 2021: https://www3.nhk.or.jp/nhkworld/en/news/backstories/1703/. (Accessed 20 September 2021).

[41] Administrative Response Inspection Committee 行政対応検証委員会, Report of the Mudslide Disaster Administrative Response Inspection Committee (逢初川土石流災害に係る行政対応検証委員会報告書), May 13 2022, 2022. https://www.pref.shizuoka.jp/soumu/documents/01saisyuuhoukoku.pdf. (Accessed 27 May 2022).

[42] Shizuoka Prefecture 静岡県, 'Summary information: response to Atami city izusan-district sediment disaster' (熱海市伊豆山地区土砂災害の被害と対応について(総括情報)), February 2, 2022: https://www.pref.shizuoka.jp/kinkyu/documents/atamidosyasai0202.pdf, 2022. (Accessed 4 February 2022).

[43] Shizuoka Shimbun 静岡新聞, Mud Removal from Residential Areas Progresses, but it Is Still a Long Way to Regain "Daily Security": Three Months since the Atami Mudslides – First Steps towards Recovery Part 4' (居住区の土砂撤去進む 遠い「安心できる日常」【再起への一歩 熱海土石流3カ月④】), 2021. October 2, 2022, https://www.at-s.com/sp/news/article/shizuoka/966938.html?lbl=613. (Accessed 27 May 2022).

[44] Sankei News 産経ニュース, 'Atami Mudslides: an organisation of residents from the restricted area requests prompt lifting of the designation and other support measures' (熱海土石流、警戒区域の住民団体が早期解除など要望), March 17, 2022, https://www.sankei.com/article/20220317-OIDVW6FQDBJYZN7D7UR37EXMYA/, 2022. (Accessed 27 May 2022).

[45] T. Sakurai, A. Ito, 櫻井 常矢・伊藤 亜都子, 'Community development and its problems of disaster reconstruction' (震災復興をめぐるコミュニティ形成とその課題), Regional Policy Studies (地域政策研究) 15 (3) (2013) 41–65.

[46] A. Mosneaga, A. Sato, N. Turner, Fukushima Global Communication Programme Final Report, UNU-IAS, Tokyo, 2016. http://collections.unu.edu/eserv/UNU:5758/FGC_Final_Report_EN.pdf. (Accessed 20 September 2021).

[47] A. Mosneaga, Technological disasters and displacement in developed world: what should we learn from Fukushima IDPs? Refug. Surv. Q. 39 (4) (2020) 572–582, https://doi.org/10.1093/rsq/hdaa023.

[48] Mainichi Shimbun 毎日新聞, When will be it possible to go home?, in: Three Years since the Western Japan Torrential Rains: Life in Temporary Housing Continues for the Affected People in Hiroshima' (自宅に戻れるのはいつ 西日本豪雨3年、仮設生活続く広島の被災者, 2021. https://mainichi.jp/articles/20210706/k00/00m/040/062000c. (Accessed 6 July 2021).

[49] H. Tsukuda, K. Hasegawa, Y. Onoda, 佃 悠, 長谷川 京子, 小野田 泰明, 'A study on the recovery of local community after a large disaster: case study of damaged areas by the Great East Japan Earthquake in Shichigahama Town, Miyagi Prefecture' (大規模災害後の地域コミュニティの回復に関する研究: 宮城県七ヶ浜町の東日本大震災被災地区の地区イベント再開状況から), Journal of Architecture and Planning (Transactions of AIJ) 86 (781) (2021) 859–868, https://doi.org/10.3130/aija.86.859.

[50] I. Gagne, Dislocation, social isolation, and the politics of recovery in post-disaster Japan, Transcult. Psychiatr. 57 (5) (2020) 710–723, https://doi.org/10.1177/1363461520920348.

[51] Shizuoka Shimbun 静岡新聞, Affected People Staring Their New Lives, while Believing in the Return to Izusan: Three Months since the Atami Mudslides – First Steps towards Recovery Part 2' (伊豆山に戻れる日信じ 被災者不安の新生活【再起への一歩 熱海土石流3カ月②】), 2021. September 30, 2021, https://www.at-s.com/news/article/shizuoka/965813.html. (Accessed 27 May 2022).

[52] T. Uematsu, Atami landslide victims sue construction and real estate firms, The Asahi Shimbun (2021). September 29, 2021, https://www.asahi.com/ajw/articles/14450340. (Accessed 2 February 2022).

[53] T. Akashi, Urban and Land Use Planning System in Japan, second ed., Japan International Cooperation Agency (JICA), 2007. March 2007, https://jica-net-library.jica.go.jp/library/jn325/UrbanLandUsePlanningSystem_all.pdf. (Accessed 10 February 2022).

[54] M. Ishioka 石岡美来, 'Atami Mudslide and Landfill Site: where Is the Locus of Responsibility' (熱海土石流 盛り土、責任の所在は), Shizuoka Shimbun, 2021. October 19, 2021, https://www.at-s.com/news/shittoko/974437.html. (Accessed 2 February 2022).

[55] Asahi Shimbun 朝日新聞, 'An Overlooked Landfill Site that Was More than 3 Times Larger than Allowed: the Responsibility and Circumstances Remain Ambiguous ' (見過ごされた基準3倍超の盛り土 経緯も責任もあいまい), 2021. July 9, 2021, https://digital.asahi.com/articles/ASP795TG7P78UTIL059.html. (Accessed 20 September 2021).

[56] Asahi Shimbun 朝日新聞, Abnormal' Landfill Work Key to Atami Landslip Disaster, 2021. August 3, 2021, https://www.asahi.com/ajw/articles/14409994. (Accessed 20 September 2021).

[57] K. Kawashima, Officials Aware of Atami Landslide Risk a Year before They Had Said, The Asahi Shimbun, 2021. October 20, 2022, https://www.asahi.com/ajw/articles/14464619. (Accessed 2 February 2021).

[58] Kyoto Shimbun 京都新聞, 'Editorial: Atami mudslide documents – government's response must be validated' (熱海土石流文書 行政対応の甘さ検証を). https://www.kyoto-np.co.jp/articles/-/662209, 2021. (Accessed 17 February 2022). October 20-2022.

[59] Cabinet Secretariat 内閣官房, Cross-ministerial coordination meeting on the prevention of disasters caused by landfill collapses: agenda for the 2nd meeting (盛土による災害防止のための関係府省連絡会議(第2回)議事次第), in: Meeting Material 2 and Reference Material 3, 2021. December 27, 2021, https://www.cas.go.jp/jp/seisaku/morido_saigai/dai2/gijisidai.html. (Accessed 2 February 2022).

[60] Cabinet Secretariat 内閣官房, Cross-ministerial coordination meeting on the prevention of disasters caused by landfill collapses, in: 4th Meeting of the Directors: Agenda for the 4th Meeting (盛土による災害防止のための関係府省連絡会議幹事会(第4回)議事次第, 2022. March 28, 2022: https://www.cas.go.jp/jp/seisaku/morido_saigai/kanjikai/dai4/gijisidai.pdf. (Accessed 27 May 2022).

[61] NHK, 'Legislative Amendment Passed for the Law on Residential Land Development, Also Known as 'Landfills Regulation Law' (宅地造成等規制法の改正案通称「盛土規制法」が可決・成立), 2022. May 20, 2022: https://www3.nhk.or.jp/lnews/shizuoka/20220520/3030015968.html. (Accessed 27 May 2022).

[62] Kyodo News, Survivors sue landowners over deadly July mudslide in central Japan, Kyodo News, September 28 (2021) 2021. https://english.kyodonews.net/news/2021/09/5e234a9d9f9c-survivors-sue-landowners-over-deadly-july-mudslide-in-central-japan.html. (Accessed 2 February 2021).

[63] T. Yamazaki 山崎琢也, 'Atami landslide: prefectural police receives homicide complaint; bereaved families say 'this case should be thoroughly examined'' (熱海土石流、県警が告訴受理 遺族「全部洗いざらいはっきりさせて」), Asahi Shimbun, December 7 (2021) 2021. https://digital.asahi.com/articles/ASPD67RHVPD6UTPB002.html. (Accessed 14 February 2020).

[64] H. Emura 江村英哲, "Atami mudslide is a human-made disaster": the affected residents sue landowners; homicide complaint is also under consideration (「熱海土石流は人災」土地所有者らを提訴、殺人容疑の刑事告訴も), Nikkei Business 4 (2021) 2021. https://business.nikkei.com/atcl/gen/19/00145/100400044/. (Accessed 4 February 2022). accessed onOctober.

[65] M. Ishiwatari, Institutional coordination of disaster management: engaging national and local Governments in Japan, Nat. Hazards Rev. 22 (1) (2021), https://doi.org/10.1061/(ASCE)NH.1527-6996.0000423.

[66] M. Ishioka 石岡美来, Wicked landfill construction: what about the administrative response?, in: Final Report of Atami Mudslides Inspection Committee' (悪質な盛り土造成 行政の対応は? 熱海土石流・検証委最終報告) Shizuoka Shimbun, 2022. May 14, 2021, https://www.at-s.com/news/shittoko/1066231.html. (Accessed 27 May 2022).

[67] K. Miyauchi, J. Mehlhorn, Mitigating flood risk in Japan - when strong is not enough, Swiss Re 14 (2020) 2020. https://www.swissre.com/en/japan/news-insights/articles/natural-catastrophes/mitigating-flood-risk-in-japan.html. (Accessed 2 February 2021). accessedMay.

[68] N. Nakai, Urbanization promotion and control in metropolitan Japan, Plann. Perspect. 3 (2) (1988) 197–216.

[69] J. Vibhu, Y. Okazawa, Case study on territorial development in Japan, in: Tokyo Development Learning Center Policy Paper Series, vol. 2, World Bank, Washington, DC, 2019. https://openknowledge.worldbank.org/handle/10986/31940. (Accessed 4 February 2022).

[70] D. Yamamoto, Geographical political economy of regional inequality in postwar Japan, in: ICES Working Paper No.167, May 2012, 2012. https://www.hosei.ac.jp/application/files/9115/8226/9513/wp167.pdf. (Accessed 14 February 2022).
[71] M. Goto 後藤道夫, 'The nexus between developmentalist state and company welfarism: how is it broken and how to break it' (開発主義国家・企業主義統合のこわれ方とこわし方), The Journal of the Association of Socio-Culture 5 (2002) 15–29, https://doi.org/10.24700/ascc.5.0_15.
[72] J. Kingston, Downsizing the construction state, Jpn. Econ. 32 (4) (2005) 36–95, https://doi.org/10.1080/2329194X.2005.11045207.
[73] R. Shimizu 清水 亮, The grand design of national spatial development and citizen activities: raising issues from the scene of earthquake recovery (国土のｸﾞﾗﾝﾄﾞﾃﾞｻﾞｲﾝと市民活動: 震災復興現場からの問題提起), Ann. Reg. Commun. Stud. 29 (2017) 43–57, https://doi.org/10.20737/jarcs.29.0_43.
[74] R. Fujikura, M. Nakayama, N. Takesada, Lessons from Resettlement caused by large dam projects: case studies from Japan, Indonesia and Sri Lanka, Int. J. Water Resour. Dev. 25 (3) (2009) 407–418, https://doi.org/10.1080/07900620902958694.
[75] A. Hattori, R. Fujikura, Estimating the indirect costs of resettlement due to dam construction: a Japanese case study, Int. J. Water Resour. Dev. 25 (3) (2009) 441–457, https://doi.org/10.1080/07900620902958785.
[76] A. Hamamoto 浜本篤史, 'The social impact model of dam projects in postwar Japan: applying the theory of the social structure of victimization' (戦後日本におけるダム事業の社会的影響モデル–被害構造論からの応用–), Journal of the Japanese Association for Environmental Sociology 21 (2015) 5–21, https://doi.org/10.24779/jpkankyo.21.0_5.
[77] T.Takao 高尾具成, 'Half a year since the Atami mudslides: past disasters should not to be forgotten' (熱海土石流から半年 過去の災害を忘れずに), Mainichi Shimbun. https://mainichi.jp/articles/20220106/ddm/005/070/006000c, 2022. (Accessed 3 February 2022), 6 January 2022.
[78] H. Ikawa, 15 Years of Decentralization Reform in Japan. Up-To-Date Documents on Local Autonomy in Japan No.4, National Graduate Institute for Policy Studies, Tokyo, 2008. http://www3.grips.ac.jp/~coslog/activity/01/03/file/up-to-date-4_en.pdf. (Accessed 14 February 2022). accessed onMarch 2008.
[79] T. Katsumi, Soil excavation and reclamation in civil engineering: environmental aspects, Soil Sci. Plant Nutr. 61 (2015) 22–29, https://doi.org/10.1080/00380768.2015.1020506.
[80] A. Usui 臼井昭仁, ''Soil for free': once you believe you get a 10m high mound which costs 70M yen to remove (「ただで土あげる」信じたら10mの山 撤去に7千万円), Asahi Shimbun (2020). August 7, 2020, https://www.asahi.com/articles/ASN845RY0N7JOIPE02H.html. (Accessed 20 September 2021).
[81] Kahoku Shinpo 河北新報, 'March 3rd Editorial: towards Enhanced Regulation of Landfill Sites and Ensuring Reuse of Surplus Soil from Construction Sites' (社説(3/3):盛り土規制強化へ/建設残土の有効利用も図れ), 2022. March 3rd 2022: https://kahoku.news/articles/20220303khn000010.html. (Accessed 27 May 2022). accessed on.
[82] House of Representatives 衆議院, The 208th Session of the National Diet, Land and Transportation Committee, Meeting Record No.9 (第208回国会 国土交通委員会 第9号), 2022. April 13, 2022: https://www.shugiin.go.jp/internet/itdb_kaigiroku.nsf/html/kaigiroku/009920820220413009.htm#p_honbun. (Accessed 27 May 2022). accessed on.
[83] H. Runhaar, P. Driessen, C. Uittenbroek, Towards a systematic framework for the analysis of environmental policy integration, Environmental Policy and Governance 24 (4) (2014) 233–246, https://doi.org/10.1002/eet.1647.
[84] H. Mano 間野博, 'The turning point for urban policy: lessons from August 20, 2014 Hiroshima landslides' (8.20広島土砂災害から見えてくる都市政策転換の構図), Kikan Chugoku-Soken (季刊 中国総研) 19–3 (72) (2015) 7–13.
[85] T. Uchida, H. Nishimoto, N. Osanai, T. Shimizu, Countermeasures for sediment-related disasters in Japan using hazard maps, International Journal of Erosion Control Engineering 2 (2) (2009) 46–53.
[86] Cabinet Office, Flood and Sediment Disaster, 2018. May 2018, http://www.bousai.go.jp/kyoiku/pdf/h30_tebikisho_english.pdf. (Accessed 20 September 2021).
[87] Japan Sabo Association 全国治水砂防協会, Situation regarding the designations of sediment-related disaster risk areas in each prefecture (各都道府県における土砂災害警戒区域等の指定状況), September 30, 2021, http://www.sabo.or.jp/topics/0005-0508/shitei-jyoukyou.htm, 2021. (Accessed 20 February 2021).
[88] Kawasaki, Y., Mizuyama, T., Morichi, S., Takeda, F. & Ando, S. 川崎優介, 水山高久,森地茂, 武田文男, 安藤尚一 (2017) 'Analysis of existing disqualified housing relocation in sediment disaster special alert areas' (土砂災害特別警戒区域における既存不適格住宅移転の課題). Journal of Japan Society of Erosion Control Engineering (砂防学会誌), 69(6): 33-41. https://doi.org/10.11475/sabo.69.6_33.
[89] A. Mosneaga, M. Vanore, An age-sensitive approach to durable solutions, Forced Migr. Rev. 52 (2016) 22–26. May 2016.
[90] H. Kobayashi 小林秀行, 'A consideration on the meaning of "disaster recovery"' (「災害復興」の含意をめぐる一考察), Journal of Disaster Recovery and Revitalization 15 (2020) 159–168, https://doi.org/10.34606/jsdrr.15.0_159.
[91] T. Sugano 菅野拓, Governance in Disaster Response (災害対応ガバナンス), Nakanishiya Publishing, Kyoto, 2021.
[92] K. Kanebishi, K. Ueda, 金菱 清・植田 今日子, Holistic approach to the disaster risks: to withstand the disaster paternalism' (災害リスクの"包括的制御"ー災害パターナリズムに抗するためにー), Jpn. Sociol. Rev. 64 (3) (2013) 386–401, https://doi.org/10.4057/jsr.64.386.
[93] Atami City 熱海市, Atami City Izusan District Recovery Plan Proposal (熱海市伊豆山地区基本復興計画(案)) Material no.3 for the 3rd Meeting of Atami City Izusan District Recovery Planning Committee, 2022. April 4, 2022: https://www.city.atami.lg.jp/_res/projects/default_project/_page_/001/012/130/kihonkeikakuan3.pdf. (Accessed 27 May 2022).