

# Eco-Model City Kitakyushu and Japan's Disposal of Radioactive Tsunami Debris

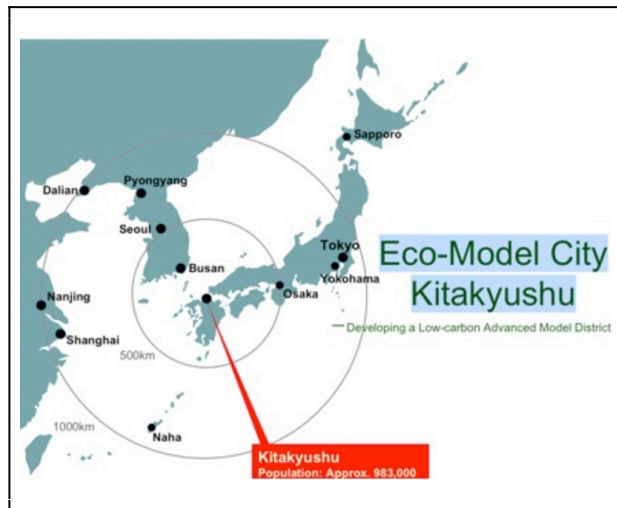
## 環境モデル都市北九州と津波の放射性瓦礫処理

### Asia-Pacific Journal Feature

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Kitakyushu is home to just under one million residents, making it the 11<sup>th</sup> most populous city in Japan. It is roughly equidistant to Shanghai and Tokyo, and actually closer to Seoul and Pyongyang than the Japanese capital. As the largest Japanese port west of Osaka-Kobe, it positions itself as a commercial gateway to Asia. Over the last thirty years the city has also worked tirelessly to shed its image as a rust belt steel town, rebranding itself as Eco-Model City Kitakyushu, a centre for environmental technology and protection measures.<sup>1</sup> This hard work threatens to be undone by decisions being taken right now.



In March 2012, the central government in Tokyo stepped up pressure on local

governments throughout the country to help dispose of radioactive debris generated by the earthquake, tsunami and nuclear disaster of March 2011. By dispersing the debris around the country, potentially as far as Okinawa, the government hopes to reinforce national unity and foster a spirit of collective reconstruction. Indeed, strengthening patriotism has been a recurring theme in Japanese politics during the last decade. While appealing to national unity, in early March 2012 Environment Minister Hosono Goshi belatedly promised financial incentives for any local government that disposes of rubble from Iwate and Miyagi prefectures. Less than a week after Hosono's comments, on March 12 all 61 members of the Kitakyushu Municipal Assembly unanimously passed a resolution agreeing to help dispose of the debris. Kitakyushu Mayor Kitahashi Kenji, a non-native of the city, has apparently been the driving force behind the policy locally.<sup>2</sup> Since the Kitakyushu city government goes to great lengths to promote its Eco-Model City image, such an about face was surprising. This case is noteworthy not only as the first place in western Japan to accept the debris but also because it is a large population centre of almost one million people. Given the increased popularity of produce from Kyushu in eastern Japan, due to its perceived greater safety from radioactive contamination, concern over Kitakyushu's intentions is not limited to the city's residents, of which the author is one.

### Eco-Model City Kitakyushu

Kitakyushu is the second largest city on Kyushu, second only to its neighbour Fukuoka,

although it is around 25% larger in land area. It was established in its present form in 1963 when the five smaller cities of Kokura, Moji, Tobata, Wakamatsu and Yahata were merged into one entity under the somewhat bland title of ‘North Kyushu City’. As such it does not boast the large central business district of other cities of its size, especially in comparison to Fukuoka. Instead, its five original cities retain their own separate identities, with Kokura at the core with its large train station, office blocks and department stores. Since the 1980s the city’s population has fallen steadily as its landmark steel industry has declined in importance. In response, the city has fostered environmental and technological initiatives to restore its flagging fortunes.

Kitakyushu was one of the first cities in Japan to stage environmental protests when in 1950 local women began petitioning local authorities over air pollution.<sup>3</sup> Their success was acknowledged at the 1992 United Nations Earth Summit in Rio when Kitakyushu was one of twelve cities in the world honoured for its environmental management. The city has become renowned within Japan as a leading force in recycling and anti-pollution measures. In addition to reinventing itself as Eco-Model City Kitakyushu, it has even been developing as a domestic tourist destination, being blessed with several scenic and diverse areas of natural beauty within the city limits. Smoke stacks do remain, however, and they are what many casual visitors to the city will first notice.

The city has been a major industrial centre since the Meiji era (1868–1912). Kitakyushu gave birth to the Japanese iron and steel industry with the founding of the Yahata steel works in 1901. During World War II, Kokura hosted a major arsenal and was the primary target of the second atomic bomb attack of August 9, 1945. Ironically, heavy pollution that day obscured the Kokura arsenal and secondary target Nagasaki was bombed instead. Kokura was also the secondary target

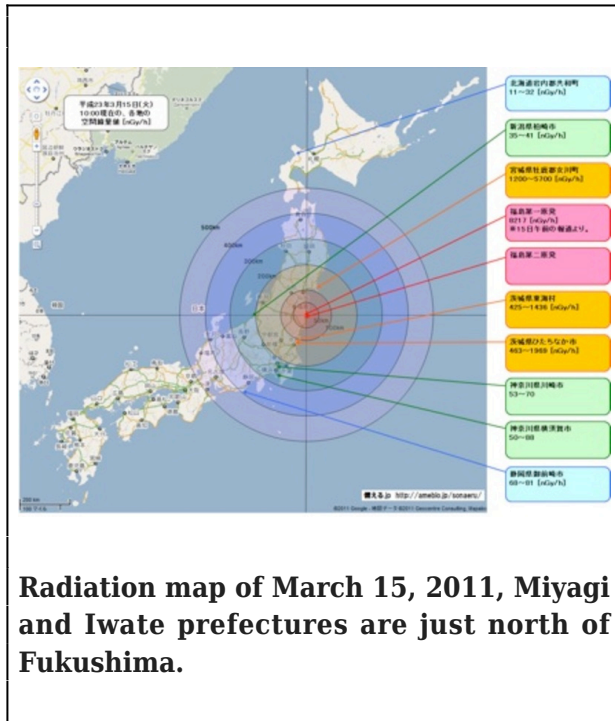
of the first atomic bomb that was dropped on Hiroshima three days earlier. The rampant development of heavy and chemical industries in Japan after 1945 was powered by industrial centres such as Kitakyushu, but the environmental costs became ever greater. Beginning in the 1960s, the local authorities took concrete steps to tackle the issue, and a 1985 report by the Organization for Economic Co-operation and Development (OECD) noted that Kitakyushu had transformed itself “from a grey city to a green city”.<sup>4</sup>

More recently, in July 2011 the OECD selected Kitakyushu as a Model City for Green Growth. The city was only the fourth to be selected under the organisation’s Green City Programme, following Paris, Chicago and Stockholm. This scheme promotes cities which prioritise research and development into renewable energies. Kitakyushu Eco-Town in Wakamatsu ward hosts some 29 recycling businesses, not far from a wind farm operation on reclaimed coastal land. Research into offshore wind power generation also began last year. Another notable project that commenced last year was the world’s first pilot scheme to power homes and businesses from recycled hydrogen generated as a by-product at steel plants. On the other side of Kitakyushu lies the Kanmon Strait, which separates Moji ward from Japan’s main island of Honshu and has some of the fastest tidal currents in the country. An experimental tide power generator in Moji began full-scale testing on March 17, 2012. The incineration of radioactive tsunami debris casts a shadow over these laudable clean energy projects.

## Dangers

Immediately after the start of the Fukushima reactor meltdowns, prevailing winds carried radiation northwest from the ailing power plant to Miyagi and Iwate prefectures. Parts of both prefectures have since been home to radioactive hotspots. Government estimates are

that radiation has contaminated around 10,000 square kilometres of northeast Japan, with more than 600 square kilometres subject to over 20 millisieverts (mSv) per year of radiation. The International Commission on Radiological Protection (ICRP), a body largely independent of the pro-nuclear lobby, suggests a maximum exposure limit of 20 mSv per year for workers at nuclear power plants and a limit of 1 mSv for the population at large.

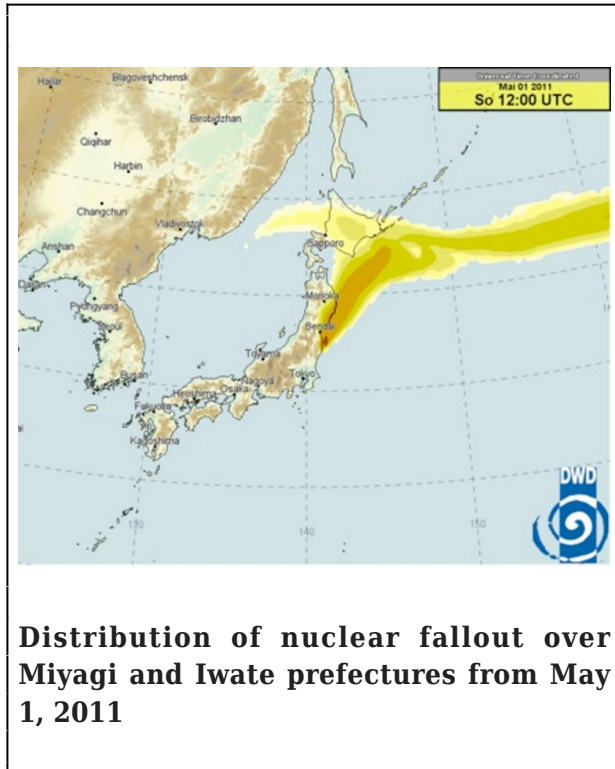


The official position of the ICRP is that even low doses of radiation raise the risk of cancer and other degenerative diseases. Internationally this is also the prevailing view among physicians and epidemiologists who specialise in researching the effects of radiation. However, after the Fukushima disaster Japanese government standards were revised radically upward to legally allow people to be exposed to much higher levels of radiation than was previously thought to be safe. After raising the official radiation limit from 1 to 20 mSv in the wake of the disaster, the Japanese government was later forced to restore the earlier 1 mSv limit in accordance with international practice.

Prior to the disaster, industrial waste containing radioactive cesium at 100 becquerels per kilogram (Bq/kg) and over had to be labelled ‘radioactive waste’ and carefully stored only at specially designed facilities. Since then the central government has decreed that any waste containing radioactive cesium at 8,000 Bq/kg or under is considered safe, and can be treated as regular waste. However, there is no credible scientific evidence that an 80-fold increase in allowable radiation is actually safe.<sup>5</sup> Instead, the Environment Ministry arrived at this limit by calculating the maximum allowable exposure of workers at nuclear power plants and applying it to the general population, including infants and children.<sup>6</sup> This is a purely political decision that will allow radioactive debris from Miyagi and Iwate prefectures to be disposed of much more easily.

The method of burning the debris is fraught with danger since it is being done in normal waste disposal facilities not equipped to handle radioactive materials. Both the central government and Kitakyushu’s local government have claimed that bag filters in the incinerators will capture and contain 99.9% of the radiation. However, the various makers of these bag filters refuse to give any guarantees, and concerned scientists question whether the government has even tested the filters.<sup>7</sup> The authorities are apparently relying on two different strands of research to support the safety of bag filtering. The first concerns the release of micro-particulate matters with a diameter of 2.5 micrometres or smaller. Since filters were able to contain such fine substance particles it is now assumed that they will also be sufficient to contain radiation emissions. Secondly, research conducted in 2009 by a local government in Japan found that bag filters can handle naturally occurring non-radioactive cesium 133. These findings were apparently extrapolated to suggest that the filters can also handle radioactive cesium 134 and cesium 137.<sup>8</sup> However, the science regarding this is far

from conclusive. For instance, in May 2012 Shimada city in Shizuoka prefecture also began incinerating tsunami debris, and initial reports suggest that some 32.6% of the radiation contained therein was released into the atmosphere.<sup>9</sup>



Once the debris has been incinerated to reduce its volume, the plan calls for much of it to be buried at landfill sites. In Kitakyushu's case, local officials admit that the safest landfill option was not chosen due to budgetary constraints.<sup>10</sup> Since the chosen landfill site sits on the coast, concerned residents worry that radioactive contamination will leak into the sea. Nevertheless, Mayor Kitahashi urged residents to eat locally caught seafood even if it contains radioactive contamination, he has also threatened harsh reprisals for anyone publically questioning the safety of local food produce.<sup>11</sup> Unfortunately, Kitakyushu's wholesale fresh market, which supplies local fish, vegetables and fruit to neighbourhood markets around the city, is located just 305 metres away from the Hiagari plant where the

first trial incinerations have already taken place (see photo below). However, a member of Kitakyushu's scientific advisory panel has tried to reassure the public that radioactive cesium 137 has a half-life of only three years, contrary to scientific orthodoxy which stresses a half-life of around 30 years.<sup>12</sup>



After it became known that Kitakyushu was planning to incinerate tsunami debris, a group of environmental refugees from the Tohoku and Kanto regions now resident in the Kitakyushu area mobilised to oppose it. Their vehicles for mobilizing public support have been Twitter, Facebook and individual blogs. The first major protest occurred on May 22 at Kitakyushu's convention centre and city hall. Hundreds of concerned residents, many of them mothers with their young children, marched two kilometres from the convention centre to the city hall demanding to speak to Mayor Kitahashi. The mayor refused to meet them. Instead, a large group of civil servants was dispatched to the lobby of city hall to block access. There was a large police presence, with some shouting insults at the demonstrators.

Parents were particularly concerned that the first burnings of tsunami debris were scheduled to take place on May 23-24 when many of their

children were outside practicing for the annual primary school sports festivals that took place on May 27. Kitakyushu city could not have scheduled the incinerations at a worse time, indicative of the haste which has surrounded the whole project. Just days later, on June 1, a Kitakyushu primary school made a school trip to the Shin Moji incinerator which on May 24 had burnt tsunami debris. Despite objections from concerned parents, the school principal had refused to cancel the trip.

## The Debris

Environment Ministry estimates suggest that the disaster generated around 22.5 million tonnes of debris in Miyagi, Iwate and Fukushima prefectures, an amount 1.6 times greater than that caused by the January 1995 earthquake in Kobe. In Kobe's case it was able to locally dispose of 93% of its debris in a much smaller, overwhelmingly urban area. Primarily rural Miyagi and Iwate prefectures are much larger in area, without the high population density of Kobe, yet in March 2012 the central government declared that some 4 million tonnes of debris in Iwate and Miyagi prefectures is beyond the disposal capabilities of both prefectures. The Environment Ministry reported that only 6.3% of the debris in Iwate, Miyagi and Fukushima prefectures had been disposed of by early March 2012. These figures prompted Prime Minister Noda to promise central government subsidies for the construction of incinerators and other disposal facilities for any local government that accepts tsunami debris from Miyagi or Iwate prefectures. Since other, unspecified financial incentives will also be forthcoming, Kitakyushu has pledged to incinerate some 39,500 tonnes of debris annually for up to two years. The city is refusing to reveal how much it will receive for handling the debris, but activists have estimated that the city could enjoy a financial windfall of up to 4.2 billion yen (US \$53.7 million).<sup>13</sup>



**Kitakyushu mothers protesting at city hall (photo by @mama\_jp)**



**Local civil servants blocking the mothers' access to city hall (photo from @Saikeman)**



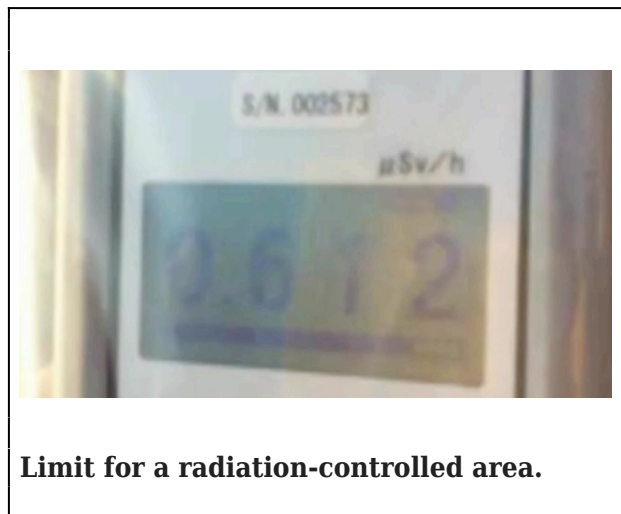
Due to such financial incentives, some 30 out of Japan's 47 prefectures are either implementing or considering disposing of debris from Miyagi and Iwate.

Since Kitakyushu's tsunami debris decision was announced, officials in Ishinomaki and elsewhere in Miyagi have been besieged by phone calls from residents of Kitakyushu and surrounding areas anxious to ascertain the real situation.<sup>14</sup> The standard reply has been that Ishinomaki city and Miyagi prefecture did not request Kitakyushu's assistance in dealing with the debris. Moreover, on May 21 it was revealed that the amount of debris remaining in Miyagi is substantially less than previous estimates since much of it has been claimed by the sea. In addition, the number of homes found to be still structurally sound is much larger than previously thought, meaning that the number that must be demolished is much lower. This has reduced the total amount of debris to be processed within Miyagi from 11.07 million tonnes to 6.76 million tonnes, a reduction of some 4.31 million tonnes.<sup>15</sup> Nevertheless, the central government is pressing ahead with plans to disperse the debris throughout the country, despite the fact it appears less necessary now that volumes have been revised downwards. Thus, some 1.27 million tonnes are still set to be disposed of outside Miyagi prefecture despite the fact that most communities in Miyagi and Iwate have moved most of the debris into storage and have the capacity to handle it themselves.

In order to process the debris in Miyagi, some 26 new temporary incinerators have been under construction, all of which will be operational by June 2012. While construction has been ongoing, the central government has stepped up the pressure on local governments throughout Japan to help process the debris. Since these new incinerators have the capacity to dispose of all the debris by the 2014 deadline, their use will consequently be restricted. For instance, whilst existing

incinerators in the prefectural capital Sendai have been operating for 340 days a year, these new incinerators will only be operational for 275 days annually. It is estimated that they need to be used for 320 days a year if all of Miyagi's debris is to be incinerated inside the prefecture before the central government deadline.<sup>16</sup>

The first incineration of debris in Kitakyushu from Miyagi prefecture's Ishinomaki took place on May 23, 2012 in the Hiagari area of Kokura, some 4 kilometres from Kokura station and Kitakyushu's central business district. It was followed by another test on May 24 in the Shin Moji port area, somewhat more distant from the city centre in a largely agricultural area. These were ostensibly to test the safety of the incineration before larger scale operations begin in mid-June. The first batch of debris was carried from Miyagi in 24 trucks registered in Kitakyushu city. Despite the radioactive cargo inside, they did not carry any nuclear warning labels to warn other road users.



**Limit for a radiation-controlled area.**



**Protestors at Kitakyushu's Hiagari incinerator under a truck delivery from Miyagi (photo by @asat8)**

Approximately 70 protestors at the incinerator plant in Hiagari on May 23 were confronted by more than 150 policemen blocking access to the plant and protecting the debris-laden trucks. Many of these protestors were from other prefectures in western Japan anxious about the regional affects of Kitakyushu's unilateral actions. Others were environmental refugees from the Kanto and Tohoku regions escaping contamination of their hometowns. One of them managed to take readings of an empty truck as it left the facility after disposing of its load. The Geiger counter quickly rose from 0.06 microsieverts per hour ( $\mu\text{Sv/h}$ ) to 0.612  $\mu\text{Sv/h}$ , the limit for a radiation-controlled area, [seen here](#).

While such readings are not conclusive, in the absence of other independent data there is little to reassure concerned residents. Kitakyushu city's data is untrustworthy since the head of the city's environmental division was unable to explain at a public meeting why the readings are so low.<sup>17</sup> For instance, prior to the trial incineration, Kitakyushu had been insisting that waste from Ishinomaki contains only 28 Bq/kg despite Ishinomaki's local government having measured it at 101 Bq/kg.

Kitakyushu city has given repeated assurances that only debris with very low levels of radioactivity is being transported to Kitakyushu. These reassurances were repeated in the aftermath of the test, as Kyodo News quoted official Kitakyushu data that only 19 to 30 Bq/kg of cesium was detected in airborne ash after the incineration, and that no cesium was detected from filtered chimneys at the two incineration plants. Mayor Kitahashi was quoted as saying, "The results will reassure residents, because they indicate (there is no threat to) people as well as farm and marine products."<sup>18</sup>

However, independent specialists have pointed out glaring errors in calculating Kitakyushu's official measurements of emitted radiation, casting doubt on the city government's claims.<sup>19</sup> Indeed, even the head of the local government's environmental division admitted the data was incomplete, and had to be estimated.<sup>20</sup> Since the local government has refused to allow independent inspectors to be present at its tests, it is impossible to verify the accuracy of these test results. Moreover, the Kitakyushu tests were themselves very limited in scope since they did not include soil samples, and only took radiation measurements inside the plants themselves.<sup>21</sup> Local residents are also concerned that debris containing the lowest levels of contamination was selected for testing, and that once the project begins debris with much higher amounts of radiation will be incinerated. In light of how Kitakyushu has handled this issue, there is little confidence that any transparent system of ongoing monitoring will be put in place.

Whilst the local government has tried to reassure local residents that the incineration is safe, it has also attempted to stifle public opposition. For instance, every other week the city government distributes a free newspaper called 北九州 (*Kitakyushu*) to all households in the city (see right, below) regarding matters of local importance. However, it has contained no

mention of the proposed incineration of debris from Miyagi prefecture. Instead, the city government distributed a flyer within another free paper called *Sunday* (see left, below), which consists of adverts from restaurants and shops and is left unread by many. As a result, it is likely that far fewer residents will have seen the information about the debris incineration.



Prior to conducting the trial burnings, the Kitakyushu city government had not obtained permission from local residents residing near the incinerators. Despite the inherent hazards in releasing radioactive material into the atmosphere, apparently the city government did not even inform neighbouring local governments of its intentions. Kitakyushu had been due to hold its first public consultation on May 25 after the first incineration had already taken place, but the day before it was due to take place it was postponed that until June 6. When the public meeting finally took place Mayor Kitahashi and colleagues were roundly criticised by members of the audience and were unable to provide satisfactory answers to the many questions from the floor. Audience members laughed at one member of Kitakyushu's scientific expert panel who has repeatedly stressed that radiation from the Chernobyl nuclear accident has caused no adverse health effects.<sup>22</sup> These critical voices were subsequently edited out of local television reports of the event. The Mayor has

subsequently held smaller meetings in local ward areas, ostensibly to listen to local residents. However, in the first such meeting many local residents were refused access since the venue was small and priority was given to specially chosen members of a residents' association who all unquestioningly supported the city's position.<sup>23</sup> In these ways, the city has been attempting to marginalise dissenting voices.

Instead of spreading this radioactive material around Japan, it seems preferable to contain it within Miyagi and Iwate prefectures. Well developed plans are in place to re-use much of the debris within the prefectures themselves to protect against future tsunami and to regenerate the coastal environment.<sup>24</sup> If necessary, incinerators and recycling plants with proper safeguards should be constructed in the devastated areas as part of their rehabilitation. Either policy stands to create more jobs in the affected prefectures, ensure cheaper and easier disposal of radioactive material and reduce transport costs and risks of moving dangerous debris. Incidentally, compared to other OECD countries, Japan incinerates much more of its household and industrial waste, and large government subsidies have long been available to construct incinerators throughout the country. The commonly cited reason is a lack of landfill, although incinerating such large volumes of even normal household refuse is not without its critics.<sup>25</sup>

### Compliant Media

Despite the presence of TV cameras and print journalists, the only contemporary mainstream media reports about the protests in Kitakyushu concerned the arrest of two protestors. Likewise, local television news reports of Kitakyushu's heated public meeting on June 6 censored all public opposition and broadcast the only comment supportive of government policy that the audience voiced.<sup>26</sup> Television has



been particularly reluctant to discuss the risks and dangers of spreading disaster debris around the country. Indeed, the mainstream media has been playing its part in central government efforts to downplay the dangers and persuade reluctant residents, as this editorial from the English edition of The Asahi Shimbun on March 14 illustrates: “We also call on private-sector companies to help in any way they can, for instance, by using debris as materials for cement production. The entire nation must rise to the challenge as the first step to repair the disfigured landscapes of the cities and towns battered by the calamity.”<sup>27</sup> Given that the Asahi is frequently cited as the most liberal of Japan’s major daily newspapers, such a stance seems particularly revealing. Even more disturbing are calls to recycle the radioactive waste into cement, which will be subsequently used to construct buildings.

It appears that the mainstream media is singing from the central government’s songbook. Among OECD countries, the Japanese government is in a strong position to deliver its message unchallenged, especially when issues of national unity are at stake. Indeed, data from the Nihon Research Centre suggests that levels of trust in the media in Japan are higher than in other OECD countries, despite significant government oversight of traditional media companies. For example, 74% of those polled said they trusted the print media and 73% trusted television news. By comparison, in the United Kingdom the corresponding figures were only 14%.<sup>28</sup> This despite the fact that Japanese institutions have become infamous for placing restrictions on independent reporting, especially with regard to nuclear issues.<sup>29</sup> For 2012 alone, the central government has allocated around 1.5 billion yen (US\$18.8 million) to promote its message of nationwide tsunami debris disposal.<sup>30</sup>

Moreover, contrary to images shown in a recent television documentary by state broadcaster NHK, visitors to affected towns

and cities in northeast Japan report that local clean up operations have for the most part been able to remove and store disaster debris. Therefore, in many cases it is doubtful that reconstruction is being held up because of mountains of debris. Instead, the inaction in many areas is mostly likely due to a lack of plans. The photo below was taken in May 2011 in Iwate prefecture’s Rikuzen Takata, one of the towns hardest hit by the tsunami.



**Rikuzen Takata in early May 2011 (photo by Anna Morris)**

### Conclusion

The plan to disperse and incinerate tsunami debris around Japan has polarised families and communities across the archipelago, including those of the author. Since one major aim of the plan is to promote national unity, in this respect the policy has already failed. For those who accept the need to disperse the debris nationwide, the credibility of government safety assurances is not questioned. Similarly, the need to assist the reconstruction effort in Miyagi and Iwate prefectures is taken at face value. Despite the ongoing controversy over nuclear power, trust in the authorities remains high. However, there is a growing section of the populous that does not unquestionably

accept official pronouncements, especially with regard to nuclear safety issues.

This article has argued that the distribution and incineration of radioactive debris from the Tohoku disaster is a risky and unnecessary act. The chief safety issue relates to the ability of bag filters on normal waste disposal facilities to contain emissions of radioactive materials into the atmosphere, soil and sea. The central government and the local administration in Kitakyushu insist that these filters contain 99.9% of radioactive emissions. However, the makers of these filters refuse to provide such assurances, and the methods used to test radioactive emissions in Kitakyushu have been scientifically dubious, incomplete and lacking transparency. As in Shimada in Shizuoka prefecture, it seems highly likely that incinerating the debris in normal waste disposal facilities will release significant amounts of radiation into the atmosphere. This is undesirable in any location, particularly in areas presently uncontaminated. The key question remains how much radiation will be released and are these levels dangerous? It appears impossible for anyone to answer such questions definitively at present. Logically, therefore, the risk should be considered too high. The official stance of the ICRP, an independent international body, is that all radiation emissions are potentially dangerous, and the danger rises linearly as emissions rise.

If the debris dispersal and disposal is really necessary due to a lack of capacity in Miyagi and Iwate prefectures, it seems odd that less than 20% of the debris is earmarked for dispersal to other prefectures. Given the newly expanded incineration capacity in Miyagi, along with the lower than estimated levels of debris and plans to recycle much of the rubble, it is highly doubtful that dispersal is required, especially since much of the debris is currently sitting in storage. However, the central government has mobilised its considerable resources to manipulate public opinion into

believing the opposite. Whilst residents across Japan run the risks of dispersal and disposal, the financial rewards will almost certainly be reaped by politically connected companies and compliant local governments. The official clean up budget for 2012 stands at 342.2 billion yen (US\$ 4.3 billion).<sup>31</sup> Thus, by disposing of debris around the archipelago, many more firms and local governments can benefit from these funds than just those in northeast Japan. However, this plan is especially curious since it is a reversal of the policy that mostly placed nuclear power plants in the poorest, least populous and most remote corners of the archipelago.

A further irony is that it is Eco-Model City Kitakyushu, of all places, which will be the first place in western Japan under this plan to chase short-term financial gain by endangering the health of its residents. Once a large city such as Kitakyushu sets a precedent, it is likely many other local municipalities will follow suit and start accepting tsunami debris. Residents of Kitakyushu, and other cities where radioactive debris burning is scheduled to take place, have the right to ask what benefits the incineration will bring them and their children, and governments have an obligation to openly discuss the risks and rewards. Local governments should also reverse course in the face of public opposition to dangerous policies. In other places, such as Tsukumi in neighbouring Oita prefecture, local resistance has stymied plans to incinerate the debris.<sup>32</sup> Regardless of how much radiation is released into the atmosphere, seeps into the ground and leeches into water sources—and the amounts remain controversial—it needlessly threatens livelihoods and perhaps lives across Japan. Export bans are already in place for many agricultural commodities from eastern Japan, and these could be extended to products from western Japan if radioactive debris is dispersed there. Radiation damage is long lasting and cumulative, with the potential to affect all aspects of the food chain. In contrast to

Kitakyushu, Fukuoka city has refused to receive any of the disaster debris, citing residents' concerns over its safety.



**Kitakyushu march on June 10, 2012, calls for recycling tsunami debris into land defences in Tohoku**

Instead of transporting radioactive material around the country, the debris should remain in the affected prefectures where much of it could be used for land reclamation projects and constructing greater coastal defences. Indeed, well-developed plans are in place to re-use much of the debris within the prefectures themselves to protect against future tsunami and to re-generate the natural environment of the devastated coast.<sup>33</sup> These will be forests planted along the coastline to help protect communities from future tsunami. This plan calls for debris to be mixed with soil and buried in the ground, whereby the debris forms a raised platform that enables trees to be grown higher than sea level. Similar landfill techniques were employed in 1923, when much of Tokyo was razed by the Great Kanto Earthquake, and in the aftermath of the 1995 Great Hanshin Earthquake in Kobe. It therefore seems incomprehensible that the Noda administration is providing financial incentives to far-flung reaches of the archipelago to

transport and incinerate the debris when less risky options are available locally.

Western Japan was lucky to escape serious affects from the Fukushima nuclear disaster since prevailing winds dispatched much of the radiation eastward across the Pacific Ocean in the early days after March 11, 2011. It would be the cruelest of ironies if central and local governments were allowed to willfully spread radiation across the Japanese archipelago to presently uncontaminated areas.

*The author is a concerned local resident.*

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## Notes

<sup>1</sup> See here: [kantei.go.jp/13Kitakyushu.pdf](http://kantei.go.jp/13Kitakyushu.pdf)

<sup>2</sup> According to local assembly members, personal communication.

<sup>3</sup> See here: [enviroscope.iges.or.jp/](http://enviroscope.iges.or.jp/). I am grateful to Andrew DeWit for drawing my attention to this.

<sup>4</sup> Cited in *Kitakyushu City: An Environmental Frontier City in Asia*, a presentation by Mayor Kitahashi Kenji, available at [kantei.go.jp/16Kitakyushu.pdf](http://kantei.go.jp/16Kitakyushu.pdf)

<sup>5</sup> For more details see: Paul Jobin, 'Fukushima One Year On: Nuclear workers and citizens at risk', *Asia-Pacific Journal: Japan Focus*, [japanfocus.org/-Paul-Jobin/3729](http://japanfocus.org/-Paul-Jobin/3729)

<sup>6</sup> For the official Environment Ministry explanation, see page 3 from here: [kouikishori.env.go.jp/news.pdf](http://kouikishori.env.go.jp/news.pdf)

<sup>7</sup> For the responses of seven bag filter makers see here: [zero1127.blog.fc2](http://zero1127.blog.fc2)

- <sup>8</sup> Cited here: Nakamura Ryūichi, 'Gareki shōkyaku bagufirutā no hōshaseibusshitsu jokyo seinō ni gimon', May 31, 2012, [windfarm.co.jp](http://windfarm.co.jp)
- <sup>9</sup> Nakayama Ken, 'Radiation Debris & Exposure', press conference, New York City, May 4, 2012, [y0utub3](https://www.youtube.com/watch?v=0utub3)
- <sup>10</sup> Comment from officials at Kokura Kita ward meeting, June 8, 2012.
- <sup>11</sup> Mayor's speech at Kitakyushu City Town Meeting, Kitakyushu International Convention Centre, June 6, 2012.
- <sup>12</sup> In the case of cesium-137 in soil near Chernobyl current research suggests a half-life of 180 to 320 years, not 30 years as is typical. For the comment see here, at 54 minutes 55 seconds: [samadi.cocolog-nifty.com/sahasrara](http://samadi.cocolog-nifty.com/sahasrara)
- <sup>13</sup> Kitakyushu city government refuses to release such sensitive financial information so this is an estimated figure based on data published for debris incineration elsewhere.
- <sup>14</sup> Various personal communications.
- <sup>15</sup> Jiji Press, 'Debris Shipments from Miyagi Reduced to Third', May 21, 2012, [fukushima-diary](http://www.fukushima-diary.com)
- <sup>16</sup> For details see here: Nasu Rie, 'Gareki sōryō ōhaba genshō ni tomonau kōiki shori-ryō minaoshi ni okeru Ōta-ku no handan ni tsuite', June 7, 2012, [blog.goo.ne.jp](http://blog.goo.ne.jp)
- <sup>17</sup> Response to public questioning at Kitakyushu City Town Meeting, Kitakyushu International Convention Centre, June 6, 2012.
- <sup>18</sup> Kyodo News, 'Debris burning safe', May 30, 2012, [japantimes.co.jp](http://www.japantimes.co.jp)
- <sup>19</sup> For example, see here: [@timestimes1954](https://twitter.com/timestimes1954)
- <sup>20</sup> Response to public questioning at Kitakyushu City Town Meeting, Kitakyushu International Convention Centre, June 6, 2012.
- <sup>21</sup> Response to public questioning at Kitakyushu City Town Meeting, Kitakyushu International Convention Centre, June 6, 2012.
- <sup>22</sup> For similar comments made at another local public meeting see here: [samadi.cocolog-nifty](http://samadi.cocolog-nifty.com)
- <sup>23</sup> Comment from a participant at the first meeting. Subsequent meetings in other wards have been open to local residents after regional media reports hinted at irregularities at the first meeting.
- <sup>24</sup> For instance, 'Creating Forests That Protect Lives', [tunagaru-japan](http://www.tunagaru-japan.com)
- <sup>25</sup> On the hazardous chemicals release, see Aoyama Teiichi, 'Ima, ichido kangaeru saigai gareki kōiki shori', May 22, 2012 [y0utub3](https://www.youtube.com/watch?v=0utub3)
- <sup>26</sup> I was at the public meeting. Uncensored coverage can be found here: [ustream.tv](http://ustream.tv)
- <sup>27</sup> Asahi Shimbun, 'EDITORIAL: Spirit of mutual help needed for disposing of disaster debris', March 15, [ajw.asahi](http://www.ajw.asahi.com)
- <sup>28</sup> Cited in Aoyama Teiichi, 'Ima, ichido kangaeru saigai gareki kōiki shori', May 22, 2012 [y0utub3](https://www.youtube.com/watch?v=0utub3)
- <sup>29</sup> See for instance: Makiko Segawa, 'Reporters Without Borders on Discrimination Against Freelance Journalists in Japan', Asia-Pacific Journal: Japan Focus, June 3, 2012, [japanfocus](http://www.japanfocus.org)
- <sup>30</sup> Ministry of the Environment Agency Reconstruction Agency, Kikaku kyōsō setsumeisho [saigaihaikibutsukouhousetsumeisho.pdf](http://www.saigaihaikibutsukouhousetsumeisho.pdf)
- <sup>31</sup> Official Ministry of Finance figures here: <http://www.mof.go.jp/budget/pdf>
- <sup>32</sup> In this primarily rural area, it is thought the

local farming lobby played a significant role in the local government's about turn.

<sup>33</sup> For instance, 'Creating Forests That Protect Lives', [tunagaru-japan](https://www.tunagaru-japan.com/)