HEIMKEHR NACH FUKUSHIMA

Adolf Muschg

Analysis by Giulia Milani

Philosophical Novel, Eco-Fiction, Social Novel

In his novel *Heimkehr nach Fukushima* (2018), Adolf Muschg reimagines the Japanese city in the aftermath of the 2011 Great East Japan Earthquake. The Swiss author focuses on the emotional and social consequences of the nuclear catastrophe that followed the earthquake, exploring themes such as contamination, displacement and resilience in a radioactive landscape.

Year of Publication	2018
Publication Place	Munich
Editor	Verlag C.H.Beck oHG
Entity	The 2011 Great East Japan Earthquake

GEOLOGICAL ANALYSIS

Earthquake The 2011 Great East Japan Earthquake

REAL EVENT

Time	11 March 2011 14:46 JST (05:46 UTC)
Location	Tōhoku Japan
Coordinates	38.103225, 142.187805
Impacted Areas	The Pacific coast of the northeastern part of Honshū, in particular Kurihara City of Miyagi Prefecture, cities and towns in Miyagi, Fukushima, Ibaraki, Iwate, Tochigi, Hokkaido, Aomori and Chiba Prefectures
Seismic Fault	Reverse fault type with WNW-ESE compressional axis (by Centroid Moment Tensor analysis)
Magnitude	moment magnitude (Mw) 9.0

Typology

Tectonic Earthquake

Source: The Geological Society. "Tohoku Earthquake." The Geological Society, www.geolsoc.org.uk/science-and-policy/plate-tectonic-stories/tohoku-earthquake/. Accessed 6 June 2025.

Anthropization Level

Remote Dwellings

The term “minka” refers to vernacular dwellings of the ancient, medieval or premodern periods, or rebuilt in the style of the period. These dwellings are divided into farmhouses, fishermen’s dwellings, mountain dwellings and merchants’ town houses (Source: “Minka.” Japan Art and Science Foundation, https://www.aisf.or.jp/~jaanus/deta/m/minka.htm. Accessed 10 June 2025.)

Huts

Japanese “yamagoyas” or “mountain huts” (Source: “Hikes in Japan.” Yamakei Online, https://hikesinjapan.yamakei-online.com/information/g.php. Accessed 18 June 2025). The poor farm-labourer and fisherman live in huts which are clustered together (Morse 47). (Source: Morse, Edward Sylvester. Japanese Homes and Their Surroundings. Project Gutenberg, 21 August 2016, https://www.gutenberg.org/files/52868/52868-pdf.pdf).

Shelters

In Tokyo one may find streets, or narrow alleys, lined with a continuous row of the cheapest shelters. The fishermen's houses are nothing more than shelters (Morse 4, 67). (Source: Morse, Edward Sylvester. Japanese Homes and Their Surroundings. Project Gutenberg, 21 August 2016, https://www.gutenberg.org/files/52868/52868-pdf.pdf).

Houses

In Japanese cities and towns, houses are built very close together, separated only by narrow streets. The most distinctive features of traditional Japanese homes are openness and accessibility. In the Japanese house [...] there are two or more sides that have no permanent walls. Instead, there are slight sliding screens that run in appropriate grooves in the floor and overhead. These grooves mark the boundaries of each room. The screens can be opened by sliding them back or removed entirely, thus combining a number of rooms into one large space. [...] Nearly all houses have a veranda (Morse xxx, 2, 6, 7). (Source: Morse, Edward Sylvester. Japanese Homes and Their Surroundings. Project Gutenberg, 21 August 2016, https://www.gutenberg.org/files/52868/52868-pdf.pdf).

Factories

Companies located in Tōhoku: Canon, Elpida, Fujitsu, Hitachi, Honda, Kyocera, Nissan, Panasonic, Texas Instruments and Sony, Shin-Etsu Chemical Plant, Sumitomo Metal, an Asahi Glass plant, high-tech and automotive production facilities (Bird and Grossman A 293). (Source: Bird, Winifred A., and Elizabeth Grossman. “Chemical Aftermath: Contamination and Cleanup Following the Tohoku Earthquake and Tsunami.” Environmental Health Perspectives, vol. 119, no. 7, 2011, A 290-A 301, https://doi.org/10.1289/ehp.119-a290. Accessed 18 June 2025). Each prefecture in Tōhoku has a distinct industrial profile: Aomori: retail trade, manufacturing industries, and electronic components; Iwate: transport machinery, food and related products, automotive industries, electronic parts and devices, pharmaceutical industries; Miyagi: automobile industry, high-tech electronics, ICT, aerospace R&D and manufacture, food-related industries; Akita: software industries, food and beverages, manufacturing industries; Yamagata: manufacturing industries, chemical products, woodcraft; Fukushima: manufacturing industries, traditional art crafts, chemical products, transport machine (Source: “Tohoku.” EU-Japan Centre for Industrial Cooperation, https://www.eu-japan.eu/eubusinessinjapan/about-japan/regions-prefectures/tohoku. Accessed 18 June 2025).

Shops

Ginza shopping district in Tokyo, Aeon Mall Natori, Mitsui Outlet Park Sendai Port, BicCamera Niigata Store, Tsuruha Drug Tendo Shop, AOKI Sendai Ichibancho, Tsuruha Drug Sendai Chuo-dori Shop (Sources: “Tokyo.” Encyclopaedia Britannica, written by the Editors of Encyclopaedia Britannica, edited by Michael Ray, 16 May 2025, https://www.britannica.com/place/Tokyo. Accessed 18 June 2025; “Best Shopping around Tohoku Spot List (2025 Edition).” Live Japan. Perfect guide, https://livejapan.com/en/in-tohoku/spot-list/area-all04/cate-cl03/. Accessed 18 June 2025).

Company Premises

770 manufacturing companies are headquartered in Tōhoku (Source: “Tohoku.” EU-Japan Centre for Industrial Cooperation, https://www.eu-japan.eu/eubusinessinjapan/about-japan/regions-prefectures/tohoku. Accessed 18 June 2025).

Offices

Office buildings in Miyagi, Fukushima and Ibaraki Prefectures (Building Research Institute 25). (Source: Building Research Institute. “The Great East Japan Earthquake Damage Report.” The Japan Journal, Dec. 2011, pp. 22-27, https://www.kenken.go.jp/english/contents/topics/japan-journal/pdf/jj2011dec_22-27.pdf. Accessed 18 June 2025).

Facilities

Oil refineries, sewer and gas lines, iron foundry, marine products processing plants, water systems (Pletcher and Rafferty), bridges and stations (Sagara and Ishiwatari 4), fishing ports, including Nagasaki, Otaru, Kushiro, and Abashiri (Popescu and Ogushi 39). (Sources: Pletcher, Kenneth, and John P. Rafferty. “Japan earthquake and tsunami of 2011.” Encyclopaedia Britannica, 12 June 2025, https://www.britannica.com/event/Japan-earthquake-and-tsunami-of-2011. Accessed 18 June 2025; Sagara, Junko, and Mikio Ishiwatari. Knowledge Note 4-1. CLUSTER 4: Recovery Planning. Infrastructure Rehabilitation. Global Facility for Disaster Reduction and Recovery, World Bank, Dec. 2011, https://www.gfdrr.org/sites/default/files/publication/knowledge-note-japan-earthquake-4-1.pdf. Accessed 18 June 2025; Popescu, Irina, and Toshihiko Ogushi. Fisheries in Japan. European Parliament, Directorate General for Internal Policies, Policy Department B: Structural and Cohesion Policies, Dec. 2014, https://www.europarl.europa.eu/RegData/etudes/note/join/2014/529044/IPOL-PECH_NT(2014)529044_EN.pdf. Accessed 18 June 2025).

Correctional Facilities

As of April 2019, the number of penal institutions in Japan totalled 184, with 61 prisons, 6 juvenile prisons, 8 detention houses, 8 prison branches and 101 branch detention houses (Ministry of Justice). (Sources: Ministry of Justice. “Regional Correction Headquarters, Correctional Institutions and Training Institute for Correctional Personnel.” Ministry of Justice, https://www.moj.go.jp/EN/kyousei1/kyousei_kyouse16-03.html. Accessed 18 June 2025; Ministry of Justice. “Penal Institutions (Prisons / Juvenile Prisons / Detention Houses).” Ministry of Justice, https://www.moj.go.jp/EN/kyousei1/kyousei_kyouse03.html. Accessed 18 June 2025).

Temples

The Shiogama Shrine, the Toshogu Shrine, Motsu-ji Temple (Akasaka et al. 14, 21). (Source: Akasaka, Makoto et al. The Great East Japan Earthquake. Report on the Damage to the Cultural Heritage. Japan ICOMOS National Committee, 20 Nov. 2011, https://openarchive.icomos.org/id/eprint/3022/. Accessed 16 June 2025).

Churches

Ishinomaki St. John the Apostle Orthodox Church (Akasaka, Makoto et al. 31). (Source: Akasaka, Makoto et al. The Great East Japan Earthquake. Report on the Damage to the Cultural Heritage. Japan ICOMOS National Committee, 20 Nov. 2011, https://openarchive.icomos.org/id/eprint/3022/. Accessed 16 June 2025).

Schools

School gymnasiums designed according to the old earthquake resistance standards across a widespread area in Ibaraki Prefecture (Building Research Institute 25-26). (Source: Building Research Institute. “The Great East Japan Earthquake Damage Report.” The Japan Journal, Dec. 2011, https://www.kenken.go.jp/english/contents/topics/japan-journal/pdf/jj2011dec_22-27.pdf. Accessed 16 June 2025).

Hospitals

1 hospital, 4 geriatric healthcare facilities in the Tōhoku area (Aoikai Medical Corporation). (Source: Aoikai Medical Corporation. “List of Hospitals and Facilities. Tohoku Area.” Aoikai Medical Corporation, https://www.aoikai.jp/eng/facility/. Accessed 23 June 2025).

Streets

As of April 1, 2022, the total length of roads in Tokyo was approximately 24,741 km (including 2,370 km of metropolitan roads), with a total area of approximately 190.31 km2 (including 46.30 km2 of metropolitan roads) (Tokyo Metropolitan Government Bureau of Construction). (Source: Tokyo Metropolitan Government Bureau of Construction. “Roads.” https://honyaku.j-server.com/LUCKENSETS/ns/tl.cgi/https://www.kensetsu.metro.tokyo.lg.jp/road/?SLANG=ja&TLANG=en&XMODE=0&XCHARSET=utf-8&XJSID=0. Accessed 23 June 2025).

Arenas

The Kamaishi Unosumai Memorial Stadium (Tohoku Tourism Promotion Organization). (Source: Tohoku Tourism Promotion Organization. "[Kamaishi, Iwate Prefecture] Tour of Kamaishi Unosumai Memorial Stadium & Earthquake Disaster Heritage Tour." Travel to Tohoku, https://www.tohokukanko.jp/en/attractions/detail_1007245.html. Accessed 23 June 2025).

Villages

Mountain villages can be found throughout the Tōhoku region. The terraced rice paddies of Ohkura village, in Yamagata Prefecture and the thickly forested mountains of Mishima village, in Fukushima Prefecture are two well-known villages in Tōhoku (National Geographic). (Source: National Geographic. “Exploring the Tohoku Trail.” National Geographic, 4 Oct. 2020, www.nationalgeographic.com/travel/article/partner-content-exploring-the-tohoku-trail. Accessed 23 June 2025).

Towns

Tourists often visit some of the following towns located in Northern Japan: Ginzan Onsen, considered the most beautiful onsen town in Japan, the preserved Edo-period town of Ouchijuku, Matsushima and the preserved samurai town of Kakunodate (Davey). (Source: Davey, Jo. “Everything you should know before visiting Northern Japan.” National Geographic, 16 Dec. 2024, www.nationalgeographic.com/travel/article/tohoku-essential-travel-guide. Accessed 23 June 2025).

Cities

The following are some of the cities in the Tōhoku region: Sendai, Natori, Kamaishi, Miyako, Fukushima (Asian Disaster Reduction Center 8, 16). (Source: Asian Disaster Reduction Center, International Recovery Platform. Great East Japan Earthquake. Preliminary Observations. ADRC, IRP, 2011, www.adrc.asia/documents/disaster_info/2011March11_EastJapan_EarthquakeReport_final.pdf. Accessed 16 June 2025).

Metropolis

Tokyo (Source: “Tokyo.” Encyclopaedia Britannica, written by the Editors of Encyclopaedia Britannica, edited by Michael Ray, 16 May 2025, https://www.britannica.com/place/Tokyo. Accessed 18 June 2025).

Megalopolis

Taiheiyō Belt (Source: “Honshu.” World Population Review, 2025, https://worldpopulationreview.com/regions/honshu. Accessed 16 June 2025).

Nuclear Power Plants

Fukushima Daiichi Nuclear Power Station and Fukushima Daini Nuclear Power Station (Sources: Tokyo Electric Power Company Holdings. “Fukushima Daiichi Decommissioning Project.” TEPCO, https://www.tepco.co.jp/en/decommision/index-e.html. Accessed 16 June 2025; Tokyo Electric Power Company Holdings. “Current Condition of Each Unit at Fukushima Daini Nuclear Power Station.” TEPCO, https://www.tepco.co.jp/en/nu/fukushima-np/f2index-e.html. Accessed 16 June 2025).

Dams

Naruko dam (Source: Ministry of Land, Infrastructure, Transport and Tourism, Tohoku Regional Development Bureau. “Naruko Dam.“ https://www.thr.mlit.go.jp/naruko/en/. Accessed 23 June 2025).

Heritage Sites

Shirakami-Sanchi (Source: “World Heritage sites.” Japan by Rail, www.japanbyrail.com/where-to-go/world-heritage-sites. Accessed 23 June 2025).

Sea Coast

Tōhoku Pacific coast (Source: “TOHOKU Pacific Coast.” Tohoku Tourism Promotion Organization, www.tohoku-pacific-coast.com/en/. Accessed 23 June 2025).

River Shores

The Iwai River, the Satetsu River, the Toyosawa River (Davey). (Source: Davey, Jo. “Everything you should know before visiting Northern Japan.” National Geographic, 16 Dec. 2024, www.nationalgeographic.com/travel/article/tohoku-essential-travel-guide. Accessed 23 June 2025).

Lake Shores

Lake Towada, Dragon Eye Lake in Hachimantai, Lake Tazawa, Juniko Twelve Lakes (Davey; Japan National Tourism Organization). (Sources: Davey, Jo. “Everything you should know before visiting Northern Japan.” National Geographic, 16 Dec. 2024, www.nationalgeographic.com/travel/article/tohoku-essential-travel-guide. Accessed 23 June 2025; Japan National Tourism Organization. “Scenic World Heritage in Tohoku. A therapeutic nature retreat through the Shirakami mountain range and Juniko Twelve Lakes”. Japan National Tourism Organization, 2025, www.japan.travel/en/itineraries/scenic-world-heritage-in-tohoku/. Accessed 23 June 2025.)

Religious Buildings And Sites

Historical Buddhist temples (Beyer). (Source: Beyer, L. Vicki. “Ancient Temples of the Deep North: Some of Tohoku’s Most Historical Temples.” Japan Today, 28 June 2021, https://japantoday.com/category/special-promotion/Ancient-temples-of-the-Deep-North-Some-of-Tohoku%E2%80%99s-most-historical-temples. Accessed 23 June 2025).

Cultural Heritage Sites

Shrines and temples in Nikko. Hiraizumi’s temples, gardens and archaeological sites represent the Buddhist Pure Land (Source: “World Heritage sites.” Japan by Rail, www.japanbyrail.com/where-to-go/world-heritage-sites. Accessed 23 June 2025).

Tourist Places

Aomori Nebuta Festival, Yamagata Cherry Festival, Lake Inawashiro Area, Akita, Hiraizumi, Senday City, Shonai (Source: Japan National Tourism Organization. “Tohoku”. Japan National Tourism Organization, 2025, www.japan.travel/en/destinations/tohoku/. Accessed 23 June 2025.)

Agriculture Areas

There are agricultural communities, farms, and agricultural lands in the Tōhoku area (Bachev 66). Fukushima has long been famous for its agriculture. It has been known since ancient times as one of Japan’s leading rice-growing regions and has earned the nickname “The Fruit Kingdom” (The Government of Japan). (Sources: Bachev, Hrabrin. Socio-economic and environmental impacts of Match 2011 earthquake, tsunami and Fukushima nuclear Accident in Japan. MPRA Paper No. 60661, Munich Personal RePEc Archive, University Library of Munich, 2014; The Government of Japan. "Fukushima Foods: Safe and Delicious." JapanGov, Autumn 2017, https://www.japan.go.jp/tomodachi/2017/autumn2017/fukushima_food.html. Accessed 16 June 2025).

Farming Areas

There are farming activities in the Tōhoku area (Bachev 33). (Source: Bachev, Hrabrin. Socio-economic and environmental impacts of Match 2011 earthquake, tsunami and Fukushima nuclear Accident in Japan. MPRA Paper No. 60661, Munich Personal RePEc Archive, University Library of Munich, 2014).

Ecological Impacts

Tsunami

The Tōhoku earthquake triggered a massive tsunami with waves up to 40 m (132 feet) high, spreading 5 km inland (Bird and Grossman A 293). (Source: Bird, Winifred A., and Elizabeth Grossman. “Chemical Aftermath: Contamination and Cleanup Following the Tohoku Earthquake and Tsunami.” Environmental Health Perspectives, vol. 119, no. 7, 2011, pp. A 290–A 301, https://doi.org/10.1289/ehp.119-a290. Accessed 16 June 2025).

Nuclear Waste

The tsunami triggered by the earthquake overwhelmed the protecting walls of the Fukushima Daiichi Nuclear Power Plant (FDNPP). This resulted in the total loss of the power supply needed to cool nuclear reactors in several units (Ishimori 2) and, therefore, in the meltdown of three nuclear reactors (National Geographic Society). The nuclear accident at the Fukushima Daiichi Nuclear Power Plant led to widespread radioactive contamination. Large quantities of radionuclides, such as radioiodine and radiocesium, were released into ecosystem and agrifood chain, contaminating air, water, soil, plants, animals and foods (Bachev 21). (Sources: Ishimori, Miki. Right to housing after Fukushima nuclear disaster: through a lens of international human rights perspective, 31 October 2017, https://disasterlaw.ifrc.org/media/1734. Accessed 16 June

2025; Bachev, Hrabrin. Socio-economic and environmental impacts of Match 2011 earthquake, tsunami and Fukushima nuclear Accident in Japan. MPRA Paper No. 60661, Munich Personal RePEc Archive, University Library of Munich, 2014; National Geographic Society. “Mar 11, 2011 CE: Tohoku Earthquake and Tsunami.” National Geographic, 5 June 2025, https://education.nationalgeographic.org/resource/tohoku-earthquake-and-tsunami/. Accessed 15 June 2025).

Physical Landscape Changes

According to the U.S. Geological Survey, about 400 km of Japan’s northern Honshū coastline sank by 0.6 m, Honshū itself shifted eastward by 2.4 m, and the Pacific Plate moved westwards by 24 m near the earthquake’s epicentre (Oskin). (Source: Oskin, Becky. "Japan earthquake & tsunami of 2011: Facts and information." Live Science, 25 Feb. 2022, https://www.livescience.com/39110-japan-2011-earthquake-tsunami-facts.html. Accessed 16 June 2025).

Destruction Of Animal Species

Around 4,550,000 poultry, 5,850 hogs, and 750 beef cattle were drowned, crushed or starved in Aomori, Iwate and Miyagi Prefectures (Bachev 38). (Source: Bachev, Hrabrin. Socio-economic and environmental impacts of Match 2011 earthquake, tsunami and Fukushima nuclear Accident in Japan. MPRA Paper No. 60661, Munich Personal RePEc Archive, University Library of Munich, 2014).

Atmospheric Changes

Large amounts of radionuclides (such as radiocesium) were released into the atmosphere, resulting in the contamination of terrestrial and marine environments. About 20% of radiocesium emitted into atmosphere was deposited on Honshū (Hirose). (Source: Hirose, Katsumi. "Atmospheric effects of Fukushima nuclear Accident: A review from a sight of atmospheric Monitoring." Journal of Environmental Radioactivity, vol. 218, July 2020, article no. 106240, Elsevier, https://doi.org/10.1016/j.jenvrad.2020.106240. Accessed 16 June 2025).

Soil Changes

In the affected areas, decontamination efforts involved removing around 20 Mm^3 of radioactive soil and organic waste, which were stored in plastic sacks throughout the region (Bundesamt für Strahlenschutz). (Source: Bundesamt für Strahlenschutz. “Environmental impact of the Fukushima accident: Radiological situation in Japan.” Bundesamt für Strahlenschutz, 21 Feb. 2024, www.bfs.de/EN/topics/ion/accident-management/emergency/fukushima/environmental-consequences.html. Accessed 26 June 2025).

Soil Degradation

Concerns about cesium-137 (137Cs) deposition and soil contamination due to emissions from the Fukushima Daiichi Nuclear Power Plant (FDNPP) emerged after the massive earthquake on 11 March 2011. Cesium-137 (137Cs), which has a half-life of 30 years, posed significant risks to agriculture, stock farming, and human health. It heavily contaminated soils in Fukushima Prefecture and across large parts of eastern and northeastern Japan, while western Japan was protected by mountain ranges (Yasunari et al. 19530, 19532). (Source: Yasunari, Teppei J., et al. “Cesium 137 deposition and contamination of Japanese soils due to the Fukushima nuclear accident.” Proceedings of the National Academy of Sciences, vol. 108, no. 49, December 2011, pp. 19530–19534, https://doi.org/10.1073/pnas.1112058108. Accessed 26 June 2025).

Pollution

In the days after the disaster, different forms of pollution emerged. Oil refineries caught fire, producing thick black smoke that filled the air (Bird and Grossman A 293). (Source: Bird, Winifred A., and Elizabeth Grossman. “Chemical Aftermath: Contamination and Cleanup Following the Tohoku Earthquake and Tsunami.” Environmental Health Perspectives, vol. 119, no. 7, 2011, pp. A 290–A 301, https://doi.org/10.1289/ehp.119-a290. Accessed 16 June 2025).

Sea Pollution

With government approval, Tepco released approximately 10,400 cubic meters of slightly contaminated water into the sea between 4 and 10 April. This was done to free up storage space for more highly contaminated water from the Unit 2 reactor and turbine buildings, which needed to be removed to ensure safe working conditions (World Nuclear Association). (Source: World Nuclear Association. “Fukushima Daiichi Accident.” World Nuclear Association, 29 April 2024, https://world-nuclear.org/information-library/safety-and-security/safety-of-plants/fukushima-daiichi-accident. Accessed 26 June 2025).

Chemical Waste

Buildings destroyed in the 2011 Tōhoku earthquake released thousands of tonnes of chemicals known as halocarbons (CFC-11, HCFC-22, HFCs), which contributed to climate change and ozone

layer depletion (American Geophysical Union). Equally concerning was the industrial chemical waste. Chemical pollutants were released from damaged industrial sites. Hazardous chemicals, such as acrylamide, benzene and formaldehyde, were present at numerous facilities in the areas affected by the disaster. Among the damaged sites were the Shin-Etsu Chemical Plant, the Sumitomo Metal, an Asahi Glass plant and numerous high-tech and automotive manufacturing plants (Bird and Grossman A 293). (Sources: American Geophysical Union. “Deadly Japan Quake and Tsunami Spurred Global Warming, Ozone Loss.” AGU Advancing Earth and Space Sciences, 26 March 2015, news.agu.org/press-release/deadly-japan-quake-and-tsunami-spurred-global-warming-ozone-loss/. Accessed 16 June 2025; Bird, Winifred A., and Elizabeth Grossman. “Chemical Aftermath: Contamination and Cleanup Following the Tohoku Earthquake and Tsunami.” Environmental Health Perspectives, vol. 119, no. 7, 2011, p. A 290–A 301, https://doi.org/10.1289/ehp.119-a290. Accessed 16 June 2025).

Social Impacts

Deaths

As of December 2021, the Reconstruction Agency confirmed 19,747 deaths and more than 2,500 missing people (Oskin). (Source: Oskin, Becky. "Japan earthquake & tsunami of 2011: Facts and information." Live Science, 25 Feb. 2022, https://www.livescience.com/39110-japan-2011-earthquake-tsunami-facts.html. Accessed 16 June 2025).

Injuries

6,157 injuries (National Centers for Environmental Information). (Source: National Centers for Environmental Information. “On This Day: 2011 Tohoku Earthquake and Tsunami” National Centers for Environmental Information, National Oceanic and Atmospheric Administration, 11 March 2021, https://www.ncei.noaa.gov/news/day-2011-japan-earthquake-and-tsunami. Accessed 24 June 2025).

Destruction Of Facilities

Several communities across the northeastern part of the Tōhoku region, particularly those in the flooded areas, suffered severe structural damage to buildings and infrastructure (Reconstruction Agency; Intergovernmental Oceanographic Commission and United Nations University 3). This included the significant destruction of roads, and airports, along with the widespread loss of essential services such as electricity, gas, running water and sewer systems (Reconstruction Agency). Even railway infrastructure was significantly damaged. Nevertheless, prior earthquake countermeasures such as seismic reinforcements helped prevent complete system failure. Approximately 325 km of railway lines were damaged, primarily by the tsunami. Furthermore, the combined impact of the earthquake and the tsunami devastated much of the port infrastructure (Sagara and Ishiwatari 4). (Sources: Reconstruction Agency. “Great East Japan Earthquake.” Reconstruction Agency, Government of Japan, https://www.reconstruction.go.jp/english/topics/GEJE/index.html. Accessed June 2025; Intergovernmental Oceanographic Commission, and United Nations University. Summary Statement from the Japan – UNESCO – UNU Symposium on The Great East Japan Tsunami on 11 March 2011 and Tsunami Warning Systems: Policy Perspectives 16 – 17 February 2012. UNESCO IOC, 2012, France, https://unesdoc.unesco.org/ark:/48223/pf0000216072. Accessed 16 June 2025; Sagara, Junko, and Mikio Ishiwatari. Knowledge Note 4-1. CLUSTER 4: Recovery Planning. Infrastructure Rehabilitation. Global Facility for Disaster Reduction and Recovery, World Bank, Dec. 2011, https://www.gfdrr.org/sites/default/files/publication/knowledge-note-japan-earthquake-4-1.pdf. Accessed 18 June 2025)

Destruction Of Dwellings

Thousands of destroyed homes (Source: “Rare Video: Japan Tsunami” , National Geographic, National Geographic Society, 2011, https://education.nationalgeographic.org/resource/tohoku-earthquake-and-tsunami/. Accessed 24 June 2025).

Social Disruption

The earthquake, the tsunami and the nuclear meltdown of the Fukushima Daiichi Nuclear Reactor displaced around 400,000 people, causing the disruption of social networks and relationships with family members, relatives, close neighbours and friends (Gagné 710-712). (Source: Gagné, Isaac. “Dislocation, Social Isolation, and the Politics of Recovery in Post-Disaster Japan”. Transcultural Psychiatry, vol. 57, no. 5, 2020, https://journals.sagepub.com/doi/full/10.1177/1363461520920348, pp. pp. 710-723. Accessed 16 June 2025).

Trauma

The event led to long-term psychological trauma and post-traumatic stress disorder (Alexis-Martin and Davies; Gagné 714; Kino et al.). The GEJE exposed thousands of people to life-threatening situations, with many experiencing the deaths of close family members, relatives and friends. Many people also witnessed others being carried away by the tsunami (Matsumoto et al. 318-319). (Sources: Alexis-Martin, Becky, and Thom Davies. “Japan earthquake: Social aftershocks of Fukushima disaster are still being felt.” The Conversation, 23 Nov. 2016, theconversation.com/japan-earthquake-social-aftershocks-of-fukushima-disaster-are-still-being-felt-69241. Accessed 16 June 2025; Gagné, Isaac. “Dislocation, Social Isolation, and the Politics of Recovery in Post-Disaster Japan”. Transcultural Psychiatry, vol. 57, no. 5, 2020, pp. 710-723, https://journals.sagepub.com/doi/full/10.1177/1363461520920348. Accessed 16 June 2025;

Matsumoto, Kazunori, et al. “Psychological trauma after the Great East Japan Earthquake.” Psychiatry and Clinical Neurosciences, vol. 70, no. 8, Aug. 2016, pp. 318–331, https://onlinelibrary.wiley.com/doi/10.1111/pcn.12403. Accessed 16 June 2025).

Diseases

Following the earthquake, various illnesses emerged, including respiratory infections such as tsunami-related aspiration pneumonia, legionellosis, and influenza; wound infections like tetanus; as well as food poisoning, tsutsugamushi disease, and measles (Takahashi et al. 20). Among evacuees, several health conditions increased considerably: hypertension rose from 53.9% to 60.1%, diabetes mellitus from 10.2% to 12.2%, and dyslipidaemia from 44.3% to 53.4%. These increases were linked to weight gain (Hasegawa et al. 241). (Sources: Takahashi, Takashi, et al. “Infectious Diseases after the 2011 Great East Japan Earthquake.” Journal of Experimental & Clinical Medicine, vol. 4, no. 1, Elsevier, Feb. 2012, pp. 20–23, https://www.sciencedirect.com/science/article/abs/pii/S1878331711001677. Accessed 25 June 2025; Hasegawa, A. et al. “Emergency Responses and Health Consequences after the Fukushima Accident; Evacuation and Relocation.” Clinical Oncology, vol. 28, no. 4, April 2016, pp. 237-244, https://www.clinicaloncologyonline.net/article/S0936-6555(16)00005-4/fulltext. Accessed 16 June 2025).

Depopulation

Data from the prefectures revealed a 12.7% population decrease across 43 coastal municipalities in Iwate, Miyagi, and Fukushima compared to pre-disaster levels. In particular, the population in Namie, Futaba, Okuma, and Tomioka declined by over 80% (Yajima et al.). (Source: Yajima, Daisuke, et al. “Tsunami-hit areas rebuilt but remain sparsely populated.” The Asahi Shimbun, 11 Mar. 2024, https://www.asahi.com/ajw/articles/15194711. Accessed 25 June 2025).

Repopulation

The population has significantly increased in Sendai (Yajima et al.). (Source: Yajima, Daisuke, et al. “Tsunami-hit areas rebuilt but remain sparsely populated.” The Asahi Shimbun, 11 Mar. 2024, https://www.asahi.com/ajw/articles/15194711. Accessed 25 June 2025).

Relocation

In December 2011, it was announced by the government that residents would be helped to return home as soon as possible (World Nuclear Association). (Source: World Nuclear Association. “Fukushima Daiichi Accident.” World Nuclear Association, 29 April 2024, www.world-nuclear.org/information-library/safety-and-security/safety-of-plants/fukushima-daiichi-accident. Accessed 26 June 2025).

Forced Relocation

After the disaster, people were forced to relocate to emergency shelters (Cosson 36-37) or to lower-risk areas (Zhu et al. 132). (Sources: Cosson, C. “From emergency shelter towards disaster-relief housing – Tōhoku’s reconstruction case study.” Budownictwo i Architektura, vol. 20, no. 1, 2021, pp. 35-46. https://doi.org/10.35784/bud-arch.1587. Accessed 16 June 2025; Zhu, Rui, et al. “GROWTH AND SHRINKAGE PRE AND POST TSUNAMI IN FUKUSHIMA PREFECTURE, JAPAN.” Landsc Res Rec., vol. 9, Mar. 2020, pp. 132-147, https://pmc.ncbi.nlm.nih.gov/articles/PMC9169785/. Accessed 25 June 2025).

Recovery

Despite the devastation, utility restoration and debris removal began promptly across much of the region (Gagnè 710). (Source: Gagné, Isaac. “Dislocation, Social Isolation, and the Politics of Recovery in Post-Disaster Japan”. Transcultural Psychiatry, vol. 57, no. 5, 2020, pp. 710-723, https://journals.sagepub.com/doi/full/10.1177/1363461520920348. Accessed 16 June 2025).

Destruction Of Goods/Commodities

This damage to the oil refining industry reduced demand for commodities (European Central Bank). (Source: European Central Bank. Monthly Bulletin, May 2011, European Central Bank, https://www.ecb.europa.eu/pub/pdf/other/mb201105_focus01.en.pdf, p. 12. Accessed 25 June 2025).

Resource Depletion

The disaster caused disruptions to supply chains and trade (Collins 1). (Source: Collins, Tara. Great East Japan Earthquake: economic and trade impact. Australian Government – Department of Foreign Affairs and Trade, 2011, https://www.dfat.gov.au/sites/default/files/great-east-japan-earthquake-economic-and-trade-impact.pdf. Accessed 28 June 2025).

Destruction Of Cultural Heritage (Materials And Sites)

The Great East Japan Earthquake (GEJE) caused significant damage to cultural heritage sites. For instance, 116 traditional buildings were damaged in Sawara, a historic canal town in Chiba Prefectu (World Monuments Fund 22; The Ono River and Sawara Cityscape Preservation Association). Heri sites in Hiraizumi, including the Konjikido, were also affected by the earthquake (Akasaka et al. 10 Several stone pagodas at the Toshogu Shrine in Sendai City, which are designated as important cult properties, suffered damage too (Akasaka et al. 13). (Sources: World Monuments Fund. World Monuments Fund. Report. World Monuments Fund, 2013, wmf-production.nyc3.digitaloceanspaces.com/documents/59_World20Monuments20Fund20in20Japan_2 11-22-171640_tlld.pdf. Accessed 27 June 2025; The Ono River and Sawara Cityscape Preservation Association. “Sawara Historic District: Steps toward Recovery from the Great East Japan Earthqua World Monuments Fund, May 2014, https://www.wmf.org/resources/sawara-historic-district. Acces 27 June 2025; Akasaka, Makoto, et al. “The great East Japan earthquake: report on the damage to tl cultural heritage.” Japan ICOMOS, 20 Nov. 2011, openarchive.icomos.org/id/eprint/3022/. Accesse June 2025).

Poverty

After the GEJE the number of unemployed people increase from 150,000 to 190,000 (Katayanagi). (Source: Katayanagi, Mitsuaki, et al. “Impact of the Great East Japan Earthquake on the Employment Status and Mental Health Conditions of Affected Coastal Communities.” International Journal of Environmental Research and Public Health, vol. 17, no. 21, 3 Nov. 2020, https://doi.org/10.3390/ijerph17218130. Accessed 28 June 2025).

Famine

In the disaster, the tsunami inundated 23,600 hectares of farmland in the six prefectures facing the Pacific Ocean. Almost 85% of the farmlands were paddy fields, while the remaining 15% were uplands with crops and vegetables such as wheat, soybeans, potatoes, cabbages, onions, radishes and cucumbers (Roy et al. 40-41). (Source: Roy, Kingshuk, et al. “Salinity status of the 2011 Tohoku-oki tsunami affected agricultural lands in northeast Japan.” International Soil and Water Conservation Research, vol. 2, no. 2, June 2014, pp. 40-50, https://doi.org/10.1016/S2095-6339(15)30005-8. Accessed 28 June 2025).

Destruction Of Public Buildings

The destruction to the built environment was immense. Around 122,000 buildings were completely destroyed, about 283,000 were severely damaged and approximately 748,000 were partially damaged. Instances of falling non-structural elements such as ceilings were reported even in buildings compliant with updated earthquake resistance standards. Many structures also tilted due to widespread ground liquefaction (Building Research Institute). (Source: Building Research Institute. “The Great East Japan Earthquake Damage Report.” The Japan Journal, Dec. 2011, pp. 22–27, https://www.kenken.go.jp/english/contents/topics/japan-journal/pdf/jj2011dec_22-27.pdf, p. 25. Accessed 23 June 2025).

Earthquake “the Big Tōhoku Earthquake am 11. März 2011” ‘the Big Tōhoku Earthquake on 11 March 2011’ (Muschg 174; my trans.).

LITERARY EVENT

Time	11 March 2011
Location	Tōhoku Japan
Impacted Areas	Fukushima City, Yoneuchi Village, Minamisōma, Sendai, Kawamata, Namie, Tomioka, Ōkuma, Naraha
Emphasis Phase	Post-disaster (consequences)
Seismic Risk Ref.	Without reference
Magnitude	“Erdbeben der Stärke 9” ‘9.0 magnitude earthquake’ (Muschg 58; my trans.).
Anthropization Level	Houses, Facilities, Villages, Towns, Cities, Nuclear Power Plants, Public Buildings, Settlements, Agriculture Areas, Farming Areas, Huts, Shelters, Factories, Company Premises, Shops, Country Houses, Churches, Schools, Hospitals, Streets

	Metropolis, Tent Camps, River Shores, Lake Shores, Tourist Places
Ecological Impacts	Nuclear Waste, Tsunami, Atmospheric Changes, Soil Changes, Soil Degradation, Sea Pollution, Pollution, Destruction Of Animal Species
Social Impacts	Deaths, Social Disruption, Depopulation, Forced Relocation, Relocation, Repopulation, Poverty, Recovery

LINGUISTIC & STYLISTIC ANALYSIS

Keywords	"Verstrahlen" 'To Contaminate With Radioactivity' (Muschg 22; My Trans.); "Strahlung" 'Radiation' (92; My Trans.); "Strahlenwerte" 'Radiation Levels' (175; My Trans.)
	"Dai Ichi" (Muschg 63), "Die Kettenreaktion" 'Chain Reaction' (53; My Trans.); "Der Störfall" 'Nuclear Accident' (72; My Trans.); "Das Havarierte Werk" 'The Damaged Plant' (167; My Trans.); "Kernschmelze" 'Core Meltdown' (200; My Trans.)
	"Geigerzähler" 'Geiger Counter' (Muschg 94-95; My Trans.); "Das Gerät" 'Device' (95; My Trans.); "Ein Gelbes Gerät" 'A Yellow Device' (107; My Trans.), "Geiger" (108)
	"Säcke" 'Sacks' (Muschg 108; My Trans.); "Sackkolonien" 'Sack Colonies' (111; My Trans.); "Eine Reihe Schwarzer Säcke" 'A Row Of Black Sacks' (164; My Trans.)
	"Katastrophe" 'Disaster, Catastrophe' (Muschg 123; My Trans.); "Ein Unglück" 'A Disaster' (59; My Trans.); "Seit Der Katastrophe Ausfälle" 'Since The Catastrophic Radioactive Fallout' (84; My Trans.)
	"Die No-Go-Area" (Muschg 53); "Die Exclusion Zone" (112), "No-Go-Zone" (162)
	"Zwangsemigranten" 'Forced Emigrants' (Muschg 89; My Trans.); "Flüchtlinge Auf Lebenszeit" 'Displaced People For Life' (89; My Trans.); "Evakuieren" 'To Evacuate' (55; My Trans.); "Evakuierung" 'Evacuation' (12; My Trans.)
	"Notunterkünfte" 'Emergency Shelters' (Muschg 10; My Trans.); "Temporary Housing" (118), "Die Notsiedlung" 'Emergency Settlement' (118; My Trans.); "Baracke" 'Hut' (124; My Trans.)
	"Dekontaminierung" 'Decontamination' (Muschg 176; My Trans.); "Dekontaminieren" 'To Decontaminate' (190; My Trans.); "Entsorgung" 'Decontamination' (53; My Trans.); "Entsorgen" 'To Decontaminate' (52; My Trans.)
	"Rückkehr" 'Return' (Muschg 22; My Trans.); "Wiederansiedlung" 'Resettlement' (10; My Trans.); "Zurückkehren" 'To Return' (93; My Trans.); "Zurückkommen" 'To Come Back' (93; My Trans.); "Rücksiedlung" 'Resettlement' (191; My Trans.)
	"Gemeinde Yoneuchi" 'Yoneuchi Municipality' (Muschg 10; My Trans.); "Dorf" 'Village' (63; My Trans.); "Yoneuchi" (64); "Das «Schönste Dorf Japans»" 'The «Most Beautiful Village In Japan»' (88; My Trans.)
	"Künstler-Kolonie" 'Colony Of Artists' (Muschg 10; My Trans.); "Künstlersiedlung" 'Artists' Colony' (19; My Trans.)
	"Tsunami" (Muschg 53); "Tsunami-Toten" 'Tsunami Deaths' (79; My Trans.); "Die Große Welle" 'The Great Wave' (112; My Trans.)
	"Fukushima" (Muschg 62), "Fukushima City" (108), "Reise Durch Fukushima" 'Journey Across Fukushima' (96; My Trans.)

Motifs, Topoi, Mythologemes	Death, Ideal Community, Civilisation, Locus Horridus, Locus Amoenus
Syntax	Hypotaxis, Complex Noun Phrases, Unconventional Position, High Frequency Connectives, High frequency of phenomena of the spoken language
Punctuation	Ellipsis, Dashes
Morphology	Preference For Nouns Adjectives, High frequency of phenomena of the spoken language
Phonetics/Prosody	Sound-related word choice (onomatopoeia, rhyme, alliteration)

In his 2018 novel *Heimkehr nach Fukushima* (*Returning Home to Fukushima*), Adolf Muschg deals with the 2011 Great East Japan Earthquake, setting the story in post-disaster Fukushima Prefecture, an area severely affected by the catastrophe. In the novel, the geological event remains in the background, as the Swiss author focuses on the emotional, existential and social aftermath of one of the three disasters that hit Japan in 2011, namely the Fukushima Daiichi Nuclear Power Plant accident.

On Friday 11 March 2011, at 2:46 PM JST, a magnitude 9.0 earthquake struck off the Pacific coast of northeastern Japan (38° 6.2′ N, 142° 51.6′ E), causing devastating damage in the Tōhoku region, especially in Miyagi, Fukushima, Ibaraki, Iwate, Tochigi, Hokkaido, Aomori, and Chiba Prefectures. It has been the largest earthquake ever recorded in Japan, and the Japan Meteorological Agency named it “The 2011 Great East Japan Earthquake” (Japan Meteorological Agency).

The Tōhoku earthquake triggered a massive tsunami with waves up to 40 m (132 feet) high, spreading 5 km inland (Bird and Grossman A 293). The tsunami inundated 561 km² of coastline (Bird and Grossman A 293), overwhelming the protecting walls of the Fukushima Daiichi Nuclear Power Plant (FDNPP). This resulted in the total loss of the power supply needed to cool nuclear reactors in several units (Ishimori 2) and, therefore, in the meltdown of three nuclear reactors (National Geographic Society). To protect residents in the areas surrounding the power plant, evacuation zones were established (Reconstruction Agency). At 7:03 PM, the Fukushima government ordered 1,864 residents within a 2 km radius to evacuate. By that evening, the evacuation zone expanded to 3 km, affecting 5,800 residents, including those instructed to take shelter within 10 km. Following the first explosion at reactor No. 1, over 50,000 residents within 20 km were ordered to evacuate on 12 March. By 15 March, more than 97% of residents within the 20 km radius had evacuated. Altogether, the designated evacuation zones covered approximately 2.7% of Fukushima Prefecture (Zhu et al. 136-137).

The Tōhoku region was not prepared to face a triple catastrophe involving a massive earthquake, a tsunami, and a nuclear disaster. The affected areas experienced extensive damage in multiple dimensions, encompassing structural and infrastructural destruction, industrial and economic losses, environmental degradation, social and human impact, as well as consequences specifically related to the nuclear disaster.

Several communities across the northeastern part of the Tōhoku region, particularly those in the flooded areas, suffered severe structural damage to buildings and infrastructure (Reconstruction Agency; Intergovernmental Oceanographic Commission and United Nations University 3). This included the destruction of roads, airports, and railway lines along with the widespread loss of essential services such as electricity, gas, running water and sewer systems (Reconstruction Agency). Nevertheless, prior earthquake countermeasures such as seismic reinforcements helped prevent complete system failure. Approximately 325 km of railway lines were damaged, primarily by the tsunami. Furthermore, the combined impact of the earthquake and the tsunami devastated much of the port infrastructure (Sagara and Ishiwatari 4). Beyond this, around 122,000 buildings were completely destroyed, about 283,000 were severely damaged, and approximately 748,000 were partially damaged. Instances of collapse of non-structural elements such as ceilings were reported even in buildings compliant with updated earthquake resistance standards. Many structures also tilted due to

widespread ground liquefaction (Building Research Institute 25). According to the Cabinet Office, the total direct financial damage caused by the disaster was estimated at approximately 16.9 trillion yen (US$154 billion) for the month of June 2011. Of this amount, around 1.3 trillion yen were attributed to damage to lifeline utilities, 2.2 trillion yen to social infrastructure, and 3.0 trillion yen to other sectors (Reconstruction Agency). Despite the devastation, utility restoration and debris removal began promptly across much of the region (Gagné 710).

In addition, the Great East Japan Earthquake (GEJE) caused significant damage to cultural heritage sites. For instance, 116 traditional buildings were damaged in Sawara, a historic canal town in Chiba Prefecture (World Monuments Fund 22; The Ono River and Sawara Cityscape Preservation Association). Heritage sites in Hiraizumi, including the Konjikido, were also affected by the earthquake (Akasaka et al. 10). Several stone pagodas at the Toshogu Shrine in Sendai City, which are designated as important cultural properties, suffered damage too (Akasaka et al. 13).

The agricultural and livestock industries suffered major destruction. Around 4,550,000 poultry, 5,850 hogs, and 750 beef cattle were drowned, crushed or starved in Aomori, Iwate and Miyagi Prefectures (Bachev 38). Furthermore, the tsunami inundated 23,600 hectares of farmland across six coastal prefectures (Roy et al. 40-41). The disaster caused significant damage to Japan's fisheries and forestry sector. A total of 28,612 fishing vessels, 1,725 shared-use facilities, and 319 harbours were affected. Additionally, forest land degradation was observed in 458 locations, and approximately 1,065 hectares of forest were damaged (Bachev 37-38).

The ecological impact too was dramatic. In the days after the disaster, different forms of pollution emerged. Oil refineries caught fire, producing thick black smoke that filled the air (Bird and Grossman A 293). This damage to the oil refining industry reduced demand for commodities (European Central Bank 12) and caused disruptions to supply chains and trade (Collins 1). Moreover, buildings destroyed in the 2011 Tōhoku earthquake released thousands of tonnes of chemicals known as halocarbons (CFC-11, HCFC-22, HFCs), which contributed to climate change and ozone layer depletion (American Geophysical Union). Equally concerning was the industrial chemical waste. Hazardous chemicals, such as acrylamide, benzene and formaldehyde, were produced in numerous facilities in the areas affected by the disaster. After the earthquake, chemical pollutants were released from the damaged industrial sites. Many of these chemicals posed risks to respiratory health and nervous system function, while others were carcinogenic. Several were also toxic, raising concerns about long-term contamination of soil and water (Bird and Grossman A 293). Among the damaged sites were the Shin-Etsu Chemical Plant, the Sumitomo Metal, an Asahi Glass plant, and numerous high-tech and automotive manufacturing plants (Bird and Grossman A 293).

The earthquake produced also physical landscape changes. According to the U.S. Geological Survey, about 400 km of Japan's northern Honshū coastline sank by 0.6 m, Honshū itself shifted eastward by 2.4 m, and the Pacific Plate moved westwards by 24 m near the earthquake’s epicentre (Oskin).

The death toll was devastating due to the high population density of the affected areas, an outcome largely influenced by Japan’s geophysical characteristics. Indeed, the scarcity of flat and arable land historically had led people to concentrate settlements along vulnerable coastal zones (Internet Geography). Regarding December 2021, the Reconstruction Agency confirmed 19,747 deaths, more than 2,500 missing people (Oskin) and 6,157 injuries (National Centers for Environmental Information). In addition, after the nuclear accident at FDNPP, nearly 470.000 people were displaced from their homes (Bachev 25).

The psychological and social consequences of this displacement were profound. Not only did the disaster displace thousands of families from their homes, but it also led to the fragmentation of family units. Before the disaster, many families lived in multigenerational households and formed close-knit communities. After that moment, these households were destroyed, and people were relocated to emergency shelters (Reconstruction Agency; Cosson 36-37) or to lower-risk areas (Zhu et al. 132; Internet Geography). This process resulted in social disruption and marginalisation (Alexis-Martin and Davies). Studies confirm that the 2011 disaster marked the beginning of a prolonged state of “chronic dislocation”, characterised by uncertainty, anxiety and frustration. As Koyama et al. (2014) report, much of the psychological and social stress arose from the disruption of social networks and

relationships, with a negative impact on family members, relatives, close neighbours and friends (Gagné 712).

Besides the physical destruction and the fragmentation of communities, the tragic event led to long-term psychological trauma and post-traumatic stress disorder (Alexis-Martin and Davies; Gagné 714; Kino et al.). The GEJE exposed thousands of people to life-threatening situations, with many experiencing the deaths of close family members, relatives and friends. Many people also witnessed others being carried away by the tsunami. The accident at the Fukushima Daiichi Nuclear Power Plant caused additional fear regarding people's health due to the invisible danger of nuclear radiation (Matsumoto et al. 318-319).

In addition to psychological effects, the disaster triggered a series of public health issues. Following the earthquake, various illnesses emerged, including respiratory infections such as tsunami-related aspiration pneumonia, legionellosis, and influenza; wound infections like tetanus; as well as food poisoning, tsutsugamushi disease, and measles (Takahashi et al. 20). Among evacuees, several health conditions increased considerably: hypertension rose from 53.9% to 60.1%, diabetes mellitus from 10.2% to 12.2%, and dyslipidaemia from 44.3% to 53.4%. These increases were linked to weight gain (Hasegawa et al. 241).

The consequences of the disaster were significant also in terms of demographics. Data from the prefectures revealed a 12.7% population decrease across 43 coastal municipalities in Iwate, Miyagi, and Fukushima compared to pre-disaster levels. In particular, the population in Namie, Futaba, Okuma, and Tomioka declined by over 80% (Yajima et al.).

Compounding the environmental damages caused by the earthquake and by the tsunami, the nuclear accident at the Fukushima Daiichi Nuclear Power Plant led to widespread radioactive contamination. Large quantities of radionuclides, such as radioiodine and radiocesium, were released into ecosystem and agrifood chain, contaminating air, water, soil, plants, animals and foods (Bachev 21). About 20% of the radiocesium emitted into the air was deposited on the island of Honshū (Hirose). Cesium-137 (137Cs), which has a half-life of 30 years, posed significant risks to agriculture, stock farming, and human health. It heavily contaminated soils in Fukushima Prefecture and across large parts of eastern and northeastern Japan, while western Japan was protected by mountain ranges (Yasunari et al. 19530, 19532). Efforts to mitigate this contamination were extensive. In the affected areas, decontamination activities involved removing around 20 Mm^3 of radioactive soil and organic waste, which were stored in plastic sacks throughout the region (Bundesamt für Strahlenschutz). Radioactive water posed another danger. With government approval, Tepco released approximately 10,400 cubic meters of slightly contaminated water into the sea between 4 and 10 April. This was done to free up storage space for more highly contaminated water from the Unit 2 reactor and turbine buildings, which needed to be removed to ensure safe working conditions (World Nuclear Association).

Intertwining real events with fictional elements, Muschg's novel *Heimkehr nach Fukushima* revolves around the 2011 Great East Japan Earthquake and the subsequent nuclear accident at the Fukushima Daiichi Nuclear Power Plant, focusing on the social and psychological dimensions of the tragedy. The Swiss architect and writer Paul Neuhaus receives an invitation from his old friends Ken and Mitsuko. Mitsuko's uncle, Seizō Irie, the mayor of Yoneuchi – a village near the Fukushima nuclear disaster zone – asks Neuhaus to visit him. Although the government authorised resettlement in April 2017, most of the evacuees, especially families with children, are afraid to return. To prevent the decline of the rural community, Seizō plans to establish an artists' colony in Yoneuchi. By attracting foreigners to the disaster zone, he wants to inspire hope in local people and encourage them to return. On 21 April 2017, Paul flies from Zurich to join the couple in Tokyo. Paul and Mitsuko then embark on a four-day journey across Fukushima Prefecture, during which they develop a more intimate relationship. They visit the Umehara family's temporary housing in Kōriyama, the towns of Kawamata and Namie, the village of Yoneuchi, the last inhabitant of the contaminated town of Tomioka, Mr Yoshimura, and the town of Naraha near the Fukushima Dai-ni nuclear power plant. During the journey, Paul becomes aware of the new world that has been created in the beautiful yet polluted landscape of Fukushima in the wake of the nuclear disaster, and observes the living conditions of the Japanese people.

The contamination of the area, the evacuation of villages, the removal of radioactive soil, and the partial failure of resettlement programmes portrayed by Muschg are all documented in historical sources. The resistance to return and the fear of radiation too were authentically experienced by the Japanese population. While all the characters in the story are fictional, Mr Yoshimura appears to be inspired by Naoto Matsumura, the last person living in Tomioka who took care of abandoned animals in the radioactive area (Kelly). The idea of establishing an artists' colony in the contaminated area is also part of the fictional narrative. The bond between Paul and Mitsuko, which develops in a polluted yet idyllic landscape, can be read through an allegorical lens. Indeed, it can be interpreted as a tension between destruction and recovery, resignation and hope, death and rebirth, both on a collective and individual level. It is exactly on that radioactive land that the two characters repeatedly engage in sexual encounters, through which new life ultimately emerges, as Mitsuko becomes pregnant.

The phenomenal dimension of the nuclear disaster is emphasized through the frequent occurrence of the following nominal phrases: "die Kettenreaktion" 'chain reaction' (Muschg 53[1]; my trans.), "*Dai Ichi*" (63, emphasis in original), "*Störfall*" 'nuclear accident' (72, emphasis in original; my trans.), "das havarierte Werk" 'the damaged plant' (167; my trans.), "Kernschmelze" 'core meltdown' (200; my trans.). Moreover, the hypernym "Katastrophe" 'disaster, catastrophe' (123; my trans.) is frequently used to refer both to the Fukushima Daiichi Nuclear Power Plant accident itself and its ecological and social consequences.

On a linguistic level, there are constant references to radiation and contaminated land. Here are a few examples: "verstrahlen" 'to contaminate with radioactivity' (22; my trans.), "Strahlung" 'radiation' (92; my trans.), "Strahlenwerte" 'radiation levels' (175; my trans.), "in einem verseuchten Gebiet" 'in a contaminated area' (123; my trans.), "auf vergifteten Boden" 'on polluted soil' (154; my trans.), "verstrahlte Erde" 'contaminated earth' (110; my trans.). Not only do these terms convey the physical condition of the landscape, but they also pertain to a semantic field which evokes toxicity and danger. The semantic field of radiation is also reinforced by the presence of the "Geigerzähler" 'Geiger counter' (94-95; my trans.), which accompanies the characters' journey across the Fukushima Prefecture. Its intermittent clicking represents the fluctuating intensity of landscape radiation, and functions as an auditory signal of the invisible danger of radiation, thus reinforcing the topic of persistent yet intangible contamination. The word "Geigerzähler" occurs throughout the literary work, sometimes undergoing lexical variations, such as the hypernym "das Gerät" 'device' (95; my trans.). In several instances, the author opts for partial repetition, retaining only the *Bestimmungswort* "Geiger" (108) from the original compound noun. Another image closely connected to soil contamination is the presence of black plastic sacks, which is linguistically marked by the repetition of the word "*Säcke*" 'sacks' (108, emphasis in original; my trans.), the compounds "Sackkolonien" 'sack colonies' (111; my trans.) and "Sackfeldern" 'fields of sacks' (136; my trans.), and the noun phrases "die schwarzen Säcke" 'black sacks' (178; my trans.) and "eine Reihe schwarzer Säcke" 'a row of black sacks' (164; my trans.).

The narrative focuses on the consequences of the nuclear disaster. For this reason, Muschg's language is rich in words belonging to the semantic spheres of decontamination, social displacement, return and resettling. The verbs "dekontaminieren" and "entsorgen" 'to decontaminate' (190, 52; my trans.), and the corresponding nouns "Dekontaminierung" and "Entsorgung" 'decontamination' (176, 53; my trans.) are related to the same semantic field of clean-up and radiation management. The atmosphere of isolation and displacement is shaped by explicit references to evacuation and places where people were forced to live, far from the so-called "die *Exclusion Zone*" or "die *No-go*-Area" (112, 53, emphasis in original). The verb "evakuieren" 'to evacuate' (55; my trans.), the compound noun "Zwangsemigranten" 'forced emigrants' (89; my trans.), the complex noun phrase "Flüchtlinge auf Lebenszeit" 'displaced people for life' (89; my trans.), and the nouns "*Notunterkünfte*" 'emergency shelters' (10, emphasis in original; my trans.) and "*Temporary Housing*" (118, emphasis in original) highlight the psychological trauma and the precarious living conditions experienced and endured by the Japanese population after the 2011 nuclear disaster. In stark contrast to the language of social disruption, the keywords associated with return and resettlement in contaminated areas emerge as a new semantic field which is shaped by the following lexemes: "Rückkehr" 'return' (22; my trans.), "*Wiederansiedlung*" and "Rücksiedlung" 'resettlement' (10, emphasis in original, 191; my trans.), "zurückkommen" 'to come back' (93; my trans.), "zurückkehren" 'to return' (93; my trans.). These words signal an attempt to restart a process of civilization in the contaminated territories, specifically

the village of Yoneuchi – described as “das «schönste Dorf Japans»” ‘the «most beautiful village in Japan»’ (88; my trans.) – through the creation of an artists’ colony (“*Künstler-Kolonie*”, 10, emphasis in original), which is seen as an ideal mean to encourage repopulation.

While *Heimkehr nach Fukushima* foregrounds the aftermath of the nuclear disaster, the other two natural catastrophes that struck northeastern Japan – the earthquake and the subsequent tsunami – remain largely in the background. Nonetheless, the following excerpts are worth quoting, as they refer to the two natural disasters that led to the nuclear catastrophe: "[…] eine dreifache Katastrophe im Nord-osten […] Erdbeben, Tsunami, und dann: der nukleare GAU." ‘[...] a triple disaster in the north-east […] earthquake, tsunami, and then: a nuclear meltdown’ (12; my trans.); “Erdbeben der Stärke 9” ‘9.0 magnitude earthquake’ (58; my trans.); “[…] die Häuser immer noch intakt aussahen […] und auch die sichtbaren Schäden des Erdbebens hielten sich in Grenzen.” ‘[...] the houses still looked intact [...] and even the visible damage caused by the earthquake was limited.’ (112; my trans.); “Hier waren die Spuren des Erdbebens unübersehbar, Dächer eingestürzt, Stützen geknickt, Balkone hingen herunter.” ‘The traces of the earthquake were clearly visible here: roofs had collapsed, pillars were damaged, and balconies were hanging precariously down.’ (166; my trans.); “ihre von drei Katastrophen betroffene Heimat” ‘her home country hit by three disasters’ (119-120; my trans.); "[…] mit den 20 000 Opfern, die *the Big Tōhoku Earthquake* am 11. März 2011 gefordert hatte [...]" ‘[...] with 20,000 victims caused by *the Big Tōhoku Earthquake* on 11 March 2011 [...]’ (174, emphasis in original; my trans.); “[…] die alten Nachbarschaften zerrissen sind […]" ‘[…] the old neighbourhoods are torn apart […]’ (92; my trans.); “Der Strand ist von Trümmern fast geräumt.” ‘The beach has almost been cleared of debris.’ (178; my trans.); “eine zerstörte Hütte” ‘a destroyed hut’ (178; my trans.); “Trümmerteils” ‘debris’ (180; my trans.); “seit der dreifachen Katastrophe vom März 2011” ‘since the triple disaster in March 2011’ (187; my trans.); “Tsunami” (53); “Tsunami-Toten” ‘tsunami deaths’ (79; my trans.); “die Große Welle” ‘the Great Wave’ (112; my trans.). These few but significant references to the 2011 earthquake and tsunami are scattered throughout the text, providing subtle reminders of the initial triggers of the nuclear disaster.

Regarding linguistic peculiarities, in the prose of Muschg there is a predominant use of dashes (single or double). In the third-person narration, double dashes are employed to mark asides and/or comments made by the narrator, as in the following passage: “Sie redeten einstweilen vom Tsunami weiter, der den Übersetzer Bansetsu Ishihara – *ihr* war der Name geläufig – weggerafft hatte […]” ‘They continued talking about the tsunami that had swept away the translator Bansetsu Ishihara – *she* was familiar with the name […]’ (72, emphasis in original; my trans.). Since the novel alternates between third-person narration and dialogues, single dash is often used to signal a return to the third-person omniscient narrator, as shown in the following example: “Danke, sagte er. – Auf Japanisch hätte das *Ja* bedeutet, aber als Deutsche verstand sie es richtig.” ‘Thank you, he said. In Japanese, that would have meant *yes*, but she understood it correctly as German.’ (36, emphasis in original; my trans.). Moreover, the single dash is frequently employed in dialogue to graphically indicate pauses, which are typical features of spoken language: “Ich bin nicht Ken, sagte er. – Und ich werde ein alter Mann.” ‘I’m not Ken, he said. – And I’m getting old.’ (80; my trans.). Other typical elements and phenomena of spoken German can be found at the syntactic and lexical levels. Non-sentential utterance, i.e. utterances that do not contain a conjugated verb, frequently occur in dialogues, as in the following examples: “Heute wohl gar nicht.” ‘most likely not today’ (106; my trans.); “Häuser wie diese Neubauten dort drüben?” ‘houses like these new builds over there?’ (176; my trans.). Another typical feature of spoken language is elliptical sentences. In the novel, the subject is often omitted for linguistic economy and to mimic the naturalness of spoken conversation: “Ich war schon um sechs Uhr wach und habe in der Halle einen Kaffee getrunken.” ‘I was already awake at six o’clock and drank a coffee in the hall.’ (105; my trans.).

As for lexical choices, it is interesting to highlight the use of *Modalpartikeln*, a group of words specific to German that have a semantic and pragmatic value within utterances, and which frequently occur in spoken language. They can be used to refer to shared prior knowledge, or to reinforce or mitigate what has been said (Barovero Buzzo Màrgari 299-303). Besides conferring spontaneity and naturalness to spoken language, these peculiar means convey the semantic category of modality, i.e. the speaker’s point of view or attitude towards the content of the utterance (Milan 49-50; Fandrych and Thurmair 171-172). They can indicate the degree of certainty or distance, desires, expectations, hopes, and assumptions of the speaker about the propositional content expressed (Costa 213-214). The

modal particles “ja”, “denn”, “doch” are the most frequently employed in the novel’s dialogic sections: “Wir haben ja noch das Wochenende für uns.” ‘After all, we do still have the weekend to ourselves.’ (20; my trans.); “Was ist denn das?” ‘What on earth is that?’ (151; my trans.); “Sie ist doch nicht verrückt.” ‘She isn’t actually crazy.’ (114; my trans.). In these examples, “ja” conveys a sense of reassurance and shared knowledge, “denn” has a reinforcing value and expresses the speaker’s amazement, “doch” is used to contradict a negative assumption.

The author’s syntactic style can be described as complex. This complexity can be found at the syntagmatic level, which is characterised by the use of complex noun phrases with modifiers placed to the right (like attributive adjectives) and to left (like relative clauses) of the head noun: “an der schmalen, doch sehnigen Hand, die sie ihm jetzt in einvernehmlicher Vorfreude über den damastgedeckten Tisch reichte” ‘on the narrow but sinewy hand that she now extended to him across the damask-covered table in mutual anticipation’ (21; my trans.). Due to the prevalence of complex noun phrases, it follows that nouns and adjectives constitute the most frequently occurring word classes in the text. On the one hand, the high density of complex noun phrases reflects the author’s descriptive precision; on the other hand, it contributes to building suspense in the reader, who has to keep other details in mind before reaching the referent. The complexity is also evident at the sentence level with a predominance of hypotactic structures, as shown in this following section, which contains temporal clauses introduced by “bevor” and “bis”, an objective clause introduced by “daß”, and a final clause introduced by “um...zu”: “Dafür sind, in Stifters Welt, viele gemeinsame Spaziergänge des Paars nötig, bevor sie auch nur ahnen dürfen, daß sie Liebende sind: um diesen Boden mit ihren Füßen gleichsam festzutreten, bis er tragfähig, tragbar wird für ihre eheliche Verbindung.” ‘For this, in Stifter’s world, the couple must take many walks together before they can even begin to suspect that they are lovers: to tread this ground with their feet, as it were, until it becomes solid enough to support their marital union.’ (33; my trans.). However, the predominant use of subordinate clauses does not exclude the presence of coordinating conjunctions (“und” ‘and’, “denn” ‘because’, “aber” ‘but’; my trans.) and pronominal adverbs (“dazu” ‘besides’, “dafür” ‘for it’; my trans.). The syntactic complexity is not just a formal feature, but also a strategy to give the narrative a philosophical tone. The use of extended noun phrases and hypotactic structures stimulates the readers’ reflection by requiring them to gradually unfold the meaning across multiple syntactic and semantic layers. Moreover, this complexity mirrors the intricacy of the situation depicted, namely the tough experience of living in a post-nuclear world. It also resonates with the philosophical themes of the narrative, such as the possibility of imagining a future within a landscape marked by radioactive contamination.

Syntactic complexity also lies in the marked order of constituents within a sentence, as shown in the following example: “Rechterhand war ein Stück flacheres Gelände offen geblieben […]” ‘To the right, a piece of flatter terrain remained open [...]’ (24; my trans.). In this sentence, the information structure is marked by the syntactic device of fronting/left shifting (*Frontierung*/*Linksversetzung*): a constituent (often an adverbial) that would normally be located in the *Mittelfeld* is moved to the left, to the *Vorfeld*. In this way, the principle “links entlastet rechts” (“left unloaded, right loaded”) is implemented: by anticipating sentence constituents with a framing function in *Vorfeld*, greater visibility is given to the right edge of the *Mittelfeld* (Dalmas 20-22). In the example shown, the predicative constituent (*Prädikativ*) “offen” is emphasised. As with complex noun phrases, placing the most significant constituents towards the right edge of the sentence creates a form of syntactic suspense. This compels the readers to maintain their attention until the sentence reaches its informational focus, which only becomes clear at its conclusion.

On a phonetic level, it is interesting to highlight the use of onomatopoeic words such as the following: “flüsterte” ‘whispered’ (36, 138, 152; my trans.), “echote” ‘echoed’ (55; my trans.), “kicherte” ‘chuckled’ (77; my trans.), “dröhnte” ‘thundered’ (93; my trans.), “quakte” ‘quacked’ (93; my trans.), “brüllte” ‘lowed’ (165; my trans.), “zitterte” ‘trembled’ (182; my trans.). Through these lexical choices, the author shapes an evocative soundscape which enriches the prose.

As regards the symbolic dimension of the literary work, the author intertwines multiple motifs: death, ideal community, civilisation, *locus amoenus* and *locus horridus*. The story is set in Fukushima Prefecture, whose name means “Insel des Glücks” ‘island of happiness’ (68; my trans.). However, the setting is highly radioactive, and the soil is contaminated, with varying levels of radiation depending on the proximity to the damaged Daiichi Nuclear Power Plant. It is a hostile and threatening place,

comparable to a *locus horridus*, where death linked to radiation is constantly present, even if invisible. Human life is in danger and protective equipment such as gloves, suits and masks must be worn. In this lethal environment for human health, nature returns to its former glory and the landscape becomes an idyll – a *locus amoenus*. Nature and its elements (mountains, bushes, forests, trees, grass, rocks) are "strahlend" 'bright' but "vergiftet" 'polluted', "verstrahlt" 'radioactive' but "zauberhaft" 'magical' (110-111; my trans.). For this reason, Fukushima can be described as an oxymoronic landscape that combines death and rebirth. Everything blooms and flourishes, nature is thriving, and Fukushima appears "beängstigend malerisch" 'frighteningly picturesque' (111; my trans.). Never before have the streams flowed more cheerfully in spring than they do now ("[...] noch in keinem Frühling sind die Bäche fröhlicher gesprungen als jetzt [...]", 111) and leathery, shrivelled fruits still clung to many branches, yellow as honey and just as sweet ("An vielen Zweigen hafteten noch ledrig geschrumpfte Früchte, gelb wie Honig und ebenso süß." 114). Through these words, Muschg portrays what Fukushima has always been: "The Fruit Kingdom" (The Government of Japan).

In this oxymoronic context, where *locus amoenus* and *locus horridus* merge, the mayor of Yoneuchi, Seizō Irie, wants to establish an ideal artists' community in order to encourage the resettlement of the Japanese population. The village appears as a building site ("noch als *Baustelle*", 173, emphasis in original), where people are slowly beginning to return during the day, and decontamination efforts – together with infrastructure reconstruction – are ongoing. Thus, civilisation is preserved, and gradually restored. Locals repair the houses damaged by the earthquake and the tsunami, and start to resettle in the area. Even the protagonist Paul Neuhaus, after discovering that Mitsuko is pregnant, decides to purchase an estate in Yoneuchi, suggesting to the reader that there is still hope for a future, for a new beginning in a world that now seems irrevocably changed.

[1] Unless otherwise indicated, all quotations in German and page numbers refer to the following text: Muschg, Adolf. *Heimkehr nach Fukushima*. C.H. Beck, 2018. ISBN 978-3-406-72702-3.

Bibliography

Muschg, Adolf. *Heimkehr nach Fukushima*. C.H. Beck, 2018.

Akasaka, Makoto, et al. "*The great East Japan earthquake: report on the damage to the cultural heritage*." *Japan ICOMOS*, 20 Nov. 2011, openarchive.icomos.org/id/eprint/3022/. Accessed 16 June 2025.

Alexis-Martin, Becky, and Thom Davies. "Japan earthquake: Social aftershocks of Fukushima disaster are still being felt." *The Conversation*, 23 Nov. 2016, theconversation.com/japan-earthquake-social-aftershocks-of-fukushima-disaster-are-still-being-felt-69241. Accessed 16 June 2025.

American Geophysical Union**.** "Deadly Japan Quake and Tsunami Spurred Global Warming, Ozone Loss." *AGU Advancing Earth and Space Sciences*, 26 March 2015, news.agu.org/press-release/deadly-japan-quake-and-tsunami-spurred-global-warming-ozone-loss/. Accessed 16 June 2025.

Bachev, Hrabrin. *Socio-economic and environmental impacts of Match 2011 earthquake, tsunami and Fukushima nuclear Accident in Japan*. MPRA Paper No. 60661, Munich Personal RePEc Archive, University Library of Munich, 2014.

Barovero Buzzo Màrgari, Renata. "Considerazioni sulle particelle modali tedesche e sulle corrispondenti espressioni italiane."*Italiano e tedesco. Questioni di linguistica contrastiva*, edited by Silvia Bosco Coletsos and Marcella Costa, Edizioni dell'Orso, 2013, pp. 299-330.

Bird, Winifred A., and Elizabeth Grossman. "Chemical Aftermath: Contamination and Cleanup Following the Tohoku Earthquake and Tsunami." *Environmental Health Perspectives*, vol. 119, no. 7, 2011, pp. A 290–A 301, https://doi.org/10.1289/ehp.119-a290. Accessed 16 June 2025.

Building Research Institute. "The Great East Japan Earthquake Damage Report." *The Japan Journal*, Dec. 2011, pp. 22-27, https://www.kenken.go.jp/english/contents/topics/japan-journal/pdf/jj2011dec_22-27.pdf. Accessed 23 June 2025.

Bundesamt für Strahlenschutz. "Environmental impact of the Fukushima accident: Radiological situation in Japan." *Bundesamt für Strahlenschutz*, 21 Feb. 2024, www.bfs.de/EN/topics/ion/accident-management/emergency/fukushima/environmental-consequences.html. Accessed 26 June 2025.

Costa, Marcella. "L'espressione della modalità: i verbi modali in tedesco e italiano". *Italiano e tedesco. Questioni di linguistica contrastiva*, edited by Silvia Bosco Coletsos and Marcella Costa, Edizioni dell'Orso, 2013, pp. 213-232.

Collins, Tara. *Great East Japan Earthquake: economic and trade impact*. Australian Government – Department of Foreign Affairs and Trade, 2011, https://www.dfat.gov.au/sites/default/files/great-east-japan-earthquake-economic-and-trade-impact.pdf. Accessed 28 June 2025.

Cosson, C. “From Emergency Shelter towards Disaster-relief Housing — Tōhoku’s Reconstruction Case Study.” *Budownictwo i Architektura*, vol. 20, no. 1, 2021, pp. 35–46, https://doi.org/10.35784/bud-arch.1587. Accessed 16 June 2025.

Dalmas, Martine. “Informationsstruktur und Übersetzung.” *Deutsch übersetzen und dolmetschen*, edited by Carlo Di Meola, Jérôme Gerdes, and Laura Tonelli, Peter Lang, 2021, pp. 15-29.

European Central Bank. *Monthly Bulletin*, May 2011, European Central Bank, https://www.ecb.europa.eu/pub/pdf/other/mb201105_focus01.en.pdf. Accessed 25 June 2025.

EU-Japan Centre for Industrial Cooperation. “Tohoku.” *EU-Japan Centre for Industrial Cooperation*, https://www.eu-japan.eu/eubusinessinjapan/about-japan/regions-prefectures/tohoku. Accessed 18 June 2025.

Fandrych, Christian, and Maria Thurmair. *Grammatik im Fach Deutsch als Fremd- und Zweitsprache*. Erich Schmidt, 2018.

Gagné, Isaac. “Dislocation, Social Isolation, and the Politics of Recovery in Post-Disaster Japan”. *Transcultural Psychiatry*, vol. 57, no. 5, 2020, pp. 710-723, https://journals.sagepub.com/doi/full/10.1177/1363461520920348. Accessed 16 June 2025.

Hasegawa, A. et al. “Emergency Responses and Health Consequences after the Fukushima Accident; Evacuation and Relocation.” *Clinical Oncology*, vol. 28, no. 4, Elsevier, April 2016, pp. 237-244, https://www.clinicaloncologyonline.net/article/S0936-6555(16)00005-4/fulltext. Accessed 16 June 2025.

Hirose, Katsumi. "Atmospheric effects of Fukushima nuclear Accident: A review from a sight of atmospheric Monitoring." *Journal of Environmental Radioactivity*, vol. 218, July 2020, article no. 106240, Elsevier, https://doi.org/10.1016/j.jenvrad.2020.106240. Accessed 16 June 2025.

Intergovernmental Oceanographic Commission, and United Nations University. *Summary Statement from the Japan – UNESCO – UNU Symposium on The Great East Japan Tsunami on 11 March 2011 and Tsunami Warning Systems: Policy Perspectives 16 – 17 February 2012*. UNESCO IOC, 2012, France, https://unesdoc.unesco.org/ark:/48223/pf0000216072. Accessed 16 June 2025.

Internet Geography. "Japan Earthquake 2011." *Internet Geography*, https://www.internetgeography.net/japan-earthquake-2011/#:~:text=Landfall%20%E2%80%93%20some%20coastal%20areas%20experienced,m%20closer%20to%20North%20America. Accessed 16 June 2025.

Ishimori, Miki. *Right to housing after Fukushima nuclear disaster: through a lens of international human rights perspective*, 31 October 2017, https://disasterlaw.ifrc.org/media/1734. Accessed 16 June 2025.

Japan Meteorological Agency. “Information on the 2011 Great East Japan Earthquake.” *The 2011 Great East Japan Earthquake – Portal*, Japan Meteorological Agency, www.jma.go.jp/jma/en/2011_Earthquake/Information_on_2011_Earthquake.html. Accessed 15 June 2025.

Katayanagi, Mitsuaki, et al. “Impact of the Great East Japan Earthquake on the Employment Status and Mental Health Conditions of Affected Coastal Communities.” *International Journal of Environmental Research and Public Health*, vol. 17, no. 21, 3 Nov. 2020, https://doi.org/10.3390/ijerph17218130. Accessed 28 June 2025.

Kelly, Erin. “Meet Naoto Matsumura, The One Man Who Cares For Fukushima’s Abandoned Animals.” *AllThatsInteresting.com*, February 11, 2020, https://allthatsinteresting.com/naoto-matsumura. Accessed 13 July 2025.

Kino, Shiho, et al. “Long-term Trends in Mental Health Disorders After the 2011 Great East Japan Earthquake and Tsunami.” *JAMA Network Open*, vol. 3, no. 8, 14 Aug. 2020, https://doi.org/10.1001/jamanetworkopen.2020.13437. Accessed 16 June 2025.

Matsumoto, Kazunori, et al. “Psychological trauma after the Great East Japan Earthquake.” *Psychiatry and Clinical Neurosciences*, vol. 70, no. 8, Aug. 2016, pp. 318–331, https://onlinelibrary.wiley.com/doi/10.1111/pcn.12403. Accessed 16 June 2025.

Milan, Carlo. *Modalverben und Modalität. Eine kontrastive Untersuchung Deutsch–Italienisch*. Max Niemeyer Verlag, 2001.

National Geographic Society. “Mar 11, 2011 CE: Tohoku Earthquake and Tsunami.” *National Geographic*, 5 June 2025, https://education.nationalgeographic.org/resource/tohoku-earthquake-and-tsunami/. Accessed 15 June 2025.

National Centers for Environmental Information. “On This Day: 2011 Tohoku Earthquake and Tsunami” *National Centers for Environmental Information*, National Oceanic and Atmospheric Administration, 11 March 2021, https://www.ncei.noaa.gov/news/day-2011-japan-earthquake-and-tsunami. Accessed 24 June 2025.

Oskin, Becky. "Japan earthquake & tsunami of 2011: Facts and information." *Live Science*, 25 Feb. 2022, https://www.livescience.com/39110-japan-2011-earthquake-tsunami-facts.html. Accessed 16 June 2025.

“Rare Video: Japan Tsunami”, *National Geographic*, National Geographic Society, 2011, https://education.nationalgeographic.org/resource/tohoku-earthquake-and-tsunami/. Accessed 24 June 2025.

Reconstruction Agency. “Great East Japan Earthquake.” *Reconstruction Agency*, Government of Japan, https://www.reconstruction.go.jp/english/topics/GEJE/index.html. Accessed June 2025.

Roy, Kingshuk, et al. “Salinity status of the 2011 Tohoku-oki tsunami affected agricultural lands in northeast Japan.” *International Soil and Water Conservation Research*, vol. 2, no. 2, June 2014, pp. 40–50, https://doi.org/10.1016/S2095-6339(15)30005-8. Accessed 28 June 2025.

Sagara, Junko, and Mikio Ishiwatari. *Knowledge Note 4-1. CLUSTER 4: Recovery Planning. Infrastructure Rehabilitation*. Global Facility for Disaster Reduction and Recovery, World Bank, Dec. 2011, https://www.gfdrr.org/sites/default/files/publication/knowledge-note-japan-earthquake-4-1.pdf. Accessed 18 June 2025.

Takahashi, Takashi, et al. “Infectious Diseases after the 2011 Great East Japan Earthquake.” *Journal of Experimental & Clinical Medicine*, vol. 4, no. 1, Elsevier, Feb. 2012, pp. 20–23, https://www.sciencedirect.com/science/article/abs/pii/S1878331711001677. Accessed 25 June 2025.

The Government of Japan. "Fukushima Foods: Safe and Delicious." *JapanGov*, Autumn 2017, https://www.japan.go.jp/tomodachi/2017/autumn2017/fukushima_food.html. Accessed 16 June 2025.

The Ono River and Sawara Cityscape Preservation Association. “Sawara Historic District: Steps toward Recovery from the Great East Japan Earthquake.” *World Monuments Fund*, May 2014, https://www.wmf.org/resources/sawara-historic-district. Accessed 27 June 2025.

World Monuments Fund. *World Monuments Fund. Report*. World Monuments Fund, 2013, wmf-production.nyc3.digitaloceanspaces.com/documents/59_World20Monuments20Fund20in20Japan_2024-11-22-171640_tlld.pdf. Accessed 27 June 2025.

World Nuclear Association. “Fukushima Daiichi Accident.” *World Nuclear Association*, 29 April 2024, www.world-nuclear.org/information-library/safety-and-security/safety-of-plants/fukushima-daiichi-accident. Accessed 26 June 2025.

Yajima, Daisuke, et al. “Tsunami-hit areas rebuilt but remain sparsely populated.” *The Asahi Shimbun*, 11 Mar. 2024, https://www.asahi.com/ajw/articles/15194711. Accessed 25 June 2025.

Yasunari, Teppei J., et al. “Cesium 137 deposition and contamination of Japanese soils due to the Fukushima nuclear accident.” Proceedings of the National Academy of Sciences, vol. 108, no. 49, December 2011, pp. 19530–19534, https://doi.org/10.1073/pnas.1112058108. Accessed 26 June 2025.

Zhu, Rui, et al. “GROWTH AND SHRINKAGE PRE AND POST TSUNAMI IN FUKUSHIMA PREFECTURE, JAPAN.” *Landsc Res Rec.*, vol. 9, Mar. 2020, pp. 132–147, https://pmc.ncbi.nlm.nih.gov/articles/PMC9169785/. Accessed 25 June 2025.

Created: 2025-06-04 | Last Updated: 2025-11-20