兵庫県

Disaster waste management efforts in Hyogo Prefecture

Marking 30 years since the Great Hanshin-Awaji Earthquake

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Contents

Great Hanshin-Awaji Earthquake

Typhoon No. 9 of 2009 (Sayo Town)

Heavy rain in August 2014 (Tamba City)

Disaster waste disposal from the Great Hanshin-Awaji Earthquake

Earthquake occurrence status

Name	Southern Hyogo Prefecture Earthquake (Great Hanshin-Awaji Earthquake)
Date and time of occurrence	January 17, 1995, 5:46 AM
Epicenter	Northern Awaji Island
Scale and intensity	Magnitude 7.3, maximum seismic intensity 7
Depth of epicenter	16km

Overview of the damage

Disaster Relief Act Number of designated cities and towns	10 cities and 10 towns	**Totally destroyed**	104,004 Buildings
Casualties	6,402 people	**Partially destroyed**	136,952 Buildings
Injured	40,092 people		
Missing persons	3 people	**Partially damaged**	297,811 Buildings

Amount of disaster waste generated

	Original Prefectural Plan	Revised Prefectural Plan	Achievements
Housing and Buildings	13 million tons	14.5 million tons	14.3 million tons
Public facilities	5.5 million tons	5.5 million tons	Approximately 5.5 million tons
Total	18.5 million tons	20 million tons	Approximately 19.8 million tons

The amount of general waste generated in 1994 was 2.48 million tons. → Disaster waste generated is equivalent to eight years' worth of general waste.

- 34 temporary incinerators and 33 crushers will be installed in addition to existing facilities in cities, towns, and villages within the prefecture.
- Off-site processing: 1.43 million tons (244,000 tons incinerated, 1,193,000 tons landfilled)
- Landfill at Phoenix, Osaka Bay: 450,000 tons of incineration ash, 2 million tons of non-combustible materials

Recycling rate (Achievements) 50.7%

Disaster waste disposal from the Great Hanshin-Awaji Earthquake

Sewage treatment

Sewerage coverage rate in the Hanshin area is 95%; flush toilets unusable due to water outage.

Temporary toilets		Vacuum trucks	
1/18	300 units provided by the Kobe City Safety Cooperation Association The prefecture secured temporary toilets (approximately 9,200 at the peak).	1/18	32 vehicles secured with support from cities and towns in the prefecture
～1/27	Provision of the necessary number of temporary toilets (3,900 units with the prefecture's cooperation)	～1/25	221 vehicles secured, including support from other prefectures
～1/31	Installation completed in Kobe City Collection system to be established in late February		

Maintenance of temporary toilets

Requests were made to city and town licensed and contracted businesses, the National Federation of Environmental Improvement Business Cooperative Associations, and the Water Quality Conservation Center. The prefecture's emergency measures will end on February 4. → Operations will be transferred to cities and towns.

Handling household waste

Collection and transportation		Waste treatment facility	
1/19	Garbage collection began in each city.	Around 1/24	20 facilities were damaged. → 13 facilities temporarily restored
～1/31	Traffic conditions between Kobe and Hanshin have worsened, and collection rates are about 50% of normal.	2/20	All facilities restored Support from other cities and towns 44 organizations Incineration volume: 11,620t
1/31	Returned to normal Kobe City requested the deployment of the Self-Defense Forces. Some cities provided support to other cities and towns (163 organizations, total of 4,155 vehicles).		

Disaster waste disposal from the Great Hanshin-Awaji Earthquake

Disaster waste disposal business

Handling the demolition and disposal of damaged houses, etc.

[Before the disaster]

- Demolition was the owner's responsibility.
- After demolition, the municipality will process the waste.
- The national government subsidized municipalities' waste disposal costs (1/2).

At the local disaster response headquarters,
Prefectures and other local governments made strong requests to the national government.

[After the disaster (1/28)]

- Municipalities dismantled and processed the items as waste.
- The national government subsidized municipalities' waste disposal costs (1/2).
  Dismantling costs were also subsidized.
- Got active cooperation from the Self-Defense Forces

Demolition costs

Handling of demolition work expenses

[Before the disaster]

- Disaster waste disposal business
  Demolition work expenses were not covered (0%).

Request from prefecture to national government official → Ministry of Finance not allowed
Mid-February: Direct request to the Director of the Ministry of Health, Labour and Welfare during his visit to the prefecture

[After the disaster (2/28)]

- The costs of demolition work were clearly stated in the grant guidelines.
  (The same applies to construction work.)

Disaster waste disposal from the Great Hanshin-Awaji Earthquake

Lessons learned from the disposal of disaster waste from the Great Hanshin-Awaji Earthquake

1. Strengthening wide-area cooperation
2. Stockpiling temporary toilets, etc.
3. The need for temporary storage facilities
4. The need for planned demolition
5. Importance of separation at demolition sites
6. Securing transportation routes
7. Capacity of waste treatment facilities
8. Technological Development

A current issue that still exists!

Subsequent major disaster responses

Typhoon No. 23 of 2004

Date and time of occurrence	October 20, 2004
Scale	Maximum rainfall in 24 hours: 309 mm
	Maximum rainfall per hour: 71.5 mm
Disaster Relief Act applicable cities and towns	5 cities and 13 towns (Tajima, Awaji, Kita-Harima, Tamba)
Totally destroyed	783 buildings
Partially destroyed	7,142 buildings
Partially damaged	1,506 buildings
Flooding above the floor	1,745 buildings
Flooding under the floor	9,058 buildings
Disaster waste	67,391 t

Broken embankment of the Maruyama River
(Tateno, Toyooka City)

Incineration support

20 cities and 6 administrative associations
in the prefecture and Osaka Prefecture

Cooperation and support for sewage and garbage collection

[Sewage] 3 cities in the prefecture (13 vehicles), Water Quality Conservation Center (54 vehicles)
[Garbage] 18 cities and 24 towns in the prefecture (865 vehicles), Kobe City Safety Cooperation Association (730 vehicles), Hyogo Prefecture Industrial Waste Association (68 vehicles)
[Temporary toilets] 321 units installed in four cities and towns (Toyooka City, Sumoto City, Nishiwaki City, Izushi Town)

Subsequent major disaster responses

A support agreement was concluded based on lessons learned from the response to Typhoon No. 23 in 2004.

1. Hyogo Prefecture Disaster Waste Disposal Mutual Support Agreement (September 1, 2005)

Agreement signatory	Prefectures, cities, towns, and administrative associations
Contents of the Agreement	① The prefecture will respond to requests from affected cities and towns and coordinate giving and receiving of support. ② Mutual support between cities and towns
Cost burden	In principle, the cities and towns that requested support Garbage collection is free (subject to local tax allocation); incineration etc. are paid for (contracted).

2. Support agreement regarding waste disposal in the event of a disaster

Agreement signatory with the prefecture	Hyogo Prefecture Industrial Resource Recycling Association (September 2005), Kobe City Safety Cooperation Association (September 2005), Hyogo Prefecture Water Quality Conservation Center (January 2006), Hyogo Prefecture Environmental Improvement Business Cooperative (July 2012), Japan Construction Federation Kansai Branch (July 2012), Hyogo Prefecture Environmental Business Commerce and Industry Association (December 2014)
Contents of the Agreement	① The prefecture receives requests from affected cities and towns and asks for support from and coordinates support requests with each organization. ② Organizations provide support to affected cities and towns.
Cost burden	In principle, the cities and towns that requested support The portion that is eligible for national subsidies is provided by the city or town, while the rest is provided by support groups.

Subsequent major disaster responses

Utilizing the Hyogo Prefecture Disaster Waste Disposal Mutual Support Agreement

● Typhoon No. 9 of 2009

Date and time of occurrence	August 9-10, 2009
Scale	Maximum rainfall in 24 hours: 327 mm
	Maximum rainfall per hour: 82 mm
Disaster Relief Act Applicable cities and towns	2 cities and 1 town (**Sayo Town, Shiso City, Asago City**)
Totally destroyed	166 buildings
Partially destroyed	305 buildings
Partially damaged	638 buildings
Flooding above the floor	334 buildings
Flooding under the floor	1,494 buildings
Disaster waste	25,929 t
Incineration support	10 cities and 2 administrative associations in the prefecture
Collection support	37 cities, towns and administrative associations in the prefecture

● Heavy rain in August 2014

Date and time of occurrence	August 16-17, 2014
Scale	Maximum rainfall in 24 hours: 392 mm
	Maximum rainfall per hour: 75 mm or more
Disaster Relief Act Applicable cities and towns	1 city (**Tamba City**)
Totally destroyed	15 buildings
Partially destroyed	51 buildings
Partially damaged	1 building
Flooding above the floor	168 buildings
Flooding under the floor	783 buildings
Mud flow	72 cases (Tamba City)
Disaster waste, etc.	Debris, driftwood, etc.: 6,692 t Soil: 54,460 m3
Collection support	15 cities and towns and 1 administrative association

As with the landslide in Hiroshima City, the debris mixed with soil is dealt with through disaster waste disposal projects.

Disaster Support [Great East Japan Earthquake 2011]

Main support

Item	Contents
Provision of temporary toilets	Hyogo Prefecture, Kobe City, Nishinomiya City, Sayo Town → Miyagi Prefecture, Sendai City
Vacuum truck dispatch	Hyogo Prefecture Environmental Improvement Business Cooperative Association → 7 vehicles to Iwate Prefecture
Garbage truck dispatch	Including requests from Hyogo Prefecture to cities and towns within the prefecture, Toyooka City, Himeji City, Akashi City, Kobe City, Nishinomiya City, Takarazuka City, Kawanishi City, and Inagawa Town → Misato Town, Osaki City, Ishinomaki City, Kesennuma City, Minamisanriku Town 25 dump trucks and packers, total of 418 personnel dispatched
Staff Dispatch	○ Advice on disaster waste disposal Hyogo Prefecture, Amagasaki City, Nishinomiya City, Takarazuka City (total of 12 people) → Miyagi Prefectural Government, Local Support Headquarters (Kesennuma, Minamisanriku, Ishinomaki) (3/16～4/4) ○ Support for debris removal, waste volume forecasting, waste disposal plan formulation, house demolition work, etc. Kobe City, Amagasaki City, Nishinomiya City, Ashiya City, Yabu City (total of 47 people) → Sendai City, Kesennuma City, Iwate Prefecture, Onagawa Town, Ishinomaki City, Shiogama City (3/25～3/31 (H25))

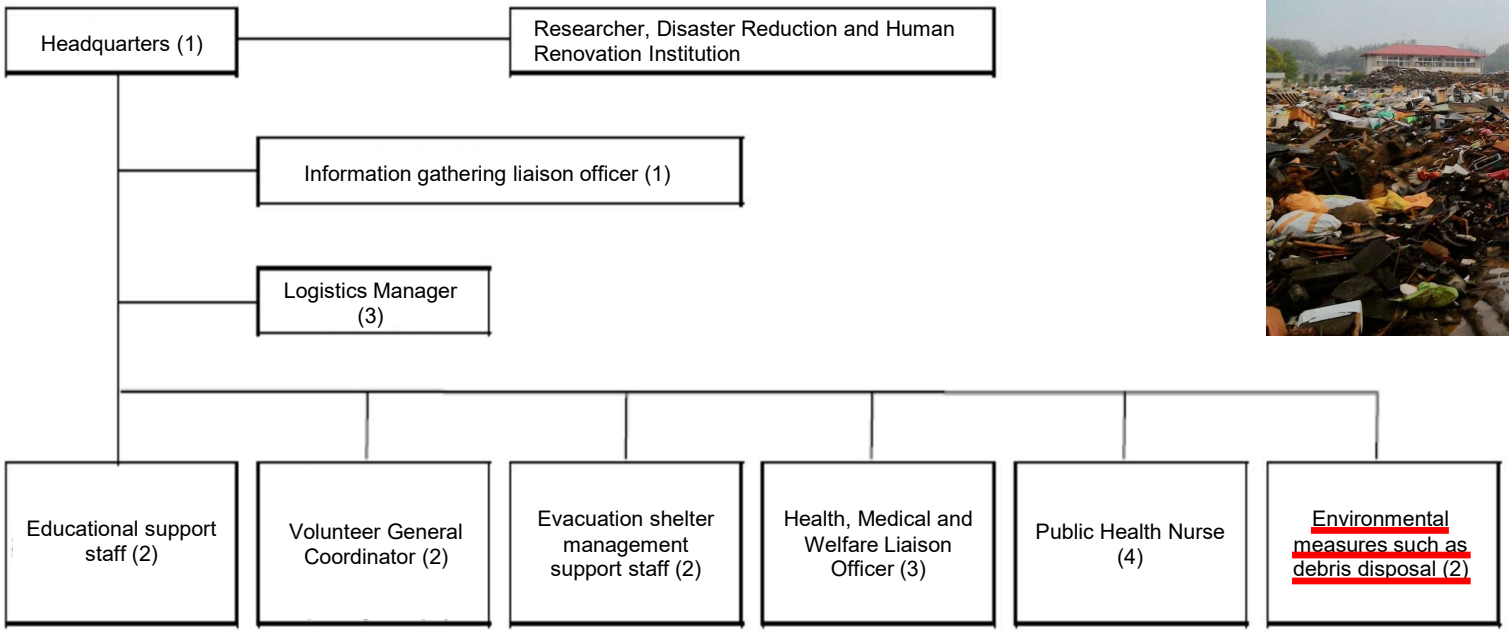
Temporary storage site (Miyako City)

Temporary storage site (Kesennuma City)

Disaster Support [2016 Kumamoto Earthquake]

Hyogo Prefecture, which is in charge of the Regional Disaster Prevention Bureau of the Union of Kansai Governments, set up a local liaison office in Mashiki Town, Kumamoto Prefecture, as a first response.

Team Composition



Primary temporary storage site (Mashiki Town)

Primary temporary storage site (Mashiki Town)

Dispatch Period

April 20 to October 27, 2016 (First batch: until April 27)

Dispatched personnel

Debris disposal and other environmental measures: 2 people
→ Wakayama Prefecture took over from the second batch onwards, ending with the 10th batch.

Disaster relief [2024 Noto Peninsula earthquake]

Support from the Union of Kansai Governments: Hyogo Prefecture → Suzu City

Support System

Hyogo Prefecture: 2 people each for environmental science positions → 1/11 to 4/26: 43 people in total
Kobe City Environment Bureau staff, one each → 1/20 to 3/31: 6 people in total

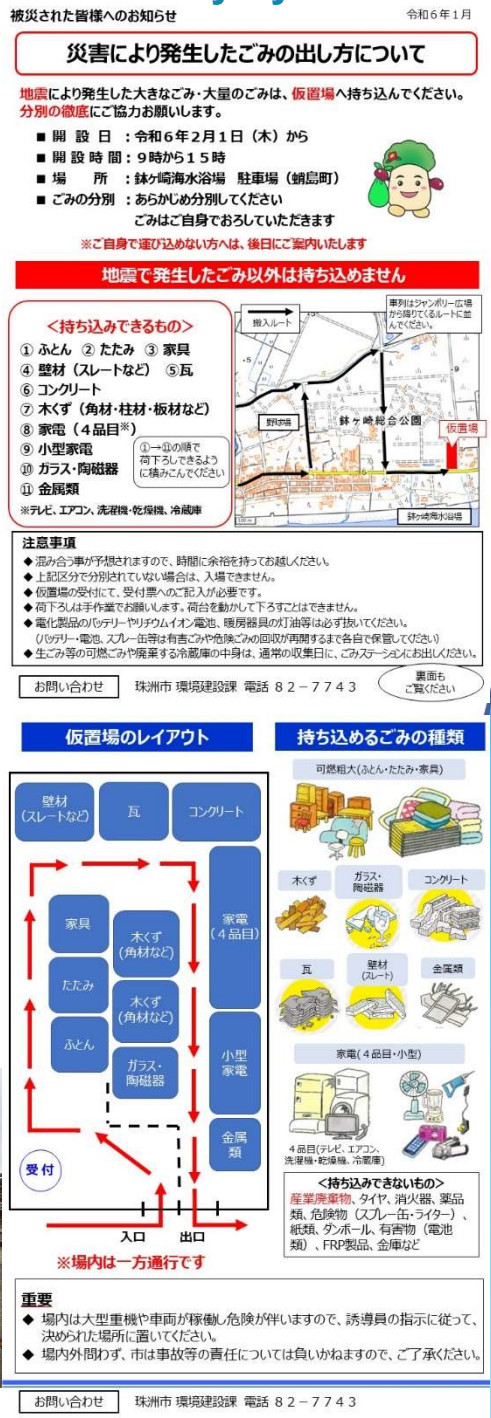
Support details

Providing detailed advice from the same perspective as city officials

1. **Sewage and evacuation center waste collection services**
   Establishment of information gathering system for evacuation centers and collection vehicle operation planning system
2. **Dealing with garbage disposal**
   Support for creating layouts for sorting wastes at temporary storage sites and support for their establishment
3. **Dealing with demolition debris**
   Support for creating layouts for sorting wastes at temporary storage sites and support for their establishment, etc.

Status of temporary storage facilities

Publicity flyer



被災された皆様へのお知らせ　令和６年１月

災害により発生したごみの出し方について

地震により発生した大きなごみ・大量のごみは、仮置場へ持ち込んでください。
分別の徹底にご協力お願いします。

- 開 設 日 ：令和６年２月１日（木）から
- 開 設 時 間：９時から１５時
- 場　　所 ：鉢ヶ崎海水浴場　駐車場（鵜島町）
- ごみの分別 ：あらかじめ分別してください
  ごみはご自身でおろしていただきます

※ご自身で運び込めない方へは、後日にご案内いたします

地震で発生したごみ以外は持ち込めません

<持ち込みできるもの>
① ふとん ② たたみ ③ 家具
④ 壁材（スレートなど） ⑤瓦
⑥ コンクリート
⑦ 木くず（角材・柱材・板材など）
⑧ 家電（４品目※）
⑨ 小型家電
⑩ ガラス・陶磁器
⑪ 金属類
※テレビ、エアコン、洗濯機・乾燥機、冷蔵庫

①→⑪の順で荷下ろしできるように積みこんでください

搬入ルート　仮置場　鉢ヶ崎総合公園　鉢ヶ崎海水浴場

注意事項
◆ 混み合う事が予想されますので、時間に余裕を持ってお越しください。
◆ 上記区分で分別されていない場合は、入場できません。
◆ 仮置場の受付にて、受付票へのご記入が必要です。
◆ 荷下ろしは手作業でお願いします。荷台を動かして下ろすことはできません。
◆ 電化製品のバッテリーやリチウムイオン電池、暖房器具の灯油等は必ず抜いてください。
（バッテリー・電池、スプレー缶等は有害ごみや危険ごみの回収が再開するまで各自で保管してください）
◆ 生ごみ等の可燃ごみや廃棄する冷蔵庫の中身は、通常の収集日に、ごみステーションにお出しください。

お問い合わせ　珠洲市 環境建設課 電話 82－7743　裏面もご覧ください

仮置場のレイアウト

壁材（スレートなど）　瓦　コンクリート　家具　たたみ　ふとん　木くず（角材など）　木くず（角材など）　ガラス・陶磁器　家電（４品目）　小型家電　金属類　受付　入口　出口

※場内は一方通行です

持ち込めるごみの種類

可燃粗大（ふとん・たたみ・家具）
木くず　ガラス・陶磁器　コンクリート
瓦　壁材（スレート）　金属類
家電（４品目・小型）
４品目（テレビ、エアコン、洗濯機・乾燥機、冷蔵庫）

<持ち込みできないもの>
産業廃棄物、タイヤ、消火器、薬品類、危険物（スプレー缶・ライター）、紙類、ダンボール、有害物（電池類）、FRP製品、金庫など

重要
◆ 場内は大型重機や車両が稼働し危険が伴いますので、誘導員の指示に従って、決められた場所に置いてください。
◆ 場内外問わず、市は事故等の責任については負いかねますので、ご了承ください。

お問い合わせ　珠洲市 環境建設課 電話 82－7743

Disaster waste management training

Training status

Fiscal year	Contents	Participants
2014	Lectures and Workshops	46 from cities, towns, etc., and 6 from prefectures
2015	Lectures and tabletop exercises	35 from cities, towns, etc., and 7 from prefectures
2016	Lectures and tabletop exercises	47 from cities, towns, etc., and 7 from prefectures
2017	Lectures and tabletop exercises	30 from cities, towns, etc., and 5 from prefectures
2018	Lectures and tabletop exercises	119 from cities, towns, etc., and 18 from prefectures
2019	Lectures and tabletop exercises	42 from cities, towns, etc., and 10 from prefectures
2020	Not held	
2021	Lectures	62 from cities, towns, etc., and 18 from prefectures
2022	Lectures and drills	50 from cities, towns, etc., and 6 from prefectures Business operators: 10 people
2023	Lectures	42 from cities, towns, etc., and 16 from prefectures
2024	Mock training (planned)	

Hyogo Prefecture Disaster Waste Management Cooperator System

1. Establishment body
   Hyogo Environmental Creation Association (Public Interest Foundation)
2. Activities
   ① Advice and support for disaster waste disposal projects carried out by affected cities and towns in the event of a large-scale disaster
   ② Advice and support for the formulation of city and town disaster waste disposal plans
   ③ Community activities and training for disaster preparedness
3. Requirements
   Those who have been involved in waste disposal business and waste administration for many years and have experience in supervising disaster waste disposal and disaster waste disposal businesses.
4. Number of collaborators
   15 people

It is necessary to increase effectiveness through not only lectures but also tabletop exercises and mock training.

Looking back from the Great Hanshin-Awaji Earthquake to the Noto Peninsula Earthquake...

Lessons learned from the Great Hanshin-Awaji Earthquake (reposted)

1. Strengthening wide-area cooperation
2. Stockpiling temporary toilets, etc.
3. The need for temporary storage facilities
4. The need for planned demolition
5. Importance of separation at demolition sites
6. Securing transportation routes
7. Capacity of waste treatment facilities
8. Technological Development

Lessons learned from disasters up to the Noto Peninsula earthquake

1. Advance notification of waste separation and preparation for business-related disaster waste disposal
2. Ensuring quality of life during disasters and accurately grasping and sharing the needs of disaster victims
3. Securing public relations methods and utilizing ICT
4. Ensuring earthquake resistance of processing facilities, strengthening complex systems, and utilizing septic tanks
5. Strengthening regional waste disposal systems
6. Ensuring a support-receiving system
7. Establishment of an intra-agency coordination system for publicly funded demolition, etc.
8. The need for continued effective on-the-job training

Thank you for your attention.