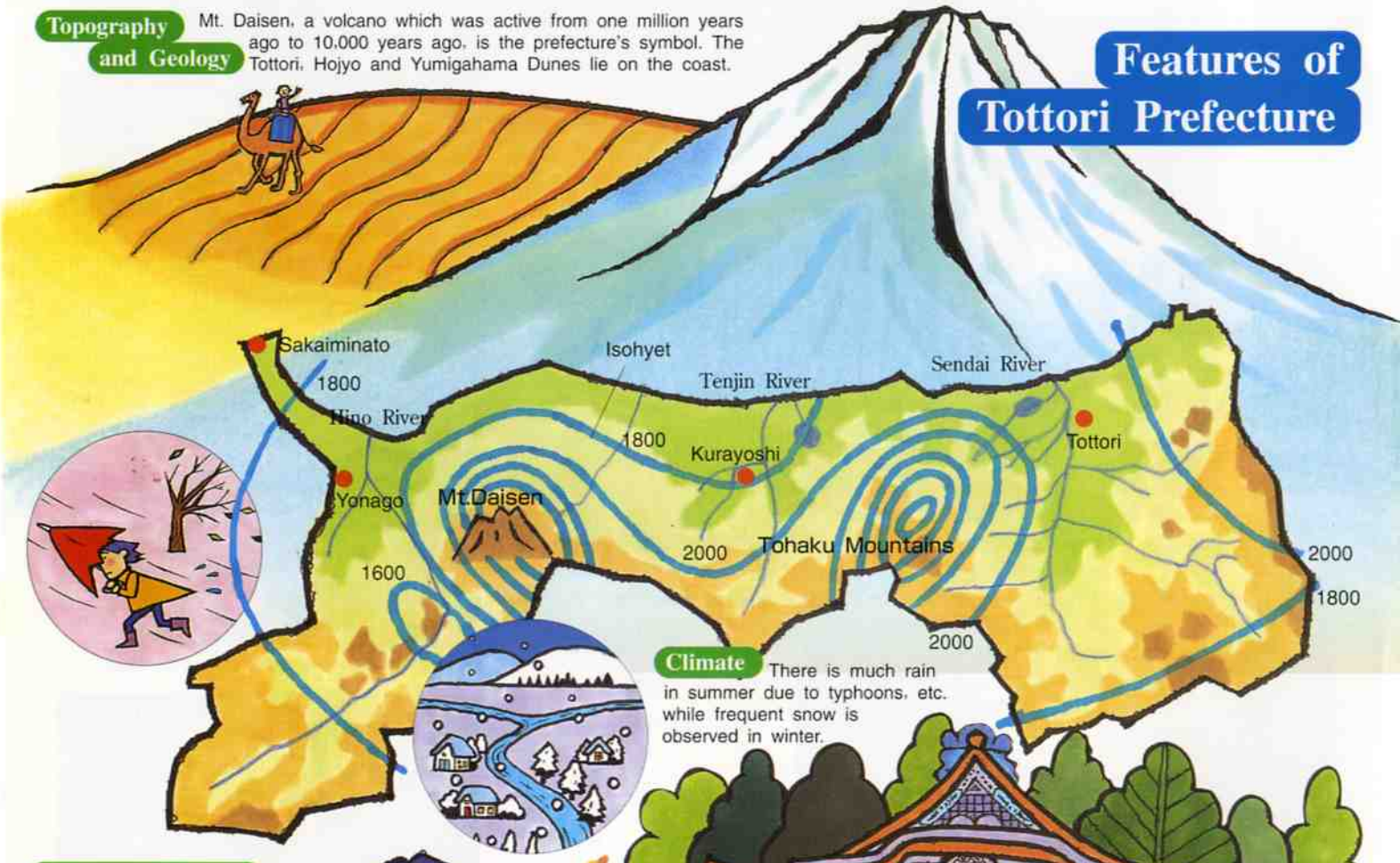
Tottori and Sabo

Tottori Prefecture is a mountainous prefecture stretching in the east-west direction to the northeast of the Chugoku Mountains and faces the Asian Continent across Japan Sea. It boasts rich tourist resources with four distinctive seasons and has a population of some 615,000.

Features of Tottori Prefecture

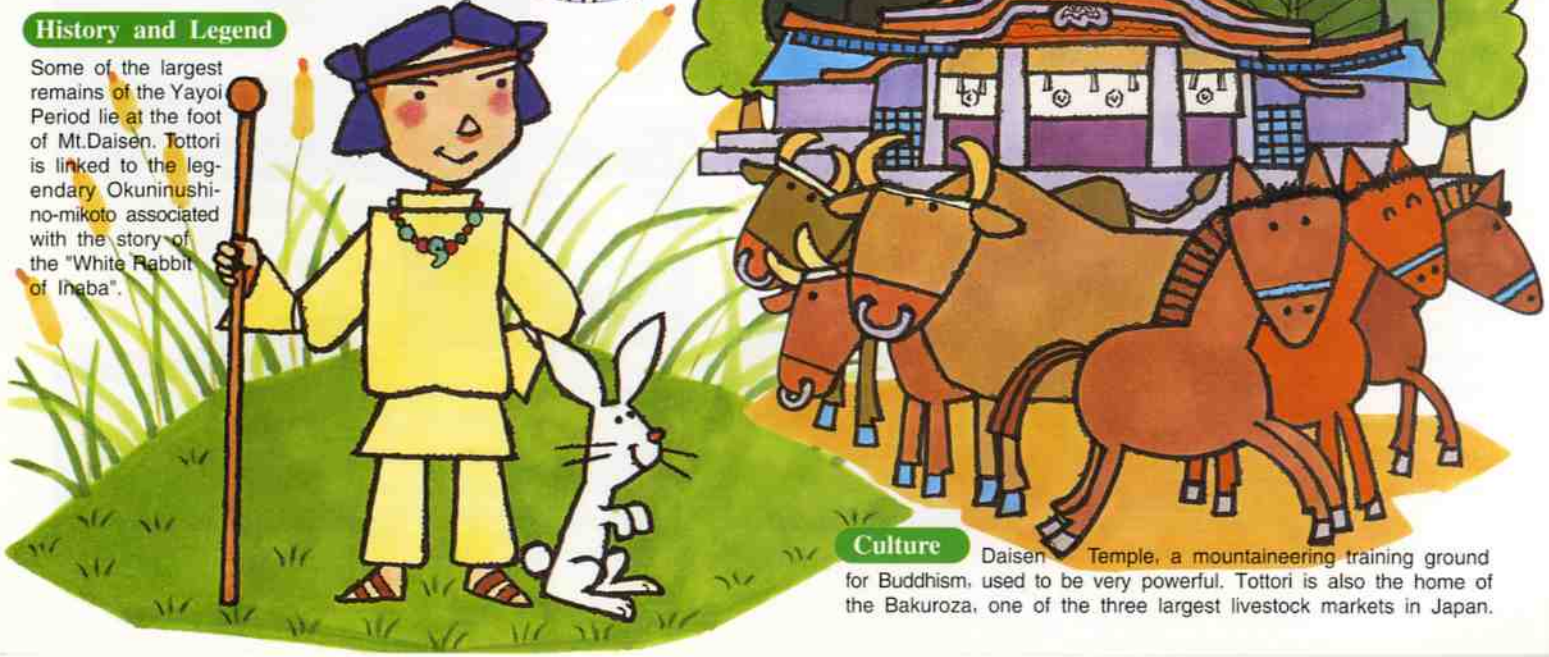
Topography and Geology Mt. Daisen, a volcano which was active from one million years ago to 10,000 years ago, is the prefecture's symbol. The Tottori, Hojyo and Yumigahama Dunes lie on the coast.



Climate There is much rain in summer due to typhoons, etc. while frequent snow is observed in winter.

History and Legend

Some of the largest remains of the Yayoi Period lie at the foot of Mt.Daisen. Tottori is linked to the legendary Okuninushi-no-mikoto associated with the story of the "White Rabbit of Inaba".



Culture Daisen Temple, a mountaineering training ground for Buddhism, used to be very powerful. Tottori is also the home of the Bakuroza, one of the three largest livestock markets in Japan.

History of Disasters and Sabo

With many rapid rivers, Tottori Prefecture has historically suffered from a series of major floods, many of which have caused sediment disasters due to the discharge of a huge amount of sediment. Sabo Works in the Daisen Mountains commenced in the drainage area of Tenjin River in 1932. These works also intended the provision of economic support for rural areas through the payment of wages to local laborers.

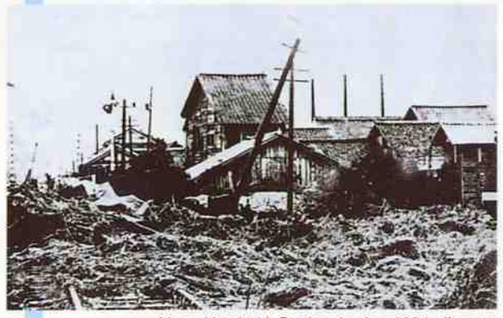
Chronology of Disasters and Sabo Works

- 567 Great flood causes widespread hunger.
- 623 Perpetual rain destroys the growth of grain.
- 779 Heavy rain in Inaba County causes landslides and flooding with more than 3,000 farmers being starved.
- 1544 A violent storm causes landslides in which several tens of thousands of people are drowned.
- 1593 A large number of people are drowned due to major flood.
- 1635 Another major flood occurs.
- 1639 Overflowing water from Hii River inundates a large area from Lake Shinji to Yumigahama and Tomimasu while Hino River is filled in by sand.
- 1698 The control of indiscriminate felling in headwater mountain areas is tightened.
- 1795 The flooding of Fukuro River claims the lives of many humans and livestock.
- 1834 The Tottori Clan commences hillside works.
- 1893 Flooding caused by a typhoon breaches Ogamo River; 328 people are either killed or reported missing.
- 1911 Hillside works commence under the Devastated Forest Land Rehabilitation Project
- 1929 (Worldwide Depression)
- 1932 The prefectural government launches sabo projects at seven streams to relieve rural villages.
- 1934 Typhoon Muroto causes extensive damage in the drainage area of Tenjin River; 81 people are either killed or reported missing.
- 1936 The central government commences a sabo project in the drainage area of Tenjin River (upstream of Ogamo River)
- 1943 (Tottori Earthquake)
- 1959 Typhoon Ise hits the prefecture; designation of a landslide prevention zone commences in the Yazu District.
- 1961 Typhoon Muroto No.2
- 1967 The Slope Failure Prevention Works commences in Tottori City.
- 1974 The central government commences a sabo project in the drainage area of Hino River.
- 1990 Typhoon No.19 brings continual rainfall of 527mm at Kurayoshi City.
- 1998 Typhoon No.10 brings continual rainfall of 220mm at Misasa Town.
- 2000 Tottori West Earthquake (M7.3)

Monument of Masao Akagi **Providing is Preventing**
Local sabo work commenced with the construction of sabo dam at Daisen along Amida River with the assistance and guidance of Masao Akagi who studied sediment control in Austria. As the creator of the foundations for sabo nationwide, Akagi is called "the father of sabo". Sama, Daisen Town

Disaster at former Kurayoshi Town in 1934

Flooding by Typhoon Ise



Near Utsubuki Station in the 1934 disaster

Sabo Dam No.1 for Shimizutani River: prior to the work

History of Coastal Sand Dunes in Tottori

Tottori Prefecture has the shortest coastline among coastal prefectures in Japan with approximately half of it consisting of sandy beaches. Sendai River, Tenjin River and Hino River, the three major rivers in the prefecture, have created the Tottori Dunes, Hojyo Dunes and Yumigahama Peninsula Dunes in their respective river mouths.

Yumigahama Peninsula and Kaike Beach

Tottori Dunes and Nearby Coastal Forests

The natural landscape of sand dunes is preserved at "the Tottori Dunes", a designated natural monument, and the surrounding area. Around 1952, there was barren land on the east and west sides of the mouth of Sendai River. However, the creation of coastal forests eventually turned these areas into farmland and urban areas.
As the greening of the Tottori Dunes has problems in regard to tourism, special topography and loss of natural vegetation, many twists and turns, including the removal of planted trees, have been experienced over the years.

Coastal Forests and Farmland Development at Hojyo Dunes

Huge sand dunes spread to the east and west of the mouth of Tenjin River in the central part of the prefecture. In the past, there used to be concave areas sandwiched by parallel sand dunes. However, the completion of erosion control planting by 1963 changed the local landscape. Today, "Shinkawa Yashiki Windbreak Forests" are observed at Hawai Town to the east of Tenjin River while coastal forests protecting scattered hamlets are observed at Hojyo Town to the west where one of the area's leading dry field farming areas has been created by continual irrigation and other projects.

Tottori Dunes

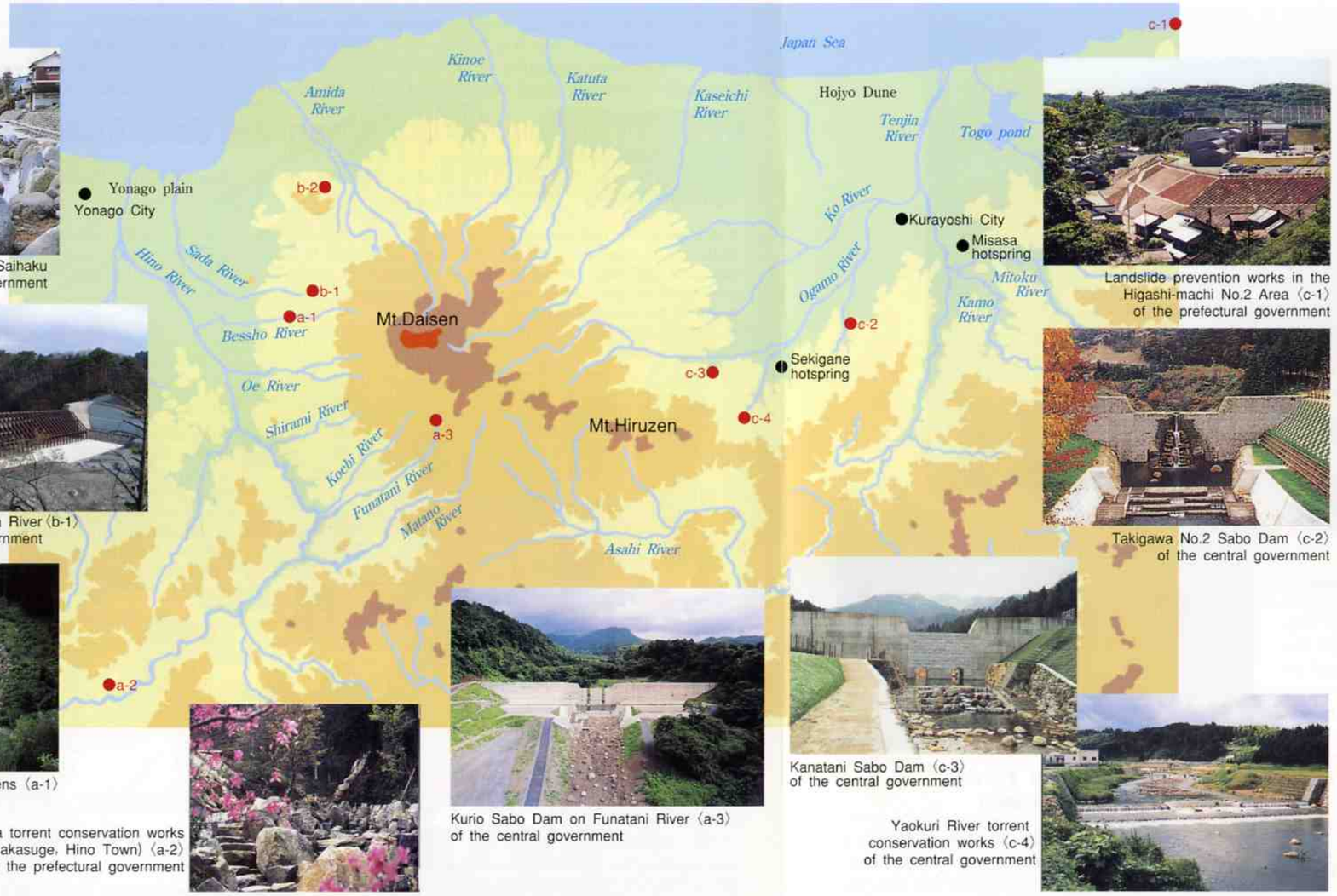
Clearing and Coastal Forests at Yumigahama Peninsula

The Yumigahama Peninsula, the largest sand bar in Japan, forms the third sandy area in the prefecture. This sandy place with an elevation of less than 10m and a high groundwater table has long been subject to clearing since the 16th century when sand fixation forests were created to maintain the traversing Yonekawa Channel built for paddy field development.
More recent housing and industrial estate development have wiped out the traditional black pine forest belts surrounding the hamlets. The Kaike Beach nourishment works have become a monument for coastal civil engineering and the offshore breakwaters constructed since 1971 have produced a beautiful tombolo.
Meanwhile, the Yumigahama Park has been developed to provide a resort area.

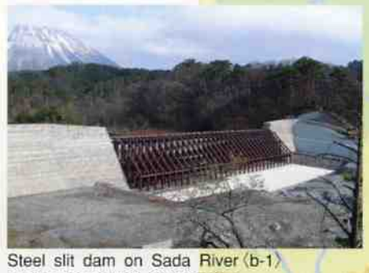
Sabo in Daisen Mountains

Sabo projects are being conducted by the central and prefectural governments to protect local areas from sediment disasters and to create areas which are full of vigor. Sabo facilities adequately control sediment movement while a warning and evacuation system for sediment disasters has also been developed.

Location map of rivers around Daisen




Amida river system (Daisen Town, Saihaku District)〈b-2〉of the prefectural government


Steel slit dam on Sada River〈b-1〉 of the prefectural government


Bessho River torrent botanical gardens〈a-1〉 created by the central government

Takiyama torrent conservation works (Nakasuge, Hino Town)〈a-2〉 of the prefectural government

Kurio Sabo Dam on Funatani River〈a-3〉 of the central government

Landslide prevention works in the Higashi-machi No.2 Area〈c-1〉 of the prefectural government

Takigawa No.2 Sabo Dam〈c-2〉 of the central government

Kanatani Sabo Dam〈c-3〉 of the central government

Yaokuri River torrent conservation works〈c-4〉 of the central government

Sabo in Hino River Drainage Area

Facing the risk of a fresh sediment outflow due to a collapse in the headwater area on the southwestern slope of Mt. Daisen and rapid development in the piedmont, the central government decided to implement an integrated sabo project together with a river improvement program in 1974. Meanwhile, at the mouth of Hino River, the decline of outwash due to the termination of iron sand collection in the upstream has led to the construction of sabo dam capable of allowing harmful sediment to pass through as a measure to prevent coastal erosion.

Sabo at Northern Piedmont of Mt. Daisen

Three torrents directly originating from the collapsing summit area of Mt. Daisen and 12 torrents originating from the hillside made up of volcanic ejecta empty into Japan Sea. National Route 9 and the San-in Main Line cross these torrents which are known for their high level of sediment production and sabo work is in progress by the prefectural government.

Sabo in Tenjin River Drainage Area

Using the disaster caused by Typhoon Muroto in September, 1934 as a lesson, channel improvement works commenced at Tenjin River the same year, followed by a sabo project on Ogamo Riverin 1936. At present, the construction of sabo dam, groundsels andtorrent conservation works is in progress at Nishi-Kamoya River, Izumitani River and Shimizutani River, etc. originating from Mt. Karasugasen and Mt. Hiruzen, both of which belong to the group of volcanoes to the southeast of Mt. Daisen. Sabo work featuring the entire drainage basin of Tenjin River has commenced in 2001.

Daisen Mountains Sabo Master Plan

For the protection of the grandiose, beautiful landscape and rich natural environment of the Daisen Mountains, an integrated sabo plan is required. A sabo master plan is designed to deal with harmful sediment which could cause a sedment disaster in the sabo plan area in a rational as well as effective manner. In the past, it was planned to deal with sediment movement due to flooding caused by individual downpours. However, a new sabo master plan is now in place for the Daisen Mountains, taking sediment movement caused by less severe rain between downpours into consideration.

Waterfront Play School Project

In order to utilise rivers constituting familiar natural space as places for children to experience and learn about nature, the Ministry of Land, Infrastructure and Transport has established a local system to support playful, educational activities at the waterfront with the cooperation of NPOs and local volunteer bodies and has been implementing the Waterfront Play School Projectto create a safe waterfront laced with rich nature.


Ogamo River "Sekigane Waterfront Play School" run by the Kurayoshi Works Office


Shirami River "Nikko Waterfront Play School" run by the Hinogawa Works Office

Earthquakes and Preparedness

Tottori West Earthquake

At around 13:30 on October 6, 2000, a severe earthquake of M7.3, exceeding the M7.2 of the Great Hanshin-Awaji Earthquake (1995), occurred below Mizoguchi Town in Hino District. The seismic scale was more than 6 at Sakaiminato City and Hino Town and slightly less than 6 at Saihaku Town and others. This was the first major earthquake to hit Tottori since the Tottori Earthquake in 1943 (M7.2 and claiming more than 1,000 victims). Up to 2,700 people were evacuated but no casualties were recorded. While no serious damage was caused in the sabo work area controlled by the central government in the Daisen Mountains, sediment disasters, including landslides, occurred at Hino Town located near the epicenter. After the earthquake, members of the Tottori Prefectural Sabo Volunteers' Association provided valuable assistance for the rehabilitation work.

What to Do When an Earthquake Occurs

Protect Yourself from Falling Objects

It is important to hide under a desk and to stay away from cupboards and heavy pieces of furniture. If you are outside, be aware of the possible collapse of concrete block walls and falling window glass.

Fire May Follow an Earthquake

Do not panic. Firstly, shut off the main gas valve. If a fire starts, conduct initial fire-fighting using a fire extinguisher, etc.

Once Your Safety is Secured

Call your family members and neighbors and act together to help each other.

Daily Preparedness

Preparedness on a daily basis is essential by means of obtaining disaster prevention items, confirming a place for evacuation and participating in disaster prevention exercises so that you can react calmly to an emergency situation.

Contact Addresses for Disaster Prevention

When signs are observed ···

Disaster Prevention and Crisis Management Office, Tottori Prefecture·····Phone:(0857)26-7064

River Sabo Section, Civil Engineering Department, Tottori Prefecture·····Phone:(0857)26-7382/86
http://www1.pref.tottori.jp/doboku/kasen/kasensabo.htm

Chugoku Regional Development Bureau
·····Phone:(082)221-9231
http://www.cgr.mlit.go.jp/

Kurayoshi Works Office·····Phone:(0858)26-6221(key)
http://www.kurayoshi-moc.go.jp/

Hinogawa Works Office·····Phone:(0859)27-5484

Useful Home Pages for Earthquake Preparedness

[Earthquake Information]

Earthquake Research Institute, The University of Tokyo : basis as well as the latest information on earthquake·····http://www.eri.u-tokyo.ac.jp/index-j.html

Japan Meteorological Agency: general information on earthquakes and meteorology ·····http://www.kishou.go.jp/

[Safety Registration and Enquiries]

IAA Project: registration of personal safety and information on survivors ·····http://www.iaa.wide.ad.jp/index-j.html

[Emergency Medical Care]

Emergency Medical Information System:
emergency medical service at the time of a disaster·····http://www.wds.emis.or.jp/

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