



# Activities of JSCE for Disaster Reduction

May 22, 2016

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# 1. Recent Disaster Events and Characteristics of Disasters in Japan

# Incident: Kumamoto Earthquake (熊本地震)

## April 2016





# President's Special Study Team (會長特別調查團)





# Incident: Kinugawa River Flooding (鬼怒川洪水)

## September 2015





# Incident: Mt. Ontake Eruption (御嶽山噴火)

## August 2014

Photo: Kuroda Terutoshi, from the video



Photo: The Huffington Post

Photo: Pronk Palisades



Photo: golden-tamatama.com





# Incident: Hiroshima Debris Flow (広島土石流) September 2014





# Incident: Snow Disasters (雪害) 2012～2014

Photo: un-farm.com



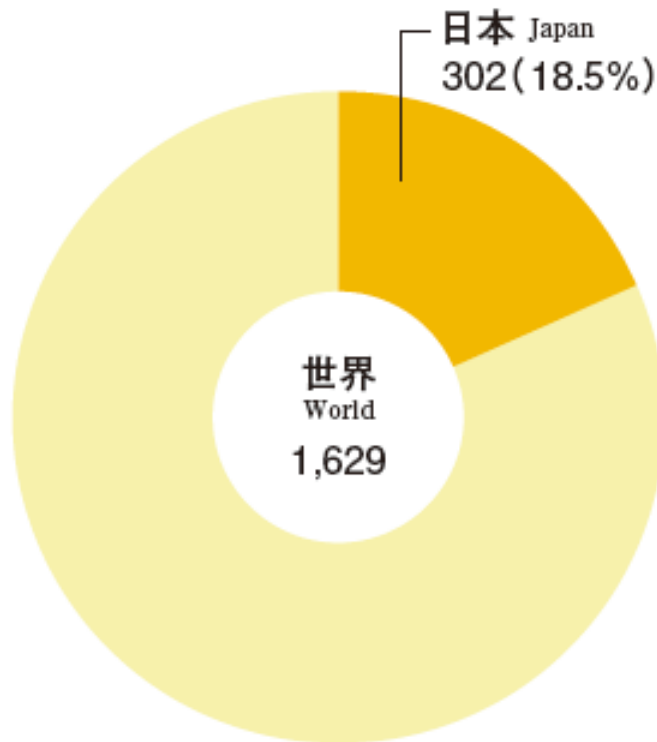
Photo: hekomi 119



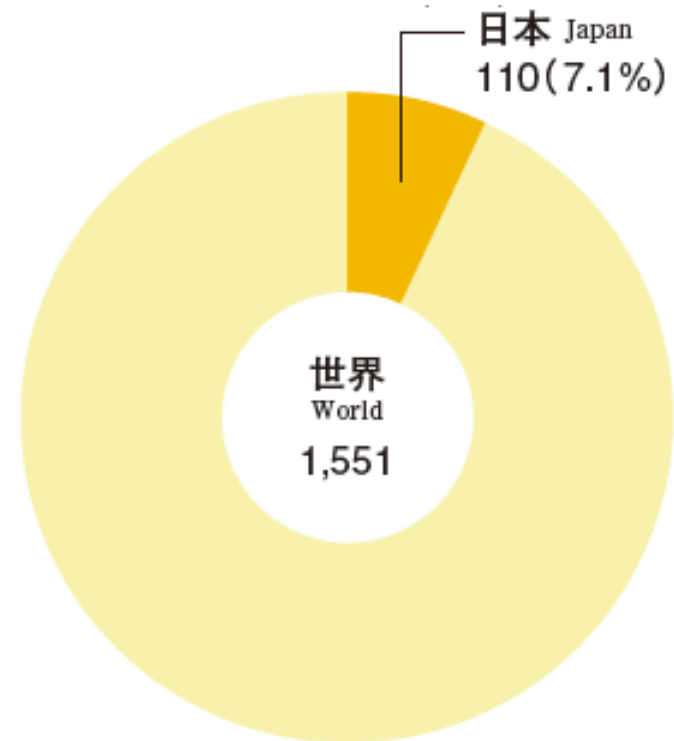
Photo: kyuumaru TK



# The Ratio of Natural Disasters in Japan to Those in the World



Number of Earthquakes with  
Magnitude of 6.0 or Greater  
(2004-2013)

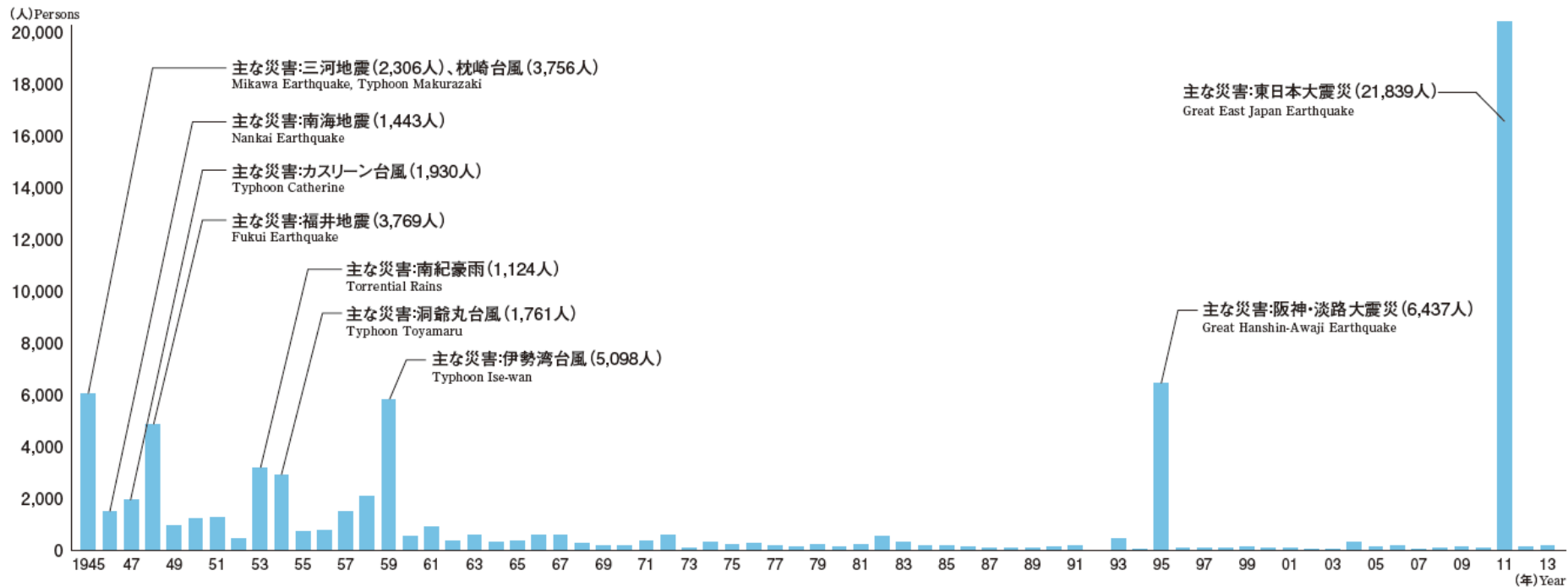


Number of Active Volcanoes  
(2014)

Source: White Paper on Disaster Management (防災白書)



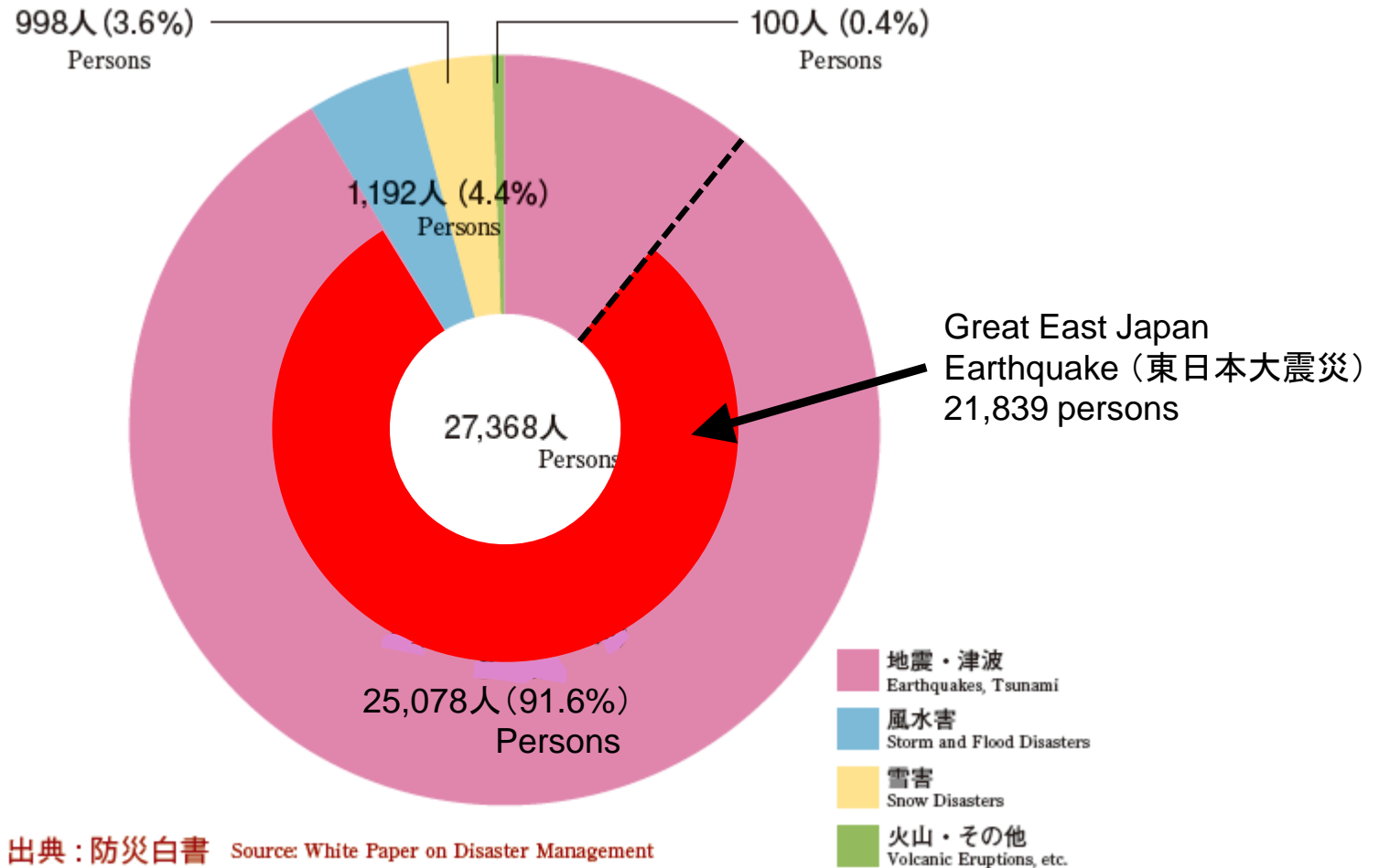
# The Number of Deaths and Missing Persons Caused by Natural Disasters in Japan



Source: White Paper on Disaster Management (防災白書)

Note: With regard to the Hanshin-Awaji Earthquake (阪神淡路大震災) and the Great East Japan Earthquake (東日本大震災), those figures include earthquake-related deaths.

# The Number of Deaths and Missing Persons by Type of Disasters in Japan (1994-2013)



Source: Modified from White Paper on Disaster Management (防災白書)



2.

## Brief History of Natural Disaster after Establishment of JSCE

# The Great Kanto Earthquake 1923 (關東大震災)

- Magnitude 7.9
- About 100,000 deaths in Tokyo (東京) and Yokohama (横浜)
- Destroyed in fire: Tokyo 46%, Yokohama 28%



Destroyed building  
block road, strand a  
tram in Hibiya (日比谷)

Photo: The Great Kanto  
Earthquake Memorial  
Museum (復興記念館)



# JSCE Earthquake Damage Study Report

- 70 committee members lead by Isami Hiroi (廣井勇), the 6th JSCE president, published the first volume in 1926, and the second and third volumes in 1927.
- The study reports were extremely detailed and became a model of disaster study reports of JSCE afterwards.



# Disaster Shortly after WWII



Typhoon Makurazaki (枕崎颱風) 1945



Nankai Earthquake (南海大地震) 1946



Typhoon Kathleen 1947



Fukui Earthquake (福井大地震) 1948



# Typhoon Isewan (伊勢湾颱風) 1959

Photo: Self Defense Force (自衛隊)



Period:

Sep. 21~27/1959

Max. wind speed: 75m/s

Min. air pressure: 895 hPa

Death: 4,697 persons

Missing: 401 persons

Injury: 38,921 persons

**Basic Act on Disaster Control Measures (災害対策基本法)** was enacted in 1961 to clarify responsibility of relevant agencies and establish organizations and institutions for disaster prevention.



Photo: Cabinet Office (内閣府)

# Niigata Earthquake (新潟地震) 1964

Photo: Wikipedia



← Collapsed apartments  
by **liquefaction**

|                      |               |
|----------------------|---------------|
| Death:               | 26 persons    |
| Totally destroyed:   | 1,960 houses  |
| Partially destroyed: | 6,640 houses  |
| Inundated:           | 15,298 houses |

**Act on Earthquake Insurance**  
(地震保険法) was enacted in  
1966. The act allows  
reinsurance by the government.

The fire caused by explosion of oil  
tanks due to **sympathetic vibration**  
continued for two weeks.



Photo: Niigata City History Museum (新潟市歴史博物館)



# The Great Hanshin-Awaji Earthquake (阪神淡路大震災) January 1995 (1/3)



Source: [www8.kobe-np.co.jp](http://www8.kobe-np.co.jp)



# The Great Hanshin-Awaji Earthquake (阪神淡路大震災) January 1995 (2/3)



Source: [www.kobe-np.co.jp](http://www.kobe-np.co.jp)




# The Great Hanshin-Awaji Earthquake (阪神淡路大震災) January 1995 (3/3)

JSCE established special committees to investigate the consequences of the Great Hanshin-Awaji Earthquake.

JSCE published a number of reports and proposed new codes and standards for earthquake-resistant designs and disaster reduction.

The event drastically changed approaches for disaster reduction and prevention in Japan.

震災デジタルライブラリー Vol.1  
阪神・淡路大震災10年デジタルアーカイブ

 土木学会  
阪神・淡路大震災10周年行事実行委員会

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(阪神・淡路大震災以降10年間に発表された学会耐震・震災関連文献約1万件を収録)

1. キーワード検索 [収録文献の検索](#)

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2. 収録文献リスト

- 2-1. 学術誌掲載論文一覧
  - 2-1-1. [学術誌別](#)
  - 2-1-2. [分類コード別](#)
- 2-2. 書籍・報告書一覧
  - 2-2-1. [発行機関別](#)
  - 2-2-2. [分類コード別](#)



[\\*全データ収録DVD販売中\\*](#)

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(このシステムの一部は学術振興会科研費により作成されています)

Digital Archives of the Great Hanshin-Awaji Earthquake



# Great East Japan Earthquake (東日本大震災) March 2011 (1/3)





# Great East Japan Earthquake (東日本大震災) March 2011 (2/3)

**2012**

土木学会主催シンポジウム  
**東日本大震災**  
あれから1年そしてこれから  
〜巨大災害と社会の安全〜

**2013**

土木学会主催シンポジウム  
**東日本大震災から2年**  
〜被災地の本格復興と日本再生への処方箋〜

**2014**

土木学会主催シンポジウム  
**東日本大震災から3年**  
〜東北復興、南海トラフ、そして福島〜

**2015**

土木学会主催シンポジウム  
**東日本大震災再考**  
〜困難課題の克服と復興の加速に向けて〜

## この5年間で 復興の加速と 次への備えに 活かすために

### 土木学会主催 東日本大震災5周年シンポジウム

**場所** 発明会館 ホール (東京都港区虎ノ門2-9-14) **定員 300名**

**主催** 公益社団法人 土木学会 (東日本大震災復興支援特別委員会)

**後援 (予定)** 国土交通省、日本建築学会、日本都市計画学会、日本原子力学会、地盤工学会

| 日時          | 2016 (平成28) 年 3月1日 (火)                              | 2016 (平成28) 年 3月2日 (水)  |
|-------------|---|---|
| 10:00~10:15 | 開会あいさつ<br>公益社団法人土木学会 会長 廣瀬 典昭                       | 10:00~11:45<br>セッション4: 災害対応のソフト〜人・組織・地域〜<br>座長: 須藤 英明 (鹿島建設)、松本 直也 (東日本建設業保証) |
| 10:15~12:00 | セッション1: 減災アセスメント: 津波総合減災を目指して<br>座長: 岡安 章夫 (東京海洋大学) | 13:00~14:45<br>セッション5: 東北の津波被災地復興の経験から何を学ぶか?<br>座長: 岸井 隆幸 (日本大学)              |
| 13:00~14:45 | 計体系/試案と<br>穀 (神戸大学)                                 | 15:00~16:45<br>セッション6: 福島第一原発事故被災地の復興をどう進めるか?<br>座長: 家田 仁 (東京大学/政策研究大学院大学)    |
| 15:00~16:45 | 生汚染廃棄物対策<br>目指して〜<br>有三 (関西大学)                      | 16:45~17:00<br>クロージングセッション: この5年間で、復興の加速と次への備えに活かすために<br>座長: 佐藤 慎司 (東京大学)     |

# Great East Japan Earthquake (東日本大震災) March 2011 (3/3)

## Conclusion of the 5th Anniversary Symposium

- JSCE will promote collaboration internally as well as **inter- and trans-disciplinary collaboration** beyond areas of expertise and organization. (ex. Japan Academic Network of Disaster Reduction (防災學術連携體))
- JSCE will continue research, discussion, and recommendation to **accelerate restoration from the Great East Japan Earthquake** (東日本大震災).
- JSCE will continue research and application of technology to local sites to **prepare for future events**. JSCE will establish a standing committee, which connects and coordinate committees concerned, to deal with disaster reduction, prevention, and restoration.



3.

## Recent Topics of JSCE's Activities for Disaster Reduction

# JSCE's New Role from Members to Society (1/3)

JSCE established “Research Committee on Disaster Reduction and Prevention to Realize Strong and Resilient Society” in December 2013 under the umbrella of the Planning Committee, with the purpose of considering how to create a “nation that is strong and resilient to natural disasters,” where people can live in peace and where the safety of citizens is protected.

## 自然災害に強いしなやかな 国土の創出のために —行動宣言と行動計画—

平成27年6月

強くしなやかな社会を実現するための  
防災・減災等に関する研究委員会

 公益社団法人 土木学会  
JAPAN SOCIETY OF CIVIL ENGINEERS

### 土木学会は減災・防災社会に貢献します

土木学会は、土木技術の専門家集団として、大規模自然災害が起きると調査団を派遣し、災害発生の原因究明や被害防止のための対策や技術的課題の解決を行ってきました。



土木学会は、土木技術の専門家集団として、自然災害に強い国土の創出のために、科学的知見の蓄積と発信、技術的な課題の解決法の提示を社会に行っていくとともに、科学・技術的知見を活かして、大規模自然災害による人命、経済活動、地域の活力を守るための具体的な行動を行っています。

### 地区防災計画の策定支援

命を守るためには、生活している地区の災害に関する適切な理解と事前の準備が十分に出来ている必要があります。土木学会は、地区の防災計画策定に必要な議論の場に立ち会い、議論が円滑に進むよう助言と支援を行います。

### 地域防災計画の点検

地区防災計画の策定には、行政の策定する地域防災計画が適切に策定されている必要があります。土木学会は、ハザードマップなどの減災・防災情報が適切に提供されているかなど、学術的知見や専門家ネットワークを利用して計画の点検支援を行います。



### 減災・防災社会の構築支援

土木学会は、地域の大学と連携、シニア土木技術者の豊かな経験を活用した地域の防災リーダーの育成、大規模災害時の課題解決やすみやかな復興のための社会の仕組みへの提言、災害の発生・被害の程度の予測技術・被害の低減を図る技術開発、日本で培われた知見に基づく海外協力などを行っています。



## 自然災害に強いしなやかな 国土の創出のために

### 土木学会から市民のみなさんへ

土木学会は、自然に対する畏敬の念を持ち、美しく豊かな国土と持続可能な社会づくりに貢献するため、2015年6月に「自然災害に強いしなやかな国土の創出のために—行動宣言と行動計画—」<sup>1)</sup>を取りまとめました。

自然災害多発国である日本では、市民のみなさん<sup>2)</sup>は常に災害が生じて被害を受けるリスクを有しています。土木学会が考える「減災・防災の基本」「災害からの回復力を持ち持続可能な社会を実現するための課題と実現策」「減災・防災力の現状と今後の対応」と、土木学会がこれから行うことをお伝えすることで、みなさんと一緒に自然災害に強い国土の構築に寄与したいと考えています。

自然災害に強い国土は、以下のような様々な観点で求められています。

- 災害対応力のある国家に向けた国土形成の観点
- 人口減少・高齢化やそれに伴う地域のありかたという社会的な観点
- 住民の災害リスクの理解や発災時の個人や地域での適切な対応という国土利用者の行動という観点
- 災害後の社会の閉塞感や経済活動の低迷を招かないための経済損失という観点

<sup>1)</sup> 土木学会のホームページ (<http://www.jsce.or.jp/>) で、全文を入手できます。

<sup>2)</sup> 土木学会は、2015年に市民のみなさんを顧客とした活動を行うことを宣言しました。



Report of the Committee, June 2015

Message from JSCE to Citizen about Disaster Reduction



# JSCE's New Role from Members to Society (2/3)

## Declaration of Action

*Japan Society of Civil Engineers (JSCE), as an organization of civil engineering technology experts, in order to create a nation that is resilient to natural disasters, will engage in the accumulation and dissemination of scientific knowledge and present the solutions to technical challenges to communities. At the same time, we will utilize scientific and technical knowledge in order to take concrete action to protect, insofar as possible, the lives of citizens, and the economic activity and vitality of the region.*

Urgent inspection by JSCE study team in an area struck by landslide, Hiroshima, 2014



## Action Plan

*Japan Society of Civil Engineers (JSCE), based on their own expertise, seek consistent support and cooperation from disaster-related fields, in order to protect the safety of the country and citizens. Based on the recognition that disasters will not wait, we aim to urgently upgrade branch systems, and have decided to carry out concrete disaster reduction activities rooted in the localities (region, district), and to urgently address the pressing issues shown below.*

- Development assistance for district disaster reduction plans
- Inspections of regional disaster reduction plans
- Development of disaster reduction leaders
- Training assistance and improvement of disaster reduction capabilities
- Recommendations to society
- Overseas cooperation, etc.



# JSCE's Disaster Reduction Initiatives in ACECC

The Asian Civil Engineering Coordinating Council  
(ACECC)

## Members

|       |  |
|-------|--|
| ASCE  | American Society of Civil Engineers                  |
| CICHE | Chinese Institute of Civil and Hydraulic Engineering |
| EA    | Engineers Australia                                  |
| HAKI  | Indonesian Society of Civil and Structural Engineers |
| ICEI  | Institution of Civil Engineers India                 |
| IEB   | Institution of Engineers, Bangladesh                 |
| IEP   | Institution of Engineers, Pakistan                   |
| JSCE  | Japan Society of Civil Engineers                     |
| KSCE  | Korean Society of Civil Engineers                    |
| MACE  | Mongolian Association of Civil Engineers             |
| NEA   | Nepal Engineers' Association                         |
| PICE  | Philippine Institute of Civil Engineers              |
| VFCEA | Vietnam Federation of Civil Engineering Associations |

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For a Better Quality of Life



- JSCE proposed to establish a new technical committee of ACECC on “**Trans-disciplinary Approach for Building Societal Resilience to Disasters**” (TC21) and approved in October 2015.

# ACECC TC21: Transdisciplinary Resilience Building

Activities of TC21 include the following:

- Studies and research on **trans-disciplinary approach** of disaster risk management among communities, private, government, and academic sectors, including case studies of **co-design**, **co-production**, **co-delivery**, and **co-implementation**.
- Studies and research of institutionalization of **disaster risk impact assessment**, which clarify disaster risk of the consequences of development and which aim to prevent new risk caused by development.

TC Chair: Kuniyoshi Takeuchi,  
Founding Director of ICHARM

Co-chair: Romeo S. Momo  
Undersecretary of Department of Public  
Works and Highways, the Philippines



Global Centre of Excellence for  
Water Hazard and Risk Management

# ICHARM

International Centre for Water Hazard and Risk  
Management under the auspices of UNESCO





# Japan Academic Network of Disaster Reduction (JANET-DR; 防災學術連携體) (1/2)

The members of **Science Council of Japan** (日本學術會議) consisting of 50 academic societies relevant to disaster management established emergency contact network named **Japan Academic Network of Disaster Reduction** (防災學術連携體) on January 9, 2016. This association aims to collaborate across academic disciplines and make efforts to integrate different specialties for disaster reduction. **JSCE** serves as the first secretariat of the network.

防災學術連携體

Japan Academic Network of Disaster Reduction

The network holds a regular symposium once every year.



# Japan Academic Network of Disaster Reduction (JANET-DR; 防災學術連携體) (2/2)



Urgent Press Conference about  
Kumamoto Earthquake (熊本地震)  
Held in JSCE Meeting Room in  
April 18th

Photo: JSCE Communications and Public  
Relations Center (土木學會土木公關中心)



Urgent Debriefing Symposium  
about Kumamoto Earthquake (熊  
本地震) held in **Science Council  
of Japan (日本學術會議)** in May  
2nd



4.

## Collaboration between CICHE and JSCE for Disaster Reduction

# JSCE Working with CICHE for Disaster Reduction

- Taiwan and Japan share **common natural environment** as well as **culture**.
- Contrast to the rich natural environment, we have been experiencing a number of natural disasters including earthquake, landslide, and flooding, unfortunately.
- Taiwan and Japan are **responsible for disaster reduction in the world** applying the abundant experience.
- Collaboration between CICHE and JSCE for disaster reduction may contribute these two regions as well as the rest of the world. The opportunities may include:
  - CICHE-JSCE Joint Workshop
  - ACECC TC21; Trans-disciplinary Approach for Building Societal Resilience to Disasters
  - Collaborative study and research for specific disaster





Thank you 謝謝

