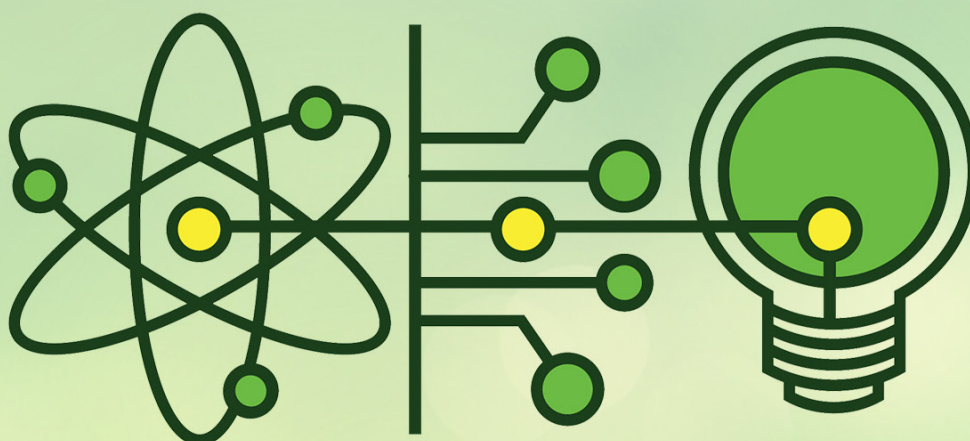


# 17<sup>th</sup> Conference of the Science Council of Asia (SCA)



**SCIENCE, TECHNOLOGY, and INNOVATION  
FOR INCLUSIVE DEVELOPMENT**

June 14-16, 2017

Philippine International Convention Center (PICC)  
Roxas Boulevard, Pasay City, Philippines

# BOOK OF ABSTRACTS



Department  
of Science  
and Technology



National Research  
Council of the  
Philippines



Science Council of Asia



Science Council  
of Japan



**F-20**

### **Science Council of Japan and Japan Academic Network for Disaster Reduction**

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Science Council of Japan (SCJ) is the representative organization of Japanese scientist community ranging over all fields of sciences subsuming humanities, social sciences, life sciences, natural sciences, and engineering. The academic organization covering all fields is rare one in the world. SCJ has four roles: 1. Policy recommendations to the government and public, 2. International activities, 3. Promotion of scientific literacy, 4. Establishment of networks among scientists. This paper focus on the 4th role and introduce an actual activity. Members of SCJ and 47 academic societies established Japan Academic Network for Disaster Reduction<sup>2</sup> in January 2016, which covers social sciences, life sciences, natural sciences, and engineering. This network works very well for promoting interdisciplinary collaboration and social implementation of research, for example the 2017 Kumamoto earthquake. In academic world, specialization has been progressed and integration has been weakened. A similar organization is expected to be established in other field for responding to the global problem, and I consider the possibility. Many natural disasters occur in Asia. I also consider what we can do to promote collaboration among Asian countries with a view to the future.

*Keywords:* Science Council of Japan; Academic Network; Disaster Reduction; collaboration among Asian countries; 2017 Kumamoto earthquake

## **Science Council of Japan and Japan Academic Network for Disaster Reduction**

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### **Abstract**

In academic world, specialization has been progressed and integration has been weakened. Members of Science Council of Japan (SCJ) and 47 academic societies (later 55) established “Japan Academic Network for Disaster Reduction(JANET-DR)” which covers social sciences, life sciences, natural sciences and engineering. JANET-DR works well for promoting interdisciplinary collaboration and social implementation of research, for the 2016 Kumamoto earthquake. JANET-DR suggests a new connection with academic association. In academic world, a similar organization is expected to be established in other field for responding to the Asian and global problem.

**Keywords:** academic network, disaster reduction, interdisciplinary cooperation

### **Introduction**

Science Council of Japan (SCJ) is the representative organization of Japanese scientist community ranging over all fields of sciences subsuming humanities, social sciences, life sciences, natural sciences, and engineering. The academic organization covering all fields is rare one in the world. SCJ has four roles<sup>(1)</sup>: 1. Policy recommendations to the government and public, 2. International activities, 3. Promotion of scientific literacy, 4. Establishment of networks among scientists. This paper focuses on the 4<sup>th</sup> role and introduces an actual activity.

Members of SCJ and 47 academic societies (later 55) established “Japan Academic Network for Disaster Reduction(JANET-DR)” in January 2016, which covers social sciences, life sciences, natural sciences and engineering<sup>(2), (3), (4)</sup>.

### **1. Japan Academic Network for Disaster Reduction (JANET-DR)**

Every time a big natural disaster occurs, various academic societies conduct lots of surveys and researches. But the result is often announced only in own academic society, and most of the information is not shared by different academic societies.

After the Great East Japan Earthquake, so many surveys were done, but the findings obtained from most of the surveys were accumulated in each academy. For disaster prevention, it is important to collect comprehensive measures by gathering knowledge from various specialized fields. A platform to promote interdisciplinary cooperation is necessary.

With this consciousness, volunteers of SCJ became founders and established the “Academic Society Liaison Association Corresponding to the Great East-Japan Earthquake” in May 2011, together with 24 academic societies (later 30) relevant to disaster management. As the successor of this association, JANET-DR was established in 2016. JANET-DR targets not only earthquakes but also other natural disasters in general.

## **2. The 2016 Kumamoto earthquake and report meetings**

The Kumamoto earthquake happened on 14 and 16 April, about three months after JANET's start. M 6.5 earthquake occurred at 21:26, 14 April 2016, in Kumamoto on the island of Kyushu in southwest Japan. Then, the strongest M 7.3 earthquake occurred at 1:45, 16 April which was called the main shock of "the 2016 Kumamoto Earthquake". The hypocenters of those earthquakes are situated at shallow depth in Futagawa and Hinagu fault zones. The displacement of those faults caused lots of aftershocks.

SCJ & JANET-DR cooperated and held a joint press conference on 18 April. Representatives of eight academic societies explained about the Kumamoto earthquake and answered many questions from various media companies. On 2 May, the "Urgent report meeting" was held and 17 academic societies announced interim reports of urgent investigation and relief activities.

On 9 May, SCJ announced President's statement "The 2016 Kumamoto Earthquake on April 16 and Our Actions" with Representative Directors of JANET-DR. This statement is attached to the end of this paper.

On 16 July, "Three-month report meeting" was held and representatives of 23 academic societies presented. This series of report meetings helped to convey accurate information from academia to society. In lots of articles on newspapers and television programs cited the presenters' comments of these report meetings.

The 2016 Kumamoto earthquake exceeded seismic intensity 7 twice, seismic intensity more than 6 seven times, aftershocks occurred more than 4,000 times. As of March 2017, 50 deaths, 174 related deaths, 2,677 wounded, 189,079 houses collapsed or damaged were reported.

In Kumamoto, in addition to the aftershocks, the eruption of Mt. Aso and the frequent occurrence of landslide disasters due to heavy rain are still concerned. Many academic societies continue researches and support activities, with accumulating a lot of knowledge.

In order to make use of these findings for disaster restoration and disaster mitigation, we thought we should hold a report meeting in Kumamoto prefecture, not in Tokyo. And it finally came to the one-year report meeting.

## **3. One-year report meeting in Kumamoto Prefectural Office**

SCJ and JANET-DR, together with Kumamoto Prefecture, held "Kumamoto Earthquake /One-year report meeting" in Kumamoto Prefectural Office on 15 April 2017. It was held as one of official events of "Kumamoto earthquake memorial event". In addition to the presentations of 30 academic societies, Kumamoto prefecture and Kumamoto city reported their current status and their plans. It is necessary to understand the situation of the affected site for contributing to future recovery and disaster prevention.

The participants of the meeting exceeded 500 people. After the opening addresses by Mr. Ikuo Kabashima, Governor of Kumamoto Prefecture, and Dr. Takashi Ohnishi, president of SCJ, we had 15 oral presentations and 16 poster presentations of academic societies. It was a stimulating meeting with many questions and answers. 17 media companies including five TV companies got interviewed.



“Kumamoto earthquake/ One-year report meeting” in Kumamoto Prefectural Office on 15 April 2017

**Program of “Kumamoto earthquake/ One-year report meeting”**

1) Oral Presentation of academic society

1-1) Observation and phenomena of the Kumamoto earthquake

The Japanese Society for Active Fault Studies

The Seismological Society of Japan

The Remote Sensing Society of Japan

1-2) About the damage situation of the earthquake and measures

Architectural Institute of Japan

The Society of Heating, Air-Conditioning and Sanitary Engineers of Japan

The Japan Society of Mechanical Engineers

Japan Society of Civil Engineers

The Japanese Society of Irrigation, Drainage and Rural Engineering

1-3) About sediment-related disasters, wind and flood damage and countermeasures

The Japanese Forest Society

Japan Society of Erosion Control Engineering

The Japanese Geotechnical Society

1-4) Information provision · evacuation · relief · restoration · reconstruction

Japan Society for Disaster Information Studies

Japanese Association for Disaster Medicine

Japan Society of Material Cycles and Waste Management

Japan Association for Earthquake Engineering

2) Presentation by Kumamoto prefecture

Response in the event of a disaster, Restoration reconstruction plan

Presentation by Kumamoto city

Response in the event of a disaster, Reconstruction plan of Kumamoto castle

3) Poster session

Association for Children’s Environment

Institute of Social Safety Science



Geographic Information Systems Association of Japan  
Japan Society of Engineering Geology  
Japan Association for Fire Science and Engineering  
Japan Association of Nursing Academies  
Japan Association for Planning and Public Management  
Japan Society of Disaster Nursing  
Japan Society for Disaster Recovery and Revitalization  
The Seismological Society of Japan  
Japan Society for Natural Disaster Science  
Japan Association for Quaternary Research  
The Japan Landslide Society  
Japanese Institute of landscape Architecture  
Geological Society of Japan  
The Japanese Society of Revegetation Technology

After the one-year report meeting, we held an exchange meeting among Kumamoto prefecture, SCJ and JANET-DR. Kumamoto Prefecture requested SCJ and JANET-DR to provide survey information for establishing the digital archive record of Kumamoto earthquake. SCJ and JANET-DR have a direction to deepen collaboration with Kumamoto prefecture and are willing to cooperate to build up digital archive.

On the day after the report meeting, 70 researchers took part in three small buses and inspected the affected areas of the Kumamoto earthquake. We went around the collapse and damage of Kumamoto castle and its restoration work, wooden temporary housings and the survey of active faults in Mashiki town. We also went to the collapse of Aso shrine and Aso bridge and their restoration site. We got detail explanation about the reconstruction situation from staffs in charge in various places.



The damage of Kumamoto castle



The survey of active faults in Mashiki town on 16 April 2017

#### **4. Association of academic societies and responsibilities of SCJ**

SCJ has a mission to build a network of scientists and disseminate the results of science and technology to society. The background of the establishment of JANET-DR has this responsibility.

The membership selection of SCJ was changed to "a system where members select the members of the next term" from 2006 (20th term) as of now. Before 2006, the membership selection was held with

the recommendation from academic societies, therefore, the connection of SCJ and academic societies was strong. After the time of change, the academic society became a "cooperative academic research organization" of SCJ, but every time the membership is reelected, the connection between SCJ and the academic societies is weakened.

In the academic world where professional differentiation continues, SCJ is standing at a position to advance integration and collaboration. SCJ is an academy rare in the world that encompasses all fields of humanities, social sciences, life sciences, natural science and engineering, and has the potential to create cooperation across fields. JANET-DR suggests a new connection possibilities with academic association.

### **Conclusion**

JANET-DR works well for promoting interdisciplinary collaboration and social implementation of research, for the 2016 Kumamoto earthquake. In academic world, specialization has been progressed and integration has been weakened. A similar organization is expected to be established in other field for responding to the Asian and global problem.

Many natural disasters occur in Asia. I also consider what we can do to promote collaboration among academies in Asian countries with a view to the future.

### **Acknowledgements**

I express sincere appreciation to President Takashi Onishi, Vice-President Keisuke Hanaki, Prof. Hisao Komatsu, Prof. Akira Wada, Prof. Teruhiko Yoda, Prof. Hiroshi Yoshino, Prof. Toshimitsu Komatsu and the members of Science Council of Japan for their guidance and cooperation. One-year report meeting was able to be carried out with strong support and cooperation of Japan Society of Civil Engineers and Kumamoto Prefecture. I deeply appreciate the steering members of JANET-DR and representatives of 55 academic societies.

JANET-DR would like to make cooperation with prefectures and municipalities, and to contribute for disaster reduction with interdisciplinary cooperation among academic societies.

### **References:**

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- (2) Masako Yoneda, Akira Wada, Teruhiko Yoda, Kazuo Tamura, Yasushi Asami and Kimiro Meguro, Establishment of Japan Academic Network for Disaster Reduction, 16<sup>th</sup> Conference of Science Council of Asia, June 1 2016, Colombo, Sri-Lanka.
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Takashi Onishi, President, Science Council of Japan

Akira Wada and Noriaki Hirose, Representative Directors, Japan Academic Network for Disaster Reduction

Science Council of Japan (SCJ) and Japan Academic Network for Disaster Reduction (JANET-DR, a network of 50 academic societies related to disaster reduction) would like to express our condolences for the people who lost lives in the Kumamoto Earthquake and offer our heartfelt sympathies for those affected by the disasters. And, we also would like to express our gratitude for the helps and sympathies offered by our colleagues abroad. We would like to urgently report what occurred in Kumamoto and what actions were taken by SCJ and JANET-DR so far.

A series of strong earthquakes attacked Kumamoto and Oita Prefectures in central Kyushu in the mid of April. The severe casualties and damages were reported: 49 killed, one missing, 18 disaster-related deaths, 1,600 wounded, 63 thousand houses collapsed or damaged, and 15 thousands evacuated as of 6 May (183 thousands on 17 April). The first strong earthquake was recorded at 21:26, 14 April, 2016, in Mashiki Town, Kumamoto. Then, after many small-scale aftershocks, the strongest shock occurred 1:45, 16 April in the same town, which was called the main shock of “the 2016 Kumamoto Earthquake”. The hypocenters of those earthquakes are situated at shallow depth in Futagawa and Hinagu fault zones, two of the most prominent active faults in Kyushu region. The displacement of those faults caused more than 1,000 shocks at various seismic intensity in Kumamoto areas.

The pictures shown on the document No. 1 were taken at the sites, which showed a strike-slip fault appeared on a paddy field, wooden houses collapsed in Mashiki Town, landslides in Minami-Aso Village and the collapse of Aso-Ohashi road-bridge presumably caused by landslide.

It is obvious that strong shocks caused by the displacement of the active faults in the vicinity destroyed mainly old wooden houses which didn't fit the current seismic design standards and killed many people inside them. Some of buildings and infrastructure facilities, however, which are supposed to possess adequate seismic capacity were also damaged. The damage of the earthquake differs according to the geographical feature and the situation of ground. Therefore, further investigation must be done.

Some of the members of SCJ and JANET-DR went to the disaster area for the urgent investigation and had two opportunities to report what learnt from these disasters.

Firstly, the emergency joint press conference was held on April 18, at the meeting room of Japan Society of Civil Engineers with the participation of 43 journalists in order to transfer the accurate information of the earthquakes and disasters caused by them from the academics to the media as shown on the document No. 2. As a result, many views of experts attended in the conference as speakers were cited in many articles.



Secondly, the urgent report meeting was held on May 2, at SCJ auditorium with the lectures from 17 societies and more than 300 participants including 54 journalists as shown on the same document No. 2. The lectures on the investigation were made by experts of many societies;

We would like to appreciate the experts who made precious reports for the understandings, lessons and scientific ideas for the further research.

The followings were stressed through lectures and discussions as what we have to:

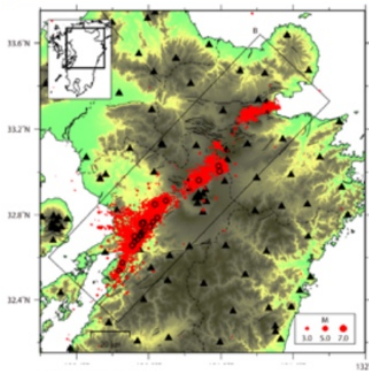
1. Understanding and even predicting the further development of the present activities of the active faults. Especially, finding how the series of earthquakes will affect other active faults or subduction- zones is what the society wants to know.
2. Understanding the expansion of landslide in mountainous areas where landslides took place due to the earthquakes.
3. Understanding how the continuous two peaks of large-scale shocks affected the destruction of man-made structures.
4. Considering how we can reduce the people's anxieties or fears caused by the earthquakes.
5. Considering how we can propagate practical disaster-reduction measures, as the Kumamoto earthquake is likely to occur anywhere in Japan.
6. Considering how we can accelerate recovery and reconstruction making use of the past experience of disasters such as effective measures in loss of power, in evacuation center management, and so on.
7. Strongly recommending retrofitting old buildings and housing, everywhere in Japan, which do not have the seismic capacity to withstand earthquakes.

We will have another report meeting when our societies finish their initial field survey hopefully in July.

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# The 2016 Kumamoto Earthquake on April 16

NO1



Hypocenter distribution  
2016/04/14 21:00~2016/04/22 06:00  
[source: NIED, Network Center for Earthquake, Tsunami and Volcano]



The 2016 Kumamoto earthquake occurred at shallow depth, in vicinity of Futagawa and Hinagiku fault zones, two of the most prominent active faults in Kyushu region. Plural active faults, related to each other, caused the earthquakes  
[source: Prof.Kato et al.,GRL, 1998, revised]

Kumamoto, on the island of Kyushu in southwest Japan. Second big earthquake was the main shock. M 3.5 or greater earthquake occurred 228 times in 20 days.

Date and Time(JST)	Hypocenter	M	S. I (Max)
14 April 2016 21:26	Kumamoto	6.5	7
14 April 2016 22:07	Kumamoto	5.8	6+
15 April 2016 00:03	Kumamoto	6.4	6+
16 April 2016 01:25	Kumamoto	7.3	7 Main
16 April 2016 01:45	Kumamoto	5.9	6-
16 April 2016 03:55	Aso	5.8	6+
16 April 2016 09:48	Kumamoto	5.4	6-

[source: Japan Meteorological Agency]



The cause of the earthquake was strike-slip fault.  
[Photograph: the Geospatial Information Authority of Japan]



Damage caused by the earthquake in Mashiki town, Kumamoto Pref.

Kumamoto Earthquake victims (6 May, 2016)  
Killed: 49 people  
Missing: 1 person  
Wounded: 1600 people  
Collapsed or damaged houses: 63000

[Photograph: Prof. Yoneda]



Landslides in Minami-aso village and collapse of Aso-Ohashi road-bridge.

The land made of volcanic ash is fragile. With heavy rain, complex disaster will be continuing.

[Photograph: Kokusai Kogyo Co.Ltd, Pasco Corporation]

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# First response to Kumamoto earthquake

NO2

## Science Council of Japan (SCJ) & Japan Academic Network for Disaster Reduction (JANET-DR)



Emergency joint press conference on 18 April 2016



Urgent report meeting on 2 May 2016

氏名	所属大学等機関	所属学会	所属学会の連絡先	所属学会の連絡先	所属学会の連絡先	所属学会の連絡先	所属学会の連絡先
山本 浩一	東京大学	地震学会	〒113-8654 東京都文京区湯島 1-1-1	03-5841-3111	03-5841-3111	03-5841-3111	03-5841-3111
山本 浩一	東京大学	地震学会	〒113-8654 東京都文京区湯島 1-1-1	03-5841-3111	03-5841-3111	03-5841-3111	03-5841-3111
山本 浩一	東京大学	地震学会	〒113-8654 東京都文京区湯島 1-1-1	03-5841-3111	03-5841-3111	03-5841-3111	03-5841-3111

平成28年(2016年)熊本地震に関する情報

平成28年5月2日(月) 熊本地震、緊急報告会開催のお知らせ

緊急報告会開催日時: 平成28年5月2日(月) 14:00~16:00

緊急報告会開催場所: 東京都文京区湯島 1-1-1 東京大学 本館5階

緊急報告会参加費: 無料

緊急報告会申し込み: <http://janet-dr.com/>

緊急報告会問い合わせ: 03-5841-3111

緊急報告会主催: 日本学術会議

緊急報告会共催: 日本地震学会

緊急報告会協賛: 日本学術会議

緊急報告会後援: 日本地震学会

緊急報告会協力: 日本学術会議

緊急報告会連絡先: 03-5841-3111

緊急報告会ウェブサイト: <http://janet-dr.com/>

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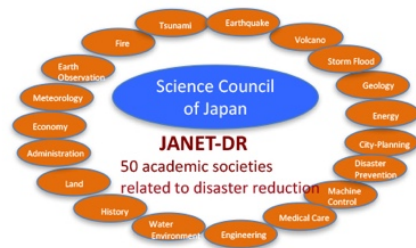
緊急報告会録音: <http://janet-dr.com/>

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緊急報告会録画: <http://janet-dr.com/>

- Experts of different fields gathered and made the opportunity to answer a variety of questions about Kumamoto earthquake.
- Accurate information was transferred from academies to media. Total 97 journalists attended and cited the opinions of experts in many articles.
- Providing the opportunity for each society to explain the report of urgent investigation.
- Promoting understanding of Kumamoto earthquake and disaster by sharing information among different academic societies.
- Promoting interdisciplinary cooperation for disaster reduction and disaster restoration.



Representatives of 47 Academic Societies and members of Science Council of Japan, January 9, 2016

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