

Promotion of Transdisciplinary Approach (TDA)

- ACECC TC21's 10-Year History -

October 23, 2025

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Promote the transdisciplinary approach (**TDA**) for **S**cientific **K**nowledge-based **D**ecision-making (**SKD**) for building societal resilience to disasters

How to design and practice TDA



- Discussion and case studies of TDA practices by members of different sectors
- Perform comparative analyses and describe factors and positive effects of TDA
- Publication and dissemination

Kick-off Meeting and Seminar in CECAR7

TC21 was approved in the 28th ACECC ECM in Gunsan, Korea in **March 2015**.

TC21 held a kick-off meeting and a seminar in CECAR7 **in August to September 2016**.



September 2016



Co-Chairs Dr. Takeuchi and Usec Momo at the TC21 Kick-off Meeting



TC21 Members from Indonesia, Taiwan, and U.S.A.

Launched TC21 Website in October 2016

<https://tc.acecc-world.jsce-int.com/TC21/>



The TOR, member list, all symposium documents are available in the site.

October 2016



Meeting with Policy Makers in the Philippines

Ormoc City: 8,000 deaths and missing by
Typhoon Uring in 1993

Tacloban City and Palo Municipality:
Severely damaged by storm surge caused by
Typhoon Haiyan (Yolanda) in 2003

November 2016

Leyte Island



Meeting with Vice-Mayor of Ormoc City,
Leyte Island, the Philippines



Meeting with Mayor of Palo Municipality,
Leyte Island, the Philippines

Site Survey in the Philippines

Ormoc City:
Establishment of Flood Mitigation
Committee covering central and city
government, and barangay, the
smallest administrative unit in the
Philippines. River maintenance works
are done by communities.



Slit Dam in Ormoc City, Leyte Island,
the Philippines

Tacloban City
Palo Municipality
Ormoc City

November 2016



Resettlement Housings, Tacloban, Leyte
Island, the Philippines

1st TC21 Symposium:

International Comparison
of Scientific Knowledge-
Based Decision-Making
Schemes for Disaster
Reduction



Panel Discussion in
the Symposium



Participants of the
Symposium

November 2016



International Symposium on Natural Disaster Mitigation was held in University of Transport and Communication in Hanoi, Vietnam

February 2017

We introduced TC21 and JSCE's activities regarding disaster risk reduction



Meeting with Policy Makers in Nepal

We discussed how scientific knowledge is applied to decision-making.

April 2017



Meeting at regional office of Department of Urban Development and Building Construction (DUDBC)



Stakeholder meeting among academia, government, and private sector



Historical Former Prime Minister's Office building in Kathmandu damaged by 2015 Nepal Earthquake

April 2017

Reconstruction works of housings in Irkhu Village, Sindhupalchowk District





TC21 committee meeting

April 2017

2nd TC21 Symposium on
Scientific Knowledge-
Based Decision-Making
Schemes for Disaster
Reduction





Video Message by
TC21 Co-Chair,
Mr. Romeo S.
Momo

May 2017

Video Message by Mr. Irwin L.
Antonio, Leyte 4th Office,
Department of Public Works and
Highways (DPWH), Philippines



Training in Taiwan and Intl' Meeting in U.K.

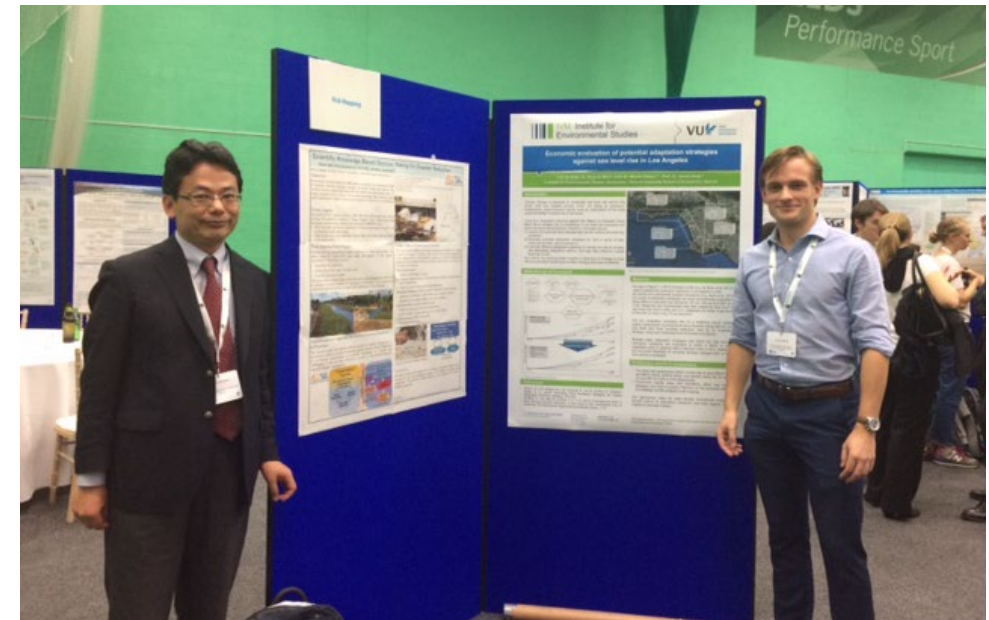


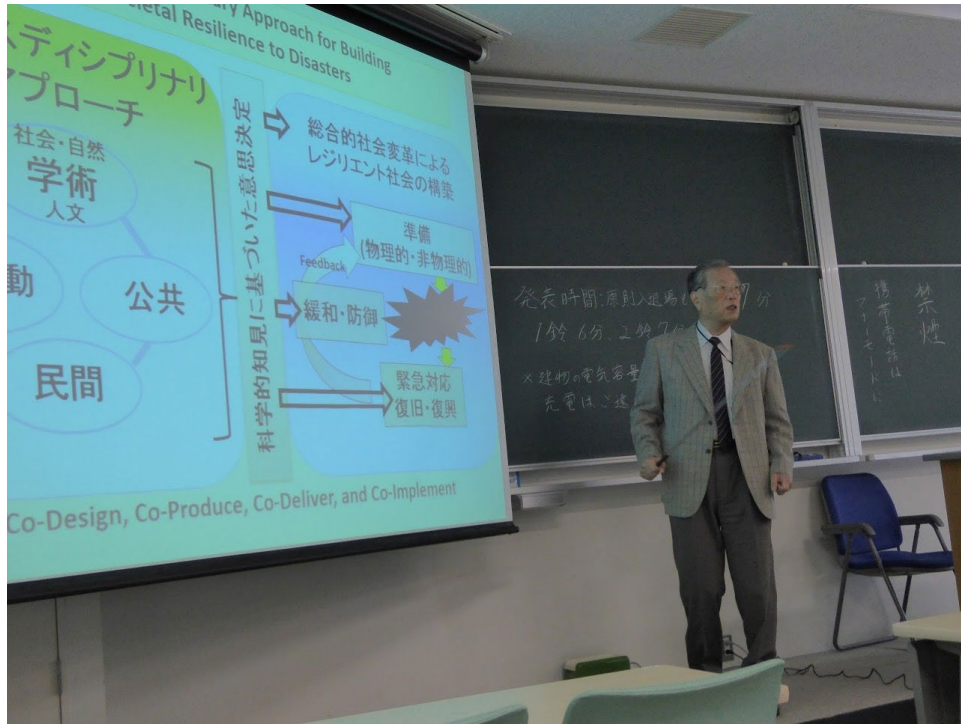
International Disaster Mitigation Training Workshop Co-hosted by National Science and Technology for Disaster Reduction (NCDR), Taiwan, TC21, and others.

July 2017

September 2017

Dr. Ishiwatari, TC21 member, introduced a case study in Ormoc, the Philippines, and TDA at the 7th International Flood Management Meeting held in Leeds, U.K.





Hosted by ACECC TC21 Support Committee of JSCE, we introduced TC21 activities and case studies in Japan from the point of view of TDA at the Annual Meeting of JSCE held in Fukuoka, Japan.

September 2017



TC21 held a special session at the World Bosai Forum held in Sendai, Japan. We introduced TDA case studies and measures to remove root causes of disaster.

November 2017



Site Survey in Nam Dinh Province, Vietnam



TC21 members surveyed areas affected by coastal erosion in Nam Dinh Province, Vietnam

April 2018

Damaged church as a monument of storm surge disaster, Nam Dinh Province, Vietnam



Meeting with Government Officials in Vietnam



April 2018

We discussed with local government officials in Nam Dinh Province about the current situation and issues about disaster management.





Transdisciplinary Approach (TDA) for Building Societal Resilience to Disasters -Concepts and case study for practicing TDA-



November 2016: Survey of flood prevention works in Ormoc, Philippines November 2016: Survey of new settlements in Tacloban, Philippines



April 2017: Survey of reconstruction after earthquake in Chaurara, Nepal April 2018: Survey of coastal hazards in Nam Dinh Province, Vietnam

TC21: Transdisciplinary Approach (TDA) for Building Societal Resilience to Disasters:
Committee of ACECC (The Asian Civil Engineering Coordinating Council)

Transdisciplinary Approach (TDA) for building Societal Resilience to Disasters

- *Concepts and case study for practicing TDA* -

<https://tc.acecc-world.jsce-int.com/TC21/>

ISBN: 978-4-8106-1014-7

April 2019

Discusses the key components and structure of TDA models that were assessed through the case studies.

The contents are intended to clarify the necessity of TDA and catalyze innovative approaches



How to design, practice, and evaluate TDA

TC21 Sessions at CECAR8 and JSCE Annual Meeting

ACECC TC21 Sessions at CECAR8: Transdisciplinary Approach (TDA) for Building Societal Resilience to Disasters



This session presents the concepts, activities, and future issues of Disaster Risk Reduction (DRR), where the main focus is on promoting transdisciplinary approach (TDA) for implementing scientific knowledge-based decision-making.

Date & Time Tuesday, April 16, 2019
First Session: 14:00-15:30 Second Session: 16:00-17:30

Venue Hotel Metropolitan Ikebukuro (Room: Fuji-2)

Program

First Session Results of Case Studies by TC21 Member States

Opening Address and Outline of the Session:

Dr. Kuniyoshi Takeuchi (TC21 Co-Chair, Emeritus Professor, Yamanashi University)

Preparedness: State, type of DRR, Presenter

Taiwan: Preparedness against landslides,

Mr. Ting-Chi Tsao (Principal Engineer and Group Chief, Sinotech Engineering Consultants, Inc., Taiwan)

Indonesia: Preparedness against tsunami, Dr. Harkunti Rahayu (Prof. Institute of Technology Bandung, Indonesia)

Recovery and mitigation: State, type of DRR, Presenter

Philippines: Recovery of city from storm surge, Dr. Senro Kuraoka (Chief Engineer, R&D Center, Nippon Koei Co., Ltd., Japan)

Vietnam: Mitigation of coastal erosion,

Dr. Pham Hoang Kien (Professor, University of Transport and Communications, Vietnam)

Bangladesh: Mitigation of vulnerable buildings,

Md. Abdul Malek Sikder (Freelance Consultant, Fellow, Institution of Engineers Bangladesh (IEB), Bangladesh)

Nepal: Recovery of buildings from earthquake,

Mr. Masashi Inoue (Researcher, EJ-Research Center for Disaster Risk Reduction, Eight-Japan Engineering Consultants, Inc. Japan)

Pakistan: Mitigation of vulnerable structures,

Dr. Sarosh H. Lodi (Faculty of Civil & Architecture, NED University of Engineering & Technology, Pakistan)

Japan: Recovery of cities from tsunami,

Dr. Mikio Ishiwatari (Visiting Prof. Graduate School of Frontier Sciences, The University of Tokyo)

Japan: Recovery of historical structure from earthquake,

Mr. Masaru Arakida (Senior Researcher, Asian Disaster Reduction Center, Japan)

Second Session Summary, Q&A, and Way Forward

Activities of TC21 from 2016 to 2019: Dr. Yoshihiro Katsuhama (Manager, R&D Planning Office, Nippon Koei Co., Ltd., Japan)

Summary of Case Studies: Dr. Senro Kuraoka (Chief Engineer, R&D Center, Nippon Koei Co., Ltd., Japan)

Forthcoming TC21 Activities / Announcement of TC21 Publication:

Dr. Kenichi Tsukahara (Professor, Faculty of Engineering, Kyushu University, Japan)

Overview Lecture: Dr. Kuniyoshi Takeuchi (TC-21 Co-Chair, Emeritus Professor, Yamanashi University)

Q&A Session: Dr. Kuniyoshi Takeuchi

Closing Remarks:

Mr. Romeo S. Momo (TC-21 Co-Chair, Grand Master of Freemasonry, Former Undersecretary of DPWH Republic of the Philippines)



Transdisciplinary Approach (TDA)
for Building Societal Resilience to Disasters



TC21 session at JSCE Annual Meeting



September 2019



April 2019



Special TC21 Session at 2019 World Bosai Forum

The aim of the session was to present the needs of the TDA for disaster risk reduction (DRR) and discuss the current progress and issues. Experts of DRR from Indonesia, Japan, Malaysia, Nepal, and the Philippines presented specific examples to clarify the needs and the merit of TDA.



November 2019

Photos of TC21 Special Session at the Sendai International Center

TC21 Webinar entitled “Transdisciplinary Approach (TDA) for Building Societal Resilience to Disasters under and after COVID-19” was held on October 6, 2020. Case studies from the Philippines and Japan were introduced to show how COVID-19 influences disaster preparedness and response from the viewpoint of TDA.



The poster features a blue background with a yellow map of Asia in the center. At the top left is the ACECC logo with the tagline 'For a Better Quality of Life'. The main title 'Technical Committee 21 Session' is in large white letters, followed by the subtitle 'Transdisciplinary Approach for Building Societal Resilience to Disasters (JSCE&PICE) Under and After COVID-19'. Below this, it states 'Video Meeting through the system 'ZOOM'' and the time '20:00-21:00, October 6, 2020 (Philippine Time)'. The host is listed as 'PHILIPPINE INSTITUTE OF CIVIL ENGINEERS, INC.' with its logo. At the bottom, there are 15 logos of participating organizations arranged in three rows.

ASCE
American Society of Civil Engineers (ASCE)

中國土木水利工程學會
Chinese Institute of Civil and Hydraulic Engineering (CICHE)

Engineers Australia (EA)

Federation of Myanmar Engineering Societies (Fed. MES)

Indonesian Society of Civil and Structural Engineers (HAKI)

The Institution of Civil Engineers (ICE India)

The Institution of Engineers Bangladesh (IEB)

The Institution of Engineers Pakistan (IEP)

Japan Society of Civil Engineers (JSCE)

Korean Society of Civil Engineers (KSCE)

Mongolian Association of Civil Engineers (MACE)

Nepal Engineers' Association (NEA)

Philippine Institute of Civil Engineers (PICE)

Vietnam Federation of Civil Engineering Associations (VFCEA)

October 2020

JAPAN SOCIETY OF CIVIL ENGINEERS 2021 ANNUAL MEETING
ACECC TECHNICAL COMMITTEE 21 (TC21) SPECIAL SESSION

How COVID-19 AFFECTED TRANS-DISCIPLINARY APPROACH (TDA) AND DECISION MAKING ON BUILDING DISASTER RESILIENCE?

This session presents the actual cases of Disaster Risk Reduction (DRR), where emphasis will be placed on transdisciplinary approach; the institutional scheme to establish efficient processes of scientific knowledge-based decision-making to implement DRR under COVID-19. Takeaway of the session will be the remarks that are reached through discussing the factors and mechanisms in light of the Sendai Framework.

- Organizer : Japan Society of Civil Engineers (JSCE)
- Date and Time : September 6th, 2021 13:00-15:00(Japan Time, UTC+9)
- Venue : Online(Vimeo) URL: <https://vimeo.com/586662066/02cb3beae2>
- Online Q&A system(Slido) URL: <https://app.sli.do/event/swbxmlzt>
- NO Reservation Required! Please visit above URL directly.

PROGRAM

(The program is subject to change without notice.)

- MC: Mr. Masashi Inoue (TC21 Member; Eight-Japan Engineering Consultants INC.)
- 13:00 - 13:05 Welcome Remarks: Dr. Mikio Ishiwatari (TC21 Co-chair; the University of Tokyo / JICA)
- 13:05 - 13:10 Keynote Speech: Congressman Hon. Romeo S. Momo
(TC21 Co-chair; Representative, CWS Partylist, Republic of the Philippines)
- 13:10 - 13:20 Outcome of TC21 activities: Dr. Daisuke Sasaki (Tohoku University)
- 13:20 - 14:30 [Panel discussion: Presentation (Video)]
Dr. Masaru Arakida (Asian Disaster Reduction Center, Japan)
"Efforts of DRR organizations in Asia under COVID-19 situation"
Dr. Youb Raj Paudyal (National Reconstruction Authority, Government of Nepal)
"Application of Project Monitoring Information System (PMIS) for the robust monitoring of the School Reconstruction Program in Nepal during Covid-19 Pandemic"
Dr. Khamarrul Azahari Razak (Universiti Teknologi Malaysia, Malaysia)
"Advancing Compound Disaster Risk and Societal Resilience in Malaysia: Progress and Challenges"
Mr. Ting-Chi Tsao (Sinotech Engineering Consultants, Inc., Taiwan)
"Disaster Management and Evacuation under COVID-19 in Taiwan"
Dr. Chandan Ghosh (National Institute of Disaster Management, India)
"Covid-19 2nd Wave in India - O2 crisis, mass congregation, statistical fallacy and Vaccination conundrum"
Mr. Warren Ladbroke (Auxilium Ltd., New Zealand)
"Working with Covid-19 - A New Zealand Perspective"
- 14:30 - 14:55 [Panel discussion: Discussion (LIVE)]
Facilitator: Dr. Mikio Ishiwatari (TC21 Co-chair; the University of Tokyo / JICA)
- 14:55 - 15:00 Closing Remarks: Dr. Kuniyoshi Takeuchi (TC21 Special Advisor, University of Yamaguchi)



Contact:

Masashi Inoue (ACECC TC21) inoue-ma@ej-hds.co.jp, Eight-Japan Engineering Consultants INC.(EJEC)

First international webinar in its history of JSCE Annual Meeting was held by ACECC TC21 discussing how COVID-19 affected transdisciplinary approach (TDA) and decision making on building disaster resilience.

September 2021

PANELIST



Dr. Chandan Ghosh
(National Institute of Disaster Management, India)
(インド国立災害管理研究所)

At CECAR9 held in Goa, India, a hybrid TC21 session combining online and in-person participation was conducted. Discussions focused on building disaster-resilient societies through a transdisciplinary approach (TDA), featuring case studies from Taiwan, Nepal, Malaysia, and the Philippines.

September 2022

CECAR9 TC21 SPECIAL SESSION IN GOA, INDIA

TRANS-DISCIPLINARY APPROACH FOR DISASTER RISK REDUCTION BY SCIENTIFIC KNOWLEDGE-BASED DECISION-MAKING

- SIX YEARS OF ACTIVITY OF TC21 AND STATEMENT FROM THE MEMBERS FOR FUTURE DRR -

This session for CECAR9 presents findings of the 6 years of efforts by TC-21 and to voice the rational and processes of decision-making by TDA for DRR to be heard by all concerned stakeholders and the future leaders. The findings will be the compiled results of case studies, presenting the mechanisms of TDA based on facts and actual processes.

■ Organizer : TC21 (Co-chaired by JSCE & PICE)
■ Date and Time : Wednesday, September 21, 2022
14:30-16:00(Indian Standard Time, UTC+05:30)
■ Venue : Hybrid (Onsite: **TBD** (Session VIII) /
Online URL: <https://zoom.us/j/95180475910?pwd=eXJGaUx4ZmRDZ2p0OXI2d0Y0RXdHUT09>
Meeting ID: **951 8047 5910** Pass Code: **618043**)



TC21 Session
(Hybrid)

TC Activity Award at CECAR9



TC21 Co-Chair Ishiwatari and Committee Member Castro receiving the award plaque

TC21 hosted a session themed “Transdisciplinary Approach toward Innovative recovery and Disaster Risk Reduction” at the Third World Bosai Forum in Sendai, Japan.

March 2023



Opening
Remarks by
Cong. Momo,
TC21 Co-Chair

TRANSDISCIPLINARY APPROACH TOWARD INNOVATIVE RECOVERY AND DISASTER RISK REDUCTION

Sendai International Center- Tachibana Conference Hall (Room2)

Fri. March 10, 2023 16:00-17:30

TC21 / Committee of ACECC: Asian Civil Engineering Coordinating Council
(Co-chaired by Japan Society of Civil Engineers and Philippine Institute of Civil Engineers)

This session presents the actual cases of TDA; Transdisciplinary Approach in Asia. TDA is a concept for optimizing and empowering the organizational structure, consisting of different disciplines and sectors, to implement scientific-knowledge-based decision-making for disaster risk reduction (DRR). It is proposed that application of TDA will make planning, designing, and implementation of DRR go beyond the limit of disciplinary knowledge and sectoral capacities, thereby creating innovative means to develop holistic and transformative solutions. In the session, the panelists from various countries will introduce several cases of disaster recovery/reconstruction in the Asian region and illustrate how TDA worked in the actual cases. Based on the introduction, participants will discuss importance and necessity of TDA. The discussions will contribute to achieve the goals of Sendai Framework, especially in risk governance to establish collaborative mechanisms.

The 50th Anniversary of CICHE and the 45th ECM of ACECC were held in Taiwan. TC21 hosted a session themed “Exploring the Synergy: Innovation and Transdisciplinary Approaches in DRR.”

September 2023



TC21Session (Hybrid)

TC21 Session and Site Survey in the Philippines

A TC21 session was held in conjunction with the ACECC ECM in the Philippines. It featured presentations on TDA case studies from both the Philippines and Japan, followed by visits to disaster prevention-related agencies for discussions.



TC21 Session



February 2024

Site and relevant
office visit

Maynilad Sewerage Treatment Plant



Office of Civil Defense

At the “Understanding Risk Global Forum 2024 (UR24)” held in Himeji, TC21 conducted a session themed “Harnessing Transdisciplinary Approach for Diversity-Inclusive Disaster Recovery and Risk Reduction.”



June 2024

TC21 Session at UR24

November 2024



Meeting at the Disaster Management Agency of East Java Province (BPBD Jawa Timur)



Buried housings caused by volcanic sediment disaster (Lumajang, East Java)

February 2025



Interview to villagers regarding reconstruction works after the 2015 Nepal Earthquake, Sindhupalchowk District



Reconstructed guesthouse in Bhaktapur

- Kuniyoshi Takeuchi, Ladylyn Mangada, Masashi Inoue, Kai Kikuiri, Kenichi Tsukahara, Yoshihiro Katsuhama, Mikio Ishiwatari (2024). “Challenges of transdisciplinary approach in disaster recovery management” Natural Hazards published online, 13 July 2024. ·
- Mikio Ishiwatari, Miho Ohara, Khamarrul Azahari Razak, Masashi Inoue, Xiang Zheng, and Rajib Shaw (2024). ACECC TC21’s note “Transdisciplinary Approach: Toward Innovative Recovery and Disaster Risk Reduction” -Special Issue on World BOSAI Forum 2023 / IDRC 2023 in SENDAI on Journal of Disaster Research Vol.19 No.3, pp.534-538.
- Mikio Ishiwatari, Kenichi Tsukahara, Kuniyoshi Takeuchi (2023). “Special Issue on Trans-Disciplinary Approach (TDA) and Decision Making on Building Disaster Resilience” Journal of Disaster Research Vol.18 No.5, 2023, pp.455.
- Ting-Chi Tsao, Chen-Yu Chen (2023). “Transdisciplinary Approach Toward Preparedness in a Mountainous Community in Central Taiwan and its Impact on Disaster Evacuation: A Case Study” Journal of Disaster Research Vol.18 No.5, 2023, pp.456-461.
- Kenichi Tsukahara (2023). “The Transdisciplinary Approach to Developing an Integrated Water-Related Disaster Information System for Municipalities” Journal of Disaster Research Vol.18 No.5, 2023, pp.462-466.
- Mikio Ishiwatari, Daniel P. Aldrich, Daisuke Sasaki (2023). “Who Pays? Cost-Sharing for Disaster Management in the US and Japan” Journal of Disaster Research Vol.18 No.5, 2023, pp.467-474.
- Masashi Inoue, Masaru Arakida, Youb Raj Paudyal, Khamarrul Azahari Razak, Ting-Chi Tsao, Chandan Ghosh, Warren Ladbroke, Kuniyoshi Takeuchi, Mikio Ishiwatari (2022). “Building Disaster Resilience amid the COVID-19 Pandemic: A Transdisciplinary Approach for Decision Making” Journal of Disaster Research Vol.17 No.1, 2022, pp.144-151.
- Katsuhama Yoshihiro (2021). Committee Report ACECC TC21’s Webinar “Transdisciplinary Approach for Building Societal Resilience to Disasters under and after COVID-19” JSCE Magazine Vol.106 No.2, pp.102-103 [in Japanese].
- Tukada Yukihiro (2020). “Accumulation and Sharing of Knowledge to counter global wild disasters” Engineers Without Borders Japan, News Letter Vol.15 June, pp.2-3 [in Japanese].
- Kuraoka Senro, Paudyal Youb Raj, and Razak Khamarrul Azahari (2020). “Transdisciplinary Approach for Building Societal Resilience to Disasters -Interpreting the Processes of Creating New Knowledge in the Context of Knowledge Management -” J. Disaster Res., Vol.15 No.7, pp. 868-877.
- Kuraoka Senro (2020). Committee Report “Transdisciplinary Approach for Building Societal Resilience to Disasters -Event Report of TC21 Session at World BOSAI Forum” JSCE Magazine Vol.105 No.2, pp.86-87 [in Japanese].

- Takeuchi Kuniyoshi(2019). “Transdisciplinary Approach for Scientific-Knowledge Based Decision Making for Building Societal Resilience to Disasters” A full paper presented at the 8th CECAR, Tokyo.
- Tsao Ting-Chi, Hsu Chih-Hao, Yin Hsiao-Yuan (2019). “*Transdisciplinary Approach in the Preparedness Phase of a Debris Flow Prone Village in Taiwan*” A full paper presented at the 8th CECAR, Tokyo.
- Rahayu Harkunti Pertiwi (2019). “*Trans-Disciplinary Approach for Enhancing Resilience of Business Communities: Learning from Padang City*” A full paper presented at the 8th CECAR, Tokyo.
- Kuraoka Senro, Jopson Tedence A., Bernadas Brando (2019). “Institutional Structure for Incorporating Science into Decision-making -Building the new-settlement of Tacloban city of the Philippines-” A full paper presented at the 8th CECAR, Tokyo.
- Kien Pham Hoang, Cong Le Van (2019). “Status of Vietnam Coastal Erosion and Preposed Policies for Protection” A full paper presented at the 8th CECAR, Tokyo.
- Inoue Masashi, Kuraok Senro, Paudyal Youb Raj, Bhandary Netra Prakash (2019). “Restoration of Housings in Nepal after the Gorkha Earthquake, April 25th, 2015 in the Light of Trans Disciplinary Approach” A full paper presented at the 8th CECAR, Tokyo.
- Lodi Sarosh H., Khan Pashid A. (2019). “Good Reconstruction Practices in Pakistan after the Kashmir Earthquake” A full paper presented at the 8th CECAR, Tokyo.
- Ishiwatari Mikio (2019). “Relocation and Land-use Regulation following the Great East Japan Earthquake: How can Scientific Knowledge be Incorporated into Recovery?” A full paper presented at the 8th CECAR, Tokyo.
- Arakida Masaru (2019). “*Trans Disciplinary Approach for Restoration of Kumamoto Castle after the Earthquakes in 2016*” A full paper presented at the 8th CECAR, Tokyo.
- Tsukahara Kenichi (2019). “*DRR Transdisciplinary approach in Civil Engineering Society*” Activities of TC21 in ACECC-2019 Annual Conference, Japan Society for Natural Disaster Science.
- Tsukahara Kenichi (2018). “*Disaster Risk Governance and Transdisciplinary Approach for Building Societal Resilience to Disasters*” ACECC TC21 Activity-The 18th Science Council of Asia (SCA) Conference.
- Ishiwatari Mikio, Takeuchi Kuniyoshi, Kaku Shuji, Muronaga Takeshi, Kikuri Kai (2017). “*Scientific Knowledge Based Decision Making for Disaster Reduction: How was the problem of informal settlers resolved?*” The 7th International Conference on Flood Management (ICFM7), Sep.15-17, Leeds.
- Katsuhama Yoshihiro (2017). Committee Report “*Transdisciplinary Approach for Building Societal Resilience to Disasters*” JSCE Magazine Vol.102 No.11, pp.68-69 [in Japanese].

