土木学会平成２９年度全国大会
研究討論会　研－14 資料

分野・部門間協働による
防災推進のためのアジア諸国の協力

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日　　時　平成２９年９月１１日（月）13:00～15:00
場　　所　九州大学伊都キャンパス
教　　室　センター2 号館 2202

ACECC TC21 国内支援委員会

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土木学会平成２９年度全国大会研究討論会
分野・部門間協働による防災推進のためのアジア諸国の協力

1. 本研究討論会の主題

科学技術の進歩にもかかわらず国内外で災害が増加しており、アジア太平洋地域では減災・防災は共通した喫緊の課題になっている。最適な科学技術のほか、災害の根本原因への取り組み、事前準備、市民参加など、防災に関する科学的考え方、経験からの教訓などが、行政や民間の防災上の様々な意志決定段階で正確に理解され、十分活用されていないこと、また学術分野や産業部門間の協働体制が不十分で、協力の効果が十分挙がっていないことが、災害拡大の主因の一つと考えられる。アジア土木学協会連合協議会の 21 番目の技術委員会である TC21 は分野・部門横断的アプローチ（Transdisciplinary Approach）により、災害に強い社会づくりに貢献することを目的として設立された。本研究討論会では、TC21 の取組みを紹介するとともに、災害の根本原因の軽減を通じた災害に強い社会づくりについて議論する。

2. ACECC TC21 活動における本研究討論会の位置づけ

研究討論会にご参加いただく日本の土木技術者に対して、ACECC TC21 の活動について知っていただくとともに、他分野との協働の必要性とその現状に関する議論を通じて、第 8 回アジア土木技術国際会議（CECAR8 ; 2019 年 4 月）の ACECC TC21 セッションで示す日本の事例についての方向性を明らかにする。

（参考：ACECC TC21 について）

土木学会は、土木界全体の国際化に取り組むための主導的な役割を果たす組織として、2012 年に国際センター（上田多門センター長）を設立して、国際活動の強化を進めている。土木学会の国際活動の一つに、アジア土木学協会連合協議会（ACECC ; Asian Civil Engineering Coordinating Council）の活動が挙げられる。

ACECC は 1999 年に設立されたアジア・太平洋地区の土木に関する学協会の連合協議会であり、13 の国と地域（米国、台湾、豪州、インドネシア、インド、バングラデシュ、パキスタン、日本、韓国、モンゴル、ネパール、フィリピン、ベトナム）の組織が参加、日本の土木学会に事務局がおかれている。減災・防災はアジア・太平洋地区の共通課題であり、日本の土木学会はこの分野における ACECC 活動についても主導的立場を務めてきた。

ACECC 活動の中心は、技術委員会（TC; Technical Committee）活動であり、学術団体の連合協議会として、各国政府や国際機関に対して科学的見地から政策提言を行うことを目的に活動している。この ACECC における減災・防災に関連する活動の一層の活性化のために、日本の土木学会は 21 番目の TC として「学術・部門横断的アプローチによる災害に強い社会作り」委員会（TC21; Transdisciplinary Approach (TDA) for Building Societal Resilience to Disasters）（共同議長：竹内邦良、Romeo S. Momo）の設立を提案、これが ACECC 理事会で承認され、2016 年 8 月にハワイにおいて TC21 のキックオフミーティングが開催された。

TC21 は米国、台湾、インドネシア、バングラデシュ、パキスタン、日本、韓国、ネパール、フィリピン、ベトナムの 10 か国・地域からの 30 名以上の委員で構成されており、日本からは国土交通省、国際協力機構（JICA）、大学、コンサルタント企業などから参加している。TC21 は 2016 年 11 月にフィリピンで、2017 年 4 月にはネパールにおいて現地調査とシンポジウムを開催するなど意欲的な活動を通じて、減災・防災の意思決定に携わる政府関係者、科学的知見を提供する学術関係者、事業を実施する民間企業や NGO、一般市民との意見交換や、事例の収集と分析を進めている。「災害に強いインフラ整備のためのアジアの国境を越えた取組み」“Resilient Infrastructure in Seamless Asia”をテーマに 2019 年 4 月に東京で開催される、ACECC の 3 年ごとの大会であるアジア土木技術国際会議（CECAR8; 8th Civil Engineering Conference in the Asian Region）において、TC21 のセッションを開催、活動成果を発表する予定である。

添付資料

1．ACECC TC21 の Terms of Reference（TOR）および Concept Note （4 ページ）
   - TOR は TC21 設立の背景、目的、組織について定めた基本文書。Concept note には、TC21 活動の基本的方向性が示されている。
2．ACECC TC21 メンバーリスト （2 ページ）
   - 2017 年 8 月 1 日現在、TC21 は 10 か国・地域からの 33 名のメンバーで構成される。
3．2017 年 4 月のネパールにおける TC21 活動報告 （5 ページ）
   - TC21 は、ACECC や公益信託土木学会学術交流基金、土木学会公益増進資金からの財政支援を得て、関係機関との意見交換、災害被災地の調査、シンポジウム開催など活発な活動を行っている。本報告は、2017 年 4 月にネパールにおいて ACECC 理事会が開催された機会を利用して行った TC21 の活動をとりまとめたものである。
4．ACECC TC21 国内支援委員会の委員兼幹事の公募 （1 ページ）
   - 日本の土木学会（JSCE）は ACECC とともに、TC21 活動において主導的役割を果たしており、この活動をより活性化させるために、ACECC TC21 国内支援委員会の委員兼幹事を公募している。同委員会は TOR に定められた日本の National Team に相当するため、同委員会に参加することにより、ACECC TC21 のメンバーも兼務することになる。
5．ACECC TC21 のロゴ （1 ページ）
   - ACECC TC21 は、2017 年 7 月に、本委員会の独自のロゴを設定した。ACECC の委員会であることを明示するために ACECC のロゴを左側に、右側には TC21 の文字を、下部には委員会名を配した。

TC21: Transdisciplinary Approach (TDA) for Building Societal Resilience to Disasters

Terms of Reference

1. Background

Disaster is a main constraint to sustainable development. Disasters cause not only the loss of lives and assets but also heavy damage to the bases of economic growth. In particular, disaster hampers poverty eradication, since poor people tend to live in disaster-prone areas and once severe disasters strike, it is much harder for them to recover from the damage and loss caused by disasters.

The international community has taken great efforts to reduce disaster risks for a long time. One big achievement is to adopt the Sendai Framework for Disaster Risk Reduction 2015-2030 (Sendai Framework) at the Third UN World Conference on Disaster Risk Reduction held in March 2015 in Sendai, Japan. It was agreed that the State has the primary role to reduce disaster risks but that responsibility should be shared with other stakeholders including local government, the private sector and others[1]. The Sendai Framework also emphasizes the importance of establishing and strengthening government coordination forums composed of relevant stakeholders at the national and local levels, such as national and local platforms for disaster risk reduction (DRR)[2].

During the cumulative discussions in international society on DRR, the roles of science and technology were also identified. It is especially critical to facilitate a science-policy interface for effective decision-making in disaster risk management[3]. It was also confirmed during the Tokyo Conference on International Study for Disaster Risk Reduction and Resilience held in January 2015 in Tokyo, Japan that national platforms should be empowered as focal fora to incorporate science and technology into real practice; and that science should play an important role in DRR by promoting inter- and trans-disciplinary approaches for human well-being[4].

To enhance scientific knowledge-based decision-making on DRR, science and technology community in each state should thus have sufficient capacity to provide relevant scientific and technological information and knowledge to national platforms in a timely and effective manner through a transdisciplinary approach (TDA) where scientists of all disciplines and stakeholders of all sectors work together for a common objective.

In this context, the Asian Civil Engineering Coordinating Council (ACECC)[5] decided to establish the 21st Technical Committee (TC21) to support states to further develop their capacity to enhance scientific knowledge-based decision-making on DRR through TDA.

1 para.19 (a) and (b), Sendai Framework.

2 para.27 (g), Sendai Framework.

3 para.24 (h), Sendai Framework.

4 2nd and 3rd paras. of Section 2, Tokyo Statement adopted during the Conference were posted.

5 The Asian Civil Engineering Coordinating Council (ACECC) consists of the Society/Institution/Association of Civil Engineering in Asian Countries, and aims at promoting the acquisition and transfer of civil engineering knowledge for advancing the design and construction practices that ultimately improve the quality of life of all citizens from ACECC member countries.

2. Objectives

TC21 aims to promote the trans-disciplinary approach for scientific knowledge-based decision-making for building societal resilience to disasters at national and local levels. In order to achieve this aim, TC21 will

(i) form National Teams in all member states

and together with them,

(ii) contribute to development of national capacity to realize TDA for scientific knowledge-based decision-making through case studies, comparative analyses, methodological developments, guidelines, workshops, training courses, etc.,

(iii) contribute to establishment of a network of effective knowledge flow from where it is available to where needed and add new knowledge to it,

and through such activities,

(iv) support member states to form and implement a national platform and/or local platforms with the function of transdisciplinary approach for scientific knowledge-based decision-making.

3. Membership

Membership of TC21 is open to those who are eager to contribute to achieving the objectives of TC21, and to form the National Team in their ACECC member organizations.

Among them, anyone who belongs to an ACECC member organization or nominated by a TC21 member can become a TC21 member upon acceptance of the ACECC member organization.

4. Organization and Responsibilities

4.1 Secretariat

(1) The Secretariat of TC21 is the administration body of TC21.

(2) The Secretariat is established by one of the ACECC member organizations. The founding Secretariat was established by the Japan Society of Civil Engineers until the CECAR8 meeting after the establishment of TC21. Any ACECC member organizations can take over the role of the Secretariat after the CECAR8 meeting.

(3) The head of the Secretariat and the vice-head of the Secretariat are appointed by the ACECC member organization establishing the Secretariat, who are called as the Secretary and the Vice-Secretary.

(4) The responsibilities of the Secretariat are to support the activities being undertaken by TC21, including but not limited to, acting as a point of enquiries and information regarding activities being undertaken by TC21, preparing summary reports of the

meetings of TC21 and publishing these on the website.

4.2 National Team (NT)

(1) The National Team is the implementation body to promote the objectives (i) through (iv) within its state.

(2) The National Team consists of all of the members of TC21 in each state.

(3) The National Team Leader is elected from among the members of the National Team, who represents and leads the National Team. The National Team Leader may appoint an alternate.

(4) The responsibilities of the National Team are to make a National Action Plan to undertake the DRR activities in its state through TDA, and to cooperate with TC21 Steering Group and the National Teams in other states.

4.3 Steering Group (SG)

(1) The Steering Group is the management body of TC21.

(2) The Steering Group consists of all of the National Team Leaders and the alternates, the Secretary and the Vice-Secretary.

(3) Co-Chairs of TC21 are elected from among all of the National Team Leaders. Co-Chairs act as co-chairs of the Steering Group as well as co-chairs of TC21. The founding Co-Chairs were appointed by the Japan Society of Civil Engineers until the CECAR8 meeting.

(4) The responsibilities of the Steering Group are to manage all of activities conducted by TC21, including but not limited to, appointing the Co-Chairs of TC21, formulating the TC21 Action Plan, coordinating, leading and supporting the implementation of the TC21 Action Plan, convening meetings of TC21, coordinating activities undertaken by the members of TC21 and the National Teams, examining the eligibility of membership when necessary, and determining and amending this Terms of Reference.

(5) The regular face-to-face meeting of the Steering Group is held every year to review the activities conducted by TC21 and the activities undertaken by the respective National Teams, revise the TC21 Action Plan when necessary, and make any other operational decisions.

TC21: Transdisciplinary Approach (TDA) for Building Societal Resilience to Disasters

Concept Note

Resilience building against damaging effects of natural hazards is the indispensable step towards sustainable development in any nation. It is obvious that in contemporary society resilience building needs the best available scientific knowledge as the basis of decision-making. Yet regardless of continuous accumulation of scientific knowledge on hazards and vulnerability, it has not been well put to practice in real societal decision-making in disaster management.

While we note that important causative factors to disasters are related to the population growth with urbanization and economic development, we believe that the societal policy and decision-making process in disaster management is the decisive factor to be improved to solve the increasingly serious disaster issues. Society should take a new approach that makes a holistic and transformative approach possible. That is a transdisciplinary approach (TDA) where scientists of all disciplines and stakeholders of all sectors work together for a common objective.

Therefore, the 21st Technical Committee (TC21) of ACECC was established to encourage the ACECC members to further develop its capacity to enhance scientific knowledge-based decision-making through TDA.

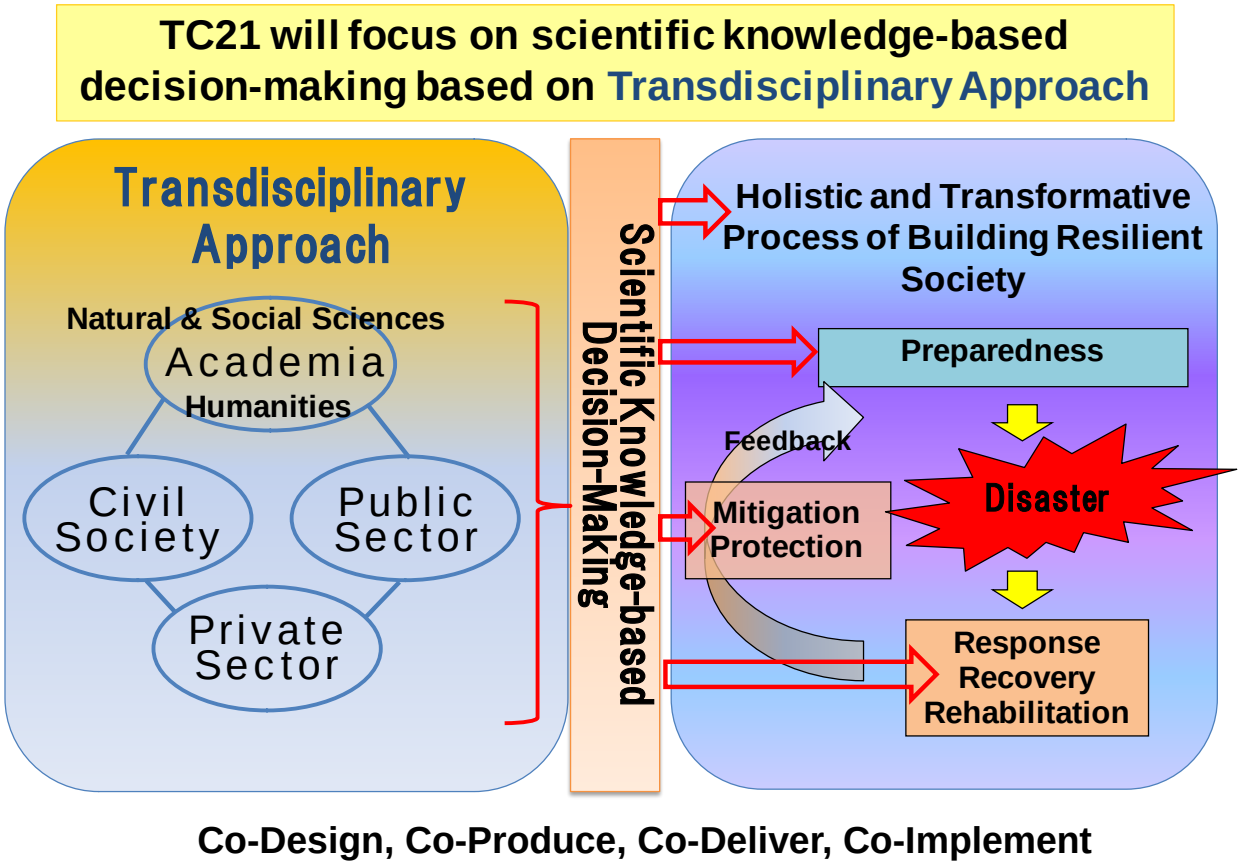

Fig.1. Transdiciplinary Approach (TDA) to Aid in Active Use of Scientific Knowledge for Decision-Making

Member List of TC21: Transdisciplinary Approach for Building Societal Resilience to Disasters (1/2)

(As of August 1, 2017)

No.	Position	Name	State	Affiliation
1	Co-Chair	Dr. Kuniyoshi Takeuchi	Japan	Professor Emeritus, University of Yamanashi
2	Co-Chair	Mr. Romeo S. Momo	Philippines	Undersecretary, Department of Public Works and Highways, Government of the Philippines
3	Secretary	Dr. Kenichi Tsukahara	Japan	Professor, Faculty of Engineering, Kyushu University, Japan
4	Vice-Secretary	Dr. Senro Kuraoka	Japan	Acting Unit Leader, Innovative Solutions Research Unit, Research & Development Center, Nippon Koei Co., Ltd.
5	Member	Dr. Vilas Mujumdar	U.S.A.	Consulting Engineer, Vienna, Virginia, US national representative to WFEO
6	Member	Dr. David Moreau	U.S.A.	Department of City and Regional Planning, University of North Carolina, USA
7	Member	Dr. Li Wei-sen	Taiwan	Co-chair of APEC Emergency Preparedness Working Group, Secretary General of National Science and Technology Center for Disaster Reduction, Taiwan
8	Member	Dr. Cheng, Thomas Chin-Tung	Taiwan	Senior Researcher / Deputy Director, Disaster Prevention Technology Research Center, Sinotech Engineering Consultants, Inc.
9	Member	Mr. Ting-Chi Tsao	Taiwan	Principal Engineer and Group Chief, Disaster Prevention Technology Research Center, Sinotech Engineering Consultants, Inc.
10	Member	Dr. Iswandi Imran	Indonesia	Professor, Head of Structural Engineering Research Group, Institute of Technology Bandung
11	Member	Dr. Harkunti Rahayu	Indonesia	Professor, Research Center for Disaster Mitigation, Bandung Institute of Technology (RCDM ITB), Indonesia
12	Member	Dr. Wayan Sengara	Indonesia	Associate Professor, Head of Laboratory, Geotechnical Engineering Laboratory, Institute of Technology Bandung
13	Member	Engr. Md. Abdul Malek Sikder	Bangladesh	Freelance Consultant, Fellow, Institution of Engineers Bangladesh (IEB)
14	Member	Dr. Sarosh H. Lodi Dean	Pakistan	Faculty of Civil & Architecture, NED University of Engineering & Technology, Pakistan
15	Member	Dr. Mikio Ishiwatari	Japan	Senior Advisor (Disaster Management and Water Resources Management), Japan International Cooperation Agency (JICA)
16	Member	Mr. Yusuke Amano	Japan	Director, International Cooperation and Engineering for Infrastructure Overseas Projects Division, Policy Bureau, Ministry of Land, Infrastructure, Transport and Tourism
17	Member	Dr. Yukihiro Tsukada	Japan	Executive Director, Japan Society of Civil Engineering
18	Member	Mr. Hisaya Sawano	Japan	Deputy Director, International Center for Water Hazard and Risk Management (ICHARM)

Member List of TC21: Transdisciplinary Approach for Building Societal Resilience to Disasters (2/2)

No.	Position	Name	State	Affiliation
19	Member	Dr. Takako Izumi	Japan	Managing Associate Professor, International Research Institute of Disaster Science (IRIDeS), Tohoku University
20	Member	Ms. Kai Kikuiri	Japan	Southeast Asia Division 3, Southeast Asia and Pacific Department, Japan International Cooperation Agency (JICA)
21	Member	Mr. Masaru Arakida	Japan	Senior Researcher, Asian Disaster Reduction Center (ADRC)
22	Member	Mr. Masahi Inoue	Japan	Researcher, EJ-Research Center for Disaster Risk Reduction, Eight-Japan Engineering Consultants, Inc.
23	Member	Dr. Naoki Sakai	Japan	Chief Researcher, National Research Institute for Earth Science and Disaster Resilience
24	Member	Mr. Daisuke Fujita	Japan	Disaster Management Division, CTI Engineering International Co., Ltd.
25	Member	Dr. Kyung Jin Min	Korea	Vice President and Chief Research Officer(CRO), Korea Water Resources Corporation (K-Water)
26	Member	Dr. Jiba Raj Pokhrel	Nepal	Vice Chancellor of Nepal Academy of Science and Technology
27	Member	Dr. Netra Prakash Bhandary	Nepal	Associate Professor, Graduate School of Science and Engineering, Ehime University
28	Member	Er. Ajay Chandra Lal	Nepal	Assistant Professor, Institute of Engineering, Central Campus, Tribhuwan University
29	Member	Dr. Hari Darshan Shrestha	Nepal	President of Society of Structural Engineers of Nepal, Executive Chairperson of Center of Resilient Development (CORD)
30	Member	Dr. Ernesto S. De Castro	Philippines	Immediate Past President, Philippine Institute of Civil Engineers (PICE)
31	Member	Mr. Ignacio Zaragoza Jr.	Philippines	Director, National Administrative Office, Philippine Institute of Civil Engineers (PICE)
32	Member	Dr. Pham Hoang Kien	Vietnam	Department for International Cooperation. Lecturer and leader of an Engineering Consultation Center at the Hanoi Transportation University
33	Secretariat	Dr. Yoshihiro Katsuhama	Japan	Manager, Innovative Solutions Research Unit, Research & Development Center, Nippon Koei Co., Ltd.

Representative Agency from Each State:

ASCE: American Society of Civil Engineers (U.S.A.)

CICHE: Chinese Institute of Civil and Hydraulic Engineering (Taiwan)

HAKI: Indonesian Society of Civil and Structural Engineers (Indonesia)

IEB: Institution of Engineers, Bangladesh (Bangladesh)

IEP: Institution of Engineers, Pakistan (Pakistan)

JSCE: Japan Society of Civil Engineers (Japan)

KSCE: Korean Society of Civil Engineers (Korea)

NEA: Nepal Engineers' Association (Nepal)

PICE: Philippine Institute of Civil Engineers (Philippines)

VFCEA: Vietnam Federation of Civil Engineering Associations (Vietnam)

Activities of
TC21 "Transdisciplinary Approach (TDA) for Building Societal Resilience to Disasters"
in association with the ACECC ECM in Nepal, April 2017

Senro Kuraoka, Yoshihiro Katsuhama (TC21 Secretariat)

TC21 members performed productive activities in association with the 32nd ACECC ECM in Nepal, April 2017. The activities included site survey, meetings, and symposium as shown in **Table 1**. TC21 would like to note that Nepal Engineers' Association (NEA) has provided significant support with exceptional kindness and efforts in coordinating the meetings with local stakeholders and maximizing the outcome of the symposium.

Table 1 Activities of TC21 in Association with the 32nd ACECC ECM in Nepal

Date	Activities
April 19 (Wed)	Observation of earthquake induced damages to the historical buildings at the former Prime Minister's Office in Kathmandu
April 20 (Thu)	Preparation for technical survey in Chautara, meetings with the local government officers, and symposium
April 21 (Fri)	Technical survey in Chautara, Sindhupalchowk District to understand the status, policies, and institutional schemes of the Department of Urban Development and Building Construction (DUDBC), which is performing the reconstruction of the housings.
April 22 (Sat)	Observation of damages to the historical buildings in Bhaktapur
April 23 (Sun)	・ Reporting of TC21 activities at ACECC ECM ・ TC21 internal meeting
April 24 (Mon)	・ Meeting between TC21 members and stakeholders of disaster risk reduction in Nepal ・ TC21 2nd Symposium on " Scientific Knowledge-Based Decision-Making Schemes for Disaster Reduction"

1. Site Surveys on April 19th

Observation of the damages to the historical buildings of former Prime Minister's Office in Kathmandu was made. Debris that fell from the walls and roofs were seen and some of the main columns had deformed, exhibiting clear shear cracks (**Photo 1**). We understood that main issues are to decide whether the old building should be demolished and be replaced with modern buildings or to retrofit the building while maintaining the historical architecture. Towards this end, significant efforts are spent by the National Reconstruction Authority (NRA) in coordinating the differences in opinions of stakeholders. We comprehended that scientific methods are needed in validating the visually evaluated conditions of damages and help making the decision.


Photo 1 TC21 members, Dr. Netra Prakash Bhandary and Dr. Senro Kuraoka, were participated in the interview by press persons regarding the historical former Prime Minister's Office buildings, which is under ongoing discussion whether they should be conserved or demolished.

2. Technical survey in Chautara on April 21st

The TC21 team visited Chautara in Sindhupalchowk district to study the recovery status of after the Gorka earthquake (25th April 2015). We met with Dr. Youb Raj Paudyal, Division Chief of DUDBC (Department of Urban Development and Building Construction) and his associates, who kindly hosted the TC21 team and briefed us regarding the status, design methods, and funding schemes for the reconstruction of the housing (**Photo 2**).


Photo 2 Dr. Youb Raj Paudyal, Division Chief of Department of Urban Development and Building Construction (DUDBC), Sindhupalchwok, made a presentation titled "Damage situation and reconstruction activities at Sindhupalchowk district. Dr. Senro Kuraoka, secretariat of TC21, made presentation to describe why transdisciplinary approach is needed.

DUDBC is collaborating with the village community, local NGOs, and international agencies to develop the design and build the capacity as well as subsidy schemes to implement the reconstruction projects. The basic design principle is to use the local resources and the indigenous knowledge, which is validated with the modern engineering assessment. This approach is consistent with one of the guiding concepts stated in Sendai Framework (2015-2030). The team of TC21 noted that these technical schemes are close to in-house development of DUDBC, with the help of international experts, and do not necessarily have formal collaboration with the universities and national research agencies.

Photo 3 Reconstruction works of housings being performed in Irkhu Village, Sindhupalchowk District. (a) Housing under construction, showing the horizontal concrete reinforcement (band) placed between stone layers in contrast to the old warehouse without the horizontal reinforcement (b).

3. Technical Survey in Bhaktapur on April 22nd

A technical survey in Bhaktapur, an ancient city in the east corner of the Kathmandu Valley, was performed on April 22nd with the supports of a lecturer and students of local university and college.

A number of buildings were damaged by the 2015 earthquake while some historical buildings such as the five-story pagoda of the Nyatapola Temple built in 1702 remained less damaged. We also observed that some of the victims of 2015 earthquake still reside in temporary housings in difficult condition as shown in **Photo 4**.

Photo 4 A number of historical buildings are being reconstructed in the ancient city, Bhaktapur. The left photo shows a building supported by timbers for anti-earthquake purpose. The right photo shows the temporary housings for the 2015 earthquake victims.

4. TC21 Internal Meeting on April 23rd

TC21 internal meeting was held on April 23 among representatives from Taiwan, Indonesia, Japan, Nepal, and Indonesia to share case studies from each member state and discuss about TC21 activities toward CECAR8 (**Photo 5**). We agreed to work together to produce either a book or booklet as the deliverables.

5. Reporting of TC21 Activities at the 32nd ACECC ECM

Co-Chair of TC21, Dr. Kuniyoshi Takeuchi and the secretariat, Dr. Senro Kuraoka, reported the activities of TC21 since the last ACECC ECM, which included the site surveys in Tacloban and Ormoc cities in the Leyte Island and the "Symposium: International Comparison of Scientific Knowledge-Based Decision-Making Schemes for Disaster Reduction" held in Davao city, the Philippines in November 2016. Dr. Takeuchi emphasized cooperation and participation from the member societies. Institution of Engineers, Bangladesh (IEB) expressed their interest in participating in the TC21 activities.

As a part of activities of the ACECC ECM, a meeting with DRR stakeholders of Nepal and the TC21 symposium were performed on April 24 as described below.

5.1 Meeting with DRR Stakeholders of Nepal

On April 24 morning, a meeting between TC21 members and stakeholders of disaster risk reduction (DRR) in Nepal was performed as shown in **Photo 6** with representatives from the Government of Nepal, international agencies, academia, and NGOs including National Reconstruction Authority (NRA), Central Level Project Implementation Unit of the Ministry of Urban Development (CLPIU-MOUD), Armed Police Force (APF), Comprehensive Disaster Risk Management Programme of the United Nations Development Programme (CDRMP/UNDP), Institute of Engineering of Tribhuvan University, and National Society of Earthquake Technology-Nepal (NSET).

The participants shared present situation of DRR in Nepal and discussed how scientific knowledge could be reflected in the decision-making processes of the government. A representative from APF mentioned about the difficulty of coordination among agencies concerned for disaster preparedness. In addition, an unsystematic situation of scientific knowledge transfer from academia to the government in Nepal was pointed out.

5.2 TC21 Symposium

"TC21 2nd Symposium on Scientific Knowledge-Based Decision-Making Schemes for Disaster Reduction" took place on April 24 afternoon. There were 65 international delegates and more than 200 experts from Nepal participated in the symposium (**Photo 7**). The symposium commenced with the welcome speech by Er. Hare Ram Shrestha, NEA President.

The symposium was comprised of three sessions. The first session started with the keynote speech entitled, "Efforts and challenges of recovery in Nepal from the 2015 Gorka Earthquake", which was delivered by Er. Dipendra Nath Sharma, the Secretary of Ministry of Urban Development, Nepal. In the second session, presentations were made by the international members of TC21. For example, a good DRR practice of Tacloban city in the Philippines was presented by the officer, Mr. Leonard Tedence A. Jopson, of Tacloban city government. The city, which was devastated by the storm surge in 2013, is under extensive recovery projects. Mr. Jopson stated that "Build Back Better" principle is practiced, owing to the development of the livelihood projects concurrent with DRR activities. He also explained that an institutional system is established such that scientific information of hazards and risks from the national institutions can be provided to the city, who then will modify the information so that the local communities

can understand and work with the city to better perform DRR. In the final third session, the panel discussion regarding transdisciplinary approach to implement scientific knowledge-based decision-making for disaster risk reduction was performed among presenters from Indonesia, Nepal, Japan, Pakistan, the Philippines, Taiwan, Vietnam, and a special guest, who is the representative of disaster cell of World Federation of Engineering Organizations (WFEO), Er. Ashok Kumar (**Photo 8**). Concluding remarks were made by Dr. Takeuchi, stating that one of the factors impeding the DRR may be traced down to poverty which in turn is closely related to practice of governance. Transdisciplinary approach will help improve the governance as it will not only help optimize the coordination but also make the decision-making process transparent.

The presentation documents can be downloaded from the flowing TC21 website:

http://www.acecc-world.org/TC21/index.htm

Photo 5 Thirteen representatives from CICHE, HAKI, JSCE, NEA, and PICE presented to the TC21 internal meeting on April 23 and made an intensive discussion for three hours.

Photo 6 A number of agencies regarding the DRR including National Reconstruction Agency (NRA), Ministry of Urban Development, UNDP, and universities joined the stakeholders meeting on April 24th morning.

Photo 7 More than 250 experts participated in the TC21 symposium on April 24 afternoon with the considerable contribution of Nepal Engineers' Association (NEA).

Photo 8 Panelists from eight ACECC member states discussed in the TC21 symposium about how to implement scientific knowledge-based decision-making for disaster risk reduction.

ACECC TC21 国内支援委員会の委員兼幹事の公募

ACECC TC21 国内支援委員会の委員兼幹事を公募します。

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この TC には、本活動に貢献しようという強い意欲をお持ちであり、委員会において承認されればどなたでもご参加いただけます。ご専門につきましては、土木工学以外の工学分野はもとより、自然科学、社会科学、人文科学のいずれの分野でも差支えありません。

TC21 活動の支援および我が国の事例の収集、分析、情報発信などを目的として、土木学会内に「ACECC TC21 国内支援委員会」（竹内邦良委員長）を設置しており、産官学より構成されるメンバーが活動しています。この国内支援委員会は、TC21 の TOR に示されている、我が国における National Team に相当します。

TC21 については、以下のサイトをご参照ください：
http://www.acecc-world.org/TC21/index.htm

「ACECC TC21 国内支援委員会」に参加することにより、TC21 のメンバーも兼務することになります。社会貢献、自己研鑽、ネットワーク構築の場として、是非ご参加ください。参加のご希望や問合せは以下宛にお願いします。なお、土木学会活動はボランティアが原則であり、報酬は一切支給されません。交通費などは土木学会規定に基づき支給されます。

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