



# ICUS

## Newsletter

Volume **12** Number **4** Jan. to Mar. 2013

**International Center for Urban Safety Engineering  
Institute of Industrial Science, The University of Tokyo**

### **New prototype for Mokumitsu -High-density wooden city with block-scale system**

By Satoru Yamashiro

Architect, buidinglandscape Ltd., Japan

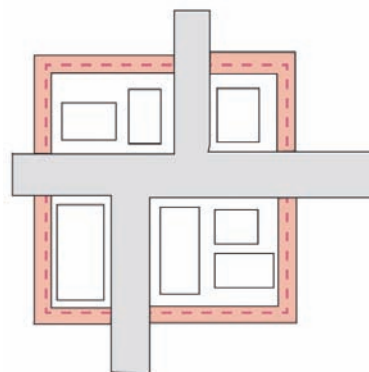
Visiting Professor, Dalian University of Technology, China

Mokumitsu is the Japanese term for high-density wooden residential areas comprised of old wooden houses. The Japanese government has a policy to convert Mokumitsu into fire-resistant concrete housing to prevent the spread of fire, especially after large earthquakes. Today, Japan is facing an aging society and population decline, so it is reasonable to expect that we will live in areas of high population density. High density living is also beneficial in developing countries to provide efficient infrastructure for large populations. As seen in



**Traditional residential areas in Tokyo**

the figure below, the traditional residential areas in Tokyo, the buildings have little resistance to nor preventative measures towards the cause and spreading of fire, yet Japanese people are attracted to the charm of its narrow streets (Roji) and community sensibility. The usage of wood in construction is beneficial because it keeps forests rejuvenated and maintains a fixed CO<sub>2</sub> emission; for this reason it is important that we use wooden material actively in cities and continue to use more wooden resources. We can process wooden materials easily so that we



**Diagram of block system**

can also arrange and maintain our living facilities easily. High-density dwellings and wooden structures are efficient and attractive, so in appreciating both the good and bad points, we propose the high-density wooden city model. The aim of this research project is to develop a new prototype for building design and infrastructure for high-density wooden housing with the latest and future technologies.

#### **Introducing the Block-Scale System to Mokumitsu**

Today we have huge buildings such as shopping malls, airports and so on. Some are as big as small towns. They are typically divided into sub-areas using fire shutters and devices to prevent the spread of fire into other areas. We introduce a similar system to the Mokumitsu urban type whereby whole suburban blocks of wooden housing are considered as a single

building. Using this method, we can consider a new way of protecting old wooden areas; for example, block fire division, block quake-proofing, block quake absorbing structures, and so on. Each small wooden building becomes simpler and cost becomes lower due with this block-scale infrastructure. We add safety to openness and renewability in Mokumitsu.

#### Site: Virtual district 'Omotesando'

We identified the Omotesando District in Tokyo, which is about 1 square kilometer in area, to test this concept virtually. This is a mixed-use area with housing, shops and offices; there are various scales of buildings and also geographical features. The details of Omotesando are as follows:

- Population (night): 5,339
- Population density: 11,606 people/km<sup>2</sup>
- Number of workers: 20,348
- Residential floor area: 178,856 m<sup>2</sup>
- Non-residential floor area: 487,078

m<sup>2</sup>

Then, we define a virtual district 'Omotesando' where we extract only the physical features such as roads, topography and building footprints. In this research, we assume that the population and floor area of Omotesando will double.

#### Scanning materials for new Mokumitsu

We conducted interview survey with ICUS members and other professionals, and reviewed scholarly literature, books and web resources. From this review, we created 'scanning materials' to represent some possible ideas arising from the collection. Next, we interpreted and combined the scanning materials. We visualized the Mokumitsu future cityscape as a hypothesis. From this we will establish the next aim of the research and development. This method is referred to as 'foresight-insight towards the future'.

We made interviews with the following specialists:

- Mar. 2010: Associate Prof. Miho

Ohara (ICUS/disaster prevention) about temporary evacuation spaces.

- Feb. 2012: Prof. Yoshihiro Suda (ITS Center) about the transportation system in 1 km<sup>2</sup> district.
- Mar. 2012: logistics consultant about the distribution system in a 1 km<sup>2</sup> district.
- Jul. 2012: Associate Prof. Yumiko Iwafune (CEE) about the energy system in a 1 km<sup>2</sup> district.

Various figures were developed from the interviews and scanning materials.

#### First prototype for new Mokumitsu

After the scanning process, we integrated some studies into a scene that is one of the visions for a high-density wooden city. In the possible housing area with a fire-proof block, each building has no anti-fire walls and can be constructed with more wooden materials. In the area there are some small squares that are surrounded by the protected blocks, and each square is designed as a temporary evacuation space.



Making 'scanning materials'



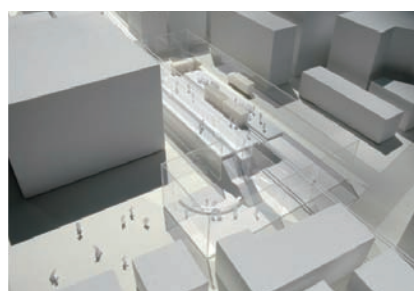
Virtual district 'Omotesando'



Study for the arrangement of temporary evacuation spaces and eco-ride system



Study model for forms of temporary evacuation spaces



Study for mixing station of eco-ride system and logistics center



Study of fire-proof block. One street is composed of the fire-proof wall and the other is open.

The picture below on the right shows the streetscape with narrow width four-story buildings. The walls are constructed with wood. This style of building can be constructed by residents with local builders. As

the usage of each building changes, the walls can be easily reconfigured. The space on the right side is a common workshop for self-building activities.

These drawings are the first

sketches based on the scanning-materials. Our next step is to get feedback on these possible designs from the researchers in different research fields.



*Fire-proof blocks (gray shown) composed by 'buildings', while there are usually fire-proof blocks inside buildings*



*Streetscape of collective housings which have common large workshop (Close up view from the location of the arrow in left figure)*

#### *Parameters for planning a high-density wooden city.*

disasters and measures	earth	sphere	nation	region	city	town	building	person	material
size	$10^4$ km	$5 \times 10^3$ km	$10^3$ km	100km	10km	1 km	100m	1m	
population	$5 \times 10^9$		$10^8$	$10^7$	$10^5$	$10^4$	$1-10^3$		
internal boundaries		ocean and mountains	ocean and mountains	prefecture boundaries	road	path	corridor	between two person	
space	sphere	nation	region, prefecture	city	district	buildings	rooms	furniture	
earthquake		international earthquake support system	earthquake support system	earthquake support system	disaster prevention system for gas	evacuation spaces	earthquake resistance	tables and beds	
fire									
fireproof			fireproof woods	fireproof woods	fireproof zoning	fireproof wall	fireproof division	fireproof clothings	
fire fighting		international fire fighting party	armed forces	helicopters	fire engine truck	fire fighting party	personal fire extinguish	personal fire extinguish	buckets
fire extinguish facility			artificial rain	artificial rain	fire hydrant	water drainage gun	sprinklers	fire extinguishers	water
traffic	aeroplanes	aeroplanes and railways	aeroplanes, railways and cars	aeroplanes, railways and cars	railways, buses and cars	eco-ride, bicycles and walking	elevators and escalators		
storm and flood damage			dam	proof woods	banks	woods	ground floors and foundation	umbrellas, waterproof clothings and scarves	
tsunami	forecasting	international tsunami warning system	tsunami system	banks	banks and protection woods	protection woods	structural resistance	life jackets	
water	ocean	sea and rivers	sea an river	rivers	tap water		pipes	faucets	
atmospheric pollution					basement floors	shelters	ventilation system	mask	
disease		immigration control	curfew	zone isolation	synthetic hospitals	town doctors	household medicine	household medicine	
crime		armed forces	armed forces	armed forces and police	police	police	guards	self defence	
biomas	forests and photosynthesis				carbon stock		effective use of woods		
energy	sun	warm and cold current	wave	river and nuclear	wind	geothermal	sunlight	foods	
endurance	$5 \times 10^9$ years	$5 \times 10^3$ years	$10^3$ years	500 years	300 years	200 years	100 years	80 years	40 years
environmental load	1	1/5	1/200	$1/10^3$	$1/10^4$	$1/10^6$	$1/10^8$	$1/(5 \times 10^9)$	$1/10^{11}$



## 25th and 26th ICUS Open Lecture held at IIS

By M. Koshihara and T. Kato

### Possibility of high density city

The 25<sup>th</sup> ICUS Open Lecture, “Possibility of high density city”, was held on March 4<sup>th</sup>, 2013.

Two speakers provided topics about a situation of high density town. Mr. Jun Manabe, MLIT (Ministry of Land, Infrastructure, Transport and Tourism), introduced the national policy for densely populated wooden building district and historic district. Founding and human resource development for “machizukuri” are prepared and can be taken advantage of. Dr. Masahiko Shinozaki, Associate Professor of Toyo University, introduced high density city in the world.

Finally Dr. Satoru Yamashiro proposed an interim report the ICUS project, “New prototype for Mokumitsu” (see main article of this volume).

Panel discussion about high density city was done after three speeches. It is confirmed that for safe and comfortable densely populated wooden building district,

both hardware and software are important. As for hardware, building and infrastructure, should be not only safe but also attractive. About Software, residents should actively participate in “machizukuri”. Based on the discussion on the above issues, ICUS project result will be introduced.



left to right: Prof. Koshihara (ICUS), Mr. Jun Manabe, Mr. Masahiko Shinozaki and Mr. Satoru Yamashiro

### The present situation and future directions for post-disaster recovery in Minami-sanriku: a view from the citizen's perspective

The 26<sup>th</sup> ICUS Open Lecture was held on March 24<sup>th</sup>, 2013. The theme of this lecture was to learn about the perspectives of people who were affected by the tsunami in 2011, particularly looking at their current situation where living in temporary housing has become the norm.

Four speakers from Minami-sanriku, Miyagi Prefecture, who are deeply involved in the recovery of their hometown and supporting the affected people in various ways, were invited to share their views on the current situation of recovery and what issues need to be tackled

next in the re-planning of the town. Around 100 people – including experts in urban planning and “machizukuri” (bottom-up town planning), who has been providing direct and/or interim support to the affected areas – participated and were involved in a passionate discussion on this theme. The bold attitude of the people was admirable: who, even with various constraints such as lack of human resources in the rural municipalities and an policy framework insufficient for dealing with the scale and dimension of this disaster, have overcome it and are trying to understand how to maintain a harmonious relationship with nature while simultaneously collaborating with government officials and other specialists to pursue a realistic solution.

It is certain that within these two years the citizens' strength in “machizukuri” has grown. However, this event has also further assured us that this strength can help correct the problems with the present system of recovery. Immediately after the earthquake, the idea of “being there for the affected people” was became popular, but now is really the time when we need to apply this concept; what is essential is the support of knowledgeable specialists who are “there for the affected people.”

The present recovery is also one process through which a new model of community planning for the future will be defined. This year at ICUS, we will continue to contribute to this process by providing further opportunities to deepen the debate on issues of recovery.



left to right: Ms Kiyomi Watanabe and Mr. Tsuyoshi Takanabe as coordinators, Mr. Hiroshi Onodera, Mr. Kazuma Goto, Mr. Tokuro Sato and Ms Akemi Utsumi from Minami-sanriku, Miyagi Pref.

# ICUS lectures at Yangon Technological University, Myanmar

By K. Nagai

ICUS gave a special lecture course titled "Introduction to Adaptive Technologies in Disaster Management" from December 2012 to March 2013 at Yangon Technological University (YTU) in Myanmar. Eight lecturers in total visited YTU from the Institute of Industrial Science (IIS), the University of Tokyo (UT), and gave lectures on Geographic Information System (GIS), infrastructure management and technology, and disaster management (see the table below). These lectures were given as a part

of YTU graduate course lectures, and more than 20 students and faculties attended the lectures and learned about the latest knowledge and technologies in the field of disaster management. It was the first time a lecture series at YTU was provided by a foreign institute, although there have been many symposiums in recent years due to Myanmar's rapid growth. Through this corroboration, YTU and ICUS could strengthen their relationship and are currently planning to continue the lecture series in the coming year as well

because education is one of the most important issues for the development of Myanmar. Furthermore, at the end of March (during Prof. Meguro and Dr. Kawasaki's visit), an alumni party of the University of Tokyo was organized and about ten Myanmar alumni who are now in Yangon were able to join it.



*The rehabilitated YTU*



*Lectures at Yangon Technological University (YTU)*



*Meeting with YTU faculties*



*UT-Myanmar alumni party*

## ICUS lecture series at Yangon Technological University, Myanmar

	Lecturer	Contents
December 4 - 6	Prof. Haruo Sawada (ICUS, IIS, UT)	History of remote sensing
December 18 - 20	Assoc. Prof. Akiyuki Kawasaki (ICUS, IIS, UT),	Introduction to Geographic Information System
January 8 - 9	Prof. Ryosuke Shibasaki (IIS, UT)	Advanced geo-spatial data analysis
January 15 - 17	Assistant Prof. Ayako Sekiyama (IIS, UT)	Application of remote sensing
January 29 - 30	Assoc. Prof. Reiko Kuwano (ICUS, IIS, UT)	Earth structure and buried infrastructure management
February 19 - 20	Prof. Hiroshi Yokota (ICUS, IIS, UT / Hokkaido University)	Infrastructure management for developed society
March 5 - 7	Assoc. Prof. Kohei Nagai (ICUS, IIS, UT)	Infrastructure management for developed society
March 15	Prof. Kimiro Meguro (ICUS, IIS, UT)	Total disaster management and strategy



# The Brahmanbaria Tornado, 2013

By Prof. M. A. Ansary, BNUS

A deadly tornado occurred on March 22, 2013, at around 5:30 PM in the southeastern district of Brahmanbaria in Bangladesh as seen in the figure on the right. It travelled at a speed of 70 kilometer per hour and lasted for 15 minutes, leaving an eight-kilometer long trail of destruction in its wake. It struck 20 villages, including Ramrail, Basudeb, Chinair, Sultanpur union of Sadar Upazila, Bijoyagar Upazila and North Akhaura union of Akhaura upazila in Brahmanbaria district. The worst damage occurred in Bijoyagar and Akhaura Upazila. Thousands of trees and utility poles were toppled and thousands of people were left homeless as the tornado swept through Urshiura and the surrounding villages of the Sadar Upazila. Many tin- and mud-built houses were badly damaged by the tornado, and part of a district jailhouse collapsed, resulting in the death of seven workers. Local hospitals were crowded with injured villagers and it was difficult to



Affected area of the tornado (Source: CDMP)



Elephant trunk like tornado (Source: DSTAR)



Damaged house (Source: DSTAR)

move from one place to another as many of the roads were blocked by fallen trees. The tornado halted both train and road transportation, which disrupted rescue operations. Thousands of people were rendered homeless, and power was out across a wide area. Crops, mostly rice, were damaged across a vast swath of land.

The tornado devastated a vast area of Brahmanbaria District. A total of three upazilas were affected including six unions. The number of fully and partially affected families were 1,326 and 402, respectively, whereas the number of fully and

partially affected people were 6,630 and 1,985, respectively. The tornado also destroyed a number of houses, with 2,635 houses affected fully and 752 affected partially. Around 173 acres of agricultural crops were fully affected whereas 1,112 acres crops were partially affected.



Affected people (Source: DSTAR)

# Preliminary report on recent PM2.5 in China

By Dr. Hong Huang, Institute of Public Safety Research, Tsinghua University, Beijing, China

Recently, fog and haze affected many areas in China, leading to flight delays, high sales of breathing masks, and a marked decrease in people doing morning exercises outdoors. Up to January 13<sup>th</sup>, 2013, the air quality index (AQI) had surged to more than 300 – which implied the air was seriously polluted – in 33 of the 74 cities where detection devices were installed, with a total affected area of 130 million square kilometers. Furthermore, on January 13<sup>th</sup>, the Beijing Meteorological Bureau issued the first haze orange alert as the PM2.5 hour maximum reached 900  $\mu\text{g}/\text{m}^3$ , exceeding the normal air quality average standard of 75  $\mu\text{g}/\text{m}^3$  more than time times and almost doubling the AQI daily serious pollution level of 500  $\mu\text{g}/\text{m}^3$ .

The burning of coal, motor vehicle exhaust, and industrial pollutants and dust which generate large amount of particles are the main sources of the haze, and it is believed that the haze occurs due to the interaction of this enormous amount of particulates and the prevailing weather conditions. Three driving mechanisms are summarized as follows:

- 1) Stagnant wind in the horizontal direction: Due to the increasing number of skyscrapers in urban areas, air movement is weakened due to blocking and friction. The increasing occurrence of this phenomenon plays a negative role in the diffusion and dilution of particulates suspended in the atmosphere, which leads to an accumulation of particulate matter in urban and suburban areas.
- 2) Temperature inversion in the

vertical direction: The inversion layer acts like a lid covering the city. This phenomenon occurs when the temperature at high altitudes is greater than that at low altitudes, which restricts the vertical movement of air in the low altitude layer and blocks the suspended particles from drifting upwards to higher altitudes. As a result, the particulate matter is trapped at low altitude near the ground.

- 3) Particle concentration in the air increases: An increase in the concentration of pollution and suspended solids may directly cause a severe reduction in visibility. The increasing concentration may be attributed to the growing population, rapid development of industry, and growth in vehicle usage.

Beijing has already begun an air-cleaning plan which involves the

construction of 35 PM2.5 detection stations. The monitoring and control of PM2.5 over the coming years is a key target of this plan, and eight steps to meet this target have been laid out:

- 1) Strictly control the increase in pollution sources
- 2) Decrease the usage of coal
- 3) Implement pollution-reducing “green” transportation
- 4) Restrict dust generation
- 5) Place limits on industrial pollution output
- 6) Planting of green space and reforestation
- 7) Improve enforcement of the laws
- 8) Promote scientific and technological solutions

The goal of these efforts in Beijing is to have more than 80% of the days in a year with air quality which meet or surpass the specified air quality level.

## Air quality index

AIR QUALITY INDEX IN CHINA		
AQI (PM2.5)	AIR QUALITY	HEALTH ADVICES
0-50	Excellent	None
51-100	Good	Don't take long time or heavy manual labor
101-150	Harmful to vulnerable people	Children, the elderly, and people with heart or lung disease should minimize their time spent outdoors or performing heavy manual labor
151-200	Harmful to health	Children, the elderly, and people with heart or lung disease should avoid spending time outdoors or performing heavy manual labor. Others should minimize their time spent outdoors or performing heavy manual labor.
201-300	Severely harmful to health	Children, the elderly, and people with heart or lung disease should avoid outdoor activities altogether. Others should avoid spending time outdoors or performing heavy manual labor.

## Professor Kimiro Meguro visited Nepal

*By Dr. Ramesh Guragain, Deputy Executive Director,  
National Society for Earthquake Technology-Nepal*

Professor Kimiro Meguro, Director, ICUS visited Nepal from January 4th- 8th January 2013 as a continuation of supervising research of the other, a JSPS/RONPAKU fellow in Nepal. In addition to the supervision and guidance on research, Prof. Meguro gave three lectures at seminars for three different target audiences on different aspects of disaster risk management.

The first seminar was on "Role of private sectors on promoting safer building construction: Experience from Japan" for private sector was held on 6th January 2013, at FNCII Hall, Teku, Kathmandu, Nepal. The seminar was jointly organized by the National Society for Earthquake Technology-Nepal (NSET), International Center for Urban Safety Engineering (ICUS) and the Federation of Nepal Chamber of Commerce and Industries (FNCCI). The main objective of the seminars was to share the experience of Japan regarding the role of private sectors such as banks and insurances on promoting safer building construction, which could be helpful in the context of Nepal. Participants were from different organizations representing NGOs, insurance companies, banks, media, professional associations, business houses and others.

The second seminar was on "Earthquake risk management in developing countries" for engineering communities in Nepal and was held on 7th January 2013 at DoLIDAR, Shree Mahal, Pulchowk, Lalitpur, Nepal. The seminar was jointly organized by Nepal Engineers Association (NEA). The main objective of the seminar was to share the experience and knowledge on possible solutions on earthquake risk management in developing countries. The seminar was very fruitful in the context of Nepal. Prof. Meguro emphasized on possible ways of reducing the high risk in Nepal by combining technical and social approaches. The emphasis was on the promotion of an appropriate solution that is technically feasible, socially acceptable, locally available and financially affordable as well. His presentation on the retrofitting techniques using low cost PP band-mesh for low rise buildings was liked by most of the participants. Over 110 participants from Institute of Engineering, Nepal Engineers Association, Engineering Consulting Firms, NGOs etc. benefitted from the seminar.

The third seminar was held at Japanese Ambassador's Residence. His Excellency Mr. Kunio

to Nepal cordially invited Prof. Meguro at his residence to deliver a lecture for the representatives of Nepal Risk Reduction Consortium and selected people from the Government, UN Organizations, JICA, NSET and other NGOs representatives. Professor Meguro gave them a lecture with emphasis on use appropriate technology and its promotion by social and technical approaches.

On January 5th, 2013, Professor Meguro visited Banepa-Dhulikhel-Tatopani stretch to observe Prevalent Building Typologies and also to check the reliability of Gabion-mesh construction and explore possible use of Gabion mesh together with PP-band mesh retrofitting technique. The area has used the gabion mesh for retaining wall construction along the road side from 30-40 years back. It was identified that about 80-90% of the gabion works is fully working even after 30 years in the adverse weather condition.



*Professor Meguro with President of  
Nepal Engineers Association*



*Seminar to Engineering Professionals  
by Professor Kimiro Meguro*



*Professor Meguro with his excellency, Mr. Kunio Takahashi, and representatives  
of Japanese Ambassador, JICA and NSET representatives after the Lecture at  
Ambassador's residence*



## ICUS invited Myanmar delegates to IIS, UT

By A. Kawasaki

ICUS invited four Myanmar delegates from Yangoon Technological University (YTU) and Mandalay Technological University (MTU) to the Institute of Industrial Science (IIS), the University of Tokyo (UT), from January 28<sup>th</sup> to 31<sup>st</sup>, 2013. Both universities, which are leading engineering schools in their country, have had difficulties carrying out undergraduate education and research until 1998. The universities were, however, reopened in December 2012 for the first time in more than ten years under the civilian government led by President Thein Sein from March 2011. Since then, their research equipment and facilities have are being gradually

upgraded, both through internal efforts as well as with aid from donor countries including Japan. Under these circumstances, ICUS, which has been offering lectures at YTU since December 2012, decided to invite a delegation from the two universities to IIS, UT to support their investigation of modern research equipment and facilities for the full renovation of their universities.

The delegation made a courtesy call on Prof. Nakano, Director General of IIS, and visited various research facilities at IIS, such as the International Research Center for Sustainable Materials, Collaborative Research Center for Energy

Engineering, Advanced Mobility Research Center, Earthquake Resistant Structure Research Center, Geospatial Information Science laboratories, and the Research Management Office.

They also met with UT President Hamada and Vice-president Maeda to exchange opinions about future mutual cooperation between YTU, MTU and UT.

There is an urgent need to promote and enhance engineering research and education in Myanmar, where rapid economic development is expected to occur in the coming years. We hope further exchanges and collaborative opportunities will be generated by this visit.



Meeting with UT President



Meeting with Director General of IIS



Visiting the smart house

## Joint UT alumni party was held in Bangkok

By A. Kawasaki

The University of Tokyo (UT) alumni party was jointly organized by three Thai alumni groups, including the Institute of Industrial Science (IIS) Alumni Thailand Chapter, in Bangkok, Thailand, on March 16, 2013. This was the second joint alumni party, since the first held in October 2011. A total of 43 alumni from the 1960s to 2000s were able to reunite at the party along with their families. Attendees included not only Thai alumni working in various fields such as government, universities, and companies, but also 15 Japanese alumni working in Thailand.

The party was filled with a friendly

atmosphere including greetings from the representatives of each alumni group, as well as short self-introductions by all alumni including

their current status and memories of their time as a student at IIS and UT.



Group photo of UT alumni party participants in Thailand

# ICUS Activities January-March

## Travel

Date	Name	Country	City	Category	Purpose
Dec.27-Jan 27	Dr. Kawasaki	Thailand	Bangkok		Operation of BNUS & lecture
Jan. 2-8	Dr. Kawasaki	Sri Lanka	Colombo	Seminar	University of Peradeniya Seminar
Jan. 27-31	Dr. Kuwano	Myanmar	Yangon	Lecture	Yangon Technology University
Feb.2- Mar.29	Dr. Kawasaki	Thailand	Bangkok		Operation of BNUS & lecture
Feb. 21-24	Dr. Numada	India	New Delhi	Symposium	Building disaster resilient societies: Lessons from Japan
Mar. 3-9	Dr. Nagai	Myanmar	Yangon	Lecture	Yangon Technology University
Jan.3-9	Prof. Meguro	Nepal	Kathmandu	Lecture	Supervision & guidance on research
Mar.13-16	Dr. Kawasaki	Myanmar	Yangon	Lecture	Yangon Technology University
Mar. 14-17	Prof. Meguro	Myanmar	Yangon	Lecture	Yangon Technology University
Mar.17-19	Prof. Meguro	Thailand	Bangkok	meeting	BNUS & alumni

## Visitors

Date	Name		Country
Jan.26-Feb.1	Prof. Nyi Hla Nge	Chairman of Steering Committee for YTU and MTU	Myanmar
	Prof. Khin Than Yu	Pro-rector and Prof. of YTU	Myanmar
	Prof. Myint Thein	Pro-rector and Prof. of MTU	Myanmar
	Dr. Myo Myint	Assoc. Prof. of MTU	Myanmar

(YTU: Yangon Technological University, MTU: Mandalay Technological University)

## Titles of graduated students

Lab.	Name	Grade	Title
Meguro	Mr. Takuya Iyama	Master	Research of the needs and sources of information to foreigners living in Japan during disasters
Meguro	Mr. Donun Ryu	Master	Numerical analysis of Tsunami-driven debris impact on structures
Meguro	Mr. Manoj Nakarmi	Master	Support system for seismic retrofitting low earthquake resistant masonry houses in Nepal using PP- band method
Meguro	Ms. Ai Nagashima	Graduate	Development of new tsunami evacuation facilities for the vulnerable people
Kuwano	Mr. ALANE, Biruk Adane	Master	Evaluation of effects of internal erosion on slope stability using hollow cylindrical torsional shear apparatus
Kuwano	Mr. SUWAL, Laxmi Prasad	Doctor	Disk transducer for elastic wave measurement and its application to unsaturated sandy soils
Koshihara	Mr. Satoshi Ikegaya	Master	A fundamental study of timber connection aiming at shortening edge distance -Axial force transmission system with prestress and friction
Koshihara	Mr. Shinya Matsuda	Master	Influence which construction methods have on redundancy of timber structures -Engineering verification of modern SAKAGURA based on a sense of values of traditional timber structures-
Koshihara	Mr. Takashi Kawai	Master	The application of truss beam to large-scale timber buildings by using production engineering of timber houses
Koshihara	Mr. Issey Kurokawa	Master	The construction method of KINTAI bridge from the point of view of tree species and the size of members
Ohara	Mr. Makoto Fujiu	Doctor	Study on development of remote building damage assessment system during large-scale earthquake disasters
Sawada & Takeuchi	Mr. Hiroto Kishi	Doctor	Analysis of global anthropogenic PM2.5 with remote sensing and emission inventory
Sawada & Takeuchi	Mr. Yuji Hosoya	Master	Performance of paddy monitoring by satellite remote sensing towards drought damage reduction, in Southeast Asia
Sawada & Takeuchi	Mr. Hiromi Jonai	Graduate	Mapping of global paddy field crop calendar using satellite remote sensing
Sawada & Takeuchi	Mr. Tatsuya Ishikawa	Master	Effectiveness of Distinction of the Liquefaction in High-resolution Satellite Image
Nagai	Mr. Koichiro Ikuta	Master	An analytical investigation of influence of bending-radius of reinforcement on failure mechanism in beam-column joint
Nagai	Ms. Reiko Kojima	Graduate	An investigation of shear performance of HPFRCC beams by image data analysis system

## Number of graduated students

	Urban Safety & Disaster Mitigation Division	Social Infrastructure Management Division	Environment Informatics Division
Undergrad	4	0	0
Master's course	12	3	5
Ph D course	6	2	0
<b>Total</b>	<b>22</b>	<b>5</b>	<b>5</b>



Prof. Y. Ichihashi

Dr.S. Kondo

## FAREWELL TO ICUS MEMBERS

Visiting Professor Yasuyoshi Ichihashi (left) and Dr. Shinya Kondo (right) left from ICUS on March 31<sup>st</sup>, 2013. Visiting Prof. Ichihashi joined ICUS in May, 2009, and he has been actively involved in organizing USMCA2012. Dr. Kondo joined ICUS in April, 2010. He will continue research activity at the Disaster Reduction and Human Renovation Institute in Kobe, Japan as chief researcher from April 2013.

## Research Themes 2012

### Urban Safety & Disaster Mitigation Division

- integrated information system for total disaster management
- low-cost and efficient retrofitting method for masonry structures considering local availability, applicability and acceptability
- estimation of electric power demand after large-scale earthquake disaster
- development of proper disaster broad cast model by mass-media for effective and efficient disaster responses during the time of digital broadcasting
- development of temporal-spatial disaster process model
- IT triage system (TRACY) for sharing medical information during large scale disaster
- effective use of earthquake early warning in manufacturing companies
- distribution of evacuation space / buildings during large-scale metropolitan flood
- research on trend of earthquake disaster management strategy and damage estimation method
- strategy for evacuation planning in urban areas against large-scale flood method
- local community collaborative activities adaptable for climate change in below-sea-level cities
- comprehensive method of advanced community-based activities and planning for disaster management
- image training for urban rehabilitation and reconstruction planning as preparation for social recovery
- study on advanced community governance through practical approach to support fishermen villages affected by the Great East Japan Earthquake Disaster
- service continuity management (SCM) model of university in preparation for emergency
- trend analysis on research field and efficient research system for disaster reduction
- disaster response of local governments at southern area of Kii Peninsula after flood and debris flow due to the Typhoon Talas



Development of effective retrofitting technology considering economical conditions and social system for its promotion

### Social Infrastructure Management Division

- formation and evaluation of sustainable construction materials based on social perspectives
- life-cycle management of civil infrastructure
- structural performance evaluation of un-reinforced concrete coastal facilities
- mechanism of combined deterioration of concrete with freezing-thawing and chloride attack
- effects of underground structure on the formation and expansion of subsurface cavity
- evaluation of long-term behavior of earthen structure
- effects of internal erosion on the stability of earthen structure
- development of sensors for the evaluation of dynamic properties of un-cemented soil
- assessment of performance degradation of deteriorated infrastructure
- anchorage performance of RC structures
- mechanics of fiber reinforced concrete under principal stress rotation
- effective press-in driving method
- infrastructure management for aging society



Inspection of concrete structures in Myanmar

### Environment Informatics Division

- operational use of remote sensing during great disaster
- automatic flood monitoring and forest development system in the Indo-China
- three dimensional measurement of ecosystem structures using LiDAR
- carbon dynamics in Brazilian Amazon
- development of historical dataset of land cover and land use using remote sensing
- investigation on emergency response of Thailand government during the Chao Phraya River flood
- disaster information dissemination for diverse communities including foreigners during disasters
- investigation on the use of social media during disasters
- development of disaster information dissemination system for local community in rural mountainous area in Asia
- investigation on the introduction of housing water tanks to store rainwater for improving urban environment and disaster risk reduction

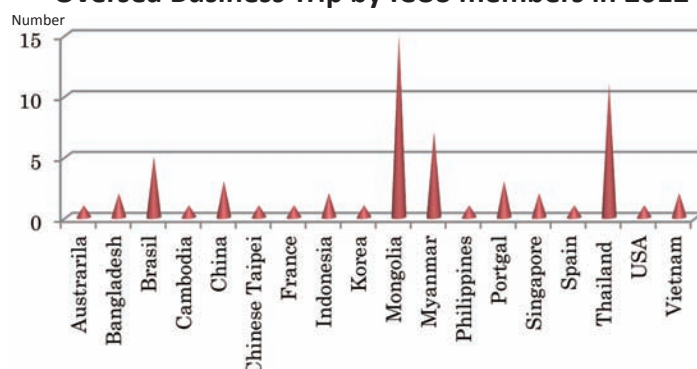


Field investigation on flood and poverty in Myanmar and Thailand

## Research Publications in 2012

	Urban Safety & Disaster Mitigation Division	Social Infrastructure Management Division	Environment Informatics Division
IIS Bi-monthly Research Report	17	8	18
Books	3	2	0
Reviewed Papers/Journal Papers	23	16	11
Conference Papers (International)	26	18	8
Conference Papers (Domestic)	27	15	16
Reconnaissance Reports	0	0	3
Others	20	6	2
<b>Total</b>	<b>116</b>	<b>65</b>	<b>58</b>

## Overseas Business Trip by ICUS members in 2012





### **Editor's note...**

On March 11, 2011, a magnitude 9.0 earthquake occurred off the Pacific coast of Tohoku in Japan. Two year later, we are gathering and analyzing the information of damage towards the publication of the final report.

In the Tohoku area some buildings have been repaired and reconstruct is

proceeding little by little. While this earthquake and tsunami caused great damage, this disaster also provided an opportunity to think about lifestyle, community and town. We should start to apply this type of thinking to our daily work as well.

The ICUS Project, 'New prototype for Mokumitsu,' is a platform to think about both our town and our life.

Everyone – not only professionals – can contribute to the safety of their town against a disaster and to the enjoyment of life. It is important to participate in the project, not to watch from the sidelines.

We hope more people will join us in thinking about their town.

**By M. Koshihara**

### **USMCA 2013: Oct 9-11 in Hanoi, Vietnam**

The 12th International Symposium on New Technologies for Urban Safety of Mega Cities in Asia (USMCA 2013) will be held in Hanoi, Vietnam on **October 9-11, 2013**.

**Deadlines: Abstract                      June 15, 2013**  
**Full Paper    September 1, 2013**

Further information is available at the USMCA 2013 official website: **<http://www.usmca2013.vn/>**

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*The purpose of ICUS is to identify, investigate, and resolve issues towards the realization of sustainable urban systems for the prosperity and safety of society considering challenging socio-economic problems.*