



# Disaster Mitigation Research Center

名古屋大学  
NAGOYA UNIVERSITY



Disaster Mitigation Research Center

# Further promoting collaboration as a base for disaster mitigation studies



## Greetings



Center Director

**Nobuo Fukuwa**

Amid concerns over a Nankai Trough mega-earthquake and another Ise Bay Typhoon, our university must, as a key university situated in the region, make proactive efforts to establish measures for disaster mitigation. In response to this situation, our center was provisionally set up in December 2010, and then officially inaugurated in January 2012 with the assignment of permanent professors. Currently, various activities are developed by 20 professors, 37 affiliate professors, 11 visiting researchers, seven special appointed researchers, 43 contract researchers, and nine cooperative assistants attached to the center.

Just over seven years after the center's official inauguration, its activities are showing a new development. The year before last, we established Aichi-Nagoya Resilience Co-Creation Center in cooperation with administration and the industrial world, and newly established the Resilience Co-Creation Division. Accordingly, the collaboration between industry, government, academia, and citizens is entering a new stage.

Regarding cooperation with the society, we have concluded agreements with various organizations such as the Tokai Disaster Mitigation Research Consortium linking up six national universities in the Tokai region, the Chubu Regional Development Bureau, the Aichi Prefecture Disaster Mitigation Office, the Nagoya City Disaster Management Office, nine cities and one town in the West Mikawa district, the Nagoya Urban Institute, the National Research Institute for Earth Science and Disaster Prevention, the Shizuoka Prefecture Risk Management Division, and Disaster Management Library. Furthermore, we are promoting regional collaboration in Hokusei, East Mikawa, and West Owari districts, and also promoting cooperation between industry, government, academia, and citizens, such as "Honno no Kai (the meeting in real intention)."

On the research front, there is progress in cooperation between different research fields through various projects. One such project is Research Project for Compound Disaster Mitigation on the Great Earthquakes and Tsunamis around the Nankai Trough Region. Another is forming collaborative research bases to realize a hierarchical resilience co-creation society.

Also, we have projects sponsored by the cross-ministerial strategic innovation promotion program (SIP) such as region-based disaster mitigation think-tanks through regional collaboration and information sharing and the development of strategies for disaster mitigation and quick recovery in broad region economy by the cooperation between industry, government, and academia.

Last year, we started measures to promote disaster prevention and mitigation further. We established the special fund "Disaster Mitigation Public Outreach Program for Protecting our Future Generations" And we also set up the crowdfunding "Saving the Records and Memories of the Showa Tonankai Earthquake Hidden by WW II for our Posterity."

The Disaster Mitigation Research Building is the first seismically isolated building on the Higashiyama campus. It offers learning opportunities by opening its first and second floors to the public, along with its roles as a base for carrying out disaster mitigation research and a response base in the case of a disaster. Visitors can also attend daily Gallery Talk lectures. Some events for children are organized during the summer holiday. Moreover, this building now has another role as an executive office of the Disaster Prevention and Mitigation College. The Disaster Mitigation Research Building has received more than 70,000 visitors in the roughly five years since it opened. Various meetings of disaster strategy planning by national and local governments are also held there.

More than seven years after the center's official inauguration, it is gradually developing an environment that promotes research, response, and preparation, concentrating the region's efforts in one place. In the future, we plan to maintain our current activities, including various symposiums and seminars, the Disaster Prevention Academy and the "Gen-Sci Cafe" for the general public, the Disaster Mitigation Manabi-ya, ESPER for technicians, NSL study sessions with the media, disaster mitigation seminars for high school students, and initiatives to develop human resources for disaster mitigation. Also, we will use the Disaster Mitigation Research Building to explore ways of improving education and awareness of the topic, moving forward together to realize a society that is resilient to disasters.

## The Disaster Mitigation Research Building —a Base for Research, Response, and Preparedness

Completed in March 2014, the Disaster Mitigation Research Building is the first building to feature a base isolation structure system on the Higashiyama campus of Nagoya University. The building provides a base for researchers involved in the Disaster Mitigation Research Center to carry out leading research on disaster mitigation, while functioning as a base for social collaboration toward disaster mitigation.

In a world-first, the underground seismic isolation devices and rooftop laboratory of the Disaster Mitigation Research Building can be used to carry out oscillation experiments that are conducted by using the entire building. In addition, an elastic base isolation structure was used for the base isolation structure devices and sufficient design margins were ensured—making this building the safest in the region against mega-earthquakes.

During ordinary times, this building serves as a base for research into disaster mitigation as well as for education and human resource development. The first floor offers various attractions: an experimental laboratory in which long-period ground motions can be simulated, an exhibition that combines detailed geographic miniatures and hazard maps,

and panel exhibitions for learning about disaster prevention and mitigation, as well as aerial photographs providing a bird's-eye view of Nagoya and its surrounding areas, miniatures for learning about earthquake resistance structures, and a handcraft area for kids. In addition, the building serves as a venue for the “Disaster Prevention Academy” and the “Gen-Sci Café”. On the second floor is a library where visitors can browse a range of materials and information systems.

Once disasters occur, the building will become a base for the university and related institutions to respond to disasters and to release information. In preparation for such disasters, the building has one week's supply of water and food, large-scale private power generation devices, terminals for connection to power supply vehicles, propane-powered air-conditioning equipment, and solar power generation devices. In addition, with the aim of sharing real-time disaster information, local authority satellite communications were established with Aichi Prefecture, while a long-distance wireless LAN was established with the Chubu Regional Development Bureau.



**Disaster Mitigation Research Building**

The first base isolation building on the Higashiyama campus with its distinctive triangular figure the building is a facility that is designed to serve as a Base for Research, Response, and Preparedness.



**Disaster Mitigation Gallery**

By seeing and touching a variety of educational materials, visitors can understand the necessity of disaster mitigation, which encourages them actively take measures. In this way, the building contributes to disaster mitigation in the region. The building regularly functions as a venue for the “Disaster Prevention Academy” and the “Gen-Sci Café”.



**Disaster Mitigation Library for Research**

The library exhibits newspaper articles, video materials, books, materials relating to historical earthquakes, hazard maps, histories of the municipalities, and other resources which have been collected for over a decade. It also provides the latest information systems for visitors to use.



**Isolation Structure Gallery**

The gallery displays the base isolation structure devices. This offers visitors the opportunity to learn about the technologies behind isolation structure systems and vibration control systems by seeing the actual devices. They can also learn about various seismometers and recording devices.



**Environment to enable oscillation experiments using the entire building**

By moving the building with a hydraulic jack, it is possible to generate free oscillation in order to conduct experiments using the entire building. In the rooftop laboratory, a range of simulation experiments can be conducted in which long-period ground motion and virtual images are synchronized.



**Disaster response base**

In addition to its elastic base isolation structure, which provides a high degree of safety, the building has an emergency power supply, a store of various necessities, and facilities for communication with the central and local governments.

# Outline and Organization of Disaster Mitigation Research Center

Creating models to realize disaster mitigation by deepening many types of cooperation in the whole region based on advanced disaster mitigation research

**Build disaster mitigation models through interdisciplinary cooperation.  
Realize a safe and secure society through regional collaboration.**

## Creation of "Intelligence" for Disaster Mitigation

Realize interdisciplinary cooperative research and regionally integrated disaster mitigation research capitalizing on collective regional powers. Take on roles of strengthened cooperation between researchers inside/outside the University, liaisons between local communities, information transmission, and the planning, coordination and promotion of disaster mitigation research projects and regionally cooperative activities.

## Expert Development

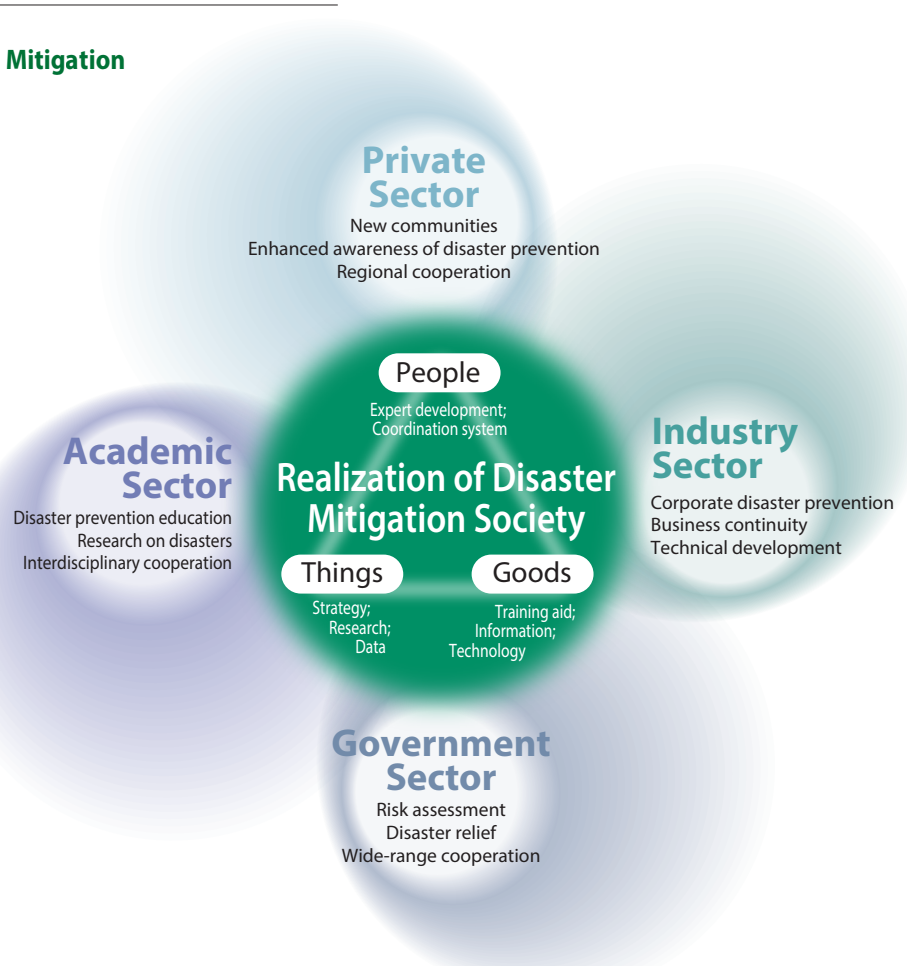
Realize human resource development projects strategically for disaster prevention that support "new communities."  
→Systematized disaster prevention education and human resource development through regional cooperation.

## Regional Cooperation

Promote framework building that helps implement regional cooperation. Interface research results through "visible" regional networks.

## International Cooperation

Transfer the best practice of regional disaster mitigation strategy models to overseas countries, so that such disaster mitigation strategies will develop in Asia.



## Organization

Promoting advanced research into disaster mitigation and conducting research in collaboration with industry  
In order to achieve both of them, we have established three divisions: Research Cooperative Division, Social Cooperative Division and Resilience Co-Creation Division

With the three pillars of the Research Cooperative Division, the Social Cooperative Division and the Resilience Co-Creation Division, the Disaster Mitigation Research Center at Nagoya University strives to conduct research, disseminate information, and raise awareness of disaster mitigation.

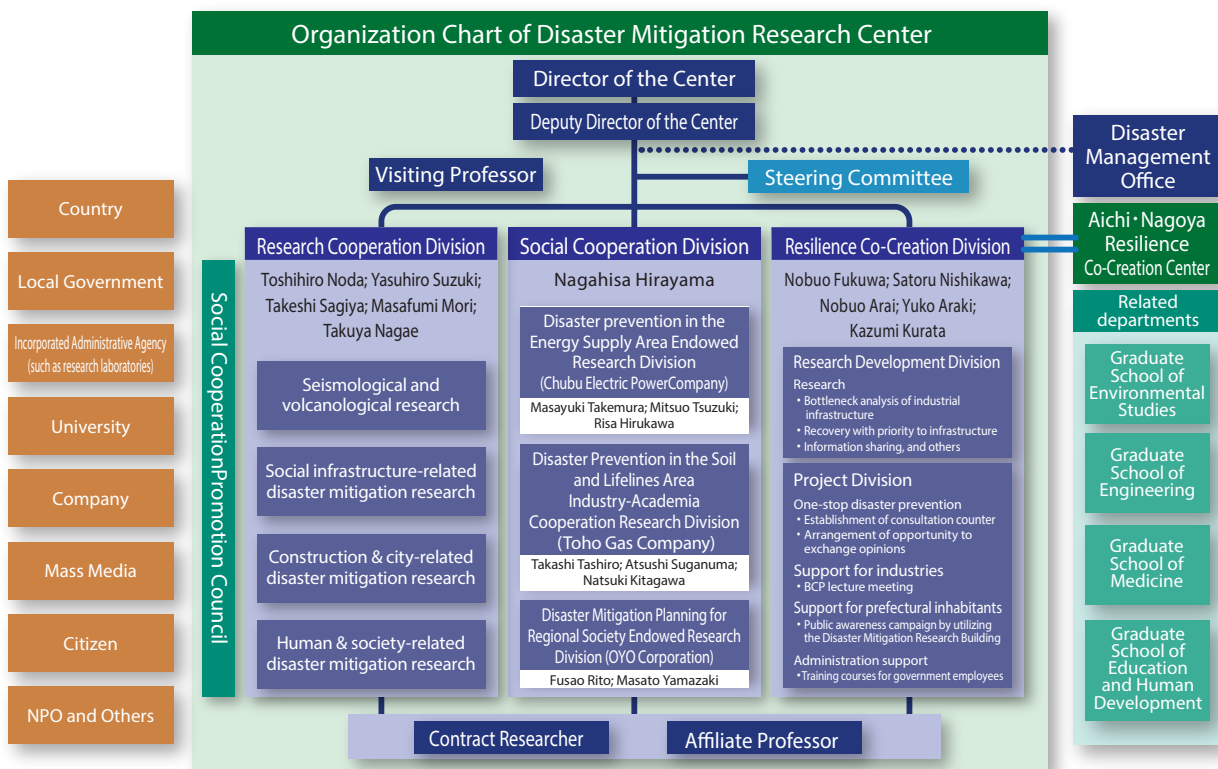
The Research Cooperative Division conducts leading research into disaster mitigation, undertaking research in a diverse range of fields, from earthquakes and volcanos, to social infrastructures, construction urban planning, and society.

The Social Cooperative Division comprises three divisions: Disaster Prevention in the Energy Supply Area Endowed Research Division, Disaster Prevention in the Soil and Lifelines Area Industry-Academia Cooperative Research Division, and Disaster Prevention Mitigation Planning for

Regional Society Endowed Research Division. Together, they contribute to human resource development from the perspective of industry and corporations to ensure safety and reassurance for the region.

The Resilience Co-Creation Division strategically promotes research and development and projects with cooperation between industry, government, academia, and citizens, in order to maintain socio-economic activities in Chubu area with a core of Nagoya, Aichi at the time of a large-scale disaster.

Through the participation of—and exchange of opinions among—public administrative bodies, citizens, mass communication organizations, and NPOs, we will be able to realize truly collaborative research that transcends the various fields of study and the entities implementing the measures.



## Aichi · Nagoya Resilience Co-Creation Center

Promoting research development and projects strategically with cooperation between industry, government and academia, in order to maintain socio-economic activities in Chubu area with a core of Nagoya, Aichi at the time of a large-scale disaster. It comprises two divisions: Research Development Division and Project Division. The Research Development Division promotes bottleneck analysis of industrial infrastructure, recovery with priority to infrastructure and research of disaster information base. The Project Division promotes one-stop disaster prevention (establishment of consultation counter and arrangement of opportunity to exchange opinions), human resources development for industries (BCP course of lectures), human resources development for citizens (enlightenment activities by utilizing the Disaster Mitigation Research Building) and human resources development for administration (training courses for government employees)

Nagoya University: Nobuo Fukuwa; Satoru Nishikawa; Nobuo Arai; Yuko Araki; Kazumi Kurata; Shogo Hashitomi  
 Cooperative associates; Takuo Katsumata; Kenji Kobori; Jun Ito; Yuki Kawasaki; Yuki Arakawa; Takanori Kato; Tomoya Yamazaki; Toru Takahashi  
 Head of office: Yasuo Kanahara

## Disaster Management Office, Nagoya University

The Disaster Management Office is the administrative support organization of Nagoya university for improving disaster prevention and mitigation ability of the university. It promotes improvement of disaster management activity including disaster prevention system within the university, business continuity plans and disaster prevention drills, while it promotes safety measure for buildings, disaster information facilities and disaster prevention education. Nagoya University's Disaster Management Headquarters will be established in the Disaster Mitigation Research Building. Accordingly, drills and lectures are implemented by using the building while it is maintained as the disaster prevention base. In June 2017, eight national universities in the Tokai region concluded an agreement on large-scale disasters response and the system for disaster response in cooperation between universities is being prepared.

The Disaster Management Office will strive to enhance the disaster prevention capability of Nagoya University, a massive organization with various education and research functions that encompasses more than 25,000 people, closely cooperating with the Disaster Mitigation Research Center.

Members of Disaster Management Office: Jun Tobita; Satoshi Iwasa; Naoko Inayoshi

## Disaster Prevention in the Energy Supply Area Endowed Research Division (Chubu Electric Power Company)

### ● Research aims

In order to improve the ability to respond to disasters in terms of energy supply and enhance measures for rapid recovery in the case of earthquakes and other natural disasters, it is essential to conduct hazard assessments by examining historical earthquake damage, assess the earthquake resistance of energy supply facilities, and accurately understand the supply-demand balance in the case of disaster.

Accordingly, this endowed research division will conduct research on the following themes with the aim of helping to enhance the region's disaster prevention ability through the maintenance of a safe and assured energy supply.

- 1 More accurate estimates of the scale of seismic ground motions and tsunami caused by Nankai Trough mega-earthquake
- 2 More accurate estimates of damage at energy supply facilities in the event of Nankai Trough mega-earthquake
- 3 Examination of preparatory measures for maintaining the function of facilities when disaster strikes, and measures for rapid recovery

## Disaster Preventions in the Ground and Lifelines Area: Academia-Industry Cooperative Research Division (Toho Gas Company)

### ● Research aims

Lifelines such as water, gas, electricity are essential items of social infrastructure that affect all of society. Revisions are underway regarding damage predictions and risk management systems in preparation of natural disasters such as earthquakes, windstorms and floods. Against this backdrop, it is critically important that we minimize damage and facilitate rapid post-disaster recovery from the perspective of maintaining

social function and economy activity.

Accordingly, this research division investigates damages from natural disasters in the past, and also analyzes risks that damaged lifelines have on social structure. It conducts research on the following individual themes with the aim of realizing prevention and mitigation of disaster in urban and rural areas.

- 1 Toughening of lifelines through assessment of the resistance of structures against great earthquakes
- 2 Risk assessment of lifelines against water hazards such as river flood and storm surge
- 3 Assessment of social influences exerted by reduction in everyday convenience due to damaged lifelines

## Disaster Mitigation Planning for Regional Society Endowed Research Division (OYO Corporation)

### ● Research aims

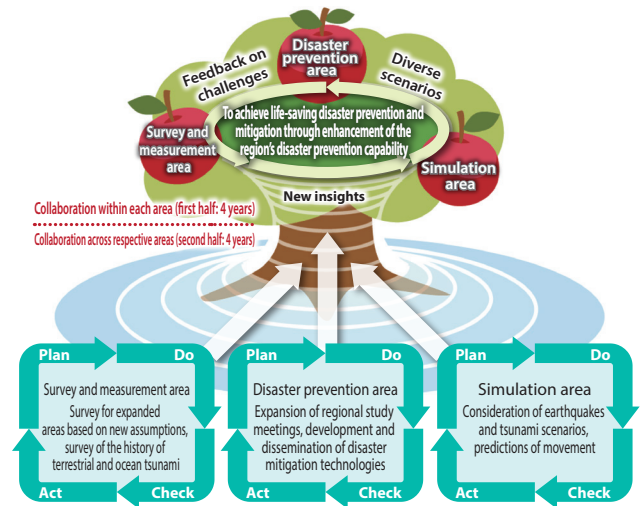
Using sociological knowledge in addition to physical and engineering knowledge that has ever been accumulated, this research division will conduct a series of research and development activities to help facilitate regional development of disaster mitigation plans so that regional society can respond to earthquakes and complex disasters, with a focus on the Tokai area.

The division's goal is to assess the economic damage from imminent great disaster and develop disaster mitigation plans based on predicted economic damage from the viewpoint of the region, thoroughly learning from the bitter experience of the Great East Japan Earthquake. Accordingly, this endowed research division focuses on the following areas:

- 1 Cross-sectional studies of disaster control measures by making full use of sociological knowledge in addition to physical and engineering knowledge
- 2 Development of a technique for estimating economic damage from disasters based on an economic equilibrium model that considers the structure of the supply chain
- 3 Proposals for disaster mitigation measures such as effectively enhancing infrastructure, using an economic indicator

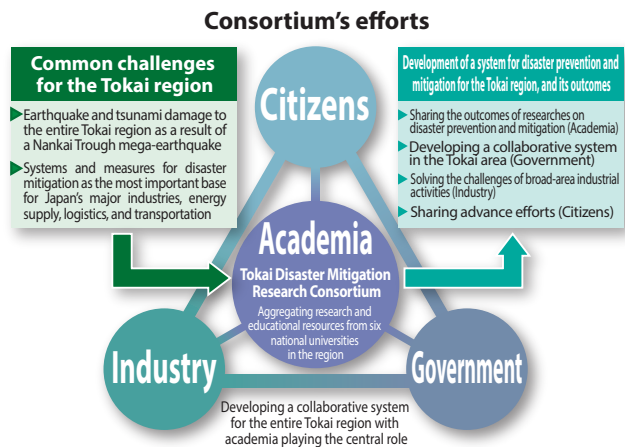
## Research Project for Compound Disaster Mitigation on the Great Earthquakes and Tsunamis around the Nankai Trough Region

With the aim of reducing damage caused by a Nankai Trough mega-earthquake and tsunami, this project will consider disaster prevention and mitigation measures and restoration and recovery plans while it will conduct investigation of great earthquake occurrence mechanism as well as clarification of subduction-zone structures and historical earthquakes and tsunamis. Nagoya University was entrusted by the Ministry of Education, Culture, Sports, Science and Technology to implement this project in fiscal 2013 in collaboration with the Japan Agency for Marine-Earth Science and Technology, the University of Tokyo, Kyoto University, Tohoku University, the National Research Institute for Earth Science and Disaster Prevention, and other organizations. Disaster Mitigation Research Center strives to enhance improvement of estimation accuracy of damages and develop a method to estimate damages that have been difficult to be assessed while it organizes research on region-collaborative disaster prevention. In fiscal 2017, a new attempt started to apply researched and developed measures to a specified area.



## Tokai Disaster Mitigation Research Consortium

Located at the center of Japan and as the nation's largest industrial base, the Tokai region faces the risk of a Nankai Trough mega-earthquake as well as other disasters. Therefore, developing effective strategies for disaster prevention and mitigation is a nationally important and urgent challenge. This Consortium was established with the aim of aggressively implementing research into reducing the impact of natural disasters in order to realize safe and assured regional societies. It is a collaborative effort involving six universities in the Tokai region—namely Gifu University, Shizuoka University, Nagoya University, the Nagoya Institute of Technology, Toyohashi University of Technology, and Mie University.



## Development of Strategic Methodologies to Reduce Economic Damage & Enhance Swift Regional Economic Recovery from Gigantic Disasters through Industry-Government-University Multi-stakeholder Cooperation

Under the cross-ministerial Strategic Innovation Promotion Program (SIP) of the Cabinet Office of Japan, we are undertaking an innovative research aiming at minimizing economic damage in trillions of yens through swift economic recovery, if in case Nankai-trough mega earthquake is to occur. Analysis of infrastructures & lifelines, inter-industrial linkages, resources necessary for recovery are examined and bottlenecks which may hinder recovery will be identified. Ways to avoid on-site rivalry & conflicts over recovery resources and multi-stakeholder consultations to develop an area wide BCP for swift economic recovery are being undertaken.



## Disaster Mitigation Renaissance through improved regional capabilities

Every year, a single municipality is chosen and designated as a model area from among municipalities in Aichi Prefecture that have populations of 100,000 or fewer (a total of five municipalities chosen in five years). All of the designated municipalities differ from one another in terms of geography, geology, past experience of natural disasters, natural disaster risk level, industrial structure, and historical background. In the model areas, documents are collected concerning regional history and geography, the population's ability to respond to disasters, and information on disaster prevention and mitigation based on the latest scientific and technological research concerning seismic disaster prevention. Using these documents, workshops are held by municipal office staff, regional companies, and residents to pave the way toward implementation of appropriate disaster prevention and mitigation countermeasures. After the completion of this project, we will aim to apply and widely extend this study's results to other municipalities that have geographical characteristics

that are similar to those of the five model municipalities. (Business subcontracted by the Ministry of Education, Culture, Sports, Science and Technology "Project for the study on support of local disaster-damage prevention measure")

In F.Y 2017, we have newly developed a unique multi stakeholder workshop methodology, combining a huge floor map with portable projection mapping system covering Aichi prefecture and its vicinity. Emergency routes, pivotal disaster response facilities, hazards generated by earthquakes are overlaid, so that numerous experts can share the geographical recognition and identify the bottlenecks for emergency operations and recovery. On 26 Dec. 2018, disaster response & waterworks experts from 10 municipalities of Nishi-Mikawa region together with Chubu Regional Bureau of MLIT, Aichi Pref., utility companies and major companies conducted a workshop with this mapping system to discuss ways to cope with possible Nankai-trough earthquake emergency.

## Research and development of advanced educational materials for disaster management

We are developing educational materials that allow people to experience realistic sensations of an earthquake, along with materials for learning about the results of seismic engineering research. The "Koso Bururu" (High-rise Building Shaking Earthquake Simulator) is a 4-layer construction with liner guide rails. It is a large-scale educational tool that allows users to easily experience the difference in shaking according to height of the building they are in, by locking and unlocking the joints between the layers. "Bururu Glasses" combine a head mounted display and 3-D virtual room images to create a virtual reality that realistically simulates the damage caused by a massive earthquake. We also developed equipment to overlay various spatial information onto the high-definition aerial photographs of Nagoya city, using projection mapping from the ceiling. This allows visitors to visually understand the features of the terrain around their home and workplace, and how they are connected to disaster risks.

The Disaster Mitigation Research Building BIM, makes use of BIM (Building Information Modeling) construction technology, in a system that allows visitors to visualize the building as a 3-D model, from its structure right through to the interior and exhibits. It gives visitors a virtual view of things that are normally out of sight, such as the Disaster Mitigation Research Building's seismic laboratory equipment.

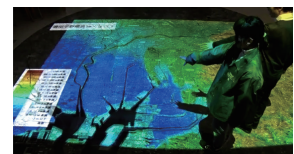
Development of the "Bururu" series of experiential educational tools for learning about disaster mitigation is ongoing. We have developed the BiCURI (Bi-directional shaker and Computed Ultra-Response Integration environment). The BiCURI system can simulate the "shaking of a skyscraper" using a vibrating table that reproduces the floor responses that result from an earthquake (long period ground motions,) together with videos of damaged rooms synchronized with its movements. The rooftop laboratory is able to shake the entire room at any given waveform, using an actuator. The vibration of the laboratory is synchronized with

video and audio so that visitors can experience the shaking of a building caused by an earthquake through all of their senses. For detailed terrain models, 3-D visualization equipment which projects hazard maps, etc. with image enhancement based on altitude data, enables visitors to gain awareness of disaster risks based on 3-dimensional information.

In addition, we are also progressing with development of effective materials that raise awareness about disaster risks, in convenient formats. We are also developing educational materials aimed at raising awareness. These include, cards, called "MAGIC Bururu" that change design according to viewing angle (lenticular printing), making it easy to see overlays of ground conditions and hazard maps. There are also the booklets, The Story of The Sujikai Family, and The Story of The Takai Family, which combine scenarios of what might happen to regular families in the event of a disaster with information on disaster management. There is an accompanying web application based on the same content called "escape" which allows users to experience disaster scenarios.



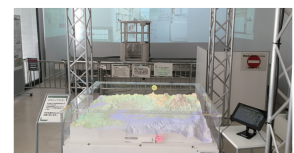
"Koso Bururu"



Projection mapping (elevation) onto an aerial photograph of Nagoya city



3-D image of the Disaster Mitigation Research Building BIM



2-dimensional long stroke shaking table, "BiCURI" and a 3-D visualization



# Education Program Development for Disaster Prevention Experts

## Disaster Prevention Academies

The Disaster Mitigation Research Center holds monthly lectures related to disaster prevention for citizen who supports disaster prevention activities. At such lectures, participants can hear easy-to-understand explanations on leading disaster mitigation studies. Lectures attract as many as 100 participants each time.



## Gen-Sci Café (A Learning Forum for Disaster Mitigation)

"Gen-Sci Café" is an event where teachers with various areas of expertise



respond to questions from citizens about natural disasters in an easy-to-understand way through a facilitator. The monthly cafés focus on themes related to disaster prevention and mitigation. The short distance between the facilitator and guest speaker and the audience always encourages vigorous discussions.

## Training programs to cultivate disaster prevention experts

In December 2010, "Committee on What Should Be Done to Cultivate Disaster Prevention Experts" was set up by volunteers representing group members of "Aichi Disaster Prevention Cooperation Society Promotion Council\*," reviewing education programs for disaster prevention experts. In December 2011, the Committee worked out a new draft plan for "Education Training for Disaster Prevention Experts," which is scheduled to start in FY2012 as a model project. Disaster Mitigation Research Center has proactively participated in this project, and will continue to do so in the future.

## Seminars on disaster prevention for high school students

These seminars target high school students with the aim of nurturing future disaster prevention leaders who will contribute to enhancing the disaster prevention abilities of schools and the region. A total of about 150 people from 30 high schools in the prefecture—several students and teachers from each school—have attended the seminars over two years. Participants initially attend four days of lectures during a summer holiday, acquiring knowledge on natural disasters and practical responses to disasters. After this, they implement their own original activities for disaster prevention promotion and implementation at their respective schools, before presenting their outcomes during the winter holiday.

## Exchange meeting for disaster prevention

These seminars gather disaster prevention leaders in the Chukyo region. The disaster prevention leaders work on building collaboration to prepare effective measures during ordinary times and during times of disaster. There are also mini-symposiums in which participants hear stories from people who are involved in regional activities for disaster prevention. Participants can bring to their own communities their learning from the seminars—insights, lessons, efforts and examples of ingenuity. In this way, they can use the connections acquired through the seminars to promote future disaster prevention measures.

## Training program for developing regional human resources for disaster prevention

Many professors of Nagoya University have been involved in various regional human resource development programs organized by prefectures and municipalities, either for planning or as lecturers. Such programs include the training of disaster prevention leaders at the "Aichi Disaster Prevention College"; a course for training volunteer coordinators held by Nagoya City, etc. In order to promote exchange among the participants who have completed these courses and are now actively engaged in activities in their areas, in 2011 the center held the "Exchange meeting for disaster prevention". The center plans to continue promoting such exchanges among disaster prevention human resources in the region and to build channels for information sharing.

## Workshops for mass media:

In the Tokai area, in preparation for large-scale disasters caused by large earthquakes and other natural hazards, members from mass media, researchers, administrative agencies, NPOs, and infrastructure companies (operating mainly in the area) started NSL (Network for Saving Lives) in 2001 for the purpose of exchanging their opinions and information. Teachers involved in Disaster Mitigation Research Center proactively participate in the NSL workshops.

## ESPER

### (Extended Seminar for Professional Engineers and Researchers)

The aim of this seminar is to help young engineers from a range of fields to enhance their skills in leadership in the prevention of earthquake-caused disasters so that they can support future disaster prevention measures in the Chubu region. In addition, it aims to enhance the effectiveness of the region's abilities in terms of disaster prevention and mitigation through the promotion of face-to-face collaboration among young engineers.

## Lectures for students

Teachers involved in Disaster Mitigation Research Center offer classes of "Be Ready for Imminent Earthquake Disasters" for liberal arts students, and "Comprehensive Disaster Prevention Theory I-IV" for postgraduates. In cooperation with Japan Bousaisi Organization, Disaster Mitigation Research Center provides a framework in which students who took classes of "Comprehensive Disaster Prevention Theory I-II" are granted qualifications of candidacy for disaster prevention experts.

# Introduction of Members

## Nobuo Fukuwa

Director of the Center / Professor  
Resilience Co-Creation Division



Fukuwa finished Graduate School of Engineering, Nagoya University in 1981. After working for a construction company, he came back to Nagoya University to take the posts of Associate Professor, School of Engineering in 1991, Professor, Cooperative Research Center for Advanced Science & Technology in 1997, and Professor, Graduate School of Environmental Studies in 2001. Then he took the current responsibility. His specialty is earthquake engineering for soil and structures. Doctor of Engineering. Structural design first-class registered architect.

## Takeshi Sagiya

Professor  
Research Cooperation Division



Sagiya dropped out of his doctoral course at Department of Geophysics, Graduate School of Science, The University of Tokyo in 1990. After serving Geographical Information Authority of Japan, he took the post of Associate Professor, Graduate School of Environmental Studies, Nagoya University in April 2003. Professor of the same in January 2008, and then the current position. His specialty is crustal movement study. Doctor of Science.

## Satoru Nishikawa

Professor  
Resilience Co-Creation Division



After receiving master's degree from the Graduate School of Engineering, University of Tokyo in 1982, he joined Japanese Government service and has held various positions in the Ministry of Land, Infrastructure, Transport and Tourism, United Nations Department of Humanitarian Affairs, Tokyo Metropolitan Government, Asian Disaster Reduction Center, the Cabinet Office and Japan Water Agency. He was appointed to the present position in April 2018. He is active in various disaster reduction fora, e.g. Member of the UN Advisory Group on the post-2015 Framework for Disaster Risk Reduction, Board Member of Institute of Social Safety Science, and Board Member of Business Continuity Advancement Organization. His scope of research includes, disaster reduction administration, international cooperation for disaster reduction, business continuity management, and public awareness methodologies. Doctor of Engineering.

## Nagahisa Hirayama

Associate Professor  
Social Cooperation Division



In March, 2004, he completed his Doctorate in Environmental Engineering at the Kyoto University Graduate School of Engineering. In 2004, he became a Senior Researcher at the Disaster Reduction and Human Renovation Institution. In 2008, he joined the Kyoto University Graduate School of Engineering as an Associate Professor. He entered his current post in 2013 after working as Senior Research Fellow at the National Institute for Environmental Studies. His specialties are Sanitary Engineering, and Disaster Environmental Engineering. Mr. Hirayama holds a doctorate in engineering.

## Masafumi Mori

Specially-appointed professor  
Research Cooperation Division



Mori finished his doctor's course at Department of Architecture, Graduate School of Engineering, Nagoya University in 1991. After working for a construction company for 15 years, he became an associate professor at Nagoya University's Graduate School of Environmental Studies from October 2006. In January 2011, he became an associate professor at the Research Cooperation Division of the Nagoya University Disaster Mitigation Research Center, before assuming his current post. His specialty includes seismic engineering, building foundation, and earthquake disaster prevention. Doctor of Engineering. Structural design first-class registered architect.

## Kazumi Kurata

Specially-appointed Associate Professor  
Resilience Co-Creation Division



Kurata finished his master course at Department of Environmental Engineering and Architecture, Graduate School of Environmental Studies, Nagoya University in 2004. He developed Web GIS (geographical information system) at a software development company, and was involved in the development of disaster prevention education/awareness systems as a member of collaborative research with Nagoya University. He took the post of assistant professor of endowed research division of Disaster Mitigation Research Center, Nagoya University and then the current position from April 2017. His specialty is earthquake disaster prevention. Doctor of engineering.

## Toshihiro Noda

Deputy Director of the Center / Professor  
Research Cooperation Division



Noda finished his later period of doctor's course at Graduate School of Engineering, Nagoya University in 1994. Before taking the current post, he was a research associate at School of Engineering, Nagoya University in 1994, and Associate Professor and Professor, Graduate School of Engineering at the University in 1996 and 2008, respectively, and then the current position. His specialty is civil engineering, particularly geomechanics, geotechnical engineering, and anti-seismic geotechnical engineering. Doctor of Engineering.

## Yasuhiro Suzuki

Professor  
Research Cooperation Division



Suzuki finished his doctor's course at Department of Geography, Graduate School of Science, The University of Tokyo. Research associate at Nagoya University in 1991. Associate professor at Aichi Prefectural University in 1993. Professor, Graduate School of Environmental Studies, and General Manager of Disaster Management Office, Nagoya University in 2004, and then the current position. His specialty includes geography, tectonic geomorphology and active fault studies. Doctor of Science. University President Adviser.

## Takuya Nagae

Associate Professor  
Research Cooperation Division



Nagae completed his doctorate at the Interdisciplinary Graduate School of Science and Engineering, Tokyo Institute of Technology in 2002. He has served as a research scientist at multiple universities including one in the U.S. Since 2006, he has been working at the Hyogo Earthquake Engineering Research Center of the National Research Institute for Earth Science and Disaster Prevention (independent administrative corporation). Nagae has been involved in many experimental projects based on E-Defense (a 3-D full-scale earthquake shaking table). He has held his current post since September 2014. Specializes in construction of anti-seismic structures. Doctor of Engineering.

## Nobuo Arai

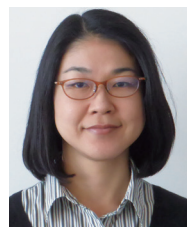
Specially-appointed Professor  
Resilience Co-Creation Division



Arai completed a masters majoring in geoscience at the Graduate School of Science at Kobe University. He has worked in the technical research institute of a construction company, a think tank, and a meteorological information provision company. He has held his present post since April 2014. Specializes in seismic disaster prevention, regional disaster prevention, natural disaster science. Doctor of Environmentalology.

## Yuko Araki

Specially-appointed Associate Professor  
Resilience Co-Creation Division



Araki completed her doctoral course at Department of Architecture, Graduate School of Engineering Faculty of Engineering, Kobe University in 2015. After working at an architectural design office, NGO of disaster recovery assistance, and others, she took the post of principal investigator of Disaster Reduction and Human Renovation Institution in 2015, and then the current position from January 2018. Her specialty is area rehabilitation and supporting sufferers. Doctor of Philosophy, and qualified architect of the first class.

## MENESES-GUTIERREZ Angela

Designated Assistant Professor  
(Young Leader Cultivation Program)



Meneses-Gutierrez is from Venezuela. She earned her bachelor's degree in Geophysical Engineering at the Simón Bolívar University, Venezuela in 2010. She finished her doctor course at the Department of Earth and Environmental Science, Graduate School of Environmental Studies, Nagoya University in 2017. Before moving to the current post in April 2019, she was a Program-Specific Researcher at the Disaster Prevention Research Institute, Kyoto University. Her specialty is geophysics. Doctor of science.

## Masayuki Takemura

Professor (visiting professor) /  
Social Cooperation Division



Takemura joined a construction company's technical research institute, after finishing his doctor's course at Graduate School of Science, Tohoku University in 1981. After working at the company's Kobori Laboratory, he took the position of Deputy Director of Takuji Kobori Research Institute in 2010. Professor of Social Cooperation Division of Disaster Mitigation Research Center, Nagoya University from 2012. And then the present position from April 2018. He has served as Director of Seismological Society of Japan, Deputy Chairman of Japan Association for Earthquake Engineering, Chairman of the Society of Historical Earthquake Studies, and others. His specialty is seismology, Doctor of Science. Disaster Prevention in the Energy Supply Area Endowed Research Division (Chubu Electric Power Company)

## Mitsuo Tsuzuki

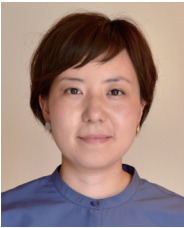
Associate Professor/  
Social Cooperation Division



Tsuzuki finished Graduate School of Science and Engineering, Waseda University in 1986. Currently he is on loan from an electric power company. His specialty is earthquake-resistant engineering. Master of Engineering. First-class registered architect.

## Risa Hirukawa

Assistant Professor/  
Social Cooperation Division



In 2010, she graduated from the Nagoya University. Currently she is on loan from an electric power company. Her specialty is Concrete Structural Engineering. Ms. Hirukawa holds a masters degree in Engineering.

## Takashi Tashiro

Deputy Director of the Center / Professor /  
Social Cooperation Division



Tashiro completed the doctoral course at Graduate School of Engineering at Nagoya University. He took the current post after serving as a research specialist at the Public Works Research Institute, Japan and an assistant professor at the Graduate School of Engineering, an associate professor of the Graduate School of Environmental Studies and then that of the endowed research division of the Disaster Mitigation Research Center, Nagoya University. He specializes in river hydraulics, river basin management, ecosystem science and engineering, and flood risk management. Academia-Industry Cooperation Research Division (Toho Gas Co. Ltd.) for Disaster Preventions in the Ground and Lifelines Area

## Atsushi Suganuma

Associate Professor/ Industry - Academia  
Social Cooperation Division



Suganuma finished his master course at Graduate School of Engineering Kyoto University in 1992. He was engaged in technology development and earthquake-resistant design of pipelines at a gas company. He took the post of contract researcher of Disaster Mitigation Research Center, Nagoya University in 2016, and then the current position from April 2017. His specialty is earthquake-resistant design of pipelines. Master of Engineering

## Natsuki Kitagawa

Assistant Professor/ Industry - Academia  
Social Cooperation Division



Kitagawa finished his master course at Graduate School of Engineering Kyoto University in 2012. He was engaged in construction of pipelines at a gas company. After then, he took the current position. His specialty includes infrastructure planning and management. Master of Engineering

## Fusao Rito

Professor /  
Social Cooperation Division



Rito graduated from Faculty of Engineering, Ehime University in 1981. He obtained a PhD (Engineering) at Ehime University in 2002. He had worked at a geological survey company for 37 years from 1981. He took the present position after having served as the technical director of Tokyo Branch in 2003, the adviser and head of chief engineers' office in 2014, and the director chief engineer in 2016. His specialty is Geotechnical Engineering. Doctor of Engineering, Professional Engineer (Civil Engineering and Engineering Management) Disaster Mitigation Planning for Regional Society Endowed Research Division (OYO Corporation)

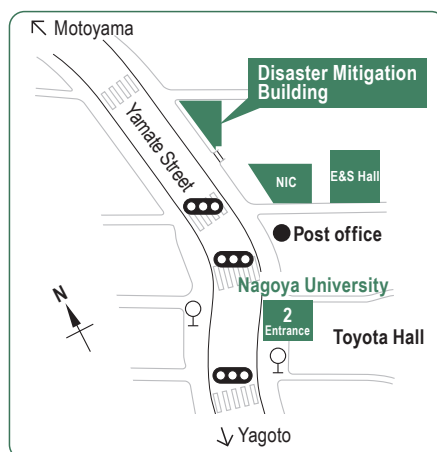
## Masato Yamazaki

Associate Professor/  
Social Cooperation Division



Yamazaki finished his later period of doctor's course at Department of Global Environmental Studies, Graduate School of Global Environmental Studies, Sophia University in 2010. He took the present position after having served as fellow at Safety Science Research Division, National Institute of Advanced Industrial Science and Technology, and postdoctoral fellow, Ritsumeikan Global Innovation Research Organization, Ritsumeikan University. His specialty is simulation analysis of economy. Doctor of Environmentology

In addition, 37 professor in Nagoya university are appointed as an affiliate professor for the center. The center also has 11 visiting researchers from other research institute and 43 contract researchers from industry and government. (As of May 1, 2019)



Disaster Mitigation Research Center,  
Nagoya University

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