

Overview of Budget for Priority Researches in Fiscal 2014

Planning and Research Administration Department, Planning Division

The NILIM will conduct 18 Priority Researches in fiscal 2014 including 7 new researches such as Disaster Prevention and Reduction Countermeasures concerning tsunami and large-scale earthquakes, etc., Aging Social Infrastructure Countermeasures concerning risk management and enhancement of technologies of checkups and repair, etc., and Formation of National Land with Sustainability and Vitality concerning dwelling life satisfaction and conversion to intensive urban structure, etc.. The Priority Researches are conducted with by independently requesting budgets, and its total cost is 234 million yen in fiscal 2014.

【New Priority Researches】

○Research to ensure safety and comfort

- Research on the use of nature and community based infrastructure for regional development in tsunami disaster regions
- Research on earthquake damage mitigation technologies for medium and low rise buildings subjected to large-scale earthquakes
- Research on the evaluation of vulnerable urban areas against seismic

- urban fires and of effectiveness of disaster mitigation countermeasures
- Research on methods of improving sustainability of infrastructure management incorporating the perspective of risk assessment
- Research to advance airport pavement inspection and repair technologies
- Research on the formation of national land and regions with sustainability and vitality and revitalization of economies
- Research on methods of effectively implementing housing policies based on the evaluation structure of the dwelling life satisfaction
- Development of Urban Asset Management Method and Location Suitability Assessment Method for New Industries for Well-planned Shrinking or Restructuring of Cities

In addition to the above, as a research institute of the Ministry of Land, Infrastructure, Transport and Tourism (MLIT), the NILIM receives budget from MLIT and conducts surveys and researches on the provision and improvement of housing and social infrastructure.

Details ◀ NILIM web site (press releases)

<http://www.nilim.go.jp/lab/bcg/kisya/journal/kisya20131225.pdf>

Technical support of NILIM after a debris flow disaster caused by Typhoon Wipha (T1326) in Izu-Oshima Island

Research Center for Disaster Management, SABO (Erosion and Sediment Control) Division

NILIM officials implemented technical support for the Tokyo Metropolitan government and Oshima town office after a debris flow disaster caused by Typhoon Wipha in Izu-Oshima Island to prevent a secondary disaster and to implement emergency recovery activities.

On October 16th, 2013, Typhoon Wipha brought precipitation exceeding 800mm in 24 hours to Izu-Oshima Island, Tokyo. As a result, simultaneous debris flows occurred on hillsides of the volcano, Mt. Mihara, resulting in 36 deaths and 3 missing (as of 15th Jan, 2014). After the debris flows, a weather forecast predicted that Typhoon Francisco (T1327) would arrive 10 days later, creating a risk of secondary disasters in the disaster area.

The SABO (Erosion and Sediment Control) Division, Research Center for Disaster Risk Management and Erosion and Sediment Control Research Group of the Public Works Research Institute implemented technical support for the Tokyo Metropolitan government and Oshima town office after the debris flow disaster to prevent secondary disasters and to implement emergency recovery activities as TEC-FORCE (Technical Emergency Control Force) from October 16th to November 2nd by dispatching personnel equal to 48 officer-days in total.

The types of technical support NILIM provided are as follows.

- Emergency ground survey to clarify damage to prevent secondary disasters (see Picture).
- Providing technical advice to the Tokyo Metropolitan Government to prevent secondary disasters and to implement emergency recovery activities.

- Providing technical advice to clarify the target area and precipitation criteria regarding issuing evacuation advisories, orders and cancelation by the mayor of Oshima
- Providing technical instruction to ensure safety during rescue activities



Emergency ground survey

Moreover, NILIM provided advice concerning the organization of results of emergency inspections of locations at risk of sediment disasters performed by the MLIT Regional Office TEC-FORCE immediately after the disaster .

The Director of the Research center for Disaster Risk Management participated in “the Izu-Oshima sediment-related disaster countermeasure planning committee of the Tokyo Metropolitan Government” as an administrative committee member to establish a master countermeasure plan. The NILIM is continuing to provide technical support for Izu-Oshima Island’s recovery.

Details ◀ SABO (Erosion and Sediment Control) Division web site “Saigai-joho (disaster information)” (in Japanese)

http://www.nilim.go.jp/lab/rbg/saigai_info.htm

■ Technical support for recovery from damage by Typhoon Haiyan (T1330) in the Republic of the Philippines

River Department, Research Center for Disaster Management

Typhoon Haiyan caused furious winds that reached the maximum wind speed of 90m/s, and caused severe storm surge damage in the Philippines as waves with height of approximately 5m combined with an approximately 5m rise of the tide level. To clarify the state of the damage, the NILIM participated in a field survey as a Japan Disaster Relief Team, a team specializing in early recovery efforts.

The following is an overview of the damage. The storm surge damage increased inside San Pedro Bay, which is a shallow bay that narrows from the outer sea.



Location Map (from global map data)

In villages at the back of the bay, the impact of the storm surge was dominant, and the damage was severe. In the San Antonia district, almost all houses located along the shoreline were totally destroyed.

The damage was also extremely serious on the eastern part of Leyte Island, where population and assets are concentrated. And outside the bay, storm surge damage was light although the land was inundated.

Not only gusts toppled wooden homes, but they caused other damage, for example blowing the roofs off important public facilities. In districts traversed by the typhoon, a great deal of damage was caused to electric power lines at every home. At Tacloban Airport, the passenger terminal and control tower suffered a great deal of damage as the strong wind and storm surges washed away machinery and material. This situation restricted the airport's control capability, causing many flight cancellations when the weather worsened.

A storm surge also inundated the District Office of the Department of Public Works and Highways (equivalent to a Regional Development Bureau of the MLIT) in the Palo District on Leyte Island. These functions are not restored, therefore it has been delaying post-disaster measures. Based on these surveys, the NILIM clarified the storm surge damage mechanism and gave technical advice concerning the enactment of basic policies for the planning of restoration of low frequency large-scale damage.

■ How to enhance the effect of public works on town planning and community development - A guidebook for improving the quality of public works -

Road Department, Landscape and Ecology Division

A technical document explaining the effects on regional town planning and community development of landscape creation in public works projects and methods of manifesting these effects has been prepared.

The Ministry of Land, Infrastructure, Transport and Tourism has expanded measures for formation of good landscapes since it announced the Outline of Policy for a Beautiful Country in 2003, but in occasional cases, landscape creation in public works projects do not necessarily contribute to the landscape of the surrounding area. In order to successfully achieve, "Improving the Quality of Life", which is the essential goal of public works projects, it is necessary to take innovative actions to create a landscape aware of its effects on regional town planning and community development. But, information which field technologists executing public works projects can use, for example answers to the questions, "what kinds of effects can creating landscapes in public works projects have on regional town planning and community development?" and "what innovative measures will manifest these effects?", is not available.

So, How to Enhance the Effect of Public Works on Town Planning and Community Development was prepared to clearly show the effects on regional town planning and community development of creating landscapes in public works projects, from the perspective of regions,

which are the end users, and to summarize concepts and methods of realizing these effects from many perspectives. This document explains 25 effects and 12 innovative points based on the analysis of 20 sample cases of advanced creation of landscapes. The division is anticipating that this document will be used to carry out beautiful town planning and community development linking landscape creation in public works projects and formation of regional landscapes.

Details ● Landscape and Ecology Division web site
<http://www.nilim.go.jp/lab/ddg/seika/>



Photo: Example of Effects on Town Planning and Community Development (Yumekyobashi Castle Road (Shiga Prefecture, Hikone City))

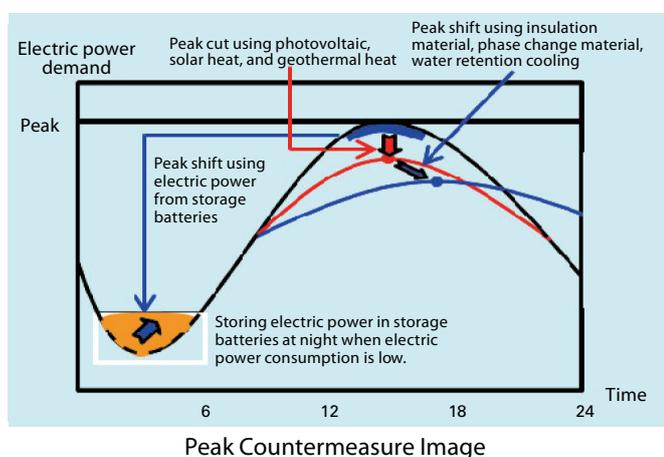
Development of building evaluation/design technologies to lower dependence on electric power

Building Department

By introducing innovative building equipment systems and body constructions and special building materials to integrate various basic technologies and verifying that these lower and shift the peaks of power consumption by buildings, the department is promoting demand side peak countermeasures.

As a result of the accident at the Fukushima Daiichi Nuclear Power Plant in March 2011, reducing Japan's dependency on electric power in the supply and demand for energy has become an urgent challenge. This research is intended to develop technologies which will contribute to lowering electric power consumption on the demand side (buildings).

The targets of electric power consumption peak countermeasures are equipment such as air-conditioning systems and lighting which



consume electric power and building bodies which impact air-conditioning load, to develop comprehensive design and evaluation systems to reduce electric power dependency of buildings.

Specifically, focusing on the fact that even when special materials called phase change materials are heated, they change phase but their temperature remains the same, simulations and numerical analysis of their effects when used to make building panels were carried out.

This verified the effects on electric power of combinations of natural energy equipment (photovoltaic power, solar heat etc.) and energy storage devices (storage batteries, heat storage tanks), which are considered to be effective as peak countermeasures, to tackle the challenge of building new electric power systems never used before in buildings. This is called a low voltage storage network which, until now, has minimized voltage transformation loss by bundling voltage transformation adapters which are attached to each device within a building, and has provided them all with electric storage functions to achieve peak shift.

And we plan to evaluate and verify the effects of peak shift of electric power consumption in buildings in cases where these newly developed technologies are applied to various buildings uses and construction regions, and to optimize and systematize electric power conservation design technologies and prepare a summary of our research results in FY2015.

Details NILIM web site (Project research)

http://www.nilim.go.jp/lab/bbg/project/ppdf/pro-h25_2.pdf

Installation of Port-EDI in Myanmar

Coastal, Marine and Disaster Prevention Department, Disaster and Emergency Management Division

The Ministry of Land, Infrastructure, Transport and Tourism has been introducing Port-EDI in the ASEAN countries, and began operating a provisional system in Myanmar in January 2014.

In countries where port related procedures have not been simplified, it is necessary to submit documents to many administrative bodies. Application forms to be submitted to each body differ, but many of the items such as ship name, call sign, date-time of arrival / departure, and so on are duplicated.

Myanmar is now expanding facilities in its ports in anticipation of Japan and other countries beginning to conduct business in the country, but it has not yet simplified and computerized port related procedures. To prepare for port logistics, which will expand in the future, the Government of Myanmar has adopted a policy of simplifying and computerizing export and import procedures.

The Government of Japan is helping Myanmar undertake this initiative, with the Ministry of Land, Infrastructure, Transport and Tourism supporting the task of computerizing port related procedures. As part of this, it is introducing Port-Electronic Data Interchange (Port-EDI) into Myanmar.



Photo Meeting Held to Explain the Operation of Port EDI in Myanmar

It began to operate a provisional Port-EDI system in Myanmar in January 2014. It is continuing this effort with the date set for the full scale system introduction as the end of 2015.

● **Schedule of Principal Events**

Scheduled Dates	Event Name
March 19	Disaster Prevention and Disaster Mitigation Research Results Briefing – Three Years after the Great East Japan Earthquake – http://www.nilim.go.jp/lab/bbg/saigai/h23tohoku/index.html

● **Publication (research achievements) < November, 2013-January, 2014>**

Download from here ☛ <http://www.nilim.go.jp/lab/bcg/siryou/index.htm>

TECHNICAL NOTE of NILIM

No.	Title of Paper	Names of Divisions
736	B-DASH Project No.1 Guideline for introducing an energy management system using intensive solid-liquid separation technology	Wastewater and Sludge Management Division
737	B-DASH Project No.2 Guideline for introducing an Innovative Biogas Production System	Wastewater and Sludge Management Division
745	A Manual on Performance Evaluation, Construction and Maintenance for Sand Dune Scarp Control Works – A Report on NILIM Public-Private Joint Research “Research on Performance Evaluation of Sand Pack Structure for Coastal Protection Works” –	Coast Division
750	Study on the omen phenomenon discovery technique using the MMS of cave-in caused by sewer system – Joint research of a new efficient technique for the inspection of sewer pipe lines –	Wastewater System Division
751	Practical Guide on the Technical Standards concerning Measures to Prevent the Fall of Ceilings in Buildings	Building Department, Research Center for Land and Construction Management
752	Sediment conditions and eelgrass (<i>Zostera marina</i>) in Miyako Bay, October 2012	Marine Environment Division
753	Spatial distribution of shallow water habitats in canals in Tokyo Port	Marine Environment Division
754	An Examination on the Actual Harborage Behavior in Major Bay Areas, Focusing on Large Bulk Carriers (Analysis by NILIM-AIS)	Port Planning Division
755	Analysis on World Container Ship Movement and Containerized Cargo Flow (2013)	Port Planning Division
756	A Study on Method of Quantitative Risk Analysis of Airport	Research Coordinator for Advanced Airport Technology
757	An Analysis on the Low-cost Carriers (LCCs)’ Entry/Withdrawal of International flights in Asian Civil Aviation Market	Airport Planning Division
758	Survey on the flood disaster caused by the torrential rains in the Northern Kyusyu, in July 2012	Flood Disaster Prevention Division
759	Report of the Lecture Meeting of NILIM (2013)	Planning Division

● **We provide you with research information.**

- 2013 Annual Report of NILIM

This web site introduces NILIM activities throughout the year, including research activities and achievements, future initiatives, etc.

Go to this web site: ☛ <http://www.nilim.go.jp/english/annual/annual2013/ar2013e.html>

	National Institute for Land and Infrastructure Management Ministry of Land, Infrastructure, Transport and Tourism Asahi 1, Tsukuba, Ibaraki, 305-0804, Japan (Tachihara) Tachihara 1, Tsukuba, Ibaraki, 305-0802, Japan (Yokosuka) Nagase 3-1-1, Yokosuka, Kanagawa, 239-0826, Japan TEL:+81-29-864-2754 FAX:+81-29-864-4322 http://www.nilim.go.jp/english/eindex.htm	 国土交通省 <small>Ministry of Land, Infrastructure, Transport and Tourism</small>
	No.47 Winter 2014 <small>Edited and Published by National Institute for Land and Infrastructure Management</small>	