

# Management to Support High-Quality Research

## 1. Implementation of external and internal evaluations to improve research from a wide range of perspectives

Based on the research policy revised in November 2017, the research planning review meetings and research evaluations are being conducted as part of the management to support high quality research.

### ■ Research Plan Review Meeting

In order for the NILIM to conduct research efficiently and effectively as a whole and to truly improve the research implementation policy and important research of each division, the research plan review meeting is held at the end of each fiscal year.

At the meeting, participants discuss what the NILIM considers to be the important issues, what kind of research strategy it should have, how it should manage the research divisions in order to maximize both the research results and the efficiency of operations, and to decide on the operation and management policy of each research division for the next year. In addition, the results, progress, and problems of major research projects in each division are reviewed to better plan the next year's research.

### ■ Main flow of research evaluation

For research subjects for which the NILIM makes its own budget request, the NILIM receives evaluations and advice from external experts, which are reflected in research management, such as receiving preliminary, interim, end-of-project, and follow-up evaluations by the Research Evaluation Committee.

As for the evaluation of the operation as a research institute, it was necessary to develop the NILIM's own evaluation method due to the need to respond flexibly to administrative needs as an internal organization of the Ministry of Land, Infrastructure, Transport and Tourism. For this reason, the NILIM voluntarily proposed its own evaluation criteria in line with its research policy based on the following, which have been externally evaluated.

- Evaluate achievements and performance and use the evaluation to make improvements for the future.
- Clearly and systematically express intentions for activities and operations.
- Emphasize the evaluation of quality, such as depth of policy development and thorough management of results, rather than numerical values, such as the number of papers published.



Figure 1. Main flow of research evaluation

### ■ Main flow of research evaluation

A management system has also been established at the implementation stage of research to improve the quality of the research, such as by discussing plans under direction of the director in the internal procedures of budget execution.

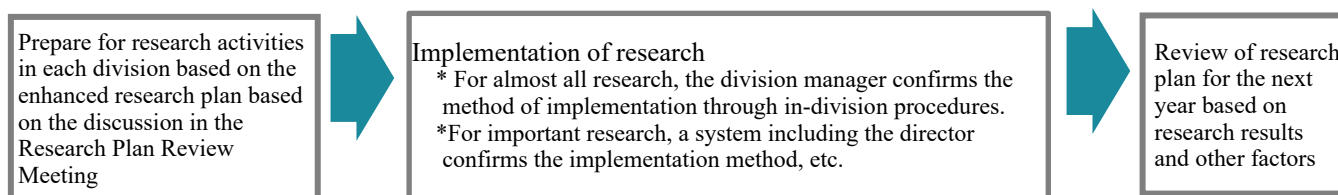


Figure 2. Main flow of research activities

## 2. Research Evaluation Committee (mechanism of external evaluation)

The General Guideline for the Evaluation of Government-Funded Research and Development (decided by the Prime Minister in December 2016) states that the "evaluation shall be conducted" "in line with the midterm (long-term) goals" and "over a period of three to seven years."

The NILIM conducts external evaluations of individual research subjects, their results, and institutional management by installing the Research Evaluation Committee that evaluates the overall activities of the R&D organization, including the implementation and promotion of R&D and institutional management, as well as a subcommittee that evaluates individual R&D themes from a specialized perspective.

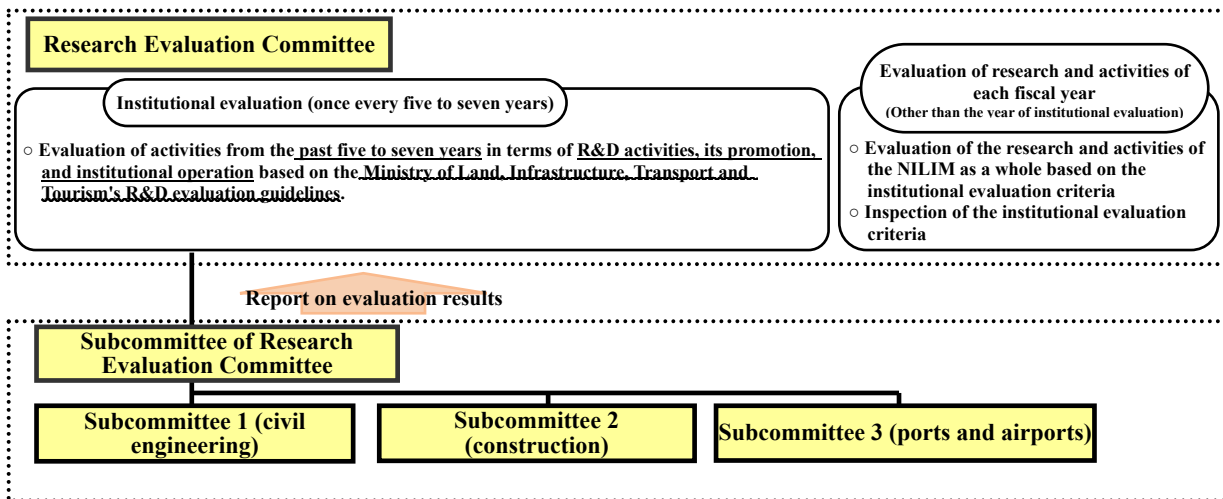


Figure 3. Structure and roles of the Research Evaluation Committee

Table 1. Past meetings of the Research Evaluation Committee

Year of the meeting	Evaluation theme and other aspects of the Research Evaluation Committee	Subcommittee (Number of evaluated items)
FY 2001-2007	<ul style="list-style-type: none"> <li>The National Institute for Land and Infrastructure Management Research Policy (draft)</li> <li>Results of R&amp;D activities and future direction</li> <li>How to manage research activities</li> </ul>	Preliminary: 77 Interim: 6 End-of-project: 29
FY 2008	<ul style="list-style-type: none"> <li>Evaluation of R&amp;D institutions etc.</li> <li>Activities of the National Institute for Land and Infrastructure Management (FY 2001-2007)</li> </ul>	
FY 2009-2012	<ul style="list-style-type: none"> <li>Status of improvement based on "New Developments in Research at the NILIM"</li> <li>Activities of the NILIM immediately after the Great East Japan Earthquake</li> <li>Revision of Research Policy</li> </ul>	Preliminary: 50 End-of-project: 42
FY 2013	<ul style="list-style-type: none"> <li>Evaluation of R&amp;D institutions etc.</li> <li>Activities of the National Institute for Land and Infrastructure Management (FY 2008-2012)</li> </ul>	
FY 2014-2017	<ul style="list-style-type: none"> <li>Core Research Activities and Policies of Initiatives</li> <li>Management for Better Research</li> <li>Revision of Research Policy</li> </ul>	Preliminary: 30 End-of-project: 41 Follow-up: 5
FY 2018	<ul style="list-style-type: none"> <li>Evaluation of R&amp;D institutions etc.</li> <li>Activities of the National Institute for Land and Infrastructure Management (FY 2013-2017)</li> </ul>	
FY 2019-2020	<ul style="list-style-type: none"> <li>Research and activities of the NILIM as a whole</li> </ul>	Preliminary: 13 End-of-project: 16 Follow-up: 1

### 3. Promotion of research in collaboration with external organizations

In light of the accelerating changes in social conditions and technological progress in recent years, the NILIM is collaborating with external organizations in order to incorporate technologies and knowledge from various fields more quickly and flexibly and to further strengthen its initiatives.

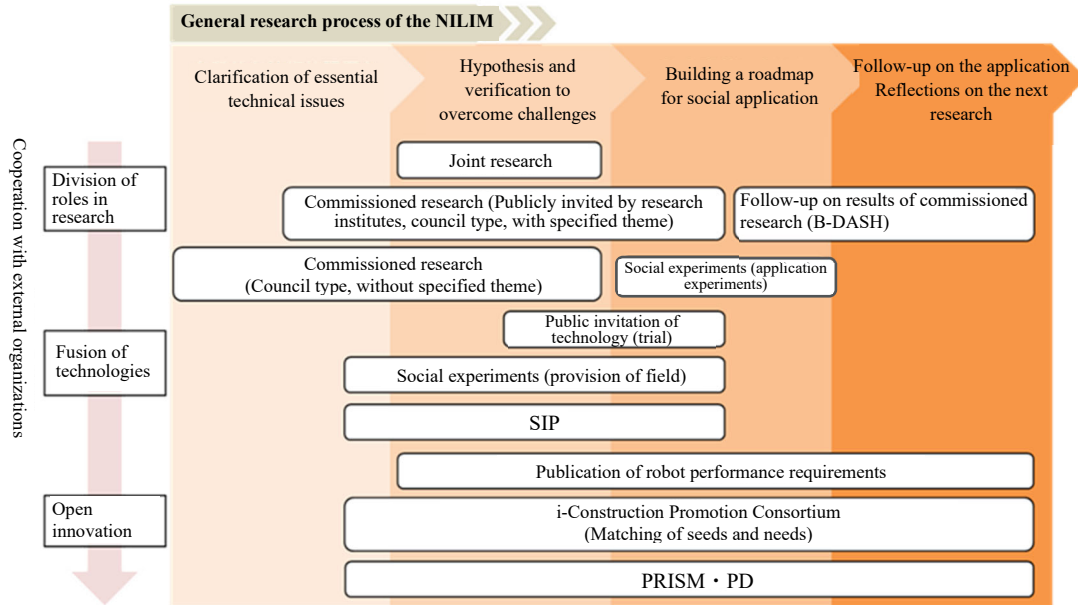


Figure 4. System of collaboration with external organizations

#### 1) Joint research

Joint research is the research conducted in collaboration with other organizations, such as private companies and universities. By collaborating with other organization, the NILIM is able to efficiently conduct research and develop new systems.

Although the number of joint research projects may change depending on the type of research being conducted at the time, about 20 projects are conducted annually. A certain number of projects have been conducted since the establishment of the NILIM. (See Figure 5)

(Cases) \* Excluding joint research conducted independently by the Public Works Research Institute, the Building Research Institute, and the Port and Airport Research Institute

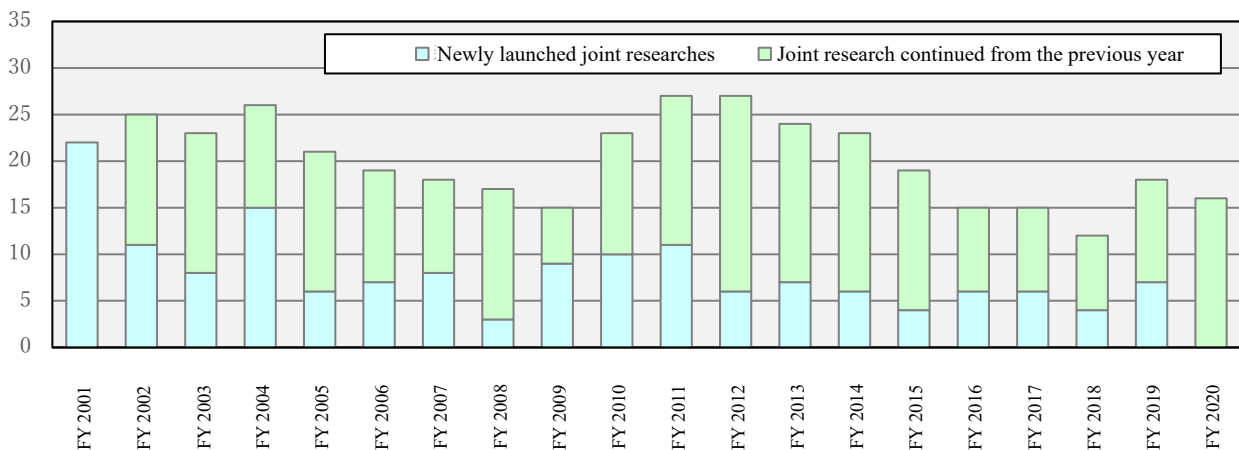


Figure 5. Number of joint research projects

## 2) Commissioned research

Commissioned research is research that is entrusted to a researcher at a university or other organization when there are results to be obtained or goals to aim for in a certain research theme, but the NILIM does not have sufficient know-how or means, or when the research is expected to proceed efficiently if it is entrusted to an organization (university etc.) that has already conducted such research. There are two types of commissioned research: one where the NILIM directly solicits or appoints the contractor, and another where the Ministry solicits applications and consigns the research to a research organization or researcher selected by the Council (Council-type commissioned research). As for council-type commissioned research, the knowledge of universities and other organizations is actively incorporated through public invitations for research and development by the New Road Technology Council, public invitations for river and erosion control research and development, and public invitations for sewerage innovative technology demonstration projects (B-DASH). Public invitations for research and development by the New Road Technology Council have been conducted since 2005, river and erosion control research and development since 2009, and sewerage innovative technology demonstration projects (B-DASH) since 2011.

The number of commissioned research projects has been increasing every year, and in recent years, about 50 research projects are being commissioned annually. (See Figure 6)

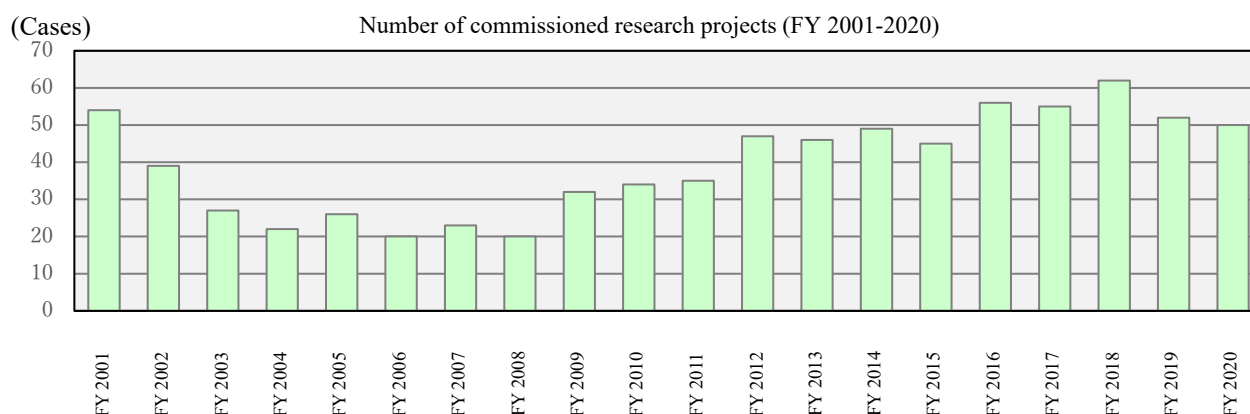


Figure 6. Number of commissioned researches

## 3) Other cooperation with external organizations

In addition to joint research and commissioned research, the NILIM is also engaging in various collaborations such as the participation in the Strategic Innovation Program (SIP), which is a research and development initiative through collaboration between government ministries and agencies, and the implementation of social experiments for the application of developed technological systems, as well as public invitations for new technological development. Other examples include research activities and initiatives to revise technical standards under industry-academia-government collaboration as activities of committees in academic associations.

Table 2. Examples of external collaboration

Type	Project name	Related institutions
SIP	Development and introduction of observation, analysis, and forecasting technologies for water-related disasters	National Institute of Information and Communications Technology, Osaka University, Toshiba, National Research Institute for Earth Science and Disaster Prevention, Japan Weather Association, Railway Technical Research Institute, Saitama University
Social experiment	Social experiment on flood damage prevention and mitigation measures using inundation forecast information	Kanda River and Shakujii River basins, five wards in eastern Tokyo
Social experiment	Social experiment on ETC 2.0 vehicle operation management support service	Private companies (service providers, logistics companies)
Public invitation of technology	Project to introduce and utilize innovative technologies to dramatically improve productivity at construction sites	33 parties in the consortium of private companies and universities
Public invitation of technology	Needs and needs matching of new technologies (AI technology that effectively utilizes construction work data etc.)	Private companies (companies that have been matched with the NILIM)