Research Policy and Management at the NILIM

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<Research policy of the entire NILIM and management policies of individual departments>

The NILIM has a document titled Research Policy.[1] This policy comprises five key components: the mission, basic stance, activities forming the basis, research attitude, and the development of a supportive research environment. The entire document is available on the NILIM website for reference. Some excerpts are shown in the right column. The NILIM Research Policy, established in 2017, remains in effect and is not updated annually. Certainly, it is not applicable universally, but the research policy will be continually verified over time as circumstances evolve (though this may sound a bit of an exaggeration). This Research Policy serves as the foundation, streamlining essential perspectives common to various activities we engage in at the NILIM. It can guide our activities like a compass. The words and phrases in the Policy might be challenging for individual staff members to grasp. However, because of its significance, the Policy is consistently emphasized at the NILIM. For instance, we spend sufficient time to explain its concepts during briefings for newly hired and transferred staff members.

Every aspect outlined in the Research Policy holds significance. However, as an organization engaged in diverse research activities, we consider *research and development that support the planning, drafting, and spreading policy for land, infrastructure, transport, and tourism* to be the most crucial concept of all. This Research Policy does not provide specific guidelines for individual research projects, topics, or themes. The NILIM operates diverse research departments, each focusing on various fields. The Management Policy is updated yearly, outlining specific research themes that align with developments in individual fields. During the internal review meeting known as the Research Plan Review Meeting, the entire NILIM team collaborates to discuss and finalize the Management Policy. This policy outlines the mission of research departments, trends and future prospects related to specific fields in land and society, and implementation policies for emphasized research and activities. You can find these documents on the NILIM website. They are located on the Research Policy page[1] as well as on the main page of each research department.[2] Please take a moment to review them.

NILIM research policy[1] (excerpt)

<Mission>
Being the only national research institute focusing on housing and social infrastructure, the NILIM strives to utilize technology as a driving force to create a safe, secure, dynamic, and appealing land and society both now and in the future.

<Basic stance>
○ Participate in the policy development of the Ministry of Land, Infrastructure, Transport and Tourism as a technical specialist taking into account the administrative perspective among other aspects.
○ Apply the advanced and comprehensive technical capabilities cultivated through research activities to the actual field of work.
○ Connect to the creation of a new policy using insight into the future image of national land/society and through the promotion of technology development.

<Activities Forming the Basis>
○ Research and development that support the planning, drafting, and spreading policy for land, infrastructure, transport, and tourism.
○ Support advanced technology to respond to natural disasters and accidents and sophisticate responding technologies.
○ Support the improvement of on-site technical capacity at Regional Development Bureaus and other facilities.
○ Gather, analyze, and manage data to develop the technical foundation for formulating policies and the utilization of the information for society.

<Attitude toward Research>
○ Understand the real needs of the government and the field and clarify the essential technical issues.
○ Formulate a research plan that includes hypotheses and verification methods to overcome challenges and a path to social application.
○ Review plans flexibly with an eye to the overall development of the research based on the facts obtained.
○ Systematically compile findings and evolve them into results that can be utilized in the field.
○ Establish a strategic path for the appropriate and smooth social application of research outcomes.
○ Follow up on the results of social applications, identify technical issues, and reflect them in the future research.

<Development of a Supportive Research Environment>
○ Develop management system to support high-quality research
○ Train human resources who have technological background and the ability to observe policy development from the perspectives of both researchers and administrator/on-site workers.
○ Own and reinforce the function of experimental facilities to support the research and development in the field of housing and social capital.

When formulating research management policies based on social trends and future prospects, it is crucial to understand not only the plans and policies of the Ministry of Land, Infrastructure, Transport, and Tourism (MLIT)—such as the Priority Plan for Social Infrastructure Development, the DX Action Plan in the Infrastructure Field, and the MLIT Green Challenge—but also national plans and policies associated with MLIT administration as a whole, such as the Basic Plan for National Land Resilience. Furthermore, it is essential to consider information gathered from activities within Japanese and international academic societies, as well as policies from countries outside Japan. We believe that examining information from various perspectives will not only facilitate research that supports current MLIT policies but also drive technological advancements, leading to policy planning and formulation in the future.

<Ministry of Land, Infrastructure, Transport and Tourism's Basic Plan on Technology and the activities of the NILIM>

As mentioned earlier, one of the plans formulated by MLIT is the MLIT Basic Plan[3] on Technology, currently in its fifth period spanning from FY 2022 to 2026, hereafter referred to as "the Basic Plan on Technology." This plan might be less familiar to the general public in comparison to better-known plans like the Priority Plan for Social Infrastructure Development. However, it specifically targets research institutions like the NILIM that are engaged in technological development. The Basic Plan on Technology outlines the fundamental direction of technology policies. It is based on the national government's Basic Plan on Science, Technology, and Innovation, as well as the Priority Plan for Social Infrastructure Development and the Basic Plan on Traffic Policy, which collectively cover land and transportation administration. This document defines crucial initiatives for promoting research and development in technology (*), the efficient utilization of technology, and the training of individuals who support technology policies (the framework for promoting technology policies). Even though the plan spans five years, it also envisions a society to be achieved from a long-term standpoint (20 to 30 years into the future) as a prerequisite for formulation of the plan.

* The plan focuses on six key areas for technological research and development:
  1. Creating societies where disaster preparedness and mitigation are prioritized
  2. Ensuring sustainable infrastructure maintenance
  3. Building sustainable and livable local communities
  4. Developing infrastructure to support a healthy economic cycle
  5. Promoting digital transformation (DX)
  6. Enhancing the quality of life through decarbonization and versatile use of infrastructure and space

The NILIM has consistently been responsible for conducting research and development in collaboration with different divisions of the MLIT in support of their policies. Moreover, the NILIM will not only assess and reaffirm the ongoing research but also play a pivotal role as the "foundation" in organizing and evaluating research directions and activities, both in the medium and long term, including the future.

The Framework for Promoting Technology Policy outlines strategies for infrastructure development, international engagement, and human resource development to foster sustainable economic growth. It highlights key priorities, such as *open innovation, interdisciplinary approaches, industry-academia-government collaboration*, and the *promotion of open data*. Additionally, the Framework emphasizes the crucial role of research institute facilities and equipment, indicating the need for effective and systematic repairs, maintenance, updates, and enhancement to ensure that they fulfill their vital functions and roles effectively. The Research Policy (full text)[1] outlines the involvement in these aspects, and the NILIM is actively working on these areas too. The NILIM is collaborating with external organizations using diverse mechanisms[4] to drive technological development. For details on the outcomes of joint research and other activities from the last fiscal year, please refer to the article titled "Technical Collaboration"[5] in this report. Concerning facilities and equipment, we are not just

maintaining them; we are also enhancing and remodeling them to align with future research directions.[6] As discussed thus far, the Basic Plan on Technology serves as a crucial foundation as the cornerstone for validating the NILIM's overall research policy.

We have discussed the Basic Plan on Technology in this document. We remain dedicated to advancing *research and development that support the planning, drafting, and spreading policy for land, infrastructure, transport, and tourism*. To achieve this, we continuously monitor plans and policies of the MLIT and national policies, ensuring our research and management policies align with these trends. Our research activities are then implemented accordingly.

The 2022 NILIM lecture, titled "Responding to Climate Change - The NILIM's Approach to the MLIT Green Challenge," provided an overview of ongoing research in this field and outlined future directions. Lecture materials and videos can be accessed on the lecture webpage[7] and the NILIM YouTube channel.[8]

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1) NILIM Research Policy
http://www.nilim.go.jp/lab/bcg/busyoukai/kenkyuhoushin/00index.htm
2) The webpage of the River Department on the NILIM website, for example
http://www.nilim.go.jp/japanese/organization/river/jriver.htm
3) The Fifth MLIT Basic Plan on Technology
https://www.mlit.go.jp/report/press/kanbo08_hh_000891.html
4) Twenty-Year History of the NILIM, Promotion of Research in Collaboration with External Organizations (pp. 264-265)
http://www.nilim.go.jp/lab/bbg/20nenshi/index_20years.htm
5) Technical Cooperation pp.140-141 of this document
6) The NILIM Pamphlet 2022, Renewed Experimental Facility (p. 9)
http://www.nilim.go.jp/lab/bcg/siryou/k2022j.pdf
7) FY 2022 NILIM Lecture
http://www.nilim.go.jp/lab/bbg/kouenkai/kouenkai2022/koen2022.html
8) NILIM YouTube channel
https://www.youtube.com/@user-oq5ud7re1l