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# Towards a Future-Oriented NILIM

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## 1. Introduction

NILIM's guidelines for research were defined in 2017. NILIM's stated mission is "As the only national research organization in the social infrastructure/housing field, our goal is to use technology as the driving force to create an attractive country and society that are safer, more secure, and more vigorous, both now and in the future." In addition, our basic stance is shown as being to:

- participate in policy development of the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) as a technical specialist taking into account the administrative perspective among other aspects;
- return advanced, comprehensive technical capabilities cultivated by research activities to practical work fields; and
- connect to the creation of new policy by insight into the future image of national land/society and promotion of technology development.

Public works-related facilities are extremely large in scale and are often exposed to harsh outdoor environments, and they are expected to be used over a long period with as little maintenance as possible. They are also characterized by the difficulty in obtaining accurate information about the environment surrounding them and the state of the interior

of the structures themselves. Amid these circumstances, NILIM has accumulated specialized and technical knowledge in the fields of housing and social infrastructure from its research activities to date and its experience based on actual case examples on the ground, among other sources. We have made every effort to resolve the issues brought to us from work sites and other places by making use of this knowledge. Moreover, I feel that one of NILIM's greatest strengths is having a comprehensive scope that enables specialists from a wide range of fields to propose solutions in response to the various issues in each region.

## 2. Towards future research

What should NILIM do to continue fulfilling the mission set out in the basic guidelines?

### 1) Efforts for new technology and findings

The first is coordination with new technology and findings. In addition to the technical knowledge in the fields of housing and social infrastructure that each research department has accumulated, it is also possible to greatly evolve this technical knowledge by working on new technology and findings. An example is ETC 2.0. By using this with ICT technology to obtain volumes of automobile probe data (travel history and behavior history data) and analyze

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it, we are now able to analyze individual congestion and traffic accident locations at the micro level. A number of research projects using this probe data are currently in progress. However, the ETC 2.0 service only began about ten years ago. The development stage preceding that took many years. For NILIM, it is very important that we are currently working on new technology and findings and searching for ways to improve each of the fields.

It hardly needs to be mentioned, but ICT technology has been progressing and spreading at a dizzying pace. The cameras and sensors installed in satellites, airplanes, and drones make it possible to collect information efficiently and with a level of detail that could not be obtained previously. In addition, there are also ICT technologies involved in AI analysis, growth in the amount of data that can be shared, and the spread of VR and other interface technologies, to name but a few. Collaborating with companies and universities that are active in these areas will enable much of the research we have been conducting to evolve in leaps and bounds. What is important here is to understand the strengths of new ICT technologies, while having a concrete, detailed understanding of where they can be applied in the existing fields of housing and social infrastructure and what required capabilities are demanded of the ICT technologies when doing so. I believe this is essential in the digital transformation of the housing and social infrastructure field.

Besides ICT technologies, it is also possible to coordinate with new materials, biotechnology, and the like. As a body that conducts comprehensive research in the housing and social infrastructure fields, NILIM expects that

research will be produced to increase their abilities and potential.

## 2) Handling challenges

The second is conducting research leading to the resolution of current and future challenges. For example, (1) global warming and carbon neutrality, (2) deterioration of structures, (3) national resilience, and (4) increasing productivity across the entire construction industry are some of the major challenges that MLIT as a whole will have to work on over the long term. I would like each research department to set more specific research topics and targets and continue working on them.

In relation to (1), materials from the 32nd meeting of the Technology Subcommittee of the Council for Infrastructure claim that two-thirds of the CO<sub>2</sub> emitted in Japan relates to the housing and social infrastructure field. I believe that there are still topics remaining that we can investigate to reduce CO<sub>2</sub> emissions in this field.

Recently, as energy supply and demand are under pressure due to Russia's invasion of Ukraine and other factors, efforts towards carbon neutrality and the like may have slowed down somewhat. However, given that global warming itself is still fundamentally unresolved, measures to counteract it will still be examined long into the future.

The Task Force on Climate-Related Financial Disclosures (TCFD) has recommended that companies and others disclose indicators, targets, and other information on risks related to climate change. Not having this will make it more difficult to procure funding internationally. Given such trends, the number of examples of companies conducting leading-

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edge technical development relating to carbon neutrality is increasing. Whether we can coordinate with the movements of these private companies to expand our research leading to policies promoting carbon neutrality, from raw material procurement to maintenance, in such fields as housing and social infrastructure will be a challenge. It is a serious challenge, but I suggest it is also a venue where we can demonstrate NILIM's comprehensive and specialized abilities.

I have used global warming and carbon neutrality as examples, but there are also mountains of other challenges. I hope to remain sensitive and find challenges to think of research topics.

### 3. Conclusion

What I have written above is entirely obvious, but I have noted it to show an attitude requiring research that is not merely an extension (to a small degree) of past research.

We must set our sights high, take a wide view encompassing movements on work sites and in universities and companies, and turn our antennas towards challenges and examples of efforts, new technologies, and findings in other fields as well. Producing results often takes time, but I hope to continue NILIM's strenuous efforts.

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☞ See here for detailed information

- 1) NILIM website: NILIM's guidelines for research  
<http://www.nilim.go.jp/lab/bcg/busvoukai/kenkyuhoushin/00index.htm>
- 2) Ministry of the Economy, Trade and Industry website: Basic Guidelines toward Achieving GX: Roadmap Looking Over the Next Ten Years  
[https://www.meti.go.jp/press/2022/02/20230210002/20230210002\\_1.pdf](https://www.meti.go.jp/press/2022/02/20230210002/20230210002_1.pdf)

- 3) MLIT website: Materials from the 32nd meeting of the Technology Subcommittee of the Council for Infrastructure, handout 3, p. 44  
<https://www.mlit.go.jp/policy/shingikai/content/001587784.pdf>