

# **Recommendation**

## **Recommendations for the 7th Science, Technology and Innovation Basic Plan**



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**Science Council of Japan**

This Recommendation is largely the outcome of the deliberations of the Subcommittee on Academic Systems of the Committee for Scientific Community, Science Council of Japan, and is issued under the auspices of the Science Council of Japan.

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This English version is a translation of the original written in Japanese.

## **Executive Summary**

### **I Background**

As the time for establishing the 7th Science and Technology Innovation Basic Plan (hereinafter referred to as the “Basic Plan”) approaches, this document was compiled as a recommendation based on bottom-up discussions from the academic community of Japan, with the aim of promoting the further development of academia to enable the maximum utilization of academic knowledge for addressing the various challenges surrounding contemporary society and of outlining a desired society of the 2030s, while keeping in mind a top-down science and technology policy centered on responding to policy issues.

### **II Current Situations and Issues**

In recent years, various changes have been accelerated at an unprecedented rate, having been affecting both domestic and international societies. For example, at the national level, Japan has been facing population decline, particularly the significant decrease in the younger generation and the arrival of a super-aging society, as well as the excessive concentration of population and public resources in urban areas. Additionally, changes in Japan's international standing in economics and academia have been progressing. On a global scale, issues such as climate change, the spread of large-scale infectious diseases, geopolitical shifts, and the rapid development of information technology (IT) including artificial intelligence (AI), are advancing with impacts that were unforeseeable based on past experiences. In contemporary society, disparities in employment and the economy, digital divide, and concerns about the future environment and health have emerged. In response, there is a growing movement to promote the well-being of each individual as a fundamental value that human beings aspire to, and to call for efforts to achieve the Sustainable Development Goals (SDGs), which are set to be achieved by 2030. Furthermore, the issues that the world will need to address in the future are also beginning to be explored. Academia has supported society by generating new concepts and theories through unfettered thoughts, as well as through future forecasting and human resource development. In particular, science and technologies, which rely heavily on public funding in contemporary society, require support from societal members and industry sectors that provide such funding. Additionally, the total amount and distribution methods of the public funding significantly influence the overall development of academia. Currently, amid a significant decline in the young population that will bear the future of academia in Japan, the crisis in research capabilities has become increasingly serious due to the decrease in

the number of students enrolling in doctoral programs and the shortage of human resources who lead academia.

In order to overcome these situations, to promote academic activities, and to create positive outcomes for society, it is essential to attract a greater diversity of talent to academic research. The key factor for that is not short-sighted approach but the establishment of attractive career paths for various professions related to academia and research activities, a balanced allocation of foundational funding and competitive grants to support the activities of research personnel, and furthermore as a foundation for all of these, the expansion of support for academia from society. From an industrial perspective, while there are growing expectations for entrepreneurship based on academic achievements, it is hoped that this trend will become more active internationally. Alongside, the situations in the eyes of the international community have reached to the point that the interference in academic activities from foreign countries and the use of information without reciprocity or permission are not only a concern for academic freedom, but also a risk to national and economic security. How to ensure research integrity is now a matter that the scientific community in Japan must address autonomously, and it is necessary to consider how to continue to address research integrity in Japan so that the research integrity in academic activities meet international standards while maintaining academic freedom. In order to achieve these goals, it is essential to explore and realize a vision for the future of society and academia that have desirable properties such as economic and social sustainability, resilience, and inclusivity. By taking into account these current social conditions, we hereby submit our recommendations for the 7th Basic Plan. These recommendations are based primarily on the findings compiled through the activities of the Science Council of Japan of the 25<sup>th</sup> term, and they reevaluate the changes in social conditions since the formulation of the 6th Basic Plan from the perspective of science, technology, and innovation policy, while also incorporating new insights and topics.

### **III Contents of the Recommendation**

#### **1. Establishing systems and initiatives to enable inclusive science, technology, and innovation that effectively address urgent challenges such as large-scale infectious diseases, climate change, and the rapidly aging and low-birthrate society and that respond to the transformative impact of rapid transformation brought by advancements in data science, including the development of generative AI.**

- (1) Establishing a system to promptly initiate research and investigation in response to unforeseeable large-scale disasters, spread of infectious diseases, and other emergencies, and building a framework that is capable of responding to such crises including disasters and infectious diseases and ensuring societal resilience.
- (2) Transitioning to a carbon-neutral society that harmonizes with the concept of

nature-positive through the utilization of the circular economy: Building a sustainable and resilient society.

- (3) Ensuring competitiveness in AI research with a foresight to future developments in AI research, establishing framework for the safe and secure implementation of AI in society, and ensuring its international applicability in legal systems.
- (4) Promoting policy formulation based on strategic intelligence
- (5) Strengthening responses to ethical, legal, and social issues to promote and advance research.
- (6) Strengthening collaboration among industry, academia, government, and citizens through the use of civic tech and citizen science
- (7) Appropriately ensuring research integrity in the process of opening access to and internationalization of research activities

**2. Supporting a broad and diverse range of research fields, including fundamental and traditional academic disciplines, in addition to research contributing to solving pressing issues, and enhancing research capabilities through the continuous accumulation of knowledge and technological advancements.**

- (1) Strengthening comprehensive policies to improve the research environment contributing to enhancing research capabilities
- (2) Transitioning to research evaluation system that takes social impact into consideration and avoids an overemphasis on quantitative evaluation
- (3) Reviewing the allocation of research funds to create results with academic and social impact
- (4) Promoting academic development in each region of Japan in light of population decline and a super-aging society
- (5) Establishing a foundation to further promote integrity in research activities

**3. Promoting the accumulation and open access to knowledge and data as public goods and responding to new scientific and technological innovations through the further advancement of data science.**

- (1) Development, strengthening, and utilization of knowledge base including data from papers and research data
- (2) Visualization of Japanese research through the formulation of a national strategy across ministries and agencies regarding Persistent Identifiers (PID)
- (3) Distribution and utilization of data across all sectors including industry, academia, government, and citizens
- (4) Strengthening research on metascience and Science of Science that foresee the future of science

**4. Developing highly skilled professionals with diverse career across all fields and**

**strengthening mechanisms that enable these professionals to demonstrate their expertise effectively in various situations.**

- (1) Cultivating human resources capable of responding to diversifying and increasingly serious social issues
- (2) Enriching the environment for nurturing doctoral talent by enhancing the appeal and advantages of graduate school education
- (3) Improving mobility to demonstrate international leadership going beyond disciplinary boundaries