Grants-in-Aid for Scientific Research: Reforms and Future Challenges

Katsuhiko Sato
President, National Institutes of Natural Sciences

As a theorist in the fields of cosmology and astrophysics, I personally do not need large sums of funding for my own research. That said, the allowance I receive from my school (an administrative budget after the school's incorporation as a national university) for basic expenses is in no way nearly enough to cover the expenditures I incur for computing facilities and travel associated with my participation in international conferences and research colloquia. My research activities to this day have been made possible by the Grants-in-Aid for Scientific Research (Kakenhi), and for that, I am deeply grateful.

In particular, back in 1982, the year I was given an assistant professorship by the University of Tokyo, it would have been impossible to start a research lab without grant funding because my lab at the time was completely devoid of personal computers, computer terminals, or anything else. I secured basic research funding for a project under the Grants-in-Aid for General Scientific Research (C) category and proceeded to equip the lab with essentials for my work using those funds as well as funds from projects in Grants-in-Aid for Co-operative Research and Grants-in-Aid for Scientific Research for Priority Areas. As the number of graduate students climbed and I became increasingly involved in collaborative efforts with space observation groups and in joint research projects with researchers from other universities, I secured larger grants for Centers of Excellence (COE) research and projects under the Grants-in-Aid for Scientific Research (S) category, and in the process, began to demonstrate improved results.

When I first began receiving Kakenhi, that funding could not be utilized to cover my expenses for travel outside Japan, nor could it even be used to fund travel by graduate students inside Japan. Moreover, grant funding for a given fiscal period was only available up to around February of that fiscal year and thus not always very easy to utilize. By some accounts, Kakenhi was rumored to be worth only half value compared to grant funds in equivalent amounts from private-sector science promotion foundations. However, reforms to the Kakenhi system made huge strides and the grants themselves became vastly easier to utilize after the Japan Society for the Promotion of Science

(JSPS) assumed the management of Kakenhi and the Research Center for Science Systems was placed into operation.

In particular, starting in fiscal 2003, recipients were allowed to carry unused grant funding forward to subsequent fiscal years. Further, in fiscal 2011, the grant system became partially fund-based, thus significantly alleviating one of the obstacles posed by the single-year system. Although I would like to see the grant system become entirely fund-based eventually, from an ease-of-use standpoint, it has already become a magnificent system in its own right. In fact, by that measure, members of the research community already rank it among the best of any of the public grant systems in operation in Japan today.

Nevertheless, turbulent trends within international society together with a declining birthrate and demographic aging in Japan have placed conventional approaches to scientific research in question, and demand additional reforms to the grant system in response. In recent years, the need for research that can bring practical outcome to help revive the weakened Japanese economy has been widely trumpeted. Some commentators have even argued that the system of Kakenhi should be downsized and the funding be diverted to other budget allocations for science and technology. Although this system of grants was designed to contribute to humankind through the creation of knowledge based on scientific research rather than fund solutions to near-term problems, it has naturally reinforced Japanese society's foundations in science and technology and helped cultivate a broader pool of human talent through research activity, thus making an immense contribution to Japan's powers of innovation in turn. One almost never hears members of the business community voicing a desire for individual technological innovations that will lead to direct economic benefits. They more likely want to see researchers use their creativity to make new discoveries that can unlock hitherto undreamed-of doors to new business endeavor or provide fresh angles for penetration into even newer fields of research. These are precisely the benefits that can help to build a stronger Japan, and it is within that context that the system of Kakenhi has served an instrumental role.

Half of Japan's national budget is covered by government bonds and public debt. In view of that reality, the task of maximizing the benefits of grant funding calls for uninterrupted efforts in structural reform. Released in July 2014, the findings of the Science Map 2010 and 2012 surveys indicate that in comparison with other nations

worldwide, Japan accounts for a dominant share of cited research literature in traditional, established fields of endeavor but a relatively small share of cited literature in new or multi-disciplinary fields.[1] Looking forward to the future, the creation of new, multi-disciplinary fields seems essential. A new category for Challenging Exploratory Research has already been set up under the Kakenhi system and the List of Categories, Areas, Disciplines, and Research Fields has been subject to occasional review and revision. Steps also have been taken to support research in multi-disciplinary fields through the creation of time-limited Disciplines and Research Fields. However, one apparent problem is that the list of Research Fields has already become too elaborate and may interfere with multi-disciplinary research with neighboring fields. Multi-disciplinary research conceivably would be more readily facilitated if the Disciplines and Research Fields were significantly consolidated and streamlined. That said, consolidation itself would not be an easy task. Many subcommittees or breakout sessions that are conducted alongside the annual conferences of various academic societies are frequently named after the Disciplines and Research Fields in which they are focused, and for some researchers, those Disciplines and Research Fields represent the essence or core of their own expertise. At the consolidation stage, the task of screening would be a huge hurdle accompanied by inevitable changes to the screening process itself.

I currently head the Subcommittee on Grants-in-Aid for Scientific Research, a body set up under the Subdivision on Technology (chaired by Shinichi Hirano) of MEXT's Council for Science and Technology. The Subdivision has been engaged in a discussion of the purpose of scientific research and other fundamental topics, and in May 2014 finished an interim report titled "Gakujutsu kenkyu no suishin hosaku ni kansuru sogoteki na shingi ni tsuite" (A comprehensive investigation of strategies for the promotion of scientific research). That report places emphasis on scientific research as a source of innovation and true national strength, and calls for an expansion of Kakenhi as a foundation of support for such research. These points motivated the Subcommittee to formulate fundamental views on reforms to the Kakenhi system and the orientation of specific strategies to that end. In September this year, we published our work in an interim report titled "Wagakuni no gakujutsu kenkyu no shinko to kakenhi kaikaku ni tsuite" (The advancement of scientific research in Japan and reforms to the Kakenhi system). Specific recommendations for the next Subcommittee meeting will be prepared

---

[1] National Institute of Science and Technology Policy (MEXT). Science Map 2010 & 2012, NISTEP Report No. 159, July 2014. (http://www.nistep.go.jp/research/sciencemap)

by an internal working group in collaboration with the JSPS Research Center for Science Systems. I would like to receive comments and opinions from many researchers on the subject of reforms to the Kakenhi system.