

The basic approach for the Moonshot Research and Development Program

Council for Science, Technology and Innovation (CSTI)

Headquarters for Healthcare Policy

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1. Purpose of the Program

Japan is now faced with many difficult issues, such as an aging and declining population, extreme natural disasters, and global climate change. These issues should be addressed and resolved by science and technology so that we may bring a better future to our society.

Under the circumstances, to overcome these difficult challenges without being afraid of failure, the ImPACT program, a five-year research and development program, was established in 2013 as a new framework to develop the growing fields in the future.

Research and development (R&D) in the ImPACT program had high-risk/high-impact characteristics with no guarantee of success, but this R&D was also expected to have a profound impact on our industry and society once the goals were achieved. In the ImPACT program, we recruited researchers with highly ambitious research concepts and ideas, and selected excellent researchers who have challenging spirits as the Program Managers, and delegated R&D management authorities to them.

These Program Managers have crossed the boundaries of traditional

organizations and research disciplines to bring together various knowledge and ideas for high-risk/high-impact R&D activities that could not be implemented in traditional national projects. Their efforts have achieved some significant results in a very short time. On the other hand, there have been approaches that were neither daring nor original enough to meet the Program's expectations for future disruptive innovations and high-impact. In addition, concerns have been raised over the lack of participation by foreign researchers and international collaborations. These suggested that the Program needed to be improved further.

Outside Japan, the European Union, the United States, and China aim to introduce disruptive innovation by announcing their ambitions and setting their goals for resolving difficult social issues in a manner that was unthinkable in the past. These countries accelerate high-risk/high-impact R&D by a much larger scale of investment than Japan does.

Their R&D management is to seek the top researchers from all over the world, bring together their wisdom, and incorporate various ideas for business while building an open innovation platform that emphasizes speed and global aspect.

Against this background, the new Moonshot Research and Development Program ("the Program") aims to create disruptive innovations from Japan and promotes challenging R&D based on revolutionary concepts that are not simply the extension of existing technologies, i.e. moonshots.

Under the Council for Science, Technology and Innovation (CSTI) and the Headquarters for Healthcare Policy, the relevant ministries and offices will cooperate to drive the Program collectively according to the principles including the following:

- a. Set ambitious goals ("Moonshot Goals") and concepts to attract people for

social issues that are difficult to tackle but will have profound impact once resolved, and aim to achieve the Moonshot Goals by bringing together wisdom from all over the world under the direction of top researchers.

- b. Insights and ideas that were still in their basic research yesterday are being applied to industry and society today at an astonishing speed, and disruptive innovations are occurred in many areas. In this situation, the Program will vigorously drive highly ambitious R&D that will maximize Japan's basic research capabilities to identify and develop revolutionary research projects without fear of failure.
- c. The Program will be managed in a new manner that will always be aware of developments in global R&D so that the relevant R&D activities can be optimized as a whole, with flexibility for their organizational structures and their activities to establish a world-leading R&D framework. In addition, to smoothly promote practical use of R&D results in society, the program will provide opportunities for researchers' communications with diverse people and establish a structure that enables researchers in various fields, including humanities and social sciences, to participate in R&D activities to respond to ethics, legal systems, and social issues. Furthermore, opening and closing strategies will be fully implemented to allow for future commercialization.

The National Research and Development Agencies (“the research promotion agencies”) tasked with this challenging R&D initiative are the Japan Science and Technology Agency (JST), the New Energy and Industrial Technology Development Organization (NEDO), Bio-oriented Technology Research Advancement Institution / National Agriculture and Food Research Organization (BRAIN/NARO), and the Japan Agency for Medical Research and Development (AMED). Program funds have been established for these agencies.

2. Basic Program Framework

For the purpose of the Program, the Cabinet Secretariat (CAS), the Cabinet Office (CAO), the Ministry of Education, Culture, Sports, Science and Technology (MEXT), the Ministry of Health, Labour and Welfare (MHLW), the Ministry of Agriculture, Forestry and Fisheries (MAFF), and the Ministry of Economy, Trade and Industry (METI) will collaborate to promote R&D under the following framework.

- (1) The CSTI and the Headquarters for Healthcare Policy each decide the Moonshot Goals, considering input from external experts. The expert members of the CSTI and under the relevant committees of the Headquarters for Healthcare Policy will offer high-level advice to effectively guide the entire Program to achieve the Moonshot Goals.
- (2) Cooperating with the relevant ministries and offices and considering the advice from the expert members, the CAS and CAO implement the following:
 - Coordinate the Moonshot Goal candidates¹.
 - Establish an organizational structure for relevant government agencies to promote related R&D through collaboration.(establish the Strategy Council (Tentative name))
 - Set guidelines for operation and evaluation of the Program that defines the process of Program Director's (PD's) appointment and Project Managers' (PMs') recruitment and selection, the procedures of middle-term/final evaluations and evaluation perspective, etc.
 - Promote related R&D strategically and collectively to achieve the Moonshot Goals, based on the discussions in the Strategy Council (tentative name).

¹The CAO coordinates the Moonshot Goals to be decided by CSTI, and the CAS coordinates the Moonshot Goals to be decided by the Headquarters for Healthcare Policy.

- (3) The CAO, the MEXT, the MHLW, the MAFF, and the METI holding jurisdiction over each research promotion agency are tasked with the following:
- Formulate the R&D concept that defines areas and fields in which R&D should be promoted, cooperating with other relevant ministries to achieve the Moonshot Goals.
 - Promote related R&D strategically and collectively, cooperating with the CAS or CAO to achieve the Moonshot Goal, based on the discussions in the Strategy Council (tentative name).
 - Give instructions to the related research promotion agencies.
- (4) Each research promotion agency implements R&D activities to achieve the Moonshot Goals by:
- Appointing PD, and recruit/select PMs.
 - Establishing organizational structure for R&D activities and implement the related investigations and analysis.
 - Implementing related R&D strategically and collectively, cooperating with the CAS or CAO and the relevant ministries and offices to achieve the Moonshot Goal, based on the discussions in the Strategy Council (tentative name).
 - Managing the progress of R&D, including middle-term /final evaluations, and other methods.
- (5) The CAS or the CAO will set detailed management policies for the Program separately if necessary, cooperating with the relevant ministries and offices.