May 11, 2020

Moonshot Agriculture, Forestry, and Fisheries Research and Development Program

Project Manager Recruitment Explanatory Materials

BRAIN

*BRAIN stands for Bio-oriented Technology Research Advancement Institution

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1. Moonshot Agriculture, Forestry, and Fisheries Research and Development Project

<Framework of Measures>
Set challenging goals for social issues that are expected to have a significant impact if achieved and **establish a fund at the Bio-oriented Technology Research Advancement Institution** with the Japan Science and Technology Agency (JST) and the New Energy and the Industrial Technology Development Organization (NEDO) **to promote research and development** to achieve these goals.

<Policy Objective>
Achievement of research results for industrial innovation and social transformation (by 2050).

<Project Description>

○ The Project promotes research and development to achieve **Moonshot Goal 5 "The creation by 2050 of industry that enables sustainable global food supply through the exploitation of unused biological resources,"** one of the six Moonshot Goals.

    [Budget approved for 2020: 100 (-) million yen] (supplementary budget for 2019: 5,000 million yen)
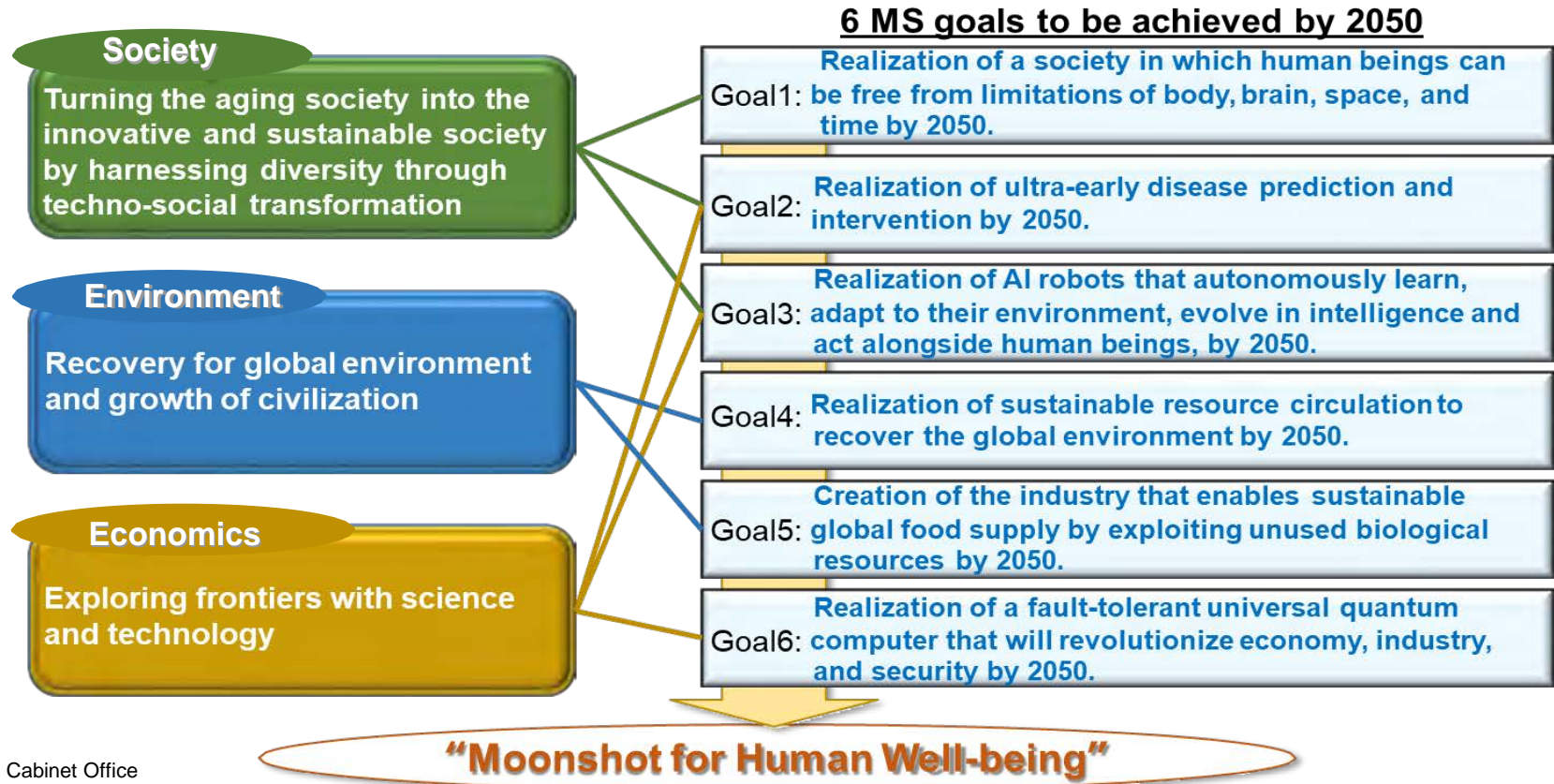
Outline

To develop radical solutions for difficult societal challenge, the Government of Japan (GOJ) set inspiring and ambitious goals for challenging R&D.

Goals

To realize "Human Well-being", six Moonshot goals (MS goals) were decided in the area of society, environment, and economics. **(Council for Science, Technology and Innovation. Jan.23, 2020)**

Society

Turning the aging society into the innovative and sustainable society by harnessing diversity through techno-social transformation

Environment

Recovery for global environment and growth of civilization

Economics

Exploring frontiers with science and technology

6 MS goals to be achieved by 2050

Goal1: Realization of a society in which human beings can be free from limitations of body, brain, space, and time by 2050.

Goal2: Realization of ultra-early disease prediction and intervention by 2050.

Goal3: Realization of AI robots that autonomously learn, adapt to their environment, evolve in intelligence and act alongside human beings, by 2050.

Goal4: Realization of sustainable resource circulation to recover the global environment by 2050.

Goal5: Creation of the industry that enables sustainable global food supply by exploiting unused biological resources by 2050.

Goal6: Realization of a fault-tolerant universal quantum computer that will revolutionize economy, industry, and security by 2050.

"Moonshot for Human Well-being"
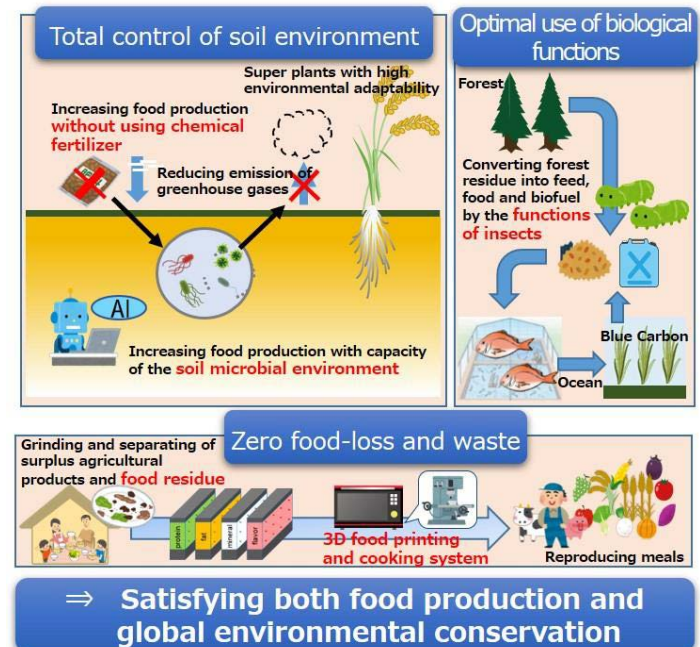
* Source: Cabinet Office

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○ **Moonshot Goal 5**

Creation of the industry that enables sustainable global food supply by exploiting unused biological resources by 2050.

○ **Targets**

・Technical development of the circular food production systems by biological measures, e.g. utilizing microbes and insects, by 2050.

・Development of technical solutions for eliminating food loss and waste and for achieving both healthy life and sustainable food consumption by 2050.

・Evaluation of the technical achievements and discussion on the ethical, legal and social implications (ELSI) matters will be done by 2030, for global spread of the technology by 2050

(Reference)

Total control of soil environment

Super plants with high environmental adaptability

Increasing food production **without using chemical fertilizer**

Reducing emission of greenhouse gases

AI

Increasing food production with capacity of the **soil microbial environment**

Optimal use of biological functions

Forest

Converting forest residue into feed, food and biofuel by the **functions of insects**

Blue Carbon

Ocean

Grinding and separating of surplus agricultural products and **food residue**

Zero food-loss and waste

3D food printing and cooking system

Reproducing meals

⇒ **Satisfying both food production and global environmental conservation**

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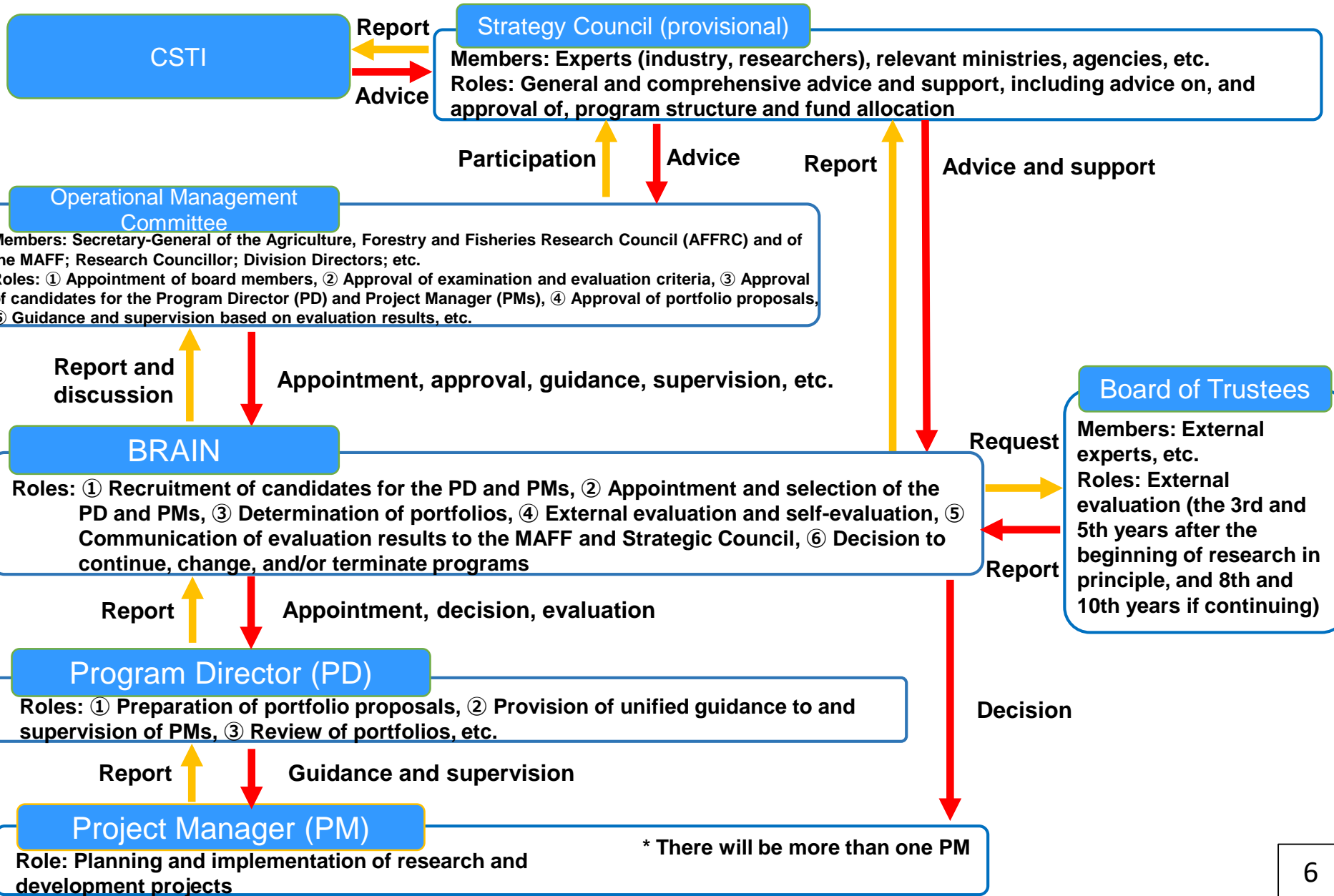# 1-3. Moonshot Goal 5 Research and Development Plan

- The Project will conduct research and development combining various research ideas, taking as its basis the Research and Development Plan set out by the Ministry of Agriculture, Forestry and Fisheries (MAFF) to achieve the fifth Moonshot Goal set by the CSTI.
- Visit the link below for the Project's development plan.

(Development Plan for the Project)
https://www.affrc.maff.go.jp/docs/moonshot/attach/pdf/moonshot-9.pdf

2. Project Promotion Framework ①

CSTI

Report

Advice

Strategy Council (provisional)
Members: Experts (industry, researchers), relevant ministries, agencies, etc.
Roles: General and comprehensive advice and support, including advice on, and approval of, program structure and fund allocation

Participation

Advice

Report

Advice and support

Operational Management Committee
Members: Secretary-General of the Agriculture, Forestry and Fisheries Research Council (AFFRC) and of the MAFF; Research Councillor; Division Directors; etc.
Roles: ① Appointment of board members, ② Approval of examination and evaluation criteria, ③ Approval of candidates for the Program Director (PD) and Project Manager (PMs), ④ Approval of portfolio proposals, ⑤ Guidance and supervision based on evaluation results, etc.

Report and discussion

Appointment, approval, guidance, supervision, etc.

BRAIN
Roles: ① Recruitment of candidates for the PD and PMs, ② Appointment and selection of the PD and PMs, ③ Determination of portfolios, ④ External evaluation and self-evaluation, ⑤ Communication of evaluation results to the MAFF and Strategic Council, ⑥ Decision to continue, change, and/or terminate programs

Request

Report

Board of Trustees
Members: External experts, etc.
Roles: External evaluation (the 3rd and 5th years after the beginning of research in principle, and 8th and 10th years if continuing)

Report

Appointment, decision, evaluation

Program Director (PD)
Roles: ① Preparation of portfolio proposals, ② Provision of unified guidance to and supervision of PMs, ③ Review of portfolios, etc.

Decision

Report

Guidance and supervision

Project Manager (PM)
Role: Planning and implementation of research and development projects

* There will be more than one PM

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2. Project Promotion Framework ②

○ Roles of the PD

Kazuhiro Chiba, President of Tokyo University of Agriculture and Technology, has been appointed as the PD. The PD plays the following primary roles:
① Creation of a Portfolio as well as ambitious and systematic promotion of research and development.
② Continuous grasping of the progress of research and development, review of the Portfolio according to the progress of the research, and provision of unified guidance and supervision to PMs.
③ Conduct review of the Portfolio based on evaluations and advice from external experts.

○ Roles of PMs

PMs are required to manage each Project under their own direction by engaging in challenging research. Listed below are the principal roles of PMs:
① Formulation of project plans (establishment of project goals, creation of research and development descriptions and the implementation schedule, construction of the implementation framework, development of plans for the allocation of research funds to research institutes participating in Projects, etc.) and implementation of Projects. They are also required to make agile and flexible changes of direction, including modification of Projects.
② Management of intellectual property and information to actively and strategically promote international cooperation.
③ Evaluation of research while seeking to use private funds. Additionally, PMs have the responsibility to conduct interactive communication activities (dialogue on science and technology with the public) to provide a clear explanation of the Projects to the public.
④ Formulation of a data management plan (DMP) as well as the aggregation of the metadata of the managed data from researchers and its submission. The research data infrastructure system, etc., are used to store and share the managed data to the extent necessary.

3. Application Requirements etc. ①

○ Requirements for Representative Organizations

A representative organization is the institution to which a PM belongs. The requirements for representative organizations are as follows:
① To be a research institute, etc., with legal personality, such as a private company, technology research association, public-benefit or general corporation, national research and development corporation, university, local government, non-profit corporation, or cooperative association.
② To be qualified to compete for selection by the MAFF (qualification for all ministries and agencies) in the Service Provision (Investigation and Research) Sector in Financial Year (FY) 2019, 2020, and 2021. It is not necessary for local governments to apply for qualification.
③ To be able to agree to the commission contract presented by BRAIN.
④ To have legal personality in Japan and have their base of operations in Japan.
⑤ To have a management system established for the execution of project expenses, such as an accounting system to facilitate separate accounting, the appointment of an accounting manager, and confirmation of the execution of expenses.
⑥ To have the ability and system established to smoothly conduct coordinating operations such as dissemination of research results and coordination with joint research institutes.

○ Requirements for PMs

•PMs are required to be capable of fulfilling all the roles of PMs (described on the previous page).
•PMs can be of any nationality; however, they must be based in Japan after being appointed as a PM.

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○ Requirements for Research Groups

Research Groups must meet the following requirements:
① All institutions participating in a Research Group must agree to conduct joint research.
② Research Groups must be able to achieve one of the following tasks:
  (i) Development of regulations regarding the research and development project to be implemented (regulation method).
  (ii) Mutual agreement between the participants in the Research Group on the research and development project to be carried out (agreement method).
  (iii) Establishment of a joint research agreement (joint research method).
③ Research Groups are required to prepare an agreement on the basic treatment of intellectual property (Intellectual Property Rights Agreement) in accordance with the commission agreement at the initial stage of research, establish an Intellectual Property Steering Committee, formulate an intellectual property rights policy to specify the plan regarding the acquisition of rights to research results, etc., to manage intellectual property.
④ The financial status of the research institutes constituting a Research Group must be stable.

3. <mark>Application Requirements etc.</mark> ③

○ Requirements for Joint Research Institutes

Joint research institutes (other than representative organizations participating in a Research Group) must meet the following requirements:
① To have the abilities and systems in place to carry out appropriate management and operation in conducting relevant research.
② To have the abilities and systems prepared to smoothly execute research and mutual adjustment with relevant organizations.
③ From the perspective of appropriate management of implementation, foreign research institutions participating research must have a contact or an agent in Japan capable of handling paperwork related to commissioned research, etc.
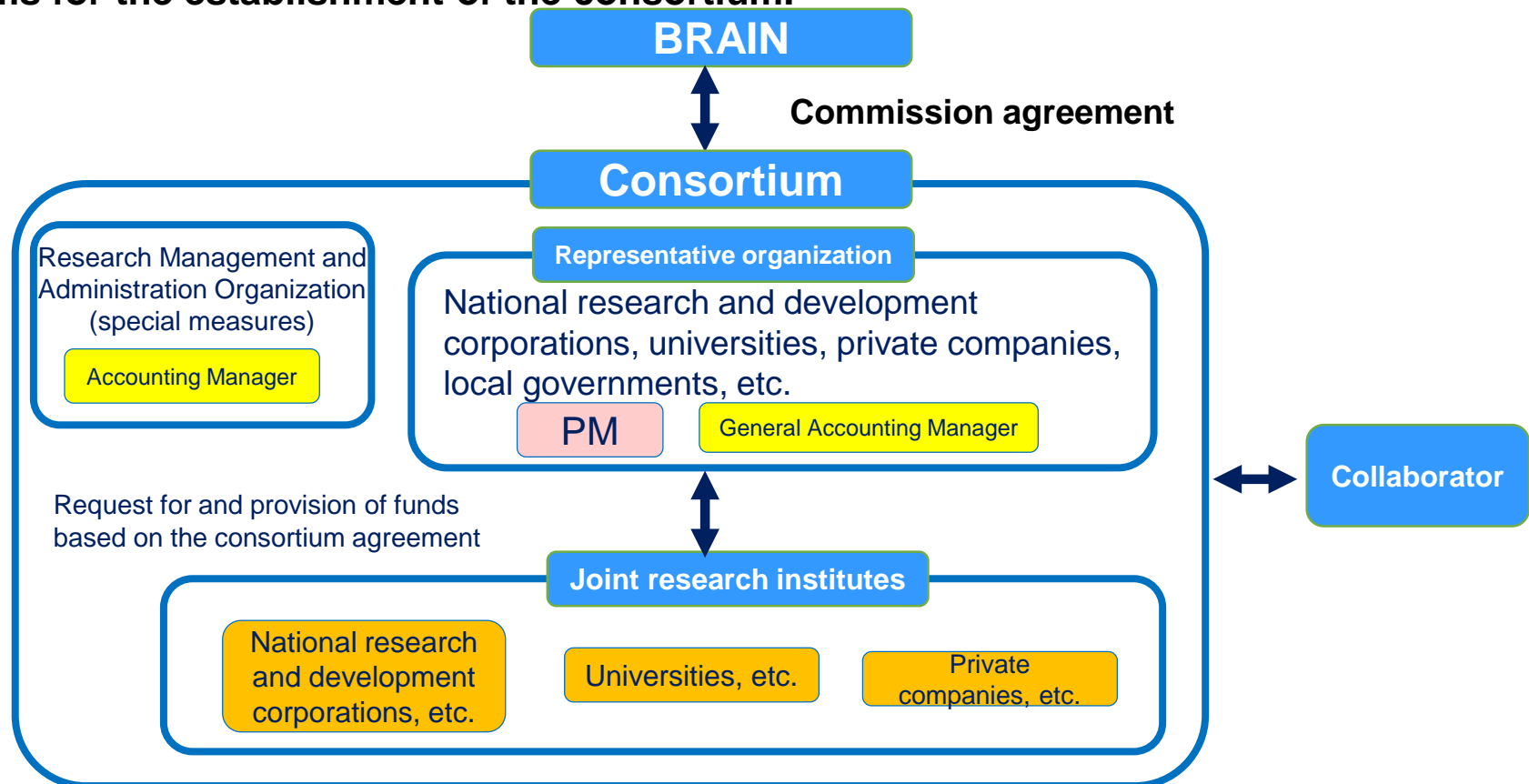
○ Collaborators

  Collaborators (third parties whose cooperation is required for the implementation of research and development are treated as follows:
① Research finds will not be allocated directly to collaborators. Necessary expenses will be paid by representative organizations or joint research institutes in the form of outsourcing, requested business trips, awards, etc.
② Collaborators cannot own patents. However, they will be allowed to have a share of intellectual property only in cases where the BRAIN approves the reason for adding a collaborator as a joint applicant specified by the representative institution or a joint research, a joint application agreement is signed, and the members of the Research Group reach an agreement.
③ Collaborators cannot present the results of research projects alone; however, they are allowed to present such results with joint research institutions.
④ Collaborators are subject to neither the provisions of the commission agreement nor confidentiality obligations, but since they are in a position to know the purpose, details, and results of research, it is necessary to set forth confidentiality in an Intellectual Property Rights Agreement, etc., to prevent divulging of results, etc.

○ Consortium Structure

Research Groups may be changed as a result of the creation of portfolios following the appointment of PMs. However, they should be prepared for the establishment of a consortium in advance so that they can submit the necessary documents, including the terms for the establishment of the consortium.

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Commission agreement

Consortium

Research Management and Administration Organization (special measures)

Accounting Manager

Representative organization

National research and development corporations, universities, private companies, local governments, etc.

PM | General Accounting Manager

Request for and provision of funds based on the consortium agreement

Joint research institutes

National research and development corporations, etc.

Universities, etc.

Private companies, etc.

Collaborator

4. Application Procedures

○ How to Apply

To apply, PMs should use the Cross-Ministerial Research and Development Management System (e-Rad) and summarize the content of the research to be conducted by the Research Group.

○ Application Form

Fill out Appendix 5: Project Plan Proposal to prepare a proposal. Download the application form from our website.
(http://www.naro.affrc.go.jp/laboratory/brain/moon_shot/koubo_PM/index.html)

○ Instructions on Preparation of a Project Plan Proposal

• The research period is 5 years in principle; however, since it can be extended up to 10 years, applicants should prepare a project plan for the required research period.

• The scenario to be created in Forms 1 and 2 needs to include a specific description of the target year and goals to be achieved during the period between the present and the achievement of Moonshot Goal 5 in 2050. Moreover, the scenario should separately describe the development and demonstration of a prototype aimed for during the project period from 2020 to 2030, as well as the prospects for its practical application, commercialization, and dissemination from 2030 to 2050 post the completion of the Project.

• Based on the scenario, describe milestones (goals to be achieved) for the third and fifth years (or eighth and tenth years, if the research lasts for ten years) in Form 3.

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(Reference) Application on e-Rad ①

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[Application]

(1) Application period
◆ **May 11 (Monday)–July 20 (Monday); 12:00**

(2) How to use e-Rad

◆ **All applications for this project must be submitted via the Cross-Ministerial Research and Development Management System e-Rad**

◆ **Applicants must register their research institutes and researchers prior to access to e-Rad**

◆ **To register the research institute and researchers (individual), apply to the official in charge of e-Rad at the Ministry of Education, Culture, Sports, Science and Technology (MEXT).**
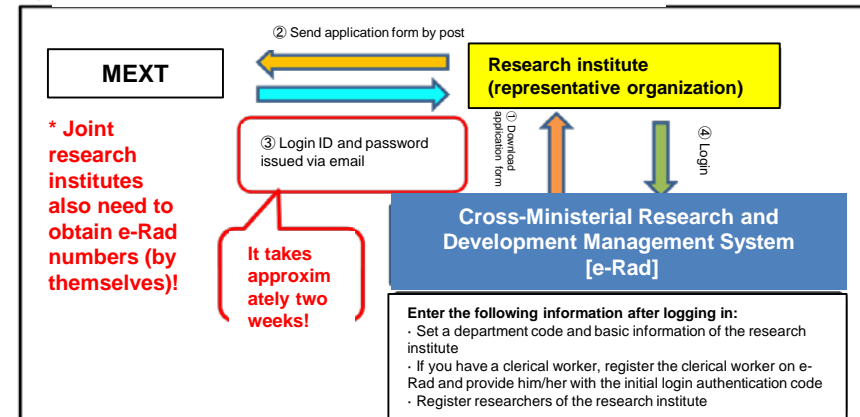
Note: Apply as early as possible because it takes approximately two weeks to complete the registration process

◆ **Prepare the application form (research proposal)**

◆ **Enter basic information on e-Rad**

◆ **Attach the application form (research proposal) (PDF file only)**

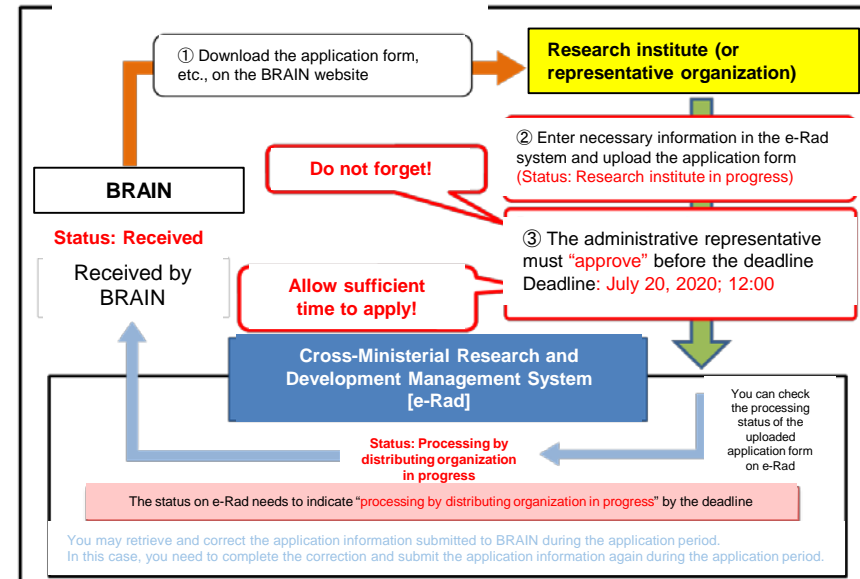◆ **Processing and confirmation of approval by the administrative staff of the representative organization**

Note: Allow sufficient time to register your application on e-Rad, as it may be difficult to connect to the system just before the deadline due to a rush of applications.

Application process on e-Rad

○ Application procedures for registration of research institutes

② Send application form by post

MEXT

Research institute (representative organization)

③ Login ID and password issued via email

① Download application form

④ Login

* **Joint research institutes also need to obtain e-Rad numbers (by themselves)!**

It takes approximately two weeks!

Cross-Ministerial Research and Development Management System [e-Rad]

Enter the following information after logging in:
· Set a department code and basic information of the research institute
· If you have a clerical worker, register the clerical worker on e-Rad and provide him/her with the initial login authentication code
· Register researchers of the research institute

○ Application procedures for research plans

① Download the application form, etc., on the BRAIN website

Research institute (or representative organization)

② Enter necessary information in the e-Rad system and upload the application form (Status: Research institute in progress)

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Do not forget!

③ The administrative representative must "approve" before the deadline
Deadline: July 20, 2020; 12:00

Status: Received
Received by BRAIN

Allow sufficient time to apply!

Cross-Ministerial Research and Development Management System [e-Rad]

You can check the processing status of the uploaded application form on e-Rad

Status: Processing by distributing organization in progress

The status on e-Rad needs to indicate "processing by distributing organization in progress" by the deadline

You may retrieve and correct the application information submitted to BRAIN during the application period.
In this case, you need to complete the correction and submit the application information again during the application period.

All applications for this project must be submitted via the Cross-Ministerial Research and Development Management System (e-Rad).

We do not accept submissions by post, in person, or via email.

Applicants must register their research institutes and researchers prior to accessing e-Rad. Ensure to allow at least two weeks for the registration process, as it may take a few days.

Allow a week or so to register your application on e-Rad, as it may be difficult to connect to the system just before the deadline due to a rush of applications.

◆ Information website: e-Rad portal site (https://www.e-rad.go.jp/)

◆For more information on how to use e-Rad, please contact:
e-Rad Help Desk
TEL: 0570-066-877
Opening hours: 9:00 a.m.–18:00 p.m.
  * Excluding Saturdays, Sundays, national holidays, year-end, and New Year holidays (December–January 3)

5. Selection of PMs ①

○ Selection Method

PMs will be selected by the Board of Trustees based on the screening criteria. Applicants may be asked to submit additional materials along with their proposals for screening.

The screening process will not be made public. Furthermore, we will not be able to respond to inquiries regarding the progress of the screening nor will the details of the screening be made public.

Research institutes that are deemed by the Board of Trustees to be unsuitable to undertake research and development under the Project may be removed from the Research Group.

○ Screening Process

In principle, there are two stages of screening: screening of documents and interview.
① Screening of application documents
The members of the Board of Trustees will examine proposals in accordance with the screening criteria.
② Interview
Applicants whose proposals are selected in the screening stage will be interviewed, and the Board of Trustees will select the proposals to be approved.
③ Selection of PMs
After the interview, applications are checked for duplicate applications, and the research institute to which the PM belongs will be selected as a contractor based on the deliberation of the Operational Management Committee of the MAFF.

5. Selection of PMs ②

○ Screening Criteria

Proposals will be screened based on the following criteria:

① Possess a broad personal network of relevant domestic and international researchers, etc., and specialized knowledge for conducting cutting-edge research and development.

② Possess management and leadership capabilities to build an optimal research and development system and flexibly review the system in line with the progress made, etc.

③ The goals and content of the Projects proposed by PMs (hereinafter referred to as the "Proposed Content") are more challenging and innovative, based on bolder ideas than conventional projects, and are expected to have a significant impact on industry and society in the future.

④ Clearly explain a reasonable scenario (hypothesis of success) from a technological perspective and in terms of social implementation, including the division of roles between the public and private sectors to achieve the goals set for 2050.

⑤ The Proposed Content brings together top-level research and development capabilities, knowledge, and ideas from Japan and overseas.

⑥ Each participating organization has a policy on the management of intellectual property and a management system with departments and officials in charge.

⑦ The budget plan for Projects is adequately prepared without excess or deficiency.

⑧ The proposal includes the participation of many young researchers (under 40 years) (eligible for additional points), etc.

In consideration of the importance of research integrity, assurance of the transparency and integrity of research, appropriate handling of research results, and management of information will also be considered.

5. Selection of PMs ③

○ Notification of Screening Results, etc.

Applicants will be notified of the results of the screening of application documents and interview, and the application numbers given to applicants via e-Rad will be posted on the BRAIN website.

Applicants whose proposals are approved at the interview stage will be informed when they receive the result of any changes they need to make so as to conduct the research.
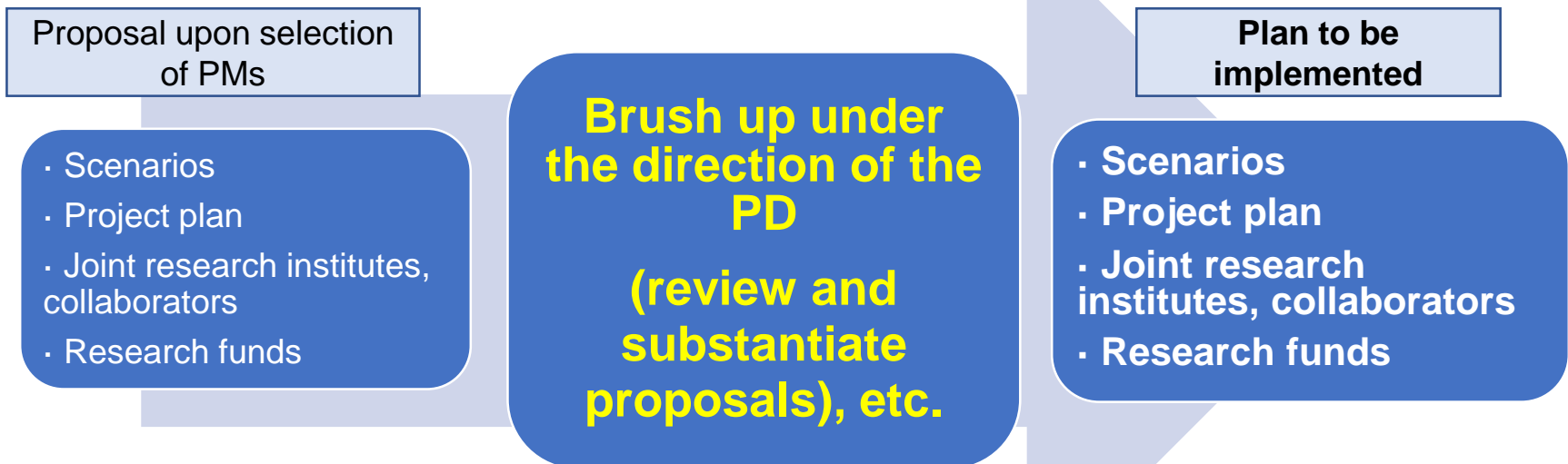
6. Refinement of Research and Development Projects

○ Steps of Refinement

Under the direction of the PD, recruited PMs will brush up (review and substantiate) the content of the Projects proposed upon submission of the application, including scenarios for achieving the Moonshot Goals, project plans, joint research institutes and collaborators (added or removed), and research funds.
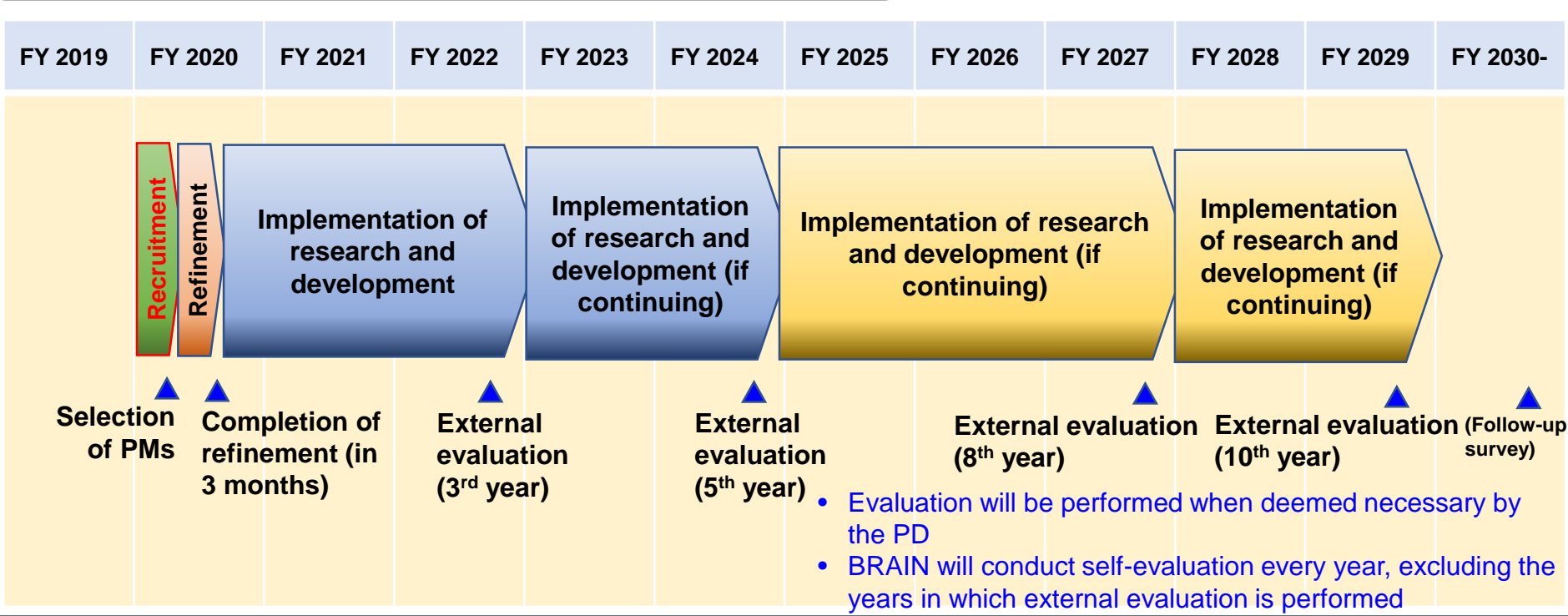
Once Projects have been refined and the creation of Portfolios, establishment of a consortium, and contract procedures are completed, the commissioned research and development will be ready to be implemented.

Proposal upon selection of PMs	Brush up under the direction of the PD (review and substantiate proposals), etc.	Plan to be implemented
· Scenarios · Project plan · Joint research institutes, collaborators · Research funds		· Scenarios · Project plan · Joint research institutes, collaborators · Research funds

7. Schedule of Research and Development Projects

![BRAIN logo]

◯ Overall Schedule

FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030-

- **Recruitment**
- **Refinement**
- **Implementation of research and development**
- **Implementation of research and development (if continuing)**
- **Implementation of research and development (if continuing)**
- **Implementation of research and development (if continuing)**

▲ **Selection of PMs**

▲ **Completion of refinement (in 3 months)**

▲ **External evaluation (3rd year)**

▲ **External evaluation (5th year)**

▲ **External evaluation (8th year)**

▲ **External evaluation (10th year)**

▲ **(Follow-up survey)**

- Evaluation will be performed when deemed necessary by the PD
- BRAIN will conduct self-evaluation every year, excluding the years in which external evaluation is performed

◯ Project Period

・ Five years in principle, may be extended up to ten years.
・ Depending on the results of evaluation, the Projects may be modified (accelerated or decelerated) or terminated.
・The CSTI will decide whether to continue or terminate the research and development (program) aimed at the achievement of the Moonshot Goals in FY 2024.

◯ Intellectual Property Management

・ **Application of the Japanese version of the Bayh-Dole Act (Article 17 of the Industrial Technology Enhancement Act)**

When a Trustee submits a written confirmation of the ownership of intellectual property in advance, BRAIN shall not claim its share of the intellectual property owned by the Trustee.

However, Article 17, Paragraph 1 of the Industrial Technology Enhancement Act shall not apply to foreign institutions, etc., and intellectual property rights shall, in principle, be shared between BRAIN and foreign institutions, etc., and at least 50% of the total equity of the Trustees and BRAIN shall belong to BRAIN.

・**Intellectual Property Rights Agreement**

An agreement on the basic treatment of intellectual property in accordance with the commission agreement must be formulated.

If a joint research institute agreement, etc., stipulates the treatment of intellectual property as required by the Intellectual Property Rights Agreement, it is not necessary to prepare a separate Intellectual Property Rights Agreement.

・**Policy on Acquisition of Rights, etc.**

A policy on acquisition of rights to intellectual property that specifies the policy regarding the acquisition of rights to research results, their confidentiality, disclosure of these through publication of academic papers, etc., and adjustments, etc., regarding decisions on standardization and licensing must be formulated based on the Intellectual Property Rights Agreement.

8. Intellectual Property ②

○ Intellectual Property Committee

Members: PD (chairperson), PMs, relevant ministries, and experts
Roles: Policy decisions on patents, etc., collaboration with consortia, adjustments
for the treatment of patents, etc., obtained from research
Office: BRAIN

○ Intellectual Property Steering Committee

Members: PD (chairperson), joint research institutes, external experts
Roles: Publication of academic papers on the research and development results, application and
maintenance of patents (including plant breeder's rights), treatment of know-how, determination
of policies on the granting of rights such as privilege, coordination of policies on the use of
intellectual property and licensing, operation of intellectual property after the Project ends, etc.
Office: Each consortium

* Establishment of the Intellectual Property Steering Committee is one of the requirements for
Research Groups.

8. Intellectual Property ③

○ **Intellectual Property Rights Arrangements**

BRAIN will decide in advance on the treatment of the following intellectual property rights and confidentiality with representative organizations under a commissioned research agreement, etc.

● **Background Intellectual Property Rights**
Background intellectual property rights are intellectual property rights held by the members of a consortium prior to participating in the research commissioned under the Project.
→The intellectual property rights required for commissioned research shall be included in advance in the Policy on Acquisition of Rights, etc.
Licensing terms may be established and used within the consortium.

● **Foreground Intellectual Property Rights**
Foreground intellectual property rights (intellectual property rights arising as a result of the implementation of the research commissioned under the Project.
→To be applied for as results of the Project, and may be shared with collaborators depending on the conditions.
Licensing terms may be established and used within the consortium.

9. Treatment of Research Results

○ Data Management

- Data obtained from publicly funded research and development is an intellectual asset shared by the public.

- The research data infrastructure system, etc., (National Institute of Informatics [NII] Research Data Cloud, etc.) will also be used to store, share, and disclose the managed data to the extent necessary.

- PMs are required to formulate a data management plan (DMP) that defines the scope, etc., of the data to be managed, compile metadata of the data to be managed submitted by researchers, and submit it to BRAIN.

- To promote open science, the Center will maintain a data catalog consisting of metadata submitted by PMs and researchers, taking into account the characteristics of the research and other factors.

10. Support for Young Researchers

○ **Support for Diverse Career Paths for Young Postdoctoral Researchers**

Provision of support to secure diverse career paths for young postdoctoral researchers when they are employed with public research funds.

○ **Employment of Students in the Second Half of Their Doctoral Program as Research Assistants (RAs)**

To attract outstanding students and working adults from Japan and abroad, the Science and Technology Basic Plan has set as a goal the provision of more financial support to graduate students, especially latter-stage doctoral students. It aims "for about 20% of (latter-stage) doctoral students to be able to receive an amount equivalent to their living expenses."

○ **Support for Young Researchers' Voluntary Research Activities**

To create opportunities for them to learn and participate in research as well as to develop their career paths, young researchers will be allowed, subject to approval by their research institutes, to allocate part of their time and resources to voluntary research activities, etc., with the expenditure of labor costs from the Projects.

11. Future Schedule (Plan)

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Publication of application guidelines	May 11, 2020

To prevent the spread of coronavirus (COVID-19), presentation meetings will not be held to explain the procedures and submission of proposals for application for the Project. Videos, etc., on the application for the Project will be posted on our website instead.

Presentation Meetings	
Application Deadline	July 20, 2020 at 12:00 p.m.
Screening of Application Documents	Early August of 2020
Interview	Late August of 2020
Selection and Official Appointment of PMs	Mid September of 2020
Refinement of Research and Development Project	September–November 2020
Establishment of Commission Agreement	From December 2020 onward

Note: The schedule is subject to change due to the current situation caused by the COVID-19 outbreak and depending on the status of screening and other factors. Any changes will be posted on our website.

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12. Contact Information

Contact the Bio-oriented Technology Research Advancement Institution (BRAIN) by sending an email to the following address:

E-mail：seiken-moonshot@ml.affrc.go.jp

(1) General Inquiries regarding Application

Strategic Research and Development Division,
New Technology Development Department, BRAIN

(2) Inquiries as regards Contract Paperwork

Research Management Division, Research Management
Department, BRAIN