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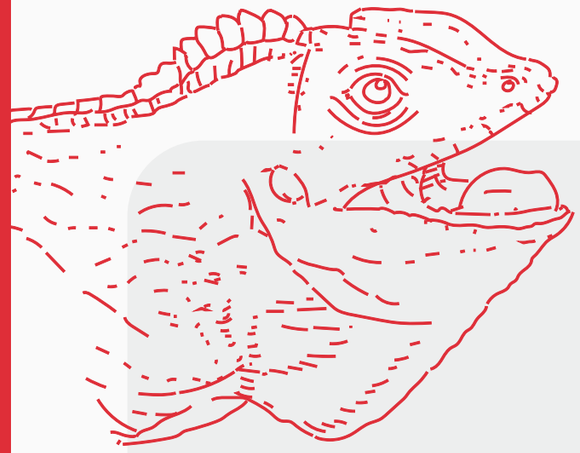

Annual Report
2023

REDISCOVERING THE NATIONAL EXCELLENCE

KDT

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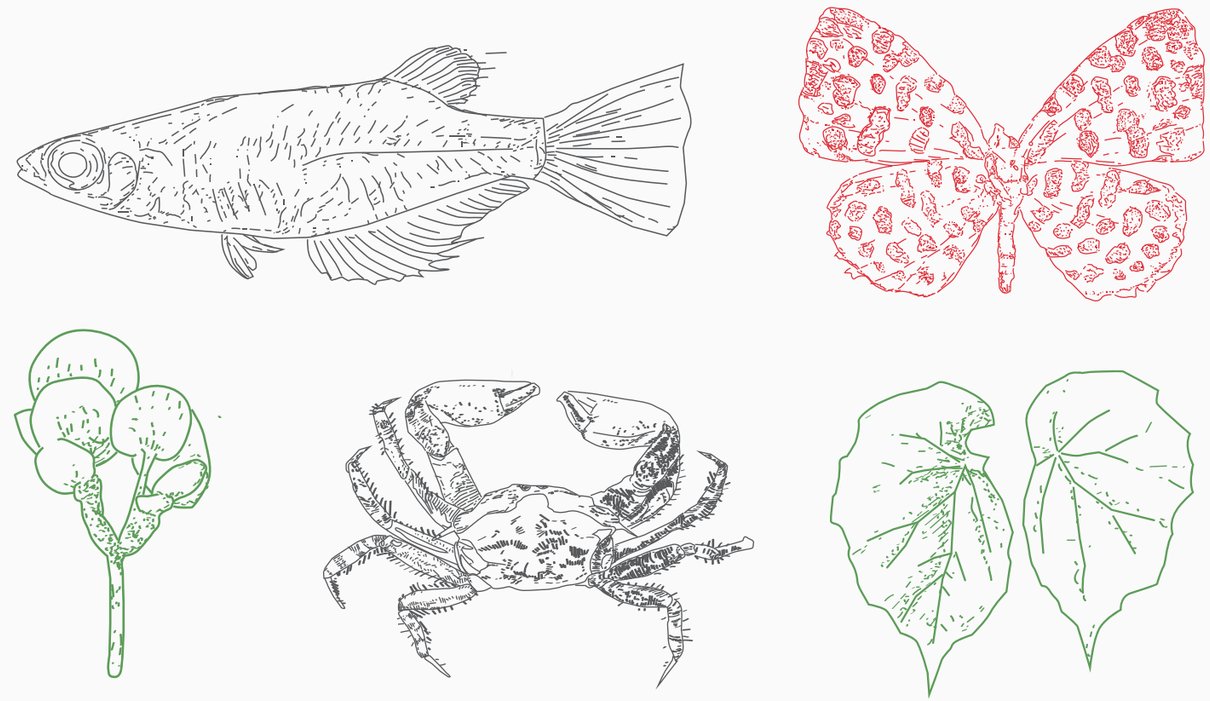

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“Research, in Indonesia, is a valuable asset of knowledge, a foundation to generate world-class innovation and innovators.”

Laksana Tri Handoko
Chairman of BRIN

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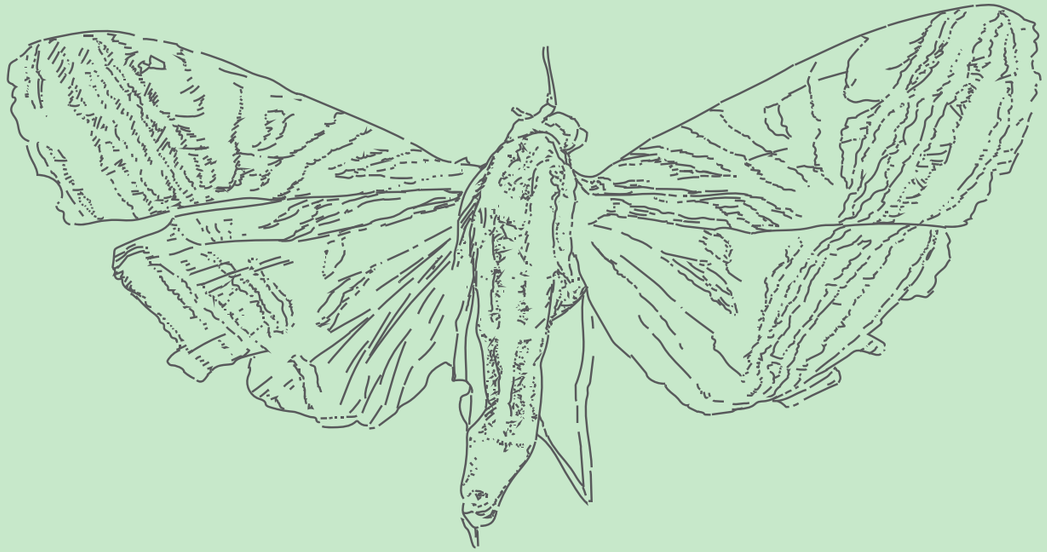


Introduction

Dr. Laksana Tri Handoko
Chairman of BRIN

Rediscovering the National Excellence

Increased productivity of national research and innovation drives Indonesia out of the middle-income trap. The largest investment in the development of human resources in the field of science and technology has become a major driver of the transformation of the knowledge-based economy. The National Research and Innovation Agency (BRIN) is actively rebuilding the ecosystem of research and innovation, accelerated by technology mastery and global collaboration. Strategic collaboration with global partners is essential in the context of big technologies such as nuclear.

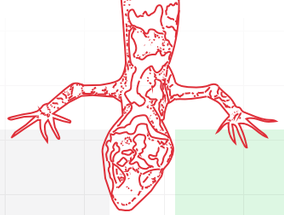
Indonesia's Global Innovation Index (GII) rankings rose sharply to 61 indexes, thanks to the role of BRIN in strengthening research collaborations and national research clusters. By 2023, 81 global research collaborations and 10,734 global publications were achieved, 1,067 Intellectual Property ownership. National-global collaboration is encouraged to support the development of human resources in science, technology, and industry as a significant pillar of increasing global competitiveness.

In the year of 2023, BRIN recorded strategic access to national excellence. An active role in global diplomacy accelerates the strengthening of national ecosystems. The year 2023 begins with strengthening research in various fields, an active role in the G20, and cooperation with China in the field of space and nuclear technology.

Although there is room for improvement, strengthening human resources remains the key in major national and global impact research. A more integrative approach will enhance the utilization of schemes involving industry. Overall, the BRIN performance indicator for 2023 reached the target, with a budget realization of 81,43% and 25 licenses.

The success from 2023 is on behalf of the joint commitment of all parties, from civitas to management. Resource empowerment is supported by transformative governance to support research and innovation. BRIN also awards researchers and civitas who have contributed to national research and innovation development.

Annual Highlights



JANUARY

1

The article entitled "Synthesis of Magnetic Activated Carbon-Supported Cobalt (II) Chloride Derived from Pecan shell (Aleurites moluccana) with Co-Precipitation Method as the Electrode in Supercapacitors," which is a synthesized cobalt (II) chloride supported by magnetic activated carbon derived from the moluccane shell using the Co-precipitation method as an electrode on the supercapacitor, published in *Materials Science for Energy Technologies*, Volume 6. This method offers an environmentally friendly and inexpensive approach to obtaining raw materials for new, cutting-edge energy applications.

2

Surya Satellite-1 (SS-1), the first Indonesian-made nanosatellite, released from the ISS to orbit LEO (Low Earth Orbit) with Japan Aerospace Exploration Agency's (JAXA) Deployer Module (JSSOD).

3

Health research, patents for stem cell research, and stem cell-based treatments have proven to have potential for regenerative therapy. BRIN and the Indonesian Association of Stem Cell (ASPI) collaborate to support the exchange and dissemination of information and ideas related to stem cell, cells, and their derivatives in the BRIN-ASPI 2023 Collaborative Seminar and Workshop Series entitled *The Rising Tide of Stem Cell Elaboration: Creating a Bigger Platform for Research and Community*.

FEBRUARY

1

The publication of the article entitled "Microbial Metabolites Diversity and Their Potential as Molecular Template for the Discovery of New Fluorescent and Radiopharmaceutical Probes", including the diversity of microbial metabolites and their potential as molecular templates for the fission of new fluorescent and radiopharmaceutical probes. The article provides a better insight into the potential of microbic metabolites as a source for discovering new biomedical probes. It contributes to the development of more effective diagnostic and therapeutic tools in the treatment of diseases. This publication is published in TrAC - *Trends in Analytical Chemistry* Volume 159.

2

PT PLN Indonesia Power (PT PLN IP) collaborates with BRIN to improve the mastery of lithium battery technology.

3

On International Mother Language Day, BRIN launches Language Documentation of Indonesia (LADIN).

4

BRIN launches Regional Competitiveness Index (IDSD) 2023, as a continuation of evidence-based policy strengthening.

MARCH

1

Publication of the article entitled "Diminishing Benefits of Urban Living for Children and Adolescents' Growth and Development", which explains the decrease in the benefits of urban life for the growth and development of children and adolescents. The article was published in *Nature*, Volume 615, Issue 7954. The publication shows that the superiority of growth and development of children living in cities has declined in various parts of the world. Besides, this superiority has increased in most of sub-Saharan Africa.

2

BRIN has a research collaboration with the Royal Botanic Gardens Kew, United Kingdom, in the field of pollen conservation.

3

BRIN pioneers research and innovation facilities specializing in marine-based halal products in the Kurnaen Sumardiharga Science Park in Pemenang, North Lombok, West Nusa Tenggara.

APRIL

1

The publication of the article entitled "Net Greenhouse Gas Balance of Fibre Wood Plantation on Peat in Indonesia" in *Nature*, Volume 616, Issue 7958 provides a complete overview of the balance of greenhouse gas flows during the rotation of plants in wood fibre plantations in the peatland.

2

BRIN initiated the Regional Oceanographic Meeting, which resulted in an agreement that Indonesia is committed to preserving the sustainability of maritime and marine resources.

3

BRIN, along with the Synchrotron Light Research Institute (SLRI) of the Kingdom of Thailand, collaborates on research and innovation collaboration in science and technology synchrotron.

MAY

1

The article entitled "Understanding the Degradation of Methylenediammonium and Its Role in Phase-Stabilizing Formamidinium Lead Triiodide" was published in the *Journal of the American Chemical Society*, Volume 145, 18. The publication discusses the degradation of methylene diamonium and its role in preserving the phase of formamidinium plumbum triiodide.

2

BRIN preserves the rare plant species Dipterocarpus cinereus, which was declared extinct by the World Conservation Agency in 1998.

3

BRIN launches Research Institute Registration System (SeBaRis/Sistem Registrasi Lembaga Riset). This system is a vital source of information for the country to observe the indicators of Science and Technology (Indikator IPTEK) so that the government can evaluate the number of researchers.

JUNE

1

Research on alveolar cell epithelial folding was published in an article entitled "Epitelial Folding of Alveolar Cells Derived from Human Induced Pluripotent Stem Cells on Artificial Basement Membrane", which is alveolar cell epithelial folding from the stem cell that has the potential to become compounding on artificial basal membrane. The article was published in *Acta Biomaterialia*, Volume 163, which reveals the kind of self-organization of epithelial cells in BM-like cultures with tissue folding by cell force.

2

BRIN obtained reasonable opinion without exception (*Wajar Tanpa Pengecualian*/WTP) from the Audit Board of The Republic of Indonesia (BPK), the first ever after its integration.

3

BRIN, along with Holtec International and Hyundai Engineering & Construction, discuss cooperation on the Small Modular Reactor (SMR) development plan.

2023

JULY

1. The article entitled "A Comparative Study of Mean-Line Models Based on Enthalpy Loss and Analysis of a Cavity-Structured Radial Turbine for Solar Hybrid Microturbine Applications" was published in *Energy Conversion and Management*, Volume 287. The article guides the development of high-efficiency and lightweight turbines in the field of energy and air transport.

2. Amorphophallus titanum Becc., better known for its corpse flowers, one of the collections of the Cibodas Botanical Garden, re-blooms for the second time this year and adorns the moment of school holidays.

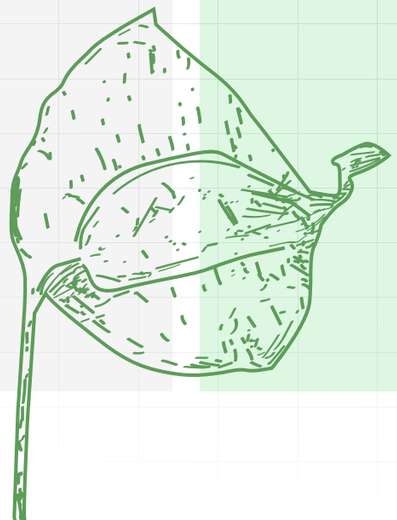
3. BRIN and the Chinese Academy of Sciences (CAS) announced the inauguration of the Sino-Indonesian Joint Laboratory for Marine Sciences, known as the Sims, a program initiated by BRIN-CAS.

AUGUST

1. The article entitled "Bioactive Peptides from Food Proteins as Potential Anti-Obesity Agents: Mechanisms of Action and Future Perspectives" was published in *Trends in Food Science and Technology*, Volume 138. The article reveals a study investigating the potential of Bioactive Peptides (BAP) in managing obesity comprehensively.

2. BRIN, together with academics, governments, local communities, international agencies, and various stakeholders, is conducting studies on small islands for tourist destination development, which are vital to minimizing the negative impact of development and maximizing benefits for the local community.

3. The Chairman of the Board of Directors of BRIN, Megawati Soekarnoputri, appointed Prof. Dr. Ir. Amarulla Octavian as Vice Chairman of BRIN. The vice chairman position is expected to provide research-based and innovation-based solutions to problems emerging in the wider society and accelerate the realization of a better research and innovation ecosystem in Indonesia.



SEPTEMBER

1. The article entitled "Generation Expansion Planning with a Renewable Energy Target and Interconnection Option: A Case Study of the Sulawesi Region, Indonesia" was published in *Renewable and Sustainable Energy Reviews*, Volume 183. The research reveals the optimal path of renewable energy development. The connector scenario ensures lower emission costs.

2. BRIN conducted the Indonesia Research and Innovation Expo (InaRI Expo) 2023. InaRI Expo is special this year because it integrates the activities of the Indonesia Electric Motor Show (IEMS) 2023, a special exhibition of electric vehicles that was previously conducted in a separate event. InaRI Expo was held on 20–23 September 2023 in the Soekarno Science and Technology Park, Cibinong, West Java.

3. BRIN researchers conducted research using LAPAN-A2 (National Institute of Aeronautics and Space) satellites that have been in orbit for eight years and have contributed in monitoring the territory of Indonesia to assist communications processes in disaster-affected areas.

4. BRIN and Japan Aerospace Exploration Agency (JAXA) Japan signed a Memorandum of Cooperation (MoC) in the field of Space Cooperation for Peaceful Purposes.

5. BRIN signed an updated MoU between the Government of Indonesia and the Chinese Government in the fields of science, technology, and innovation.

6. BRIN launched book for Indicator of Science, Technology, and Innovation of Indonesia 2023, which presents not only data and achievements, but also describes important roles of Indonesia globally.

OCTOBER

1. The article entitled "Comparison of Acid and Alkaline Pre-Treatment on Methane Production from Empty Palm Oil Fruit Bunches (OPEFB): Effect on Characteristics, Digester Performance, and Correlation of Kinetic Parameters" was published in *Renewable Energy*, Volume 215, Issue 100. The article compares the impact of two different chemical pretreatments on the various characteristics of OPEFBs.

2. BRIN researchers discovered Orephyrne riyantoi, a new species of frog endemic to Sulawesi. The brown frog with its round squid was found on the leaves of the mountain forest in Mount Mekongga, Southeast Sulawesi, at an altitude of 2528m above sea level.

3. BRIN and PT Dirgantara Indonesia (PTDI) signed a cooperation agreement on licensing and royalty of industrial design: Aircraft (IDD0000044432).

NOVEMBER

1. An article entitled "Integrated Adsorption and Photocatalytic Removal of Methylene Blue Dye from Aqueous Solution by Hierarchical Nb2O5@PAN/PVDF/ANO Composite Nanofibers" was published in *Nano Materials Science*. The article reveals a new strategy for designing novel semiconductor catalysts loaded on nanofiber membranes for the effective and efficient degradation of dye pollutants in industrial wastewater treatment applications.

2. BRIN Indonesia, Korea Institute of Industrial Technology (KIET), and Cheil Jedang Korea signed a partnership focused on joint research in the energy and manufacturing sectors in the circular economy.

DECEMBER

1. The article entitled "Primaquine Radical Cure in Patients with Plasmodium Falciparum Malaria in Areas Co-Endemic for P Falciperum and Plasmedium viVvax (PRIMA): A Multicenter, Open-Label, Superiority Randomised Controlled Trial", published in *The Lancet* Volume 402, Issue 10417. The research supports the use of high-dose short-term primakuin as a safe and effective strategy to reduce the risk of P. vivax parasitemia in patients co-infected with P. falciparum and P. vitax.

2. BRIN implemented the utilization of an Appropriate Technology (*Teknologi Tepat Guna*/TTG) waste disposal machine (MPS100) for village-scale garbage handling.

PART

01

The Role of BRIN for Indonesia

Strengthening the Research and Innovation Ecosystem

In line with the direction and priorities of national development as well as strengthening the national research and innovation ecosystem, the research and innovation cluster is focused on six key areas, namely food sovereignty, energy sovereignty, social and community resilience, environmental sustainability, transition towards knowledge-based economy and health sovereignty. This reinforcement is based on the development of the national research and innovation ecosystem that has been formed, with a successful record of 2,388 research activities and 1,217 research achievements from 12 research organizations. These organizations act as drivers of natural resource-oriented development transformation based on knowledge and superior human resource capabilities.

Food sovereignty, health, and energy sovereignty maintain sustainable conservation of nature and a sustainable environment, supporting the social and community resilience that is ultimately a transition to a knowledge-based economy. Research and innovation activities ensure the investment of knowledge to capture and rediscover the nation's excellence by creating superior human resources that benefit the global strategic environment.

BRIN strives to strengthen the research and innovation ecosystem to ensure the discovery of national excellence that impacts the transformation of the national knowledge-based economy. The efforts are carried out in six clusters of national excellence organized through funding agencies, executing agencies, and national policy supporters.

Funding agencies act as research and innovation facilities that are implemented to ensure more efficient, integrated, open, and impactful investment in research and innovations, human resources, infrastructure, and funding that is more efficient, well integrated, open, and impactful. This facilitation aims to support executing agencies as the organizer of competitive and superior research and innovation activities. Therefore, these research and innovation activities generate knowledge for solving the nation's problems, which impacts the economy and creates policy recommendations supporting evidence-based national development.

Food Sovereignty Cluster

RESEARCH AND INNOVATION ECOSYSTEM FOOD SOVEREIGNTY

Human Resources of Science and Technology

2,564

Funding

Rp25,731,405,710

Ethical Clearance

139

PUBLICATION

940 Global Publication

555 Cites

INTELLECTUAL PROPERTY

99 Listed Patent

46 Granted Patent

2 Copyright

10 Licence

2 Innovation Sectoral Electronic Catalogue Products

108 Partners

Rp33,081,245,904
Super Tax Deduction Potential

Scan here!
To get access to the complete data

Research activity in Green House, Science and Technology Park of Soekarno, Cibinong. © BKPUK BRIN

Towards Food Sovereignty Through Research and Innovation

Food sovereignty is a foundation for the food sustainability of a nation. In Indonesia, it represents the spirit of independence in managing local food resources to ensure adequate, quality, and sustainable food availability for the whole population. Food sovereignty becomes essential for a country to reduce its dependence on food imports from abroad, safeguard food security in the future, and protect the interests and well-being of food for future generations.

BRIN has carried out interdisciplinary collaboration and worked with foreign researchers to improve the quality of research and innovation in food sovereignty. Efforts to accelerate the quality of human resources have been made through the collaboration of researchers from various fields covering 2,564 human resources of science and technology, including 321 foreign scientists and 3 visiting researchers. Open research collaboration at the national and global levels will enable large-scale research activities involving multiple stakeholders to run sustainably and strengthen national excellence.

Financing facilitation for food sovereignty amounted to Rp25,731,405,710, consisting of Rp20,000,000,000 from the Research and Innovation for Onward Indonesia (RIIM) scheme managed by Indonesia Endowment Fund for Education Agency (LPDP), Rp655,555,710, from the research grant for palm trees, and Rp324,350,000 from global funding. To improve quality and integrity in food sovereignty research, BRIN facilitated 139 ethical clearances.

Cell Culture Laboratory, Genomic Building, Soekarno Science and Technology Park. © BKPUK BRIN

One of the process of Seed Collecting in Seed Bank Laboratory. Seed Bank has become one of the method of Ex-situ Conservation of plants that is efficient to save biodiversities in the level of species and genetics. © BKPUK BRIN

BRIN has conducted research and innovation to strengthen local food systems, improve food security, and ensure quality and sustainable food availability to reach food sovereignty. Food sovereignty research productivity has produced 246 highly reputable globally indexed scientific journals, 338 medium-reputed globally Indexed scientific journals, 257 globally-reputed Indexed scientific journals, 99 other globally indexed scientific journals, and 555 citations through collaboration between national and global research groups.

In addition, the 147 Intellectual Property that have been produced consist of 99 registered patents, 46 granted patents, and 2 copyrights. This approach demonstrates the mastery of food technology and knowledge ready to be utilized by the industry.

The utilization of research in the field of Food Studies has resulted in 10 licenses for appropriate technology in food processing and microbiological research to cope with soil crises and liquid green fertilizer technology. To boost industry contribution towards food sovereignty, the potential super tax deduction of Rp33,081,245,904 and 2 products are displayed on the sectoral electronic catalogue of innovation. Other than such occasions, BRIN has established cooperation with 108 partners.

Energy Sovereignty Cluster

RESEARCH AND INNOVATION ECOSYSTEM ENERGY SOVEREIGNTY

Human Resources of Science and Technology

2,291

Funding

Rp395,383,872,000

Ethical Clearance

28

PUBLICATION

858 Global Publication

659 Cites

INTELLECTUAL PROPERTY

198 Listed Patent

28 Granted Patent

8 Copyright

1 Industrial Design

6 Licence

5 Partner

Rp56,666,582,996
Super Tax Deduction Potential

Scan here!
To get access to the complete data

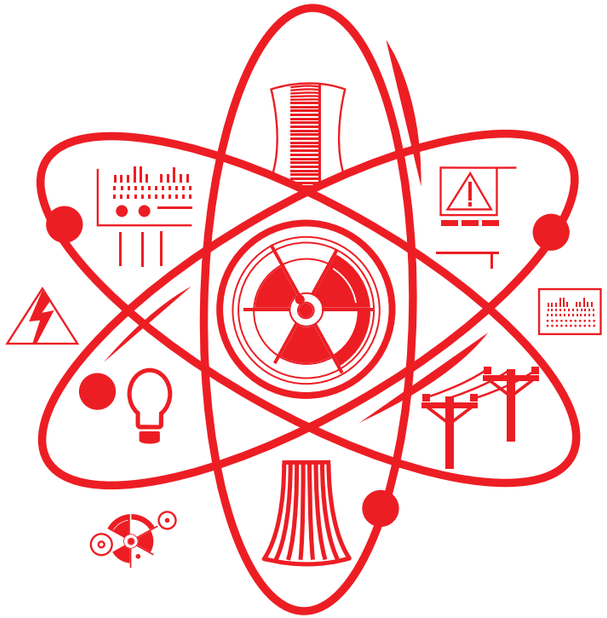
Physics Laboratory, Science and Technology Park of BJ Habibie BRIN. © BKPUK BRIN

Indonesia's Strategic Steps to Build Energy Sovereignty

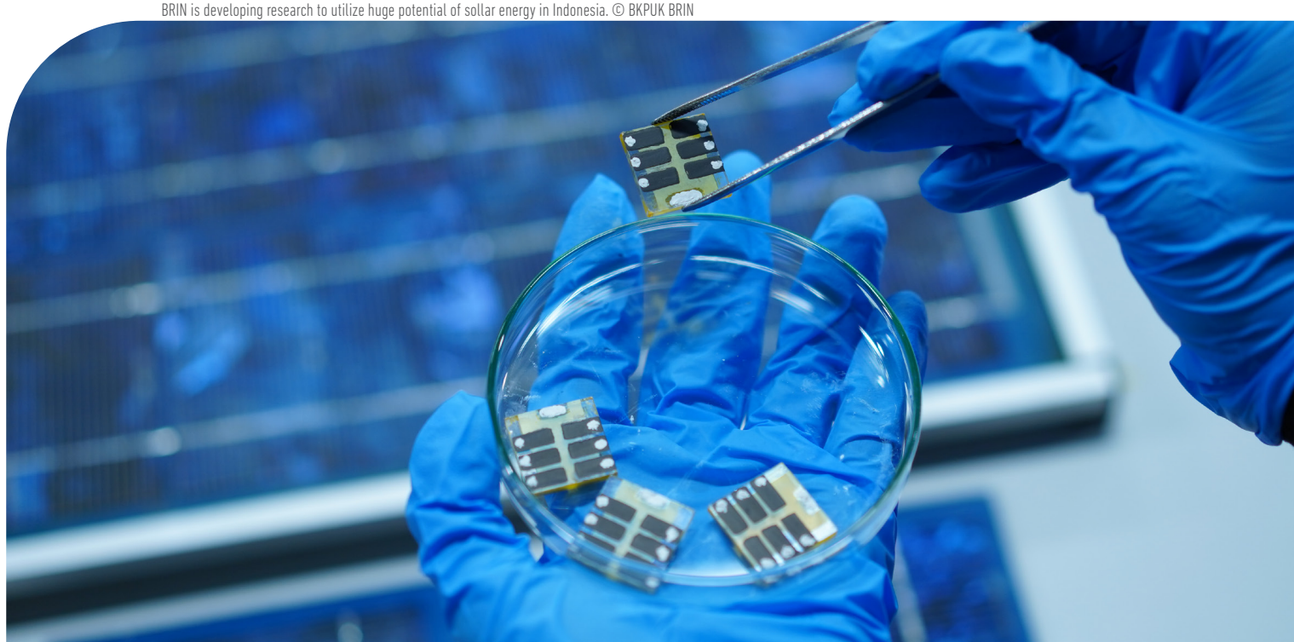
Energy sovereignty plays a vital role in the national development of Indonesia, a country endowed with abundant natural resources, especially in the energy sector. This strategic move enables Indonesia to reduce its dependence on energy imports, which are often unstable and can cause economic risks. Indonesia can drive rapid and sustainable economic growth by focusing on sustainable and environmentally friendly energy development.

By the year 2023, there were 2,291 registered researchers active in conducting energy sovereignty research, including 18 visiting researchers. Through Nuclear Technology Polytechnics, BRIN strives to produce excellent human resources in the nuclear field to ensure that Indonesia is not only able to catch up the national research lag but also has specialized expertise that supports the development of nuclear technology for improving the quality of life of the people.

This achievement of BRIN is supported by the allocation of significant research and innovation funds, reaching Rp395,383,872,000. This fund comes from various channels, including DIPA BRIN of Rp39,447,857,000, RIIM fund managed by LPDP of Rp3,202,000,000, and global funding of Rp5,220,357,000. To improve the quality and integrity of energy sovereignty research activities, BRIN has been facilitated 28 ethical clearances.



BRIN is developing research to utilize huge potential of sollar energy in Indonesia. © BKPUK BRIN



Nuclear facilities, reactor of GA Siwabessy, located in Science and Technology Park of BJ Habibie, Serpong. © BKPUK BRIN

BRIN has recorded significant progress in achieving energy sovereignty through excellent research performance. BRIN produced 152 highly reputable globally indexed scientific journals, 311 medium-reputed globally indexed scientific journals, 139 globally-reputed indexed scientific journals, 256 other globally indexed scientific journals, and 659 citations through collaboration between national and international research groups. This success demonstrates Indonesia's commitment to contributing to global energy knowledge.

Mastery of technology in the energy field has been achieved through 235 intellectual properties consisting of 198 registered patents, 28 granted patents, 8 copyrights, and 1 industrial design. This achievement results from a collaboration covering various topics and research areas, including the energy sciences field and the environment that develops renewable energy sources and nanomaterials that develop energy storage materials. Moreover, the results of energy sovereignty research have produced 6 licenses and collaborated with 5 partners.

Utilizing new technologies in the energy sector provides a potential super tax deduction of Rp56,666,582,996, which could encourage more investment in research and development.

Social and Community Resilience Cluster

RESEARCH AND INNOVATION ECOSYSTEM SOCIAL AND COMMUNITY RESILIENCE

Human Resources of Science and Technology

1,814

Funding

Rp102,411,580,988

Ethical Clearance

444

PUBLICATION

603 Global Publication

498 Cites

INTELLECTUAL PROPERTY

28 Listed Patent

3 Copyright

23 Industrial Design

5 Partner

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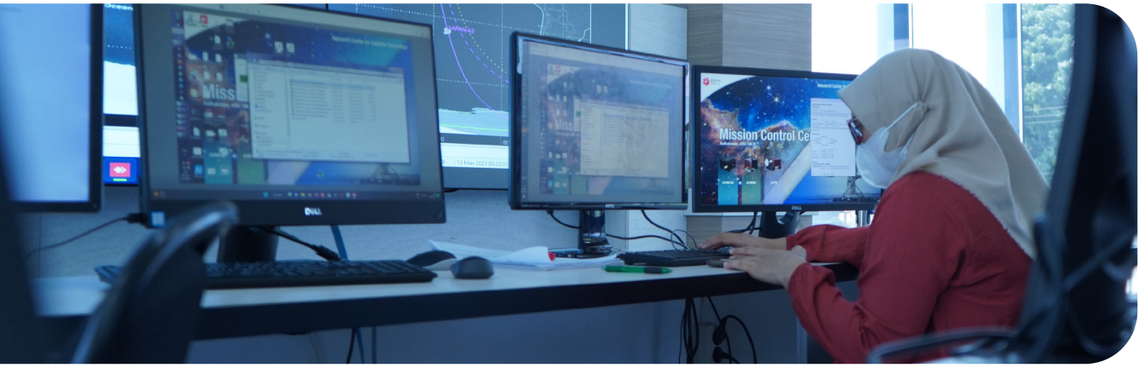

The activity of LAPAN A1, LAPAN A2, and LAPAN A3 satellite in Mission Control Center, Rancabungur Earth Station. These three satellites are utilized for disaster mitigation, whether it is for imaging, communication, or for maritime surveillance in Indonesia and across the globe. © BKPUK BRIN

Strengthening Social and Community Resilience in Facing Global Challenges

In an era of globalization and increasingly complex multidimensional challenges, social and community resilience is not only an important pillar but also a decisive foundation for the progress of a nation. Strengthening social resilience means building resilient, adaptive, and resilient societies that can overcome challenges with solidarity and innovation. It is essential to create an environment conducive to growth and equal progress in all segments of society.

In 2023, 1,814 registered researchers conducted social and community resilience research, including 28 visiting researchers. Significant achievements in the field of social and community resilience are the result of strong and structured funding support for research and innovation, with a total funding of Rp102,411,580,988. This funding comes from various entities, including DIPA BRIN of Rp89,085,768,000, RIIM managed by LPDP of Rp722,000,000 as well as a grant fund of Rp12,603,812,988, both domestic and international that have laid a solid foundation for research in this field. In addition, in the area of Social and Community Resilience, 444 ethical clearances have been facilitated.

The process of Sperm Whale (Physeter macrocephalus) evacuation that was stranded in Yeh Malet Beach, Karangasem, Bali. This Sperm Whale will be part of Scientific Collection of Kehati Building, Science and Technology Park of Soekarno, Cibinong. © BKPUK BRIN

In 2023, through research under social and community resilience research, BRIN produced 307 highly reputable globally indexed scientific journals, 154 medium-reputed globally indexed scientific journals, 104 globally-reputed indexed scientific journals, 38 other globally indexed scientific journals, and 498 cites.

Intellectual property achievement is recorded as 54, consisting of 28 registered patents, 3 copyrights, and 23 industrial designs. BRIN demonstrates its commitment to protecting and commercializing research results. This intellectual property not only adds economic value but also strengthens Indonesia's knowledge and technology base.

Meanwhile, BRIN has established cooperation with five partners in the field of social and community resilience. This cooperation is expected to form a basis for accurate research findings and policy analysis to guarantee development measures that are not only effective but also inclusive and sustainable.

Field Station Area (KSL), Earth Station of BRIN Biak, functioned to receive data and control of satellite, space and atmosphere observation. © BKPUK BRIN

Sustainable Environment Cluster

RESEARCH AND INNOVATION ECOSYSTEM SUSTAINABLE ENVIRONMENT

Human Resources of Science and Technology

3,760

Funding

Rp522,547,000,000

Ethical Clearance

283

PUBLICATION

3,348 Global Publication

259 Cites

INTELLECTUAL PROPERTY

203 Listed Patent

40 Granted Patent

22 Copyright

8 Industrial Design

7 Licence

5 Innovation Sectoral Electronic Catalogue Products

36 Partner

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Towards a Sustainable Environmental Future

A sustainable environment has become a significant focus on global research and development to maintain the balance of ecosystems for a better future. The initiative aims to integrate sustainability principles into all aspects of life, from natural resource management to the development of environmentally friendly technologies. With interdisciplinary collaboration, this research on environmental sustainability seeks to produce research that can be directly applied in policy and practice to achieve sustainable development goals.

Conservation activity carried out by BRIN in order to be part of the solution in tackling biodiversity lost. © BKPUK BRIN

By 2023, there were 3,760 researchers conducting sustainable environmental research, including 31 visiting researchers. The achievement is inseparable from significant financial support, with the total funding for research and innovation reaching Rp522,547,000,000 from various channels, including the State budget (APBN) through the BRIN DIPA of Rp498,720,000,000, RIIM managed by the LPDP of Rp21,270,000,000, domestic grants amounting to Rp457,000,000 and global grants of Rp2,100,000,000. To ensure high-quality and impactful research outcomes, BRIN has facilitated 283 ethical clearances.

The researcher of BRIN is conducting the handling of rock sampling as a the result of expedition/exploration in Geodiversity Laboratory, Geodiversity Scientific Conservation Park Sukendaar Asikin, Karangsambung. © BKPUK BRIN

Within the framework, BRIN has recorded significant achievements in the field of environmental sustainability. To date, BRIN has produced 448 highly reputable globally indexed scientific journals, 347 medium-reputed globally indexed scientific journals, 459 globally-reputed indexed scientific journals, 2,094 other globally indexed scientific journals, and 259 citations, which mark the high quality of research and international performance. The most significant recorded achievement is 233 intellectual properties, with 203 registered patents, 40 granted patents, 22 copyrights, and 8 industrial designs.

Sustainable environmental research covers various topics, including waste management technologies, renewable energy innovations, and biodiversity conservation strategies that demonstrate BRIN's commitment to supporting environmental sustainability. The research results have contributed as many as 7 licenses and 5 sectoral electronic catalogue products demonstrating practical applications of such research in various sectors, and have collaborated with 36 partners.

Discovery of 49 New Taxa for Indonesian Biodiversity and Conservation

The discovery of 49 new taxa by the researchers of BRIN is an important record that is increasingly adding data on Indonesian biodiversity. The discovery of new taxa is an important step that enriches the understanding of biodiversity and opens up significant new research opportunities. Furthermore, the discovery facilitates more effective protection of vulnerable species and ecosystems. This exploration was carried out in the Sulawesi region to excavate the wealth of biodiversity that has not been uncovered in Indonesia. The discovery covers a wide range of species of fauna, flora, and microorganisms, with more than a quarter being endemic to Indonesia. The presence of this endemic species underlines the importance of efforts to preserve biodiversity in Indonesia.

The discovery of 49 new taxa by BRIN demonstrates the agency's commitment to expanding taxonomic knowledge and strengthens BRIN's position as a pioneer in exploring biodiversity in Indonesia. This significantly contributes to science, conservation, and environmental sustainability by continuously exploring and identifying new species. BRIN advances science and plays a crucial role in conservation efforts. This success also demonstrates the importance of collaboration and support from the global community to ensure the preservation of rich biodiversity for the sustainability of generations.

The discovery of new taxa of Indonesian Biodiversity in Sulawesi Region. © PRBE BRIN

Transition Towards Science-Based Economy Cluster

RESEARCH AND INNOVATION ECOSYSTEM TRANSITION TOWARDS SCIENCE-BASED ECONOMY

Human Resources of Science and Technology

3,495

Funding

Rp873,340,000,000

Ethical Clearance

117

PUBLICATION

886 Global Publication

897 Cites

INTELLECTUAL PROPERTY

148 Listed Patent

39 Granted Patent

42 Copyright

12 Industrial Design

2 Licence

125 Partner

78 Innovation Sectoral Electronic Catalogue Products

Rp81,096,050,000
Super Tax Deduction Potential

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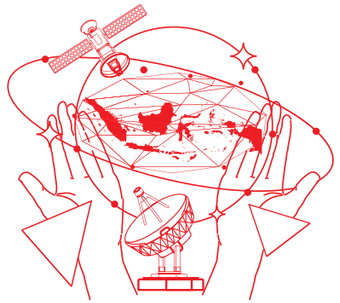
One of the innovation product is seaweed-based capsule shell. © BKPUK BRIN

Optimizing a Knowledge-Based Economy in Global Innovation

The transition to a knowledge-based economy is a strategic initiative designed to support the economic transformation from traditional paradigms to more innovative, sustainable, and knowledge-oriented approaches. With a focus on quality human resource development, future-orientated research and development, and the application of advanced technology, this research plays a vital role in preparing economies to meet contemporary global challenges.

By 2023, the number of active researchers involved in this research reached 3,495 people, including 3 visiting researchers. Research transition to a knowledge-based economy is not exempted from solid financial support, with total funding for research and innovation reaching Rp873,340,000,000. This funding comes from DIPA BRIN Rp872,000,000 and RIIM managed by LPDP of Rp1,340,000,000. Through collaboration and an inclusive approach, BRIN also facilitated as many as 117 ethical clearances to harmonize innovative measures with strong ethical principles.

| Transition Towards Science-Based Economy Cluster



In the field of knowledge-based economics, BRIN produced 274 highly reputable globally indexed scientific journals, 250 medium-reputed globally indexed scientific journals, 251 globally-reputed indexed scientific journals, 111 other globally indexed scientific journals, and 897 citations. This data demonstrates BRIN's significant contribution to global knowledge and wide recognition of its research quality.

BRIN's intellectual property achievement is 202, consisting of 148 registered patents, 39 patents granted, 42 copyrights, and 12 industrial designs. Research in this field covers various innovative topics, including the blue-green economy, the development of satellite detection technology, crew aircraft for precision farming, and the exploration of other alternative economies. Through its research, BRIN has also produced two licenses, exhibiting 78 Innovation Sectoral Electronic Catalogue Products, super tax deduction worth Rp81,096,050,000 as well as collaborating with 125 partners who have made major contributions for the research conducted by BRIN that gives impact to the economy and public policy.

The Strength Testing of biomaterial with using method of pull-testing in ILab, Science and Technology Park of Soekarno, Cibinong. © BKPUK BRIN

Health Sovereignty Cluster

RESEARCH AND INNOVATION ECOSYSTEM HEALTH SOVEREIGNTY

Human Resources of Science and Technology

1,669

Funding

Rp47,870,214,000

Ethical Clearance

232

PUBLICATION

1,849 Global Publication

1,846 Cites

INTELLECTUAL PROPERTY

86 Listed Patent

28 Granted Patent

3 Copyright

53 Partner

61 Innovation Sectoral Electronic Catalogue Products

Rp79,480,358,674
Super Tax Deduction Potential

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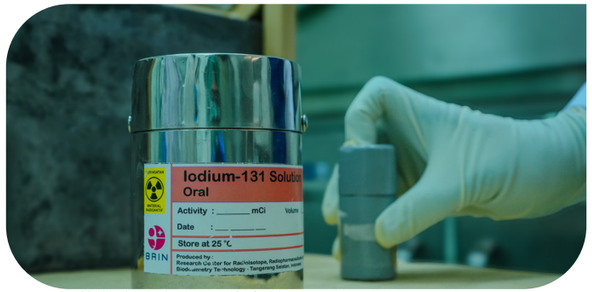
Innovation Increases National Health Sovereignty

Health sovereignty research is an important initiative aimed at strengthening the national health system through the development of innovation and research. The main focus of this research is to create innovative and sustainable health solutions that can improve people's quality of life and ensure wider access to quality health services. Health has become one of the main pillars of the national strategy for achieving higher social well-being and sustainable development.

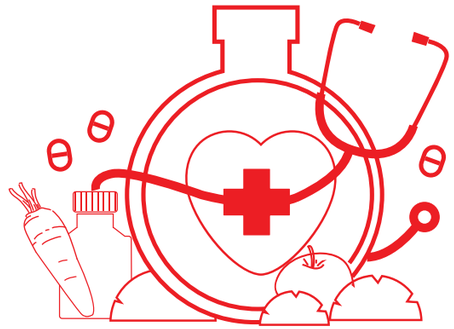


BRIN is developing Iodium-131 Oral for diagnostic and tiroid cancer therapy , and other tiroid diseases. This innovation is expected to substitude the imported Iodium-131. © BKPUK BRIN

The total number of researchers in the field of health reached 1,669, including 15 visiting researchers. Excellent human resources and open research facilities in the field of health sovereignty are supported by a competitive and open funding scheme, thus providing excellent opportunities for research collaboration.

Health sovereignty research is supported by significant research funds amounting to Rp47,870,214,000. The funds come from various sources, such as DIPA BRIN of Rp39,447,857,000, RIIM managed by LPDP of Rp3,202,000,000 and global funding of Rp5,220,357,000. BRIN has facilitated 232 ethical clearances.

BRIN is developing the product of bone replacement implant for pelvic joints. This cementless-type product was developed with the collaboration of University of Indonesia. © BKPUK BRIN



In health sovereignty, BRIN has recorded achievements by producing 565 highly reputable globally indexed scientific journals, 491 medium-reputed globally indexed scientific journals, 451 globally-reputed indexed scientific journals, 342 other globally indexed scientific journals, and 1,846 citations. This achievement demonstrates BRIN's significant contribution to the global scientific community and the growing recognition of the quality of health research in Indonesia. In addition, BRIN has successfully registered 86 registered patents, 28 granted, and 3 copyrights.

Laboratory of Radioisotop Production and Radiopharmaceuticals located in Soekarno Science and Technology Park, Serpong, to support research and development of domestic development in the field of radiopharmaceuticals. © BKPUK BRIN

BRIN is committed to the innovation and development of intellectual property in the field of health sovereignty.

The achievement in this research also generates a potential super tax deduction of Rp79,480,358,674, showcasing 61 Innovation Sectoral Electronic Catalogue Products and collaborating with 53 partners.

Laboratory for the Standardization of Pharmaceutical Ingredients and Traditional Medicine located in Co-working Space of Tawangmangu (Soetarman) to support standardization of Pharmaceutical Ingredients and Traditional Medicine that can be developed in to standardized-herbal medicines (OHT), phitopharmaca, and modern plant-based medicines. © BKPUK BRIN

PART

02

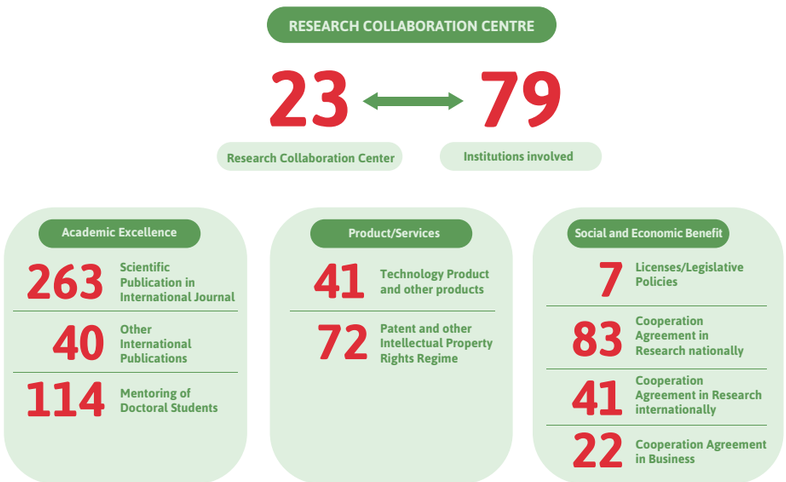
National Ecosystem Reinforcement

The reinforcement of the research and innovation ecosystem is carried out by BRIN through a number of activities, such as the construction of open-ended research infrastructure and facilities, facilitating the financing of research and innovations that are accessible to universities, enterprises, and industry through the 9 schemes in the Research and Innovation for Advanced Indonesia (RIIM) program, and the open mobility scheme for research talent and innovation.

The Facilitation of the Research Collaboration Center (PKR)

The Research Collaboration Center (PKR) is a research center that acts as a focal point for collaboration in the implementation of research and innovation at the international level in a multi and interdisciplinary field with very high standards of results and relevant to the needs of science and technology-users. BRIN has developed 23 PKRs and has collaborated with 79 agencies. As a vessel of collaboration, PKR not only produces research but also succeeds in accelerating the achievement of research and innovation in terms of academic access and national and international cooperation.

PKR's existence is considered to be able to create a good research and innovation ecosystem by bringing together innovation actors in research collaboration. The collaboration is proven by 263 scientific publications in international journals, 40 other international publications, and 114 supervised doctoral program students. The collaboration of 23 PKR BRIN has produced 41 products/services of technology and other products, as well as 72 patents and other HKI regimes. The conclusion of research and business cooperation contracts also marks the success of PKR development.



Facilitation of Research-Based Startup Companies

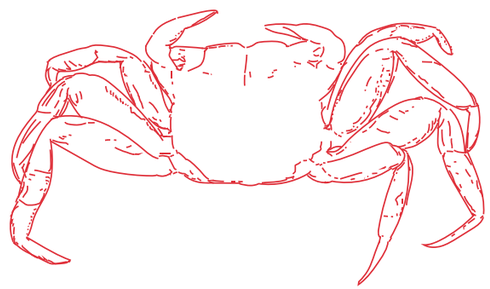
BRIN facilitates 65 Research-Based Startup Companies (PPBR), and 10 PPBR have passed the incubation period. PPBR is a program given to a candidate or company to become a start-up based on the results of research that is expected to be independent, capable of yielding profits, and the enterprise developed can be sustainable.

The program aims to promote the commercialization of BRIN research and community research (colleges, local government, or other research institutions) and develop research-based start-ups. Here are the 10 PPBRs that passed incubation in 2023:

Gluten free spaghetti	PT Noang Prima Utama
DOOPINC Nano Biopesticide	PT Asatu Sembilan Enam
Microbiology Laboratory	PT Pipetin Biomedika Indonesia
Honey water	PT Amalose Tekno Indonesia
Monoclonal antibody	PT Indomabs Biosaintika Utama
Dosimetry Laboratory Service	PT Greenova Daya Prima
Satellite-based IoT	PT Netra Teknologi Nusantara 2023
Aceh patchouli oil antiaging serum	PT Biona Ceudah Rupa
Drone	PT Elevasi Teknologi Aeronautika Nusantara
Cattle food	PT Juli Sapi Domba Oke

Locapasta, a gluten free spaghetti, innovation from PPBR BRIN, PT Noang Prima Utama. © BKPUK BRIN

Antiaging Serum product extracted from patchouli oil originated from Aceh, innovation of PPBR BRIN, PT Biona Ceudah Rupa. © BKPUK BRIN



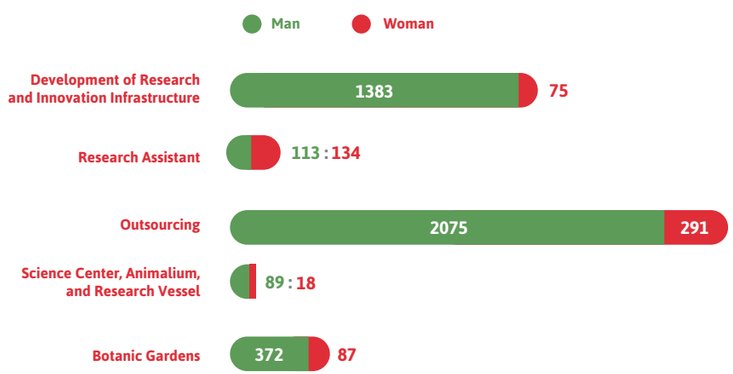
Implementation of Super Tax Deduction Policy and Innovation Sectoral Electronic Catalogue

BRIN has verified and assessed 72 proposals submitted by 19 research and innovation industry partners to obtain tax reduction incentives to implement a super tax deduction policy. Meanwhile, creating an ecosystem of research and innovation has provided benefits in the form of an innovative sectoral electronic catalogue transaction amounting to Rp66,470,917,414. The transaction was conducted on four electronic catalogue exhibitions: the health and medicine innovation exhibition, the transportation innovation exhibition, the information and communication technology innovation display (TIK), and the food and agriculture innovation display.

Field of Work Sector as the Supporter of Research and Innovation

The existence of BRIN contributes to the creation of research and innovation ecosystems to enhance the competitiveness of a science and technology-based nation. BRIN's presence also opens up a number of new jobs in the ecosystem-supporting sector, such as garden managers, animal nurses, research assistants, and various other jobs.

As of 2023, 4,637 people have been employed in the research and innovation support sector, including 4,032 males and 604 females, spread across facilities managed by BRIN and BRIN partners, such as Bogor Botanical Garden, Cibodas Botanical Garden, Bali Botanical Garden, Animalium, and Research Vessel.



Infrastructure

In realizing the objective of strategic infrastructure development in the field of research and innovation in 2020-2024, BRIN, in 2023, has completed the construction of infrastructure, revitalization of strategic science and technology facilities, and the development of science and technology parks.

Karangsambung Geodiversity Park as the center for Geological Conservation and as display for Indonesian Geodiversity. © BKPUK BRIN

Bandung Advance Sciences and Creative Engineering Space (Basic) located in Science and Technology Park of Samaun Samadikun, Bandung. © BKPUK BRIN

Development of Strategic Research Infrastructure developed by BRIN:

- Development of Infrastructure of Biodiversity Data Center in Cibinong, West Java
- Development of Infrastructure of Geo-Diversity Facilities of Indonesia in Karangsambung, Central Java
- Development of Integrated National Tropical Biological Diversity Infrastructure in Cibinong, West Java
- Development of Bandung Advanced Sciences and Creative Engineering Space (BASIC) Infrastructure in Bandung, West Java
- Development of Appropriate Technology Laboratory Facility In Subang, West Java
- Development of The Low-Cost and Zero Waste Technology-Based Local Strategic Mineral Processing Laboratory Facility Infrastructure At Tanjung Bintang, Lampung
- Development of Infrastructure Building for Incubation Facility and Laboratory for Integration of Remote Sensing Data and Information Services in Cibinong, West Java
- Development of Infrastructure Facility for Earth Control Station and Satellite Data Receiver in Biak, Papua

Development of the Science and Technology Park

The Science and Technology Park (KST) is a professionally managed area intended to develop and drive sustainable economic growth through the development and application of science and technology and the growth of technology-based start-ups. KSTs whose management is prioritized are KST Soekarno, located in Cibinong; KST Bacharuddin Jusuf Habibie in Serpong; KST Samaun Samadikun in Bandung, and KST Gerrit Augustinus Siwabessy located in Pasar Jumat Jakarta.

Main gate of Soekarno Science and Technology Park located in Cibinong, Kab. Bogor, West Java. © BKPUK BRIN

In addition, BRIN has developed areas with a different focus: the Iskandar Zulkarnain Science Park, focusing on local mineral processing; the Muhammadi Siswosudarmo Science Park, focusing on the development of appropriate technology; the Kurnaen Sumadiharga Science Park focusing on marine and terrestrial bioindustries, the Aprilani Soegiarto Science Park concentrating on oceanography and deep seas, the Umar Anggara Jenie Science Park, focusing on development of the halal food industry, the Said Djauharsjah Jenie Sciences Park which concentrates on hydrodynamic technology, and the Sarwono Prawirohardjo Science Park, focusing on social and humanity research.

National Talent Management in the field of Research and Innovation

President Joko Widodo initiated the National Talent Management Program (MTN) to accelerate the availability of quality human resources, as envisaged in the National Long-term Development Plan (RPJPN) 2005-2025, in achieving the Golden Indonesia Vision for 2045. BRIN, as the MTN task force, plays a role in coordinating the maintenance of MTN in the field of research and innovation. BRIN has implemented the implementation programs to facilitate the availability of talented human resources in the field of research and innovation, which are divided into four main stages:

1. *Talent acquisition and nurturing* is a selection process of talents through research competition for the final year students in bachelor and master programs at the Indonesia Research and Innovation Fair (IRIFair), as well as facilitating the participants of scientific competitions at the regional and international levels;

2. *Talent assistance* is a supporting activity of bachelor, master, and doctoral students' research activities through the MBKM research internship program, Research Assistance for Talent Research and Innovation (Barista), and research assistant;

3. *Talent qualification enhancement* is an acceleration of the upgrading of doctoral education qualifications for research talent through the Degree by Research program at universities in the country and abroad, and a Doctoral Fellowship in Talent Renewal and National Innovation is organized in collaboration with the Ministry of LPDP and KDP;

4. Talent maturation facilitates the collaboration of talented researchers to carry out joint research activities, namely post-doctoral researchers, visiting researchers, joint research and research visits, international scientific oral and keynote speakers, and hands-on training.

More than 10,000 research and innovation talents who have been coached by BRIN prove that the potential for research and innovation is unlimited. Through concrete efforts to build research and innovation talents to strengthen and expand collaboration, BRIN forms the foundation for The Golden Indonesia 2045 Vision.

BRIN 2023 Research and Innovation National Talents

1,314 Person — Merdeka Belajar-Kampus Merdeka

247 Person — Research Assistant

278 Person (267 Indonesians, 11 Foreigners) — Post-Doctoral

89 Person (60 Indonesians, 29 Foreigners) — Visiting Researcher

2,631 Person — Barista-UKT financial support

350 Person — S2 Degree by Research

Participants of mentoring from the program of expertise facilitation — **2,200+** Person

1,482 Person — Barista-Financial Support for Research

660 Person — S3 Degree by Research

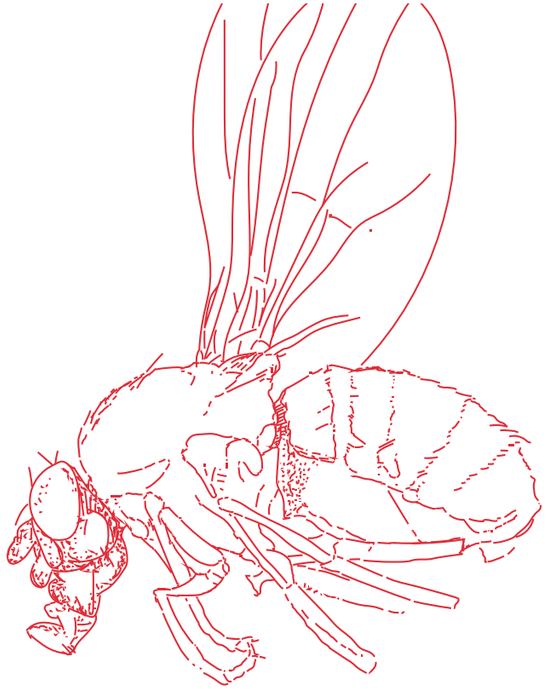
The involvement on funding program for oral paper, key presenter of international training, joint research visit, *joint research visit, on job insfrastructure training* — **100+** Person

Participant of Indonesia Research and Innovation Fair from local and foreign Universities — **799** Person

Primary Data Management

Based on Law number 11/2019, every primary data and output of research results is given a state service to be stored and managed in the long term, which will be an important asset for future research and innovation activities. Primary data is stored and managed securely. The law also guarantees easy access and use and respects the rights of data owners. The facilitation of primary data management services and the output of research results through the National Scientific Repository (RIN) is integrated with the funding and research licensing scheme so that each data owner will be easily to fulfill his obligations, i.e., the obligation to hand over and keep the data according to the law.

To enhance food sovereignty, BRIN has produced 1,161 datasets in the field of Food Sovereignty, consisting of 300 data from academics, 150 data from externals, and 15 data from foreign researchers. In addition, the acquisition of local knowledge in the field of Food Sovereignty has been enriched by the publication of 18 books, accessed 15,484 times. Meanwhile, the field of Energy Sovereignty has been stored in 11,051 datasets with publications of 14 books that have been accessible 36,426 times.



In Social and Community Resilience, 875 datasets have been preserved and reinforced with 20,346 accesses from 23 published scientific books. In the field of Sustainable Environment, 5,975 data sets and 12,984 accesses to scientific literature from 14 books have been recorded. At the same time, the area of Transition to a Knowledge-based Economy has produced 9,012 datasets and 17,954 access to literature of 15 books. Meanwhile, health sovereignty has generated 6.232 stored datasets and 15,923 accesses of science literacy from 7 available scientific journals. Managing primary data and the research output will be a wealth of national research and innovation potential to ensure the quality of more efficient and sustainable research activities.

Collection Management

In the implementation of Law number 11/2019, concerning the National Science and Technology System, BRIN Regulation No. 12/2023 – Mandatory Delivery and Mandatory Storage of Primary Data and Output of Research Results as well as Presidential Instruction No. 1, the year 2023, on Prioritizing the Conservation of Biodiversity in Sustainable Development, BRIN has managed the national collection for botanical/herbarium, xylarium, zoology, artefacts, seed bank, geo-diversity, microorganisms and collections of living plants in five BRIN-managed botanical gardens.

President Joko Widodo with His Excellency Emperor Naruhito visiting Orchid Collection in Griya Anggrek, Bogor Botanical Garden. © DIRI BRIN

State Visit from Japanese Emperor His Excellency Naruhito and Her Excellency Princess Masako in Bogor Presidential Palace. © DIRI BRIN

Plant Collections in Botanical Gardens

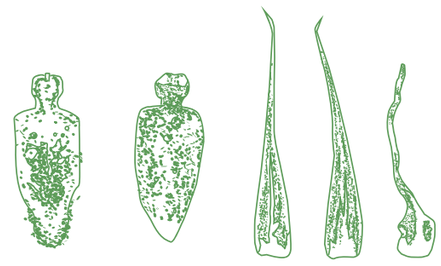
BRIN manages 63,729 plant collections spread across 5 botanical gardens with different plant characteristics: the Bogor Botanical Garden has a collection of wet lowland plants, the Cibodas Botanical Gardens has a collection of wet-highlands, Cibinong Botanical Park has an ecoregional collection of plants in the Indonesian islands, the Purwodadi Botanical Garden has a collection on dry lowland, and the Bali Botanical Garden Eka Karya has a dry highlands plant.

President Jokowi welcoming the visit from His Excellency Emperor Naruhito to Indonesia since his coronation. © DIRI BRIN

Herbarium Collection

Herbarium bogoriense is the largest herbarium in Indonesia and Southeast Asia, located at Cibinong Science Center (CSC), Cibinong, West Java. The herbarium collection is a valuable asset that can be preserved and used in various research related to Indonesian plant health. It also supports other scientific studies, including ecology, conservation, phytochemistry, and ethnobotany. The herbarium collection consists of seeded plants (angiospermae and gymnospermaes), mushrooms, and spores (spores, lichens, ferns) stored in dry and wet forms.

Herbarium collections come from the territory of Indonesia, and gift collections from several herbariums abroad. The collections are a reference source for taxonomists focusing their research in the Malesia region (Indonesia, Malaysia, Singapore, Brunei Darussalam, Philippines, Timor Leste, Papua New Guinea, and Solomon Islands). There are many collections from some of the world's botanists, including J.E. Teijsmann, C.A. Backer, Cl.L. Blume, J.K. Hasskarl, S.P. Koorders, A.G.O. Penzig, K.B. Boedijn, a.J.G.-P. Kostermans, JJ. Smith, and R. E. Holttum. The total herbarium collection managed by BRIN is currently 883,864 specimens.



Microorganism Collection

BRIN has authority in managing microbial resources, namely the storage, access, distribution, and protection of microorganism assets in Indonesia. Over 6,000 microorganisms include 7 main groups: actinomycete, archaea, bacteria, bacteriophages, fungi, yeasts, and microalgae. The current storage location is at the Indonesian Culture Collection building (InaCC).

Seed Bank

The seed bank is considered one of the most efficient ex-situ conservation because it does not require large space; its storage time is relatively longer; the diversity is preserved relatively longer, and it facilitates the provision of genetic products. The current seed bank collection comes from cultivated gardens, natural/forest habitats (through exploration/expedition activities), and donations. BRIN has managed 5,440,625 seeds, comprising 136 tribes, 495 families, 741 types, 150 species, and 1,432 collection numbers.

One of the collection of Oroxylum indicum (L.) Venth which kept in Seed Bank, Soekarno Science and Technology Park, Cibinong © BKPUK BRIN

Geological Collection Room located in Karangsambung Geodiversity Park.
This collection room is open for public. © BKPUK BRIN

Geodiversity Collection

The geodiversity collection is currently stored in the Karangsambung Geodiversities Park in Kebumen, Central Java. The area is a natural learning center for geology researchers and students from all over Indonesia. It also serves as a geoconservation area that provides a place for geological collections collected from expeditions and exploration across Indonesia, totaling 288 collection numbers.

Archaeological Collection Room located in Biodiversity Building,
Soekarno Science and Technology Park, Cibinong. © BKPUK BRIN

Archaeological Collection

The archaeological collection is now under the management of BRIN and is widely spread throughout Indonesia, including six locations of the former National Archaeological Research Center and other eleven offices unit. This collection includes a total of 2,996,619 artefacts.

Zoological Collection

BRIN preserves around 1,004,407 zoological collections and serves as an important national repository for the collection of animal specimens. This collection has been accumulated since the establishment of the Zoologicum Bogoriense Museum (MZB) in 1894, which is the largest zoological museum in Southeast Asia.

Zoological Collection Room which managed by BRIN. This room is located in
Biodiversity Building, Science and Technology Park of Soekarno, Cibinong.
© BKPUK BRIN

Xylarium Collection Room located in Biodiversity Building, Soekarno Science and Technology Park, Cibinong. © BKPUK BRIN

Xylarium Collection

Xylarium is a herbarium dedicated to the conservation of the wood collection. Herbarium plays an important role in the process of identification of wood, supporting research, education, as well as bioforensics that uses wood as authentic evidence. Indonesian xylarium collections include wood, bamboo, rattan, wood fossils, and other non-wood forest products. The collection has collected 700 wooden specimens consisting of discs and trapezium shapes representing 146 species, 135 genera, and 40 families that are valuable scientific resources.

Research Financing Facilitation

In organizing its facilitation and research funding function, BRIN partnered with the Indonesia Endowment Fund for Education Agency (LPDP) as the Endowment Fund for Research Manager through the Research and Innovation Program for Advanced Indonesia (RIIM). By 2023, the funding managed by BRIN amounted to Rp16,9 billion, and from the Endowment Fund for Research administered by LPDP worth Rp153,5 billion. In addition, it has also received a commitment of funding from funding agency partners both domestically and abroad in the amount of Rp115 billion as a matching fund. Based on the performance indicator of the Directorate of Research and Innovation Financing in 2023, such achievement has been obtained: 3,880 proposals out of the target 2,900 proposals received from the entire research group/team of the institute managed by the Directorate of Research and Innovation Funding.

1. The RIIM Competition scheme is a research funding program for developing the novelty of science and technology.
2. RIIM Start-up Scheme is a research funding program for developing research-based start-ups in Indonesia to become independent and sustainable start-ups.
3. RIIM Expedition scheme is a research funding program for conducting exploration and field research to produce scientific collections such as specimens and data recordings and new knowledge of the diversity of natural resources, socio-cultural aspects, religion, and archaeological aspects.
4. RIIM Collaboration Scheme is a research funding program granted to enhance cooperation between Indonesian researchers and researchers from abroad through collaborative programs, joint calls, and co-funding.
5. The RIIM Invitation scheme is a research funding program that produces transformative change according to the theme of the research organizer and the needs of ministries, institutions, or enterprises.
6. Innovation Product Testing Scheme (Health, Agriculture, and Technology) is used as a facilitation to conduct research innovation product testing.
7. Research Collaboration Center Scheme is used as facilitation for research activities and management as a collaboration media for the implementation of research activities in specific fields that are multi and interdisciplinary.

Scientific Awards and Outstanding Researchers

Scientific Awards

BRIN gives awards and recognizes the dedication and scientific achievement that has been achieved as a form of appreciation to individuals who are active and highly committed in the discovery, development, and dissemination of various innovative scientific and technological activities as well as disseminating science to society.

From left to right: Melanie Budianta, Jamaluddin Jompa, and Oman Fathurahman. © BKPUK BRIN

The Sarwono Award and the Sarwono Prawirohardjo Memorial Lecture

BRIN presented the **2023 Sarwono Award** to **Prof. Melanie Budianta, Ph.D.**, a professor of the Faculty of Cultural Sciences of the University of Indonesia, an expert in Cultural Studies who is active in developing cultural studies and strengthening Indonesian identity through literature and cultural symbols. On the same occasion, **Prof. Dr. Ir. Jamaluddin Jompa, M.Sc.**, a scientist focusing on the conservation of coral reefs and strengthening the role of Indonesia in the preservation of the marine environment, was honoured to deliver a scientific lecture in the series of **Sarwono Prawirohardjo Memorial Lecture in 2023**.

Habibie Prize

The 2023 Habibie Prize is awarded to **Prof. Dr. Oman Fathurahman, M.Hum.**, an Indonesian philologist leading the Digital Repository of Endangered and Affected in Southeast Asia (DREAM SEA). With a "plus philology" approach, he expanded his understanding of Nusantara's Islamic manuscripts through digitization and a program for studies on Ancient Manuscripts of the Archipelago program, which is called Ngaji Manuskrip Kuno Nusantara (Ngariksa).

Nurtanio Award

BRIN awarded the **2023 Nurtanio Award** to **Prof. Dr. Harijono Djodjodihardjo, Sc.D.**, a researcher in the field of air transportation and space, as well as a former professor at the Bandung Institute of Technology and Al-Azhar University of Indonesia. The award is given in recognition of his skill in Indonesian aviation and space, including his contribution to developing the CN-235 and SAFET-03 Aircraft. **Nurtanio Lecture 2023** is delivered by **Adi Rahman Adiwoso, M.Sc.**, a researcher in the field of space studies who now serves as the Chief Director of the PT Pacific Satelit Nusantara (PSN), as well as the inventor of satellite phones that enable smartphone communications to be carried out anywhere.

G.A Siwabessy Memorial Lecture

The G.A. Siwabessy Memorial Lecture year 2023 Scientific Lecture was delivered by **Dr.-Ing. Yuliang Sun**, Deputy Chief Engineer of the Institute of Nuclear and New Energy Technology, Tsinghua University, and **Dr. Jun Sun**, Division Head of Reactor Physics, Thermal Hydraulics, and System Simulation of the Institutes of nuclear and new energy technology, Tsinghua University. Both have contributed to the research and development of high-temperature gas-cooled reactor technology or High Temperature Gas Cooled Reactor (HTGR) in China.

From left to right: Harijono Djodjodihardjo and Yuliang Sun. © BKPUK BRIN

BRIN Research Award: Enhancing National Innovation

From left to right: Thomas Djamaluddin, M. Furqon Azis Ismail, Ferensa Oemry, Wahyudi Hasbi, Edvin Aldrian, Ignasius Dwi Atmana Sutapa, Maskur, Sukandar, Gina Kusuma, Joko Sumanto, Gideon Rendy Natanael, and Indi Dharmayanti. © BKPUK BRIN

By 2023, BRIN researchers have demonstrated dedication and contributions to science and technology. Their contributions have produced significant innovations in various fields and enriched human knowledge.

Thomas Djamaluddin was acknowledged for his achievements in the field of space studies by receiving the APRSAF *Space Achievement Award* through his contribution to expanding activities in the Space Frontier Working Group.

M. Furqon Azis Ismail received the award from the *Alexander von Humboldt Stiffung/Foundation*, an international *Georg Forster Research Fellowship* program, for conducting physical oceanography research at the GEOMAR Helmholtz Center for Ocean Research Kiel.

Ferensa Oemry was selected as the winner of the *Asian Oceania Neutron Scattering Association Young Research Fellow 2023*, an award that supports talented young scientists in neutron science and technology in Asia-Oceania.

Wahyudi Hasbi was awarded the title of a hero of innovation by the Indonesia Forum Foundation (YIF) in collaboration with *Corporate Innovation Asia* (CIAS). This award reflects his dedication to driving technological progress and contributing to society.

Edvin Aldrian was awarded the *Bintang Jasa Pratama* Medal of Honor for his contributions to the field of science. His research on climate and environment has had a broad impact on policy development in Indonesia.

Ignasius Dwi Atmana Sutapa has been awarded the UNESCO RSC IHP *For Asia Pacific Region Award* for outstanding contributions in the field of hydrology. This award reaffirms his commitment to sustainable management of water resources.

Maskur is recognized for his achievements in the field of nuclear medicine technology through the formulation of radiopharmaceuticals, which pushed Indonesia towards independence in drug production. This achievement is significant not only for the health sector but also for national sovereignty in the field of pharmaceuticals.

Sukandar, Gina Kusuma, Joko Sumanto, dan Gideon Rendy Natanael won the Gold Award from *Indonesia Healthcare Innovation Awards*/IHIA VII-2023 in the Category of Health Devices for their innovation in nuclear-based thyroid diagnostic medical devices that strengthen the health sector with advanced technology.

Indi Dharmayanti has been awarded by the Ministry of Empowerment of Women and Child Protection of the Republic of Indonesia as a strong and inspiring woman in 2023. As a researcher, she has been an advocate for many women in science and research.

Additionaly, BRIN also awarded 12 distinguished researchers who have delivered their best achievements. The researchers chosen for the BRIN Research Award are:

1. **Fairul Zabadi**
2. **Widya Fatriasari**
3. **Yuliar Firdaus**
4. **Agung Dwi Laksono**
5. **Teguh Wahyono**
6. **Phil Hendris Wongso**
7. **Farohaji Kurniawan**
8. **Nidya Judhi Astrini**
9. **Ali Rahmat**
10. **Dedi Supriadi**
11. **Edi Kurniawan**
12. **Ahmad Fudholi**

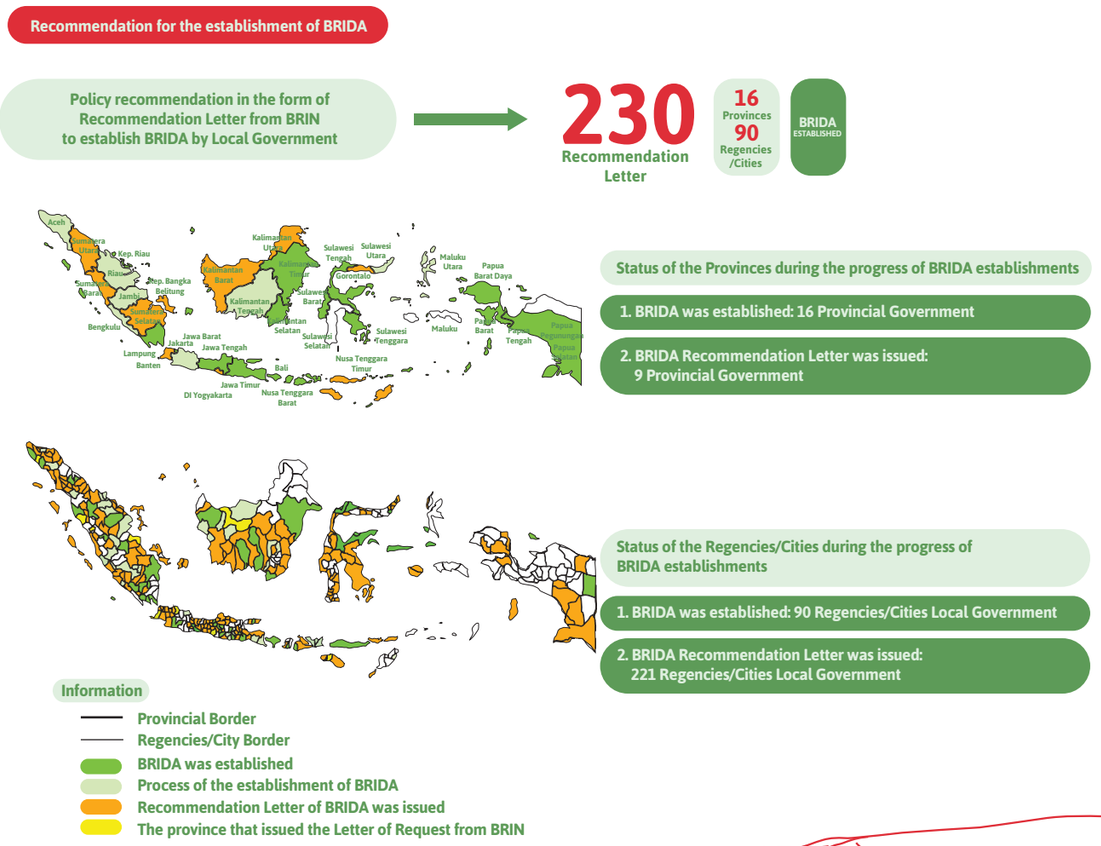
BRIN also awarded researchers with Intellectual Property (KI) with the highest royalty value in a year. The award was given to **Ir. Basril**, who created technology for the manufacture of membrane pericardium products and bone transplantation sterile demineralization radiation.

PART

03

Policy Recommendation

BRIN plays an important role in advancing science and technology, both at the regional and national levels and internationally. Through collaboration and active involvement in various programs and committees, BRIN demonstrates its commitment to sustainable development and global cooperation through policy recommendations.



Evidence-Based Area Development

During the year 2023, BRIN has issued 230 letters of recommendation for consideration of the establishment of the Regional Research and Innovation Agency (BRIDA), which includes 9 letters of consideration for the creation of BRIDA at the provincial level and 221 letters of consideration for the formation of BRIDA at the regencies/city level.

BRIN carries out the construction of BRIDA, which has been formed through many activities such as coordination of the preparation of master plans and road maps as well as planning, programs, budgeting, institutions, research resources, development, assessment, and application, inventions, and innovations in the region; coordination and supporting solutions to the technology needs, and innovation for improving the competitiveness of the region.

In addition, BRIN also contributes to the delivery of scientific evidence-based policy recommendations at the regional level. BRIN has produced 23 policy recommendations related to Food Sovereignty issues, 8 related to health issues specific to stunting management and control policies, and 11 political recommendations towards environmental sustainability. In terms of energy sovereignty, BRIN has produced two policy recommendations. In addition, BRIN has produced 22 policy recommendations related to knowledge-based economic transition issues and 11 policy recommendations related to social resilience.

Rakortek BRIDA 2023 and Launching of Regional Competitiveness Index (IDSD). IDSD has become a comprehensive regional standard to reflect the regional productivity level. © BKPUK BRIN

National Evidence-Based Policy

To ensure the sustainability of the research ecosystem towards food sovereignty, BRIN, through the Research and Innovation Policy Forum (FKRI), produced 26 policy recommendations, including policies on food supply strategies, commodities related to land ownership, and the development of farmers' cooperatives (Koperasi Petani) in Indonesia. BRIN has played an important role in supporting government policy by actively producing six significant policy recommendations, including those related to Net-Zero Emission (NZE) and Nuclear Power Plants. (PLTN). The Social and Community Resilience Guide has been drawn into 51 policy recommendations covering vital aspects such as research and innovation ecosystems, regional development strategies, and empowering fishermen and farmers to reduce economic inequalities.

BRIN has successfully formulated seven policy recommendations to support various aspects of sustainable development, including the preservation of the mangrove environment, sustainable management of fish resources, and optimization of the use of natural resources. BRIN has formulated and prepared 13 policies on the management of nuclear fuel materials, the utilization of satellite images, the identification of productive economies, village main products, the implementation of regional autonomy, and the ecosystem for the needs of digital talent in Indonesia. BRIN has also produced 11 policy recommendations, including on Indonesian Nutrition and Stunting Status Results, which have been submitted to the relevant ministries/agencies.

BRIN's Strategic Role in International Policy

BRIN contributes to the formulation of policy recommendations at the international level. These contributions are produced by a number of focal points under the coordination of BRIN, including the Indonesian National Committee for Intergovernmental Hydrological Programme (IHP) - UNESCO in the field of research, innovation, and global policy for clean water, the Indonesians National Commission for Man and the Biosphere Programme - UNESCO for biosphere reserves, The Indonesia National Committee of the Inter Governmental Oceanographic Commission (IOC)-UNESCO for marine fields including fishing, Management of Social Transformation (MOST) - UNESCO in the sphere of social and cultural transformation, the Indonesia Space Agency (INASA) for the implementation of space studies field, the International Nuclear Agency of Indonesia (INUA Indonesia) for nuclear energy, and the APEC Policy Partnership on Science, Technology and Innovation (APEC PPSTI) in the areas of cooperation of science, technology, and innovation.

BRIN has produced worldwide recognition by UNESCO for the new Biosphere Reserve Bantimurung Bulusaraung Ma'rupanne of South Sulawesi, as well as the success of periodic reviews of three Indonesian Biosphere Reserves which includes Cibodas Biosphere Reserve, West Java, Giam Siak Kecil-Bukit Batu Biosphere Reserves, Riau, and Wakatobi Biosphere Reserve, Southeast Sulawesi.

It also contributed significantly to the global policy recommendations in water resource management at the UNESCO IHP Session, the policy recommendation for extreme climate change at the COP, the establishment of science-based policies, and the 2030 and 2045 road maps for disaster resilience and climate to support the recommendations of the UN Office Global Platform for Disaster Risk Reduction (GPDRR) 2022, G20, Mid-Term Review SFDRR 2030, SDGs 2030. BRIN also contributed to the Archipelagic and Island State (AIS) Forum to provide alternative solutions to marine garbage, small island governance, and alternatives to mitigating the effects of extreme climate change. In the field of space studies, BRIN strengthened diplomacy and struggle for the basic position of the Government of RI in the use of outer space for peaceful purposes at the UN Committee on Peaceful Uses of Outer Space (UNCOPUOS).

The activity of The Development of Policy and Public Service Seminar in BRIN Office Science Park of Sarwono Prawirohardjo in Jakarta. © BKPUK BRIN.

Furthermore, BRIN also plays an important role as the focal point of the ASEAN Committee on Science, Technology, and Innovation (ASEAN COSTI) in Indonesia. As a focal point, BRIN can play an active role in ensuring that research and innovation policies carried out in ASEAN are in line with the interests, priorities, and goals of the management of research and innovations in Indonesia.

In line with its role, BRIN is strategically and continuously involved in various priority activities at ASEAN COSTI, including policy formulation activities on ASEAN research and innovation sectors, such as preparing the ASEAN Blue Economy Roadmap on Science, Technology, and Innovation. ASEAN COSTI Indonesia also plays a role in various competence development activities (ASEAN HPC School, ASEAN Workshop on AI), including an active role in efforts to provide research and innovation infrastructure, facilitating research and innovations, and leveraging research and innovations—for example, activities related to ASEAN Technology Management Hub, Establishment of ASEAN HPC Infrastructure and others. Moreover, ASEAN COSTI Indonesia is actively engaged with various ASEAN partners to gather support for the implementation of activities within the scope of ASEAN.

BRIN plays a crucial role in advancing research and innovation, ensuring that Indonesia remains competitive at a global level, even more in becoming a new growth hub, contributing significantly to the Research and Development sector, national development, and improving the quality of life of Indonesians.

International Footprint

G20 Research and Innovation Initiative Gathering (RIIG) was held on 4-5 July 2023 in Mumbai, India. One of the outcome points of the agreement reaffirms the G20 countries' commitment to open, fair, and secure scientific collaboration, as well as encouraging collaborative research and innovation in the fields of materials for sustainable energy, a bio-circular economy, environmentally friendly innovation for energy transition, and a sustainable blue economy. © BKPUK BRIN

Technology Forum in G20

BRIN has demonstrated its international leadership by actively participating in the G20 summit. As the host of the 2022 G20, Indonesia has led discussions on the importance of research and innovation in sustainable development. BRIN's collaboration in the G20 side event – Research and Innovation Initiative Gathering (RIIG) demonstrates Indonesia's commitment to research and innovation. During India's 2023 Presidency, the RIIG was held under the theme 'Research and Innovation for Equitable Society.' BRIN was involved in forming the new working group, the Research and Innovation Working Group, and was active in the Research Ministers Meeting. Through various opportunities, BRIN advocates Indonesia's commitment to research and innovation and explores opportunities for international collaboration in various fields, such as agriculture, health, maritime, environment, and climate change. Thus, BRIN has strengthened Indonesia's position in global research and innovation.

Belt and Road Initiative

Indonesia is a strategic partner in the Belt and Road Initiative (BRI) adopted by China, which involves infrastructure development and investment in the countries under the BRI. BRIN plays a vital role in international cooperation, especially in technology transfer and the development of the digital economy. Cooperation with partner countries, especially China, has strengthened innovation and economic growth. However, challenges such as technological complexity, skill gaps, and cultural differences remain obstacles to overcome. Through schemes like the BRI, BRIN strives to facilitate the dissemination of knowledge and technology that is beneficial to the development of the digital economy in Indonesia. Investments in research infrastructure, human resources training, and supportive policies are also integral to BRIN's work in an international context. Thus, BRIN has become a key player in directing international cooperation towards sustainable innovation and inclusive economic growth in Indonesia.

At the plenary session of the Belt and Road Conference on Science and Technology Exchange in Chongqing, China, the Chairman of BRIN offered a joint research funding scheme collaboration to the countries that participated in the Belt and Road Initiative (BRI). © BKPUK BRIN

Collaboration of BRIN and ASEAN HPC School in the field of High Performance Computing

BRIN actively collaborates internationally on High Performance Computing (HPC). The EU and RIKEN of Japan support strengthens ASEAN HPC School 2023 by providing a platform for ASEAN young researchers to understand and develop high-performance computing systems. ASEAN HPC School enables young scientists to leverage HPC, expand networks, and enhance cross-country collaboration. This collaboration reflects BRIN's commitment to broadening access and research capabilities in the field of HPC in ASEAN, supporting the development of an inclusive and sustainable digital economy, and increasing competitiveness and innovation in the ASEAN region.

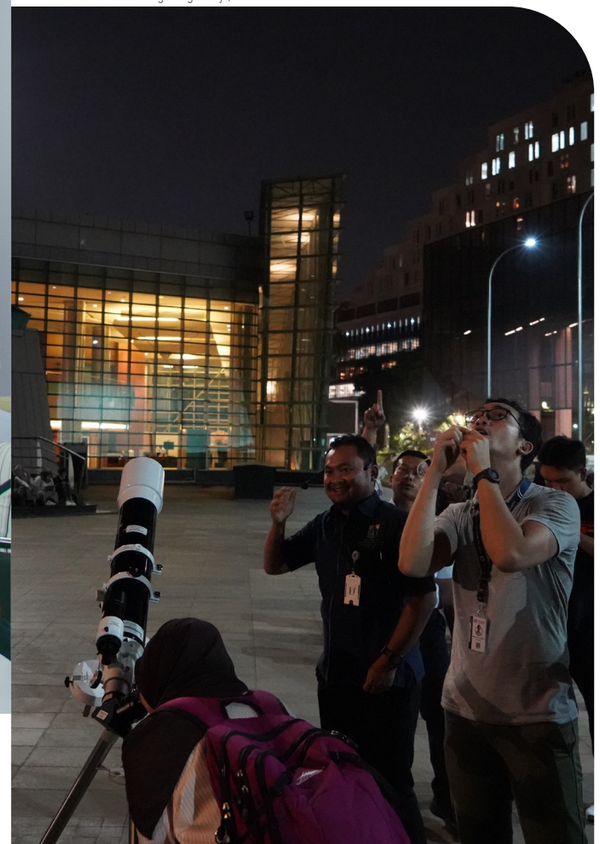
The activity of Asean High-Performance Computing (HPC) School 2023 was held on 11-16 December 2023 at Science and Technology Park of Soekarno, Cibinong involving 44 lecturers from leading institutions in the European Union and ASEAN to 82 researchers and students from ASEAN member countries. © BKPUK BRIN

The 29th Asia-Pacific Space Forum (APRSAF-29)

The activity of 29th APRSAF at BJ Habibie Building, Thamrin on 17-23 September 2023. © BKPUK BRIN

BRIN has taken important steps in increasing Indonesia's contribution to the economy of space, a domain considered the key to the future. The use of space technology in the production and distribution sectors has been a driving force for economic growth and has had a significant impact. Through the leadership of BRIN, Indonesia hosted the 29th Asia Pacific Space Forum (APRSAF) on the theme "Accelerating Space Economies through Regional Partnership." The meeting aims to enhance cooperation and international cooperation in the Asia-Pacific region in the field of space, as well as to promote space-related activities and build strong cooperation at all levels. BRIN is also actively anticipating challenges, such as space traffic, by encouraging regional partnerships to find solutions. Through various activities at APRSAF-29 and InaRI Expo 2023, BRIN has strengthened Indonesia's position as a leading player in exploring and utilising space studies and developing a global cooperation network in this field.

"Stargazing Party", one of the side event of APRSAF-29. © BKPUK BRIN



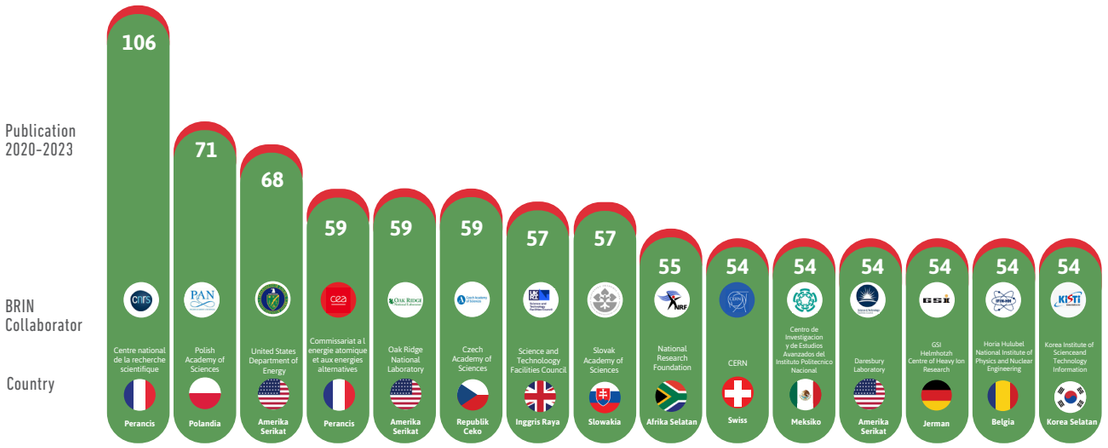
The activity of BRIN and LDE Academy on 23-27 October 2023 in Serpong, Tangerang, Banten. © BKPUK BRIN

BRIN and LDE Academy Research Collaboration: The Smart, Sustainable, and Healthy City

BRIN collaborated with various universities in the Netherlands, such as Leiden University, Delft University of Technology, and Erasmus University Rotterdam (LDE), which produced the BRIN-LDE Academy on 23-27 October 2023 under the theme "The Smart, Sustainable and Healthy City." The research collaboration aims to enhance the research ecosystem of BRIN and improve the quality of research from various disciplines, especially related to urban studies, AI, and environmental health. This research collaboration is expected to benefit significantly Indonesia and the Netherlands in addressing the challenges of urbanization, strengthening bilateral relations between the two countries, and being an important milestone in dealing with future urbanization challenges.

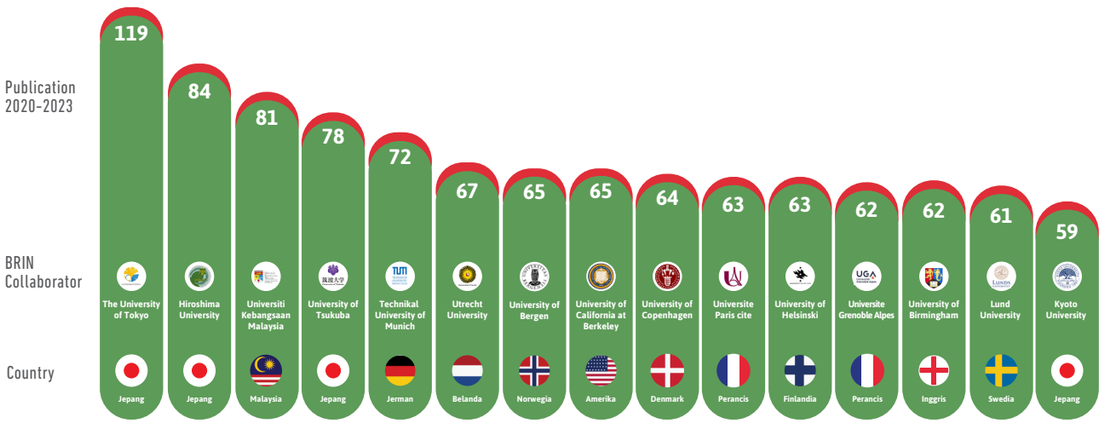
Research Collaboration with the Global Research and Development Institute

BRIN's research collaboration with global research and development agencies has been a critical pillar in strengthening the innovation ecosystem in Indonesia. Through strategic partnerships with various leading R&D institutions worldwide, BRIN has successfully expanded its international partnership network. Engaging in this kind of collaboration provides more comprehensive access to the most up-to-date resources, knowledge, and technology in a wide range of scientific fields, thereby enabling BRIN to enhance its research and innovation capacity at home and accelerate the development of relevant and globally competitive technologies. This collaboration also facilitates some ideas exchanges, inter-agency experiences, and opens up opportunities for new discoveries that can produce significant benefits for national development.



BRIN Research Collaboration with Global Universities

BRIN's research collaboration with global universities has been an important milestone in strengthening Indonesia's research and innovation ecosystem. To enhance research capacity and expand international cooperation networks, BRIN has established partnerships with several of the world's leading universities. Through this research collaboration, BRIN can accelerate the development of research and innovations in Indonesia, advance technology, and increase Indonesia's competitiveness in the international arena. This collaboration extends access to global resources and knowledge and exchanges ideas, technologies, and best practices in various scientific fields. Thus, the research has significantly contributed to national development and strengthened Indonesia's position as a leading player on the global scientific stage.



PART

04

Governance

BRIN has produced a number of important achievements throughout 2023, revealed in a series of independent assessments and audits by financial and performance institutions. By accepting the Rational Opinion Without Exception (WTP) from BPK RI, BRIN demonstrated integrity and transparency in its financial report. The quality of this effective governance has been shown by the audit of the 2022 financial statements scheduled for May 24, 2023.

The results of the audit are independent assessments of the Government's Internal Control System (SPIP), the Capacity Level of the Internal Surveillance Apparatus (APIP), and legislative reforms as well as the implementation of the merit system in the management of ASN (government officials). In addition, public information openness and archival accreditation are part of the ongoing reform. It demonstrates BRIN's commitment to open, accountable governance and support for national research and innovation.

The result of the analysis of the BRIN budget efficiency for the year 2023 is 1.87, obtained from the average percentage of access to performance versus the % of average access to budget absorption. Based on these calculations, it can be concluded that BRIN's performance access to the budget realization reach is ≥ 1. That is, there is efficiency in the use of the budget.

BRIN accept students with the purpose of internship in research, one of which is in Research Center for Appropriate Technology, in Science Area Subang (Muhammadi Siswosudarmo). © BKPUK BRIN.

Fundamental Transformation

The fundamental transformation BRIN has undertaken as a whole has become a benchmark for modern digital-based governance in the era of change. These include new working patterns through the Work from Anywhere system based on Co-Working Space, transparency of digital financial budget governance and non-cash scheme using single-bank partners, program effectiveness through integration of cross-unit functions, budget efficiency through the consolidation of structural positions from 911 to 195 positions, normalization of research spending needs, elimination of total financial spending and unrelated activities, management of research resources and innovation based on open competition, as well as opening public access to resources (human, infrastructure, budget) of research and innovation to all parties based on open platform.

WTP

Based on the results of the audit of the 2022 financial report carried out by BPK RI in 2023, BRIN has achieved the Opinion Performance Indicator of Normal Without Exception (WTP). These results are established based on an audit of the financial report by BPK RI with Number 30.b/LHP/XV/05/2023 dated May 24, 2023.

NKA

The Ministries/Agency Level Budget Performance Value combines the work of Echelon 1 and the score of Strategic Target Achievement, resulting in an excellent category score of 91.39.

Maturity Rate

Based on the report for evaluating the results of the independent assessment maturity maintenance of SPIP at the National Research and Innovation Agency in 2023, No. PE.09.02/BA-513/D205/2/2023, the Inspectorate of BRIN has obtained a SPIP maturity score of 2,886 or has met Level 2 (developing) characteristics of the SPIP maturity maintenance.

Capability Level

The BRIN APIP capability level achievement in 2023 is at level three, which results from the improvement of several elements and topics that are the areas of improvement by the results of the BPKP evaluation in the previous year. BRIN has improved the human resources management elements, professional practices, and APIP roles and services. There are six elements in the capacity assessment, namely (1) human resources management, (2) professional practice, (3) accountability and performance management, (4) organizational culture and relations, (5) governance structure, and (6) role and service.

Law Reform

The assessment of the index of legal reforms is carried out in two stages. First, the independent assessment was conducted by the BRIN Advisory Team on August 23, 2023 and August 29, 2023 by the BRIN Assessory Team. Second, the assessment results are submitted to the Minister of Legal Affairs and Human Rights through the information system and then continued evaluation by the national team formed by the Ministers of Law and Human Resources. Based on assessments made by the National Team, BRIN has obtained a rating of the 2023 Law Reform Index of 97.30 with the AA category (outstanding).

Merit System

To improve the quality management of ASN management based on merit under law number 5 of 2014, BRIN has enhanced some aspects of the merit system. Based on the assessment results, four of the eight aspects have already received full value, while the other four are struggling to reach the maximum value, including career development, promotion and mutation, performance management, and information systems. On the merit system assessment, BRIN entered the rating of 18 National Non-Targeted National Priorities Institutions with a rating of 3.3 in the category of Excellent.

The Index of Procurement Management

Based on the Assessment of the Procurement Management Index (ITKP) results in 2023, BRIN scored 77.87 with a good category.

Researcher activity of BRIN in Science Park of Kurnaen Sumadiharga, Lombok. © BKPUK BRIN.

Certification of the Archive Accreditation

The components of the reforms carried out by the ministry/agency to improve the quality and competence of archival resources are the selection of outstanding archive experts and the use of information technology. The value of the archive surveillance results is the accumulation of the external archive monitoring scores and the internal archive supervision scores. The archive oversight values apply to the provisions, i.e., the external archive inspection values with a weight of 60% and internal archives supervision value with a weight of 40%. By 2023, BRIN obtained the archival supervision rating of 90.79 with the AA category (very satisfying).

ASN Working Culture

From the results of the survey of work culture mapping of ASN, BRIN participated with 6856 responses; BRIN entered the category relatively healthy with a score of 50.5%.

Performance Accountability Level

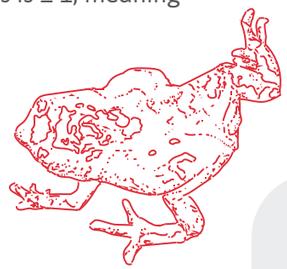
Based on the results of AKIP Evaluation 2023, BRIN scored 71.33 with Predicate BB or excellent. This assessment shows that the implementation of SAKIP BRIN has applied budget efficiency in achieving a reliable information technology-based performance and performance management system.

Public Information Openness

With a view to public information openness (PIP), BRIN has prepared the completion of the Monev (monitoring and evaluation) and implementation of law No. 14 of 2008 on Public Information Openness and Its Implementation through Perki No. 1 of 2021 on the Public Information Service Standards (SLIP) as a form of good and democratic governance. Overall, the stages, processes, and instruments used, BRIN entered an informative rating qualification in the KIP assessment with a range of values from 90 to 100.

The Level of Resource Efficiency Usage

The BRIN budget efficiency analysis results for 2023 are 1.87 billion or trillion obtained from % average performance access versus % average budget absorption achievement. Based on these calculations, it can be concluded that BRIN performance access to budget realization access is ≥ 1, meaning that budget use is efficient.



Appreciation of the Implementation of Bureaucratic Reforms

BRIN has produced results through a number of appreciations from ministries/institutions, such as the following:

1. BRIN achieved the top Digital Implementation Star 4 from It Works magazine and Top Leader on Digital Implementation awarded to Laksana Tri Handoko, Chairman of BRIN
2. BRIN Innovation of Malam Batik Sawit was established as the TOP 45 Public Service Innovation Competition of Kemenpan RB
3. BRIN Achieved the Digital Government Award in the SPBE Management Implementation category from The Ministry of State Apparatus Empowerment and Bureaucratic Reform (Kemenpan RB)
4. BRIN received the High-Quality Opinion Predicate or Category B with a rating of 83.03 and was in the green zone. It was given at the Public Service Standards Compliance Predicates award by Ombudsman RI

Minister of State Apparatus Empowerment and Bureaucratic Reforms (PANRB) Abdullah Azwar Anas handed over Top 45 Outstanding Public Service Innovation to the Chairman of BRIN Laksana Tri Handoko. © BKPUK BRIN

5. BRIN achieved three categories of BKN Award 2023, namely: (1) Implementation of Norms, Standards, Procedures, and Criteria (NSPK) of the best Civil Servants Management (ASN), (2) 4th rank of Application of Data Usage - Information Systems and Computer Assisted Test (CAT), and (3) 5th ranking of Competence Development for Non-Ministerial Institutions of Large Type
6. Achieved Silver Winner at Humas Indonesia Award (AHI) 2023 for the category of Innovative Public Information Services Subcategory of Public Information Space and PPID Category of Best Subcategories of PPID
7. Award for the category of Best UPZ Collection from BAZNAS RI
8. Award for the category of Predicate System of Very Good Merit and the category of Quality of Fulfillment of the Position of High Leadership (JPT) at the Meritocracy Awards of the Year 2023 organized by the Commission of State Civil Service (KASN)
9. Best Top 7 Exhibitors at the ASN Culture Fest 2023 organized by The Ministry of State Apparatus Empowerment and Bureaucratic Reform (KemenPAN-RB)

Young Leadership at BRIN

As of December 2023, BRIN has 148 persons in Senior Leadership/*Pimpinan Tinggi Madya* (Chairman of Research Organization) and Position of Higher Leadership/*Pimpinan Tinggi Pratama* (Head of Research Center). Meanwhile, 57,48% of them are under 50 years old. There are 7 BRIN leaders at the level of Senior Leadership (Head of Research Center) who are under 40 years old. It shows that BRIN has implemented young leadership by providing equal opportunities for every member to enter and contribute to the leadership of BRIN management.

Types of Leader	Under 40	41-45	46-50	51-55	56-60	Total
JPTP & JPTM	2	8	13	19	11	53
Chairman of Research Organization + Head of Research Center	5	24	34	24	8	95
Grand Total	**7**	**32**	**47**	**43**	**19**	**148**

Ahmad Ridwan | 36 y.o
Head of Research Center for Quantum Physics

Masteria Yunovilsa | 39 y.o
Head of Research Center for Vaccine and Drug

Prakoso Bhairawa | 39 y.o
Head of Bureau for Planning and Finance

Ajeng Arum | 40 y.o
Director of Research and Innovation Funding

Nugroho Adi | 40 y.o
Head of Research Center for Sustainable Production System and Life Cycle Assessment

Ahmad Fathoni | 40 y.o
Head of Research Center for Applied Microbiology

Satriyo Krido | 40 y.o
Head of Research Center for Food Technology and Processing

BRIN from their Perspective

"The National Research and Innovation Agency (BRIN) is an important catalyst in driving bureaucratic reform in Indonesia through an evidence-based policy approach. As an innovation center, BRIN contributes to analyzing problems and providing effective policy solutions. Based on evidence and innovation, BRIN strengthens government action in various areas, including poverty eradication and increased investment. Collaboration and extensive networking were the keys to its success. I support BRIN in continuing to produce breakthroughs that significantly impact Indonesian society."

The Minister of State Apparatus Empowerment and Bureaucratic Reform (PANRB). Abdullah Azwar Anas.

"Research and innovation activities have played a crucial role in helping the Ministry of Tourism and Creative Economy face the challenge of the COVID-19 pandemic. We can identify targeted, beneficial, and timely programs by focusing on analyzing travel patterns and quality tourism development in super-priority destinations such as Lake Toba and Borobudur. As a result, we can effectively support the revival of the tourism sector and the creative economy, ensuring a sustainable and inclusive recovery for Indonesia."

Minister of Tourism and Creative Economy, Sandiaga Salahuddin Uno.

"The collaboration between the Ministry of Agriculture and the National Research and Innovation Agency (BRIN) has opened a new path for innovation and development in the Indonesian agricultural sector. By focusing on utilizing genetic resources, post-harvest technology, and increased paddy production, we are working toward better and more efficient outcomes. The collaboration also explores the use of irradiation technology to extend agricultural commodities' lifespan, support the planting sector's digitization, and develop genetically engineered products. Through the synergy, we are determined to strengthen the national food ecosystem, build a food landscape, and accelerate agricultural reform. BRIN has become a strategic partner in realizing the vision of more advanced and sustainable agriculture in Indonesia."

Head of the National Food Agency, Arif Prasetyo Adi.

"The National Research and Innovation Agency has demonstrated a vital role in improving waste management through the latest innovation and technology. With the launch of the Environmental Approval Information System Application and Waste Destruction Tool Technology, we have effectively addressed environmental challenges. These initiatives improve waste management efficiency and raise public awareness of the importance of environmental sustainability. Working with BRIN and stakeholders has demonstrated a shared commitment to creating a cleaner and greener Subang district. I hope this effort can be a model for other regions to manage environmental issues innovatively and collaboratively."

A Regent of Subang Regency, Kang Jimat.

"As a higher education institution with a mission to become a research university, Padjadjaran University (Unpad) has always sought to implement research that synergizes the academic performance of lecturers, researchers, and students. This intellectual activity is carried out to produce creative innovations based on IPTEK that have a high utility for solving various problems in the middle of society. The academic objective of Unpad is in line with the presence of the BRIN, which is present to facilitate the college's research activities consistently. BRIN's Advanced Indonesia Research and Innovation Financing Program (RIIM) has been a catalyst for the growth of research among Unpad's academic civilization, where a number of researchers have benefited from this year's batch. May BRIN's positive synergies with research-based higher education institutions in Indonesia, especially with Unpad, continue in the future."

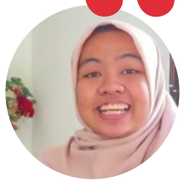
Rector of Padjadjaran University, Rina Indiastuti .

“Based on data from SCIVAL, UI has produced more than 500 research publications in the last three years in collaboration with BRIN. One of the determining factors is that UI is included in the national research consortium of 21 PTNBH, namely Indonesian Collaboration Research involving researchers from BRIN. The dominant areas of collaboration are in the fields of environmental science, various engineering, and energy engineering. The publication of this collaboration has an average FWCI metric of 0.64, which is close to the rate of world recognition. Of course, this is a significant achievement and a basis for increasingly close collaboration in the future. As the Deputy Rector of UI Research and Innovation, I am very grateful to BRIN for all the grant support and research and innovation facilities. Through collaboration with BRIN, many brilliant, strategic, and potentially real solutions for society research and innovation ideas.”

Rector of the University of Indonesia, Ari Kuncoro.”

“BRIN can enhance local civilization interaction with global researchers, improve international collaboration, and co-counselling with foreign experts. The implementation of the activities of the visiting researcher is not free from the various dynamics that need to be improved from the point of view of implementing the activities and the policy of the visiting researcher. The activity provides the potential for enhancing the network of partnerships with researchers abroad. Thus, this program can realize the role of BRIN as knowledge production through research activities at various research centers at BRIN.”

Professor of Indonesian Philology at the Institute for Languages and Cultures of the Islamic World, University of Cologne, Germany, Edwin P. Wieringa.”



"I feel very lucky to be part of the Barista program organized by BRIN. With direct guidance from a mentor, I experienced the ease in accessing and analyzing data and the opportunity to collaborate with the Geospatial Information Agency. It gave me an exciting challenge to carry out my final assignment in the field of industrial engineering. Thank you to BRIN for this opportunity that has enriched my research experience."

Student of Industrial Engineering, Gajah Mada University/Awardee of the BRIN Barista Program, Zahwa Devarrah.”

"My research focus on the BRIN Postdoctoral program is optimizing nucleic acid extraction robots and characterizing chemical pollutants in rainwater. I've also collaborated with the university to apply biochemistry and bioinformatics to health. Since joining this program in July 2023, BRIN has supported me in developing chemical and biochemical sciences and produced publications in four international journals. I hope more and more colleagues can expand their knowledge at BRIN."

Postdoctoral researcher of Research Center for Climate and Atmosphere, Ilma Fauziah Ma'ruf.”

"I have felt the real benefits of the Degree by Research or DBR program during my S2 master's program at UGM. This program not only smoothed up my research process in the office but also significantly supported my research activities on campus. Thanks to the funding from the DBR program, I was able to focus on writing a publication for a reputable international journal that is currently under review. The DBR program really opens up opportunities for S1 and S2 students to job research achievements while completing postgraduate studies. I highly recommend this program because it provides substantial funding support and integrates work research experience with academic achievement.”

A Researcher at Research Center for Technology and Food Process, BRIN/Degree by Research (DBR) Participant, Wahyu Anggo Rizal.”

“Previously, our products only had a storage period of three months at room temperature, not qualifying for a minimum of one year for the export market. Thanks to the IPTEK-based Micro-Enterprise Facilitation (FUMI) program and a series of intensive research, we managed to increase the storage time of our products to one year at room temperature. With this new standard, we are ready to enter and compete in the export market.”

Founder of small and medium-sized enterprises (SMEs/UMKM) Bumi Omah Hensin, Henry.”

Location and Address of BRIN

Lampung Province

1 **Iskandar Zulkarnain Science Park**
Jl. Sutami Km. 15, Tanjung Bintang
South Lampung 35361

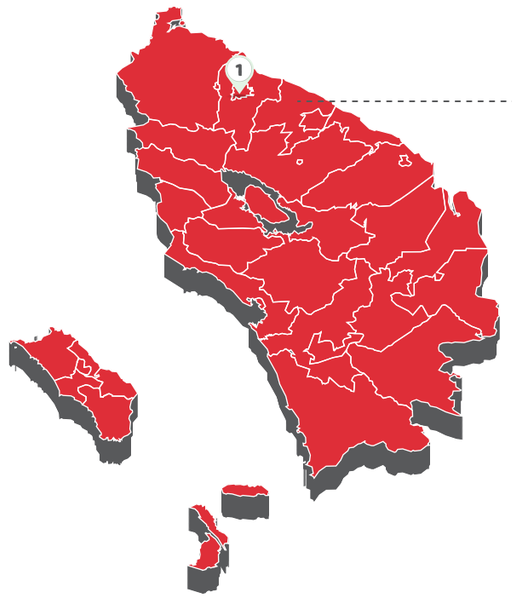
2 **Field Station Area Experimental Garden of Anak Tuha**
Bumi Aji, Anak Tuha
Central Lampung 34161

South Sumatera Province

1 **Co-working Space of Palembang**
Jl. Kancil Putih, Lorong Rusa,
Demang Lebar Daun, Palembang,
South Sumatera 30137

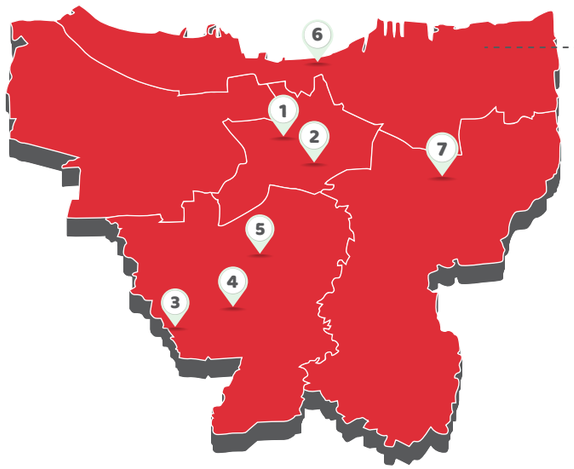
West Sumatera Province

1 **Field Station Area Agam Observatoin Station**
Koto Rantang, Palupuh
Agam, West Sumatera 26151



North Sumatera Province

1 **Co-working Space of Medan**
Jl. Seroja Raya, Gang Arkeologi,
Medan, North Sumatera 20134



DKI Jakarta Province

1 Administration Area
Bacharuddin Jusuf Habibie
Gedung B.J. Habibie
Jalan MH. Thamrin No. 8
Central Jakarta 10340

2 Co-working Space
Doddy Achdiat Tisna Amidjaja
Jl. Raden Saleh Raya No. 43, Cikini
Menteng, Central Jakarta 12710

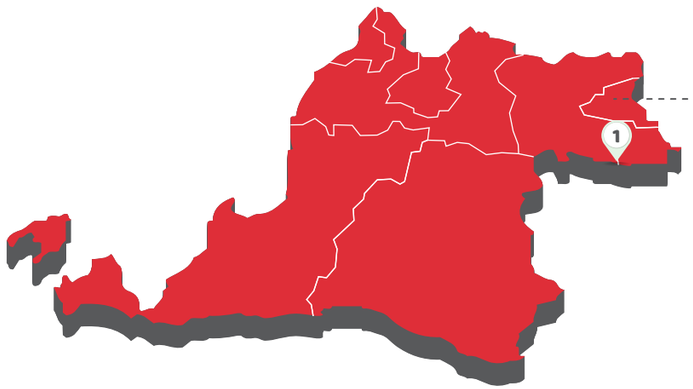
3 Science and Technology Park
Gerrit Augustinus Siwabessy
Jl. Lebak Bulus Raya No. 49
South Jakarta 12440

4 Science Park
Raden Pandji Soejono
Jl. Condet Pejaten
South Jakarta 12510

5 Science Park
Sarwono Prawirohardjo
Jl. Gatot Subroto No. 10
South Jakarta 12710

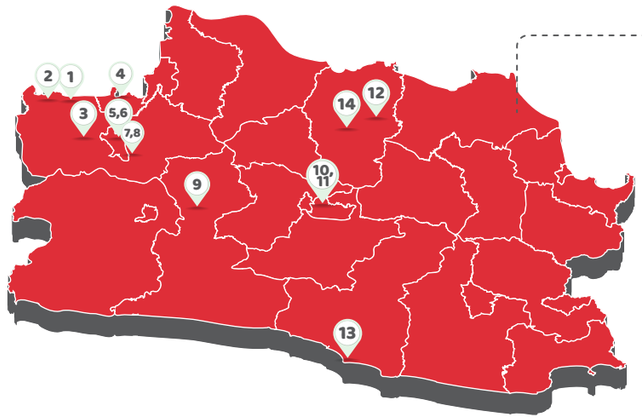
6 Science Park
Aprilani Soegiarto
Jl. Pasir Putih Raya No. 1
North Jakarta 14430

7 Co-working Space
Harsono Wiryosumarto
Jl. Pemuda Persil 1, Rawamangun
Pulo Gadung, East Jakarta 13220



Banten Province

1 Science and Technology Park
Bacharuddin Jusuf Habibie
Jl. Raya Puspiptek 60
South Tangerang 15310



West Java Province

1 Administration Area
Soedjono Djoened Poesponegoro
Jalan Pendidikan, Gunung Sindur
Bogor, West Java 16340

2 Science Park
Jacob Salatun
Jl. Raya Lapan Sukamulya, Rumpin
Bogor, West Java 16350

3 Science Park
M. Ibnoe Soebroto
Jl. Cagak Satelit No. 8, Rancabungur
Bogor, West Java 16310

4 Science Park
R. Sunaryo
Jl. Raya Lapan Mekarsari 2, Tarogong
Bogor, West Java 16350

5 Scientific Conservation Park
Bogor Botanic Garden
Jl. Ir. H. Juanda 54
Bogor, West Java 16122

6 Co-working Space
Kusnoto Setjodiwirjo
Jl. Ir. H. Juanda 18
Bogor, West Java 16122

7 Science and Technology Park
Soekarno
Jl. Raya Jakarta-Bogor Km. 46
Cibinong, West Java 16911

8 Scientific Conservation Park
Cibinong Botanic Garden
Jl.Raya Jakarta-Bogor Km. 46
Cibinong, West Java 16911

9 Scientific Conservation Park
Cibodas Botanic Garden
Sindanglaya, Cipanas,
Cianjur, West Java 43253

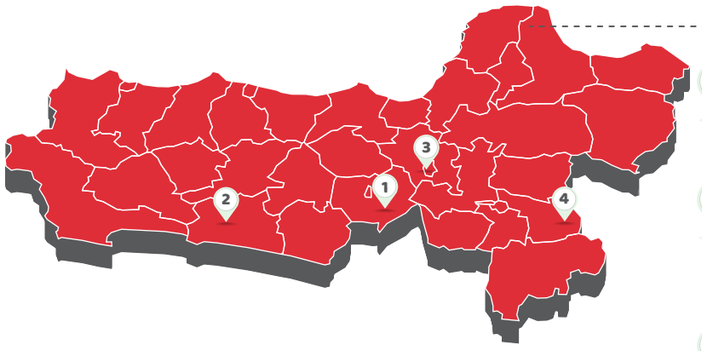
10 Science and Technology Park
Samaun Samadikun
Jl. Cisitu Sangkuriang
Bandung, West Java 40135

11 Co-working Space
Tamansari
Jl. Taman Sari No. 71
Bandung, West Java 40132

12 Science Park
Muhammadi Siswosudarmo
Jl. KS Tubun 5, Subang
West Java 41213

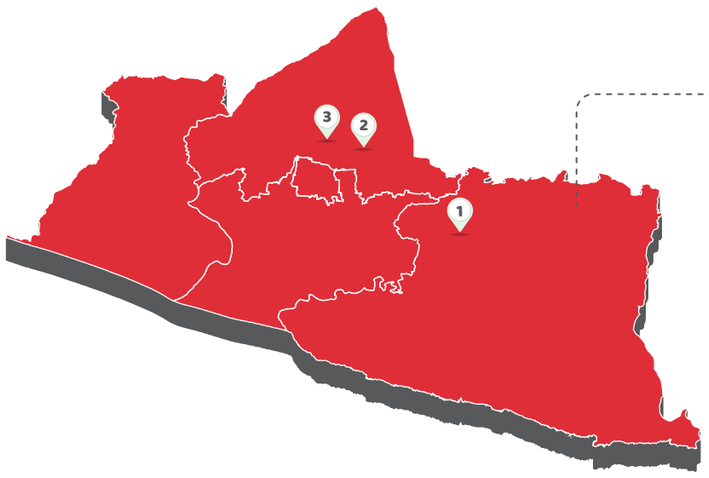
13 Scientific Conservation Park
Pamengpeuk Botanic Garden
Jl. Cilauteureun, Pameungpeuk
Garut, West Java 44177

14 Field Station Area
Experimental Garden of Dawuan
Jl. Raya Kalijati Km. 9
Subang, West Java, 41270



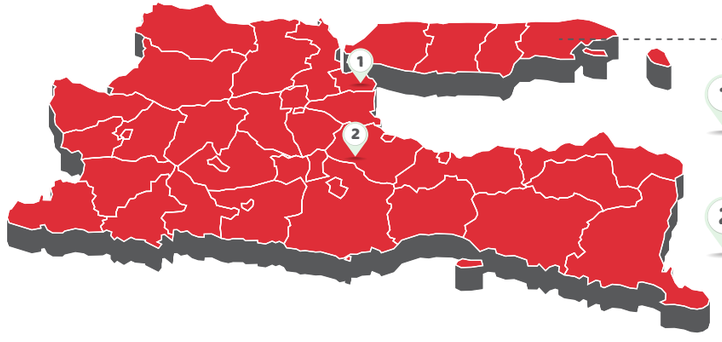
Central Java Province

1. **Co-working Space Muhilal**
   Desa Kavling Jayan, Borobudur
   Magelang, Central Java 56553
2. **Scientific Conservation Park Geodiversity Area Sukendar Asikin**
   Jl. Karangsambung Km. 19
   Kebumen, Central Java 54353
3. **Co-working Space M.F. Sustriayu Nalim**
   Jl. Hasanudin 123
   Salatiga, Central Java 50721
4. **Co-working Space Soetarman**
   Jl. Raya Lawu 11, Tawangmangu
   Karanganyar, Central Java 57792



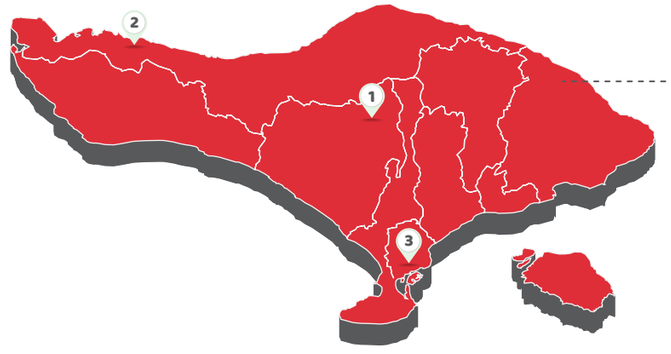
DI Yogyakarta Province

1. **Science Park Umar Anggara Jenie**
   Jl. Raya Jogja-Wonosari Km. 31,
   Gunung Kidul, Yogyakarta 55861
2. **Science and Education Park Achmad Baiquni**
   Jl. Babarsari
   Yogyakarta 55281
3. **Co-working Space & Indonesian Nuclear Technology Polytechnic Subandono Diposaptono**
   Jl. Grafika Sekip 2
   Sleman, Yogyakarta 55284



East Java Province

1. **Science Park Said Djauharsjah Jenie**
   Jl. Hidro Dinamika, Keputih
   Surabaya, East Java 60112
2. **Scientific Conservation Park Purwodadi Botanic Garden**
   Sembung Kidul, Purwodadi
   Pasuruan, East Java 67163

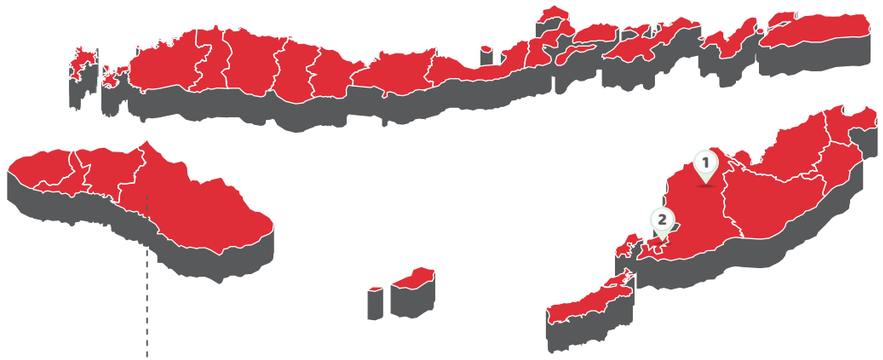


Bali Province

1. **Scientific Conservation Park Eka Karya Bali Botanic Garden**
   Jl. Kebun Raya, Candikuning,
   Baturiti, Tabanan, Bali 82191
2. **Scientific Conservation Park Conservation Area of Marine Ecology**
   Br. Gondol, Gerokgak
   Buleleng, Bali 81155
3. **Co-working Space of Denpasar**
   Jl. Raya Sesetan No. 80
   Denpasar, Bali 80223

West Nusa Tenggara Province

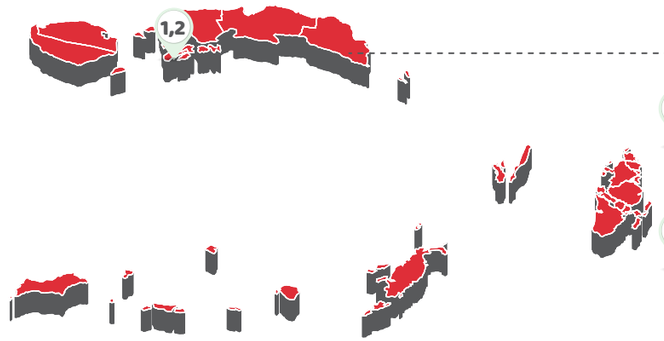
1 **Science Park Kurnaen Sumadiharga**
Jl. Senggigi, Malaka, Pemenang, North Lombok
West Nusa Tenggara 83352



East Nusa Tenggara Province

1 **Field Station Area ObsNas Gunung Timau**
Bitobe, Amfoang Tengah
Kupang, East Nusa Tenggara 85374

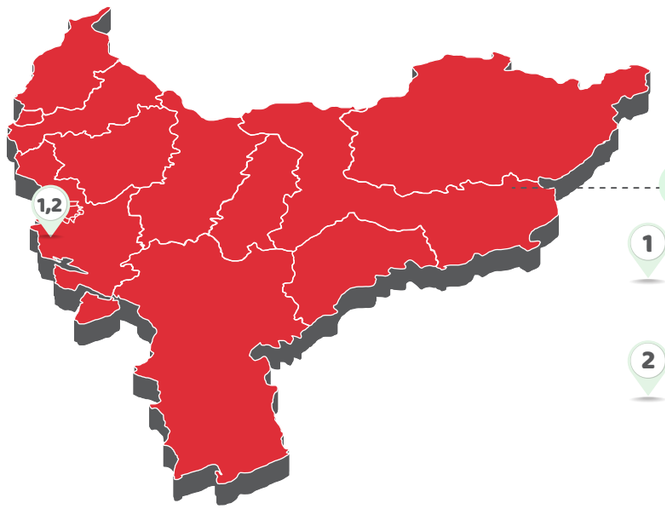
2 **Co-working Space of Tilong**
Desa Oelnasi, Tilong, Central Kupang
East Nusa Tenggara 85361



Maluku Province

1 **Co-working Space of Ambon**
Jl. Namalatu-Latulahat
Ambon, Maluku 97118

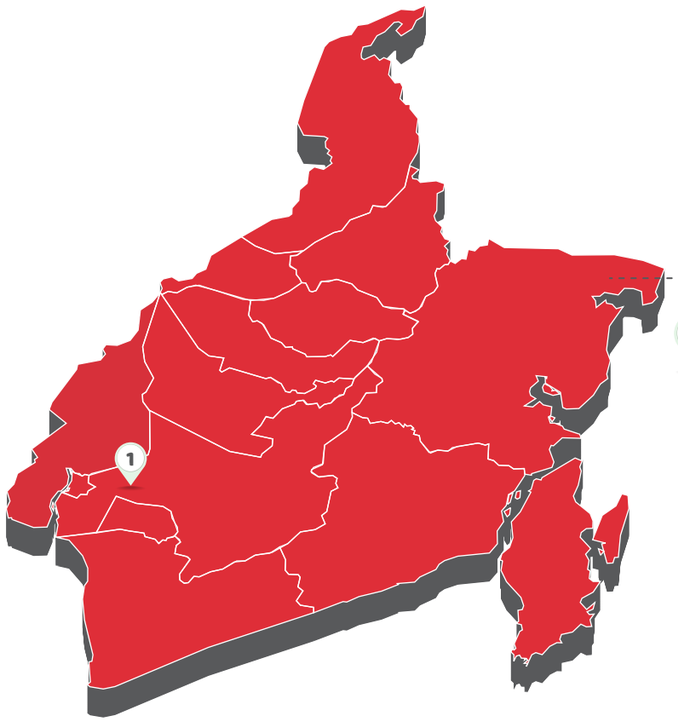
2 **Co-working Space Atjep Suwartana**
Jl. Y. Syaranamual, Poka
Ambon, Maluku 97233



West Kalimantan Province

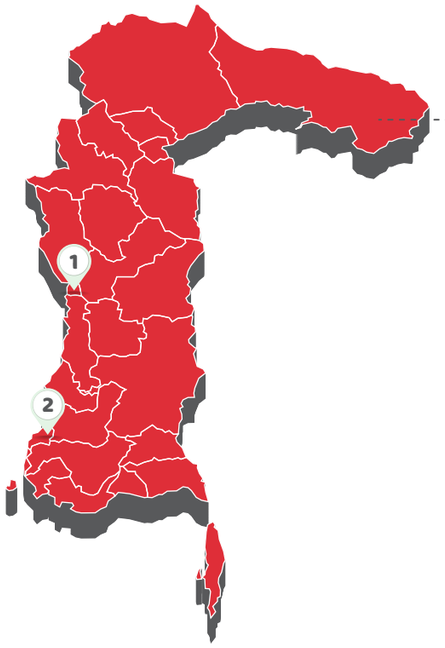
1 **Scientific Conservation Park Pontianak Botanic Garden**
Jl. LAPAN Perjuangan 1, Siantan
Mempawah, West Kalimantan 78352

2 **Co-working Space of Pontianak**
Jl. 28 Oktober, North Pontianak
Pontianak, West Kalimantan 78214



South Kalimantan Province

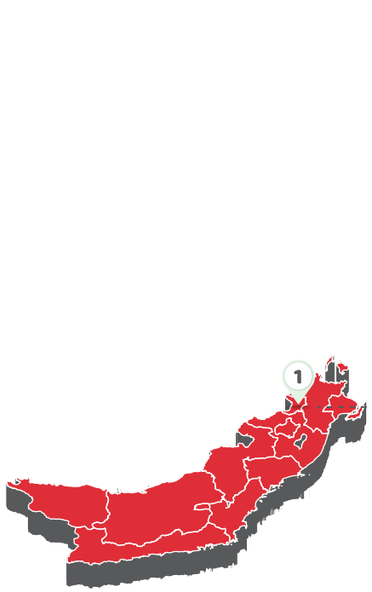
1 Co-working Space of Banjarmasin
Jl. Gotong Royong II, Banjarbaru
Banjarmasin, South Kalimantan



South Sulawesi Province

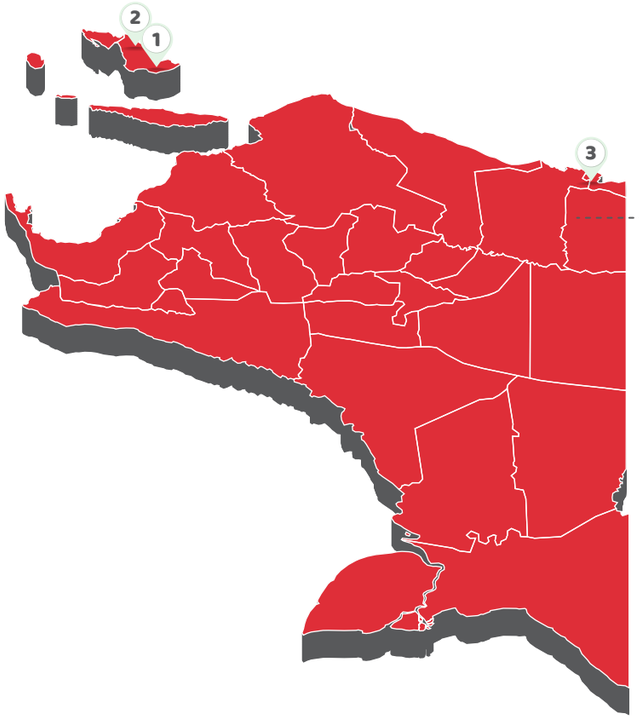
1 Field Station Area Earth Station Parepare
Jl. A. Yani Km.6, Soreang
Parepare, South Sulawesi 91131

2 Co-working Space of Makasar
Jl. Pajjaiyang No. 13, Sudiang
Makasar, South Sulawesi 90242



North Sulawesi Province

1 Co-working Space of Manado
Jl. Pingkan Matindas No. 92,
Manado, North Sulawesi 95128



Papua Province

1 Field Station Area Earth Station Biak
Jl. Goa Jepang, Samofa, Biak Numfor
Biak, Papua 98118

2 Field Station Area Bandar Antariksa Biak
Desa Soukobye, Biak Numfor
Biak, Papua 98118

3 Co-working Space of Jayapura
Jl. Isele, Waena Kampung
Jayapura, Papua 99358

Closing

Rediscovering national excellence became the main focus of BRIN's journey as a national pioneer, ensuring economic transformation based on knowledge-based research and innovation. The success of research and innovation achievements also reflects a rapid and inclusive transformation journey in a positive direction. This annual report reflects part of BRIN's journey to have a significant national impact and a global role while recognizing that many aspects still need to be strengthened and enhanced in line with the great potential of the Indonesian nation. Closer collaboration within the research and innovation ecosystem, with strong coordination between executive agencies, funding agencies, and policymakers, is critical to achieving BRIN's more significant impact and future role.