



HIROSHIMA UNIVERSITY

SDGs Report 2022

Hiroshima University SDGs REPORT



The SDGs start with peace.

**Hiroshima University,
a university pursuing peace**

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Hiroshima University is a university established in Hiroshima, which suffered the first atomic bombing in the world, and thus upholds peace. The university is also a comprehensive research university that advocates the Five Guiding Principles: “The Pursuit of Peace,” “The Creation of New Forms of Knowledge,” “The Nurturing of Well-Rounded Human Beings,” “Collaboration with the Local, Regional, and International Community” and “Continuous Self-Development.” In 2017, we formulated the long-term vision “SPLENDOR PLAN 2017” and drew up an action plan aiming to establish “Science for Sustainable Development”- an action plan that embodies the Five Guiding Principles that had been the spiritual pillars until then. They are exactly in line with the principles of the Sustainable Development Goals (SDGs) adopted by the United Nations General Assembly in 2015, and we reaffirmed our determination to further contribute to humankind, society, and the future through all the efforts of the entire university.

Based on this determination, we established the Network for Education and Research on Peace and Sustainability (NERPS) as a one-stop office for university-wide SDGs-related activities in 2018, as the first year of SDGs implementation. “FE” stands for “Future Earth,” an international collaborative research platform that aims to realize a sustainable global society. As a member of the Japan Consortium of the platform, NERPS serves as the representative institution of the entire university and as a contact point for internal and external communication regarding the SDGs. Furthermore, it plays a very important role as a research promotion base for the transdisciplinary study on “Peace and Sustainability” based on collaboration with various actors.

As a university-wide feature, our university is characterized by the integration of thorough university reform and university-wide efforts to achieve the SDGs. For example, Hiroshima University and Higashi-Hiroshima City, where its main campus is located, have collaborated to make the Hiroshima University “Carbon Neutral x Smart Campus 5.0 Declaration” which aims for the co-creation of a new society through

the “Town & Gown Concept” and to realize carbon neutrality and Society 5.0 on the Higashi-Hiroshima Campus by 2030. We have established Hiroshima University Town & Gown Office as a promotion organization to realize the declaration. In August 2022, we drew up “Toward 2030 Hiroshima University Carbon Neutrality ~Road to 2030~: Action Plan (2022~2027)” as an action plan to realize carbon neutrality. In addition, the Ministry of Education, Culture, Sports, Science, and Technology has approved an increase in the maximum number of entrants to the School of Informatics and Data Science by 70, making the maximum number of entrants 150, from the fiscal year 2023. Hiroshima University will strive to nurture highly skilled human resources for the promotion of industry digital transformation and take the lead in realizing regional revitalization and Society 5.0 to meet the needs of regional communities.

In this way, Hiroshima University has positioned contributions to the achievement of the SDGs as a top university-wide priority and makes further contributions in this regard in all aspects of research, education, and social contribution, while bringing about synergistic effects with thorough university reforms and university-wide efforts to achieve the SDGs. We hope that this report will help you to deepen your understanding of the SDGs-related initiatives of our university, and we ask for your continued support for our endeavors.



Mitsuo Ochi
President, Hiroshima University

Greetings from the Director of NERPS

It has been four years since Hiroshima University started SDGs implantation in full swing, and Hiroshima University has steadily made efforts toward achieving the SDGs.

First, there has been steady progress in HU members' activities on advancing the SDGs, and interest and awareness level of the SDGs throughout the university have increased. The British higher education journal Times Higher Education (THE) published its Impact Rankings 2022 — a list that assesses universities against the United Nation's Sustainable Development Goals (SDGs) in April 2022.

"THE University Impact Rankings," a participatory university ranking to promote and evaluate the university's efforts toward advancing the SDGs, was inaugurated in 2019, and Hiroshima University has been participating in the ranking since its inception. The ranking has gradually increased every year. In 2022, Hiroshima University (HU) placed 3rd in Japan with Keio University, Kobe University, Tohoku University, and the University of Tsukuba. 76 universities in Japan participated in the rankings in 2022. For the overall ranking, HU ranked 101-200th among 1,406 universities worldwide.

In April 2022, Times Higher Education (THE) announced the shortlist for THE Awards Asia 2022, placing Hiroshima University — the only nominee in Japan — among the eight finalists for the International Strategy of the Year category. HU's international efforts to achieve the SDGs were highly evaluated and led to the nomination for this award. This is the fourth year that THE runs these awards, which began in 2019, to recognize outstanding reform efforts by Asian universities. About 500 universities from across Asia and the Middle East applied for the awards, and only eight universities were selected as finalists in each category.

The latest SDGs awareness survey conducted every year since 2019 shows that the awareness of the SDGs among HU members has nearly reached 100%, suggesting that the term "SDGs" is adequately recognized university wide. The survey has also revealed that HU members are highly motivated to contribute to the SDGs achievement. In addition to the fact that contributions to the achievement of the SDGs have become more important nationwide, this is a result of establishing solid systems that supports the achievement of the SDGs throughout the university, such as setting a long-term vision of leading "Science for Sustainable Development," the announcement of "Carbon-Neutral x Smart Campus 5.0 Declaration" as the first of its kind at universities in Japan, providing training programs for members of faculty and staff, and introduction of sustainable development courses as common graduate courses.

Furthermore, the SDGs contribution by HU faculty members has increased since 2016 when we analyzed the SDGs contributions based on Hiroshima University's unique Achievement-motivated Key Performance Indicators (AKPI) and the publication of academic journal articles. HU members engage in world-class activities to realize a sustainable society and contribute to local and international society as a national comprehensive research university. Due to limited space, only a limited number of cases are presented in this

report, but the rest are posted on the website of the Network for Education and Research on Peace and Sustainability (NERPS), so please visit our website and learn about Hiroshima University's wide range of SDGs initiatives.

Second, NERPS has taken a step toward the creation of a worldwide research and education center that leads "Science for Sustainable Development," which is a unique initiative of Hiroshima University. The formulation of international research clusters of transdisciplinary research on "Peace and Sustainability" has been making steady progress in cooperation with three universities and one research institute overseas.

In March 2022, we successfully hosted the international conference, "Hiroshima International Conference on Peace and Sustainability 2022 (HICPS 2022)." This hybrid conference attracted nearly 200 participants from 38 countries including Japan ranging from academic researchers, graduate students, and policymakers to representatives of non-governmental organizations and private companies, who attended and presented their work. The conference was organized in collaboration with 15 institutions including the three universities and one research institute that have been cooperating with HU in carrying out the transdisciplinary research on "Peace and Sustainability". Those partner institutions contributed substantively to the conference by, for example, organizing panel sessions and workshops, or chairing breakout sessions. On the last day, Prof. Jeffrey D. Sachs, Director of the Center for Sustainable Development at Columbia University, delivered a keynote lecture highlighting the significance of global cooperation and partnership for achieving peace and sustainability and addressing key global challenges such as geopolitical conflicts, the pandemic of infectious diseases, climate change and nuclear disarmament. NERPS will henceforth hold the international conference on peace and sustainability every year. The conversations and collaborations between various stakeholders working on issues related to peace, sustainability, or their nexus will be further facilitated during the next conferences. The next conference is scheduled to be held in Thailand in March 2023.

Hiroshima University will continue and further develop these efforts to contribute to the achievement of the SDGs in 2030 and the realization of a peaceful and sustainable world beyond 2030. We are also committed to making these contributions visible from anywhere around the world.



Shinji Kaneko

Director, NERPS
Executive Vice President for Global Initiatives

Principles and Vision

Guiding Principles

Founding principle

Inheriting the founding principle of “A Single Unified University, Free and Pursuing Peace,” we will fulfill our mission as a national university under the five Guiding Principles.



Hiroshima University Charter

Hiroshima University is a national research university established in 1949 in Hiroshima, which is the first atomic-bomb-stricken city in the history of humankind.

Hiroshima University's mission is to contribute to the well-being of humankind by realizing a free and peaceful society based on

the following five guiding principles: The Pursuit of Peace; The Creation of New Forms of Knowledge; The Nurturing of Well-Rounded Human Beings; Collaboration with the Local, Regional and International Community; and Continuous Self-Development.

1 – Respect for human rights

In all its activities, Hiroshima University will not tolerate discrimination or harassment of any kind in relation to ethnicity, nationality, religion, belief, gender, economic or social status, or disability, and will respect and protect the human rights and individuality of each person.

2 – Education

Hiroshima University will create an environment in which each student can learn independently and flexibly, while nurturing individuals with a rich sense of humanity, broad education, excellent specialized knowledge, and the ability to discover and solve problems on their own, who will contribute to the realization of a society that enables free and peaceful sustainable development.

3 – Research

Hiroshima University will strive for an in-depth search for the truth and the creation of new knowledge through advanced and innovative research based on the free thinking of its researchers and will share the fruits of such endeavors with the wider community, in order to continuously create innovations to solve the problems faced by the local, national and international communities.

4 – Social Contributions

As a university aspiring to be open to and trusted by society, Hiroshima University is determined to contribute to local and international society by actively publicizing its activities, securing cooperation and collaboration with local communities, industry, and other organizations concerned, and engaging itself in all activities including education, research, and medical care.

5 – Realization of a sustainable society

Hiroshima University, as a university engaged in world-class activities for the realization of a sustainable society, will strive to lead the world in providing cutting-edge solutions to global issues such as poverty, conflict, the suppression of human rights, infectious diseases, and environmental, resource and energy problems.

The members of Hiroshima University will take pride in their work, reflect tirelessly on the role expected of them by the nation and the world, and continue to fulfill each member's mission by fully

demonstrating his/her individuality and abilities while ensuring full compliance and showing mutual trust and respect.

Hiroshima University Code of Conduct

As a national research university established in Hiroshima, Hiroshima University is committed to fulfilling its mission of contributing to the well-being of humankind by realizing a free and peaceful society, and at the same time, it is required to be highly

ethical, transparent, and fully accountable for its activities. In order to live up to this responsibility, the University has established the “Hiroshima University Code of Conduct” as a guideline that all members should always be aware of and follow.

1 – Respect for human rights and diversity

We will respect the human rights and personality of each individual, will not tolerate discrimination or harassment of any kind, and will realize a campus where all members can fully demonstrate their individuality and abilities.

2 – Upholding independence and autonomy

In giving due consideration to social norms, ethics, and the integrity of our individual activities, we will uphold academic freedom and the autonomy and independence of education and research. We will aspire to conduct and develop research and education that are of the highest international standard and will return the fruits of such research and education to society.

3 – Compliance with laws and regulations

In our activities as members of Hiroshima University, we will comply with social norms and rules, relevant laws and regulations, and university regulations.

4 – Disclosure/Protection of Information

In order to fulfill our accountability to society in a transparent and fair manner, we will disclose to society the content and results of our activities and other information held by the University in a timely and appropriate manner and will hold ourselves to high ethical standards in the use of that information, as well as in the protection of personal information.

5 – Information Management

In order to ascertain the value of Hiroshima University’s information assets and to ensure their safety and reliability, we shall fully recognize the threats to information security and shall manage and operate information appropriately in accordance with our respective duties.

6 – Appropriate management of expenses and assets

We will manage and use the university’s expenses and assets in an appropriate and efficient manner, always being aware that most of the expenses and assets for our activities come from taxes and other forms of social support.

7 – Maintenance of a safe and secure environment

We will raise awareness of safety in the conduct of our operation and provide a safe, secure and comfortable environment for education, study, research, and work.

8 – Addressing environmental issues

We will take the initiative in addressing global environmental issues such as climate change, large-scale disasters, environmental pollution, and resource and energy problems, to hand over a stable environment to future generations.

Long-term vision “SPLENDOR PLAN 2017”

(SPLENDOR: Sustainable Peace Leader Enhancement by Nurturing Development of Research)

Hiroshima University's Mission (mission and role)

By establishing a new philosophy of peace science, “Science for Sustainable Development,” and disseminating information related to our global challenges both domestically and internationally, Hiroshima University fulfills the role of building a free and peaceful international

community that fosters diversity by accepting students and researchers who aspire to create knowledge from around the world, and by producing human resources who seek peace and have a challenger's spirit into various fields and the international community.

Goal: Creation of a Worldwide Research and Education Center Leading “Science for Sustainable Development”

To lead “Science for Sustainable Development,” it is indispensable to embrace all disciplines related to the sustainability of humans, society, culture, food, the environment, and nature, and to produce knowledge that leads to a peaceful diverse society without borders in collaboration with society. Hiroshima University will devote all its

energy to the realization of its goal and produce the next-generation human resources that will contribute to the well-being of humankind by becoming a global educational and research center that practices “Science for Sustainable Development.”

Hiroshima University's Three Visions

Research	Enhancement of basic and advanced studies leading to “Science for Sustainable Development.”
Education	Cultivating individuals who can oversee a changing world and can challenge existing norms on a global scale
Social Contribution	Strengthening of partnerships with regional and international societies

Hiroshima University's Efforts to Achieve the SDGs

Establishment of the university-wide SDGs hub

Background

To establish Science for Sustainable Development, implementing “interdisciplinary research,” which crosses traditional academic boundaries, and “transdisciplinary research,” which aims for problem-solving by going beyond the boundaries of academics and different stakeholders, are important.

In April 2014, Hiroshima University launched the “Taoyaka program for creating a flexible, enduring, peaceful society”. Taoyaka program is a transdisciplinary 5-year master’s and doctoral degree program that aims to train students from different academic disciplines to take the lead in the mutual creation of regional culture and state-of-the-art science to offer solution-oriented innovative technologies by working closely with local communities facing complex challenges.

In October 2015, Hiroshima University established the Hiroshima University Future Earth (FE) Education Research Network as a university-wide organization and formally joined the FE Japan Consortium (currently the FE Japan Committee).

Through discussions and interactions in FE, which is an international network of scientists and innovators who aim to realize a sustainable society, the potential of implementing transdisciplinary research on “Peace and Sustainability” and its importance were suggested.

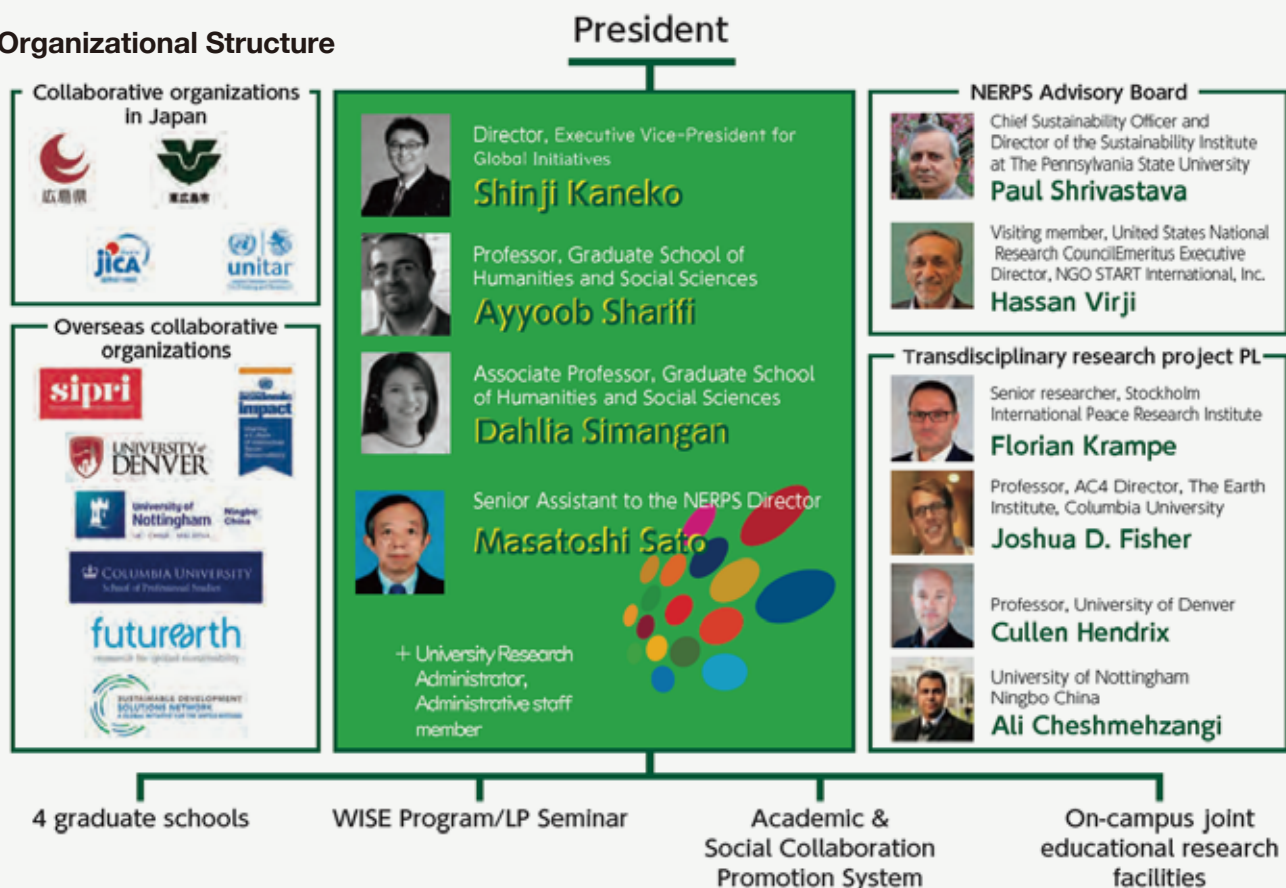
In April 2017, the new long-term vision “SPLENDOR (Sustainable Peace Leader Enhancement by Nurturing Development of Research) PLAN 2017” was established. Hiroshima University set a mission to contribute to the realization of a diversified, free, and peaceful global society by establishing a new philosophy of peace science, “Science for Sustainable Development”.

In May 2018, the FE network was restructured as the Hiroshima University FE/SDGs Network (English official name: Network for Education and Research on Peace and Sustainability; NERPS) to implement the three purposes indicated below and started implementing the SDGs in full scale and transdisciplinary research on “Peace and Sustainability.”

Purpose

- 1 — To establish “Science for Sustainable Development” which is stipulated in our university’s long-term vision “SPLENDOR PLAN 2017” while consolidating the various efforts of Hiroshima University that contribute to solving global issues and strengthening research and educational capabilities to achieve the SDGs.
- 2 — To form international research clusters of the transdisciplinary research on “Peace and Sustainability” to promote Purpose 1.
- 3 — To disseminate the outcomes of education and research on the SDGs, and to promote networking with faculty members, students, staff members, domestic and international researchers, practitioners, and citizens.

Organizational Structure



NERPS badges



SDGs are global norm-building activities. For this reason, the United Nations has created SDGs logos and badges as communication tools. The number of people who agree with this and wear the badges has increased. In general, wearing the badges not only raises public awareness of the organization and initiatives throughout society, but also increases a sense of solidarity among members of that organization, who become committed to the spirit of their organization and initiatives.

SDGs initiatives cover an extremely wide range of fields, and Hiroshima University is working as a whole making a certain direction and applying its own characteristics. This is reflected in the SPLENDOR PLAN 2017, and in order to clearly demonstrate this commitment, original NERPS logos and badges were created to show how peace

pursuits and education are being carried out by Hiroshima University. Specifically, we are focused on the initiatives for “Goal 4: Quality Education” and “Goal 16: Peace, Justice, and Strong Institutions,” and we are confident that they will further drive our initiatives in relation to other goals. Students are invited to learn about these outlooks and specific initiatives and participate in them. They are encouraged to wear NERPS badges during their job-hunting.

Original logos and badges can be used to show that the wearer not only knows about or has individually joined and participated in SDGs activities carried out by the UN, but is also aware of the activities carried out by Hiroshima University as a whole and its active commitments. We hope that more members of Hiroshima University will support and participate in the initiative by wearing these badges.

Hiroshima University's Efforts to Achieve the SDGs

Visualization of University-Wide Contributions to the SDGs

Estimate the contribution to the SDGs using unique goal-achieving key performance indicators

At Hiroshima University, we use keyword information from academic journal papers published by faculty members of Hiroshima University to identify contributions to each SDG. By combining the keyword datasets and AKPI® (Achievement-motivated Key Performance

Indicators) which our university has developed on its own, we try to grasp the efforts of faculty members from a broader perspective, including educational and social contribution activities. Please refer to the bottom of the next page for an overview of AKPI®.

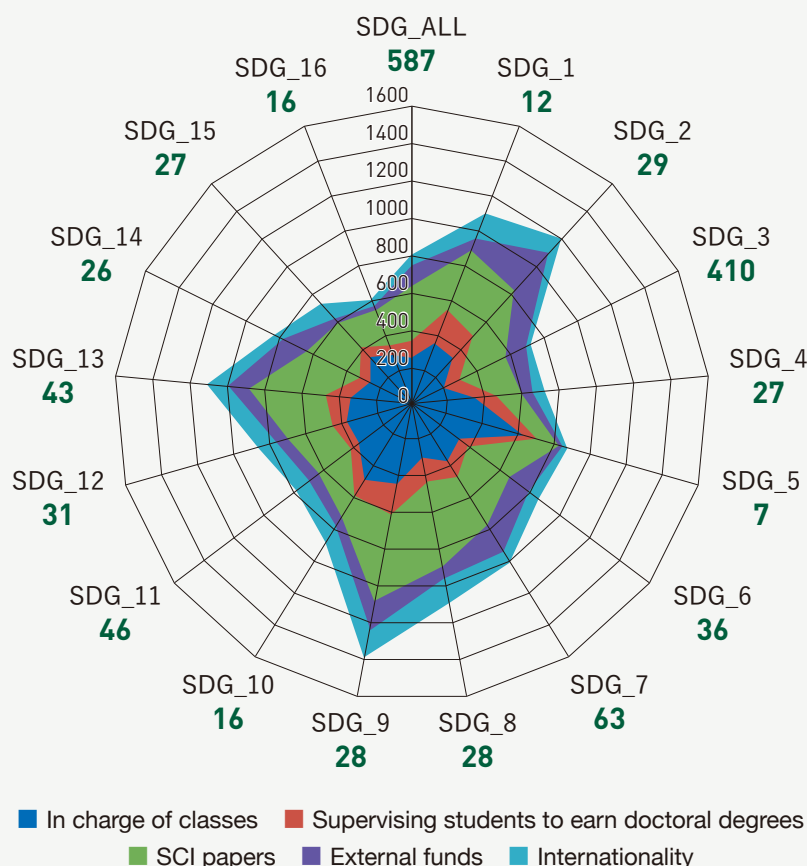
Specific estimation method

- Using the SDGs keyword list (Elsevier 2021 SDG mapping * 1), we have identified contributions to each SDG from Scopus papers published by Hiroshima University faculty members from 2012 to 2021 (who are employed as of May 1 of each year), and have clarified HU faculty members' involvement in the SDGs by each paper,
- We have associated the involvement of each faculty member in the SDGs in ① to the AKPI® points for each fiscal year and have accumulated the AKPI® points of the faculty members who were involved in the 17 SDGs. After that, we calculated the average value per person by dividing the points of 17 SDGs by the number of the involved faculty members.

Figure A shows the visualization of the calculation results of papers published in 2021 using the left method. Looking at this figure, we can see that:

- SDG, which has many faculty members involved, are in the order of SDG_3 (410 people, 721.6P), SDG_7 (63 people, 1016.6P), SDG_11 (46 people, 785.1P), SDG_13 (43 people, 1115.4P), and SDG_6 (36 people, 859.1P).
- SDG with high AKPI® values are in the order of SDG_9 (1394.4P, 28 people), SDG_2 (1203.1P, 29 people), SDG_13 (1115.4P, 43 people), SDG_1 (1101.4P, 12 people), and SDG_8 (1100.7P, 28 people).

Figure A: Contribution to the SDGs (= AKPI® values of faculty members related to the SDGs) (2021)

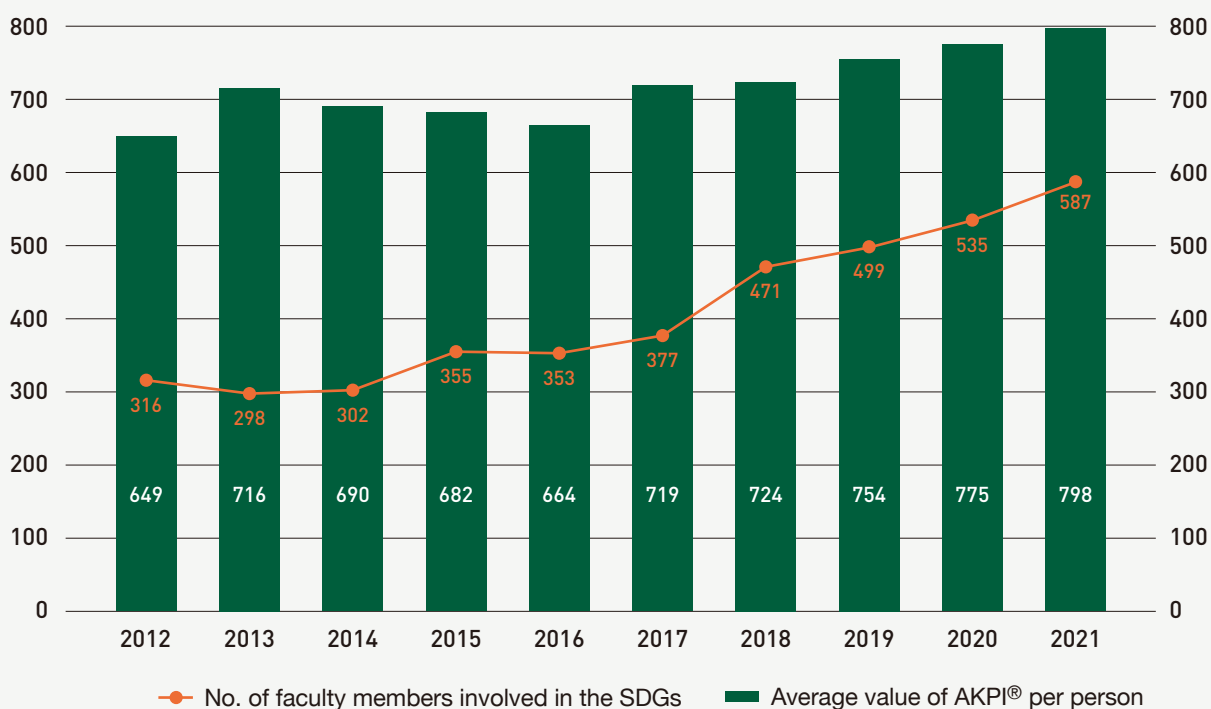


Also, Figure B is a visualization of the changes over time in the average values of the number of faculty members involved in SDGs and the AKPI® value per person based on the Scopus papers published by Hiroshima University faculty members each year, based on the information on faculty members employed as of May

1 of each year.

Looking at this figure, we can see that both the number of faculty members working with their SDGs expertise and the average value of AKPI® are gradually increasing.

**Figure B: Changes over time in the degree of contribution to the SDGs
(= AKPI® values of faculty members related to the SDGs) (2012 ~ 2021)**



What is AKPI® (Achievement-motivated Key Performance Indicators)?

AKPI® is a key performance indicator to be set as a target value for the next 10 years for one of the world's top 100 universities.

AKPI® is composed of five elements ((1) In charge of classes [300 points], (2) Supervising students to earn doctoral degrees [150 points], (3) Number of SCI papers [300 points], (4) Acceptance of external funds [150 points], and (5)

Internationality [100 points]). And if the total points of the five elements are 1,000 points per faculty member on average, it is an indicator showing that Hiroshima University is one of the top 100 universities in the world. For details, please see Hiroshima University's official website.
https://www.hiroshima-u.ac.jp/en/sgu/page02_02

*1 Rivest, M. et al. (2021), "Improving the Scopus and Aurora queries to identify research that supports the United Nations Sustainable Development Goals (SDGs) 2021", Mendeley Data, V1, DOI: 10.17632/9sxdykm8s4.4

Hiroshima University's Efforts to Achieve the SDGs

Hiroshima University SDGs Awareness Survey

Since 2019, NERPS has been conducting SDGs awareness survey of Hiroshima University members every year in order to understand their SDG awareness levels and contributions and to use it as a material for considering efforts to achieve the SDGs. The degree of recognition of the SDGs has nearly reached 100%, suggesting that the term "SDGs" is adequately recognized university wide. With

many respondents answering "Interested in various goals and want to make a contribution," we can see that there are many people who want to contribute to the achievement of the SDGs. On the other hand, there are still room for improvement in their efforts, so our future challenge remains to encourage them to put their motivation into action.

Outline of the survey

Target	All members of Hiroshima University
Period	February 28 to March 18, 2022
No. of valid responses	1044
	Students: 508, staff members: 300, faculty members: 236

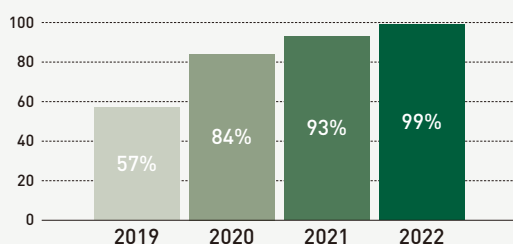
This is the fourth survey, continued from 2019. However, in 2019, the survey targeted only students.

Details are available on the following website:

<https://nerps.hiroshima-u.ac.jp/efforts-list/efforts-list-2019/>



The degrees of recognition of the SDGs in Hiroshima University



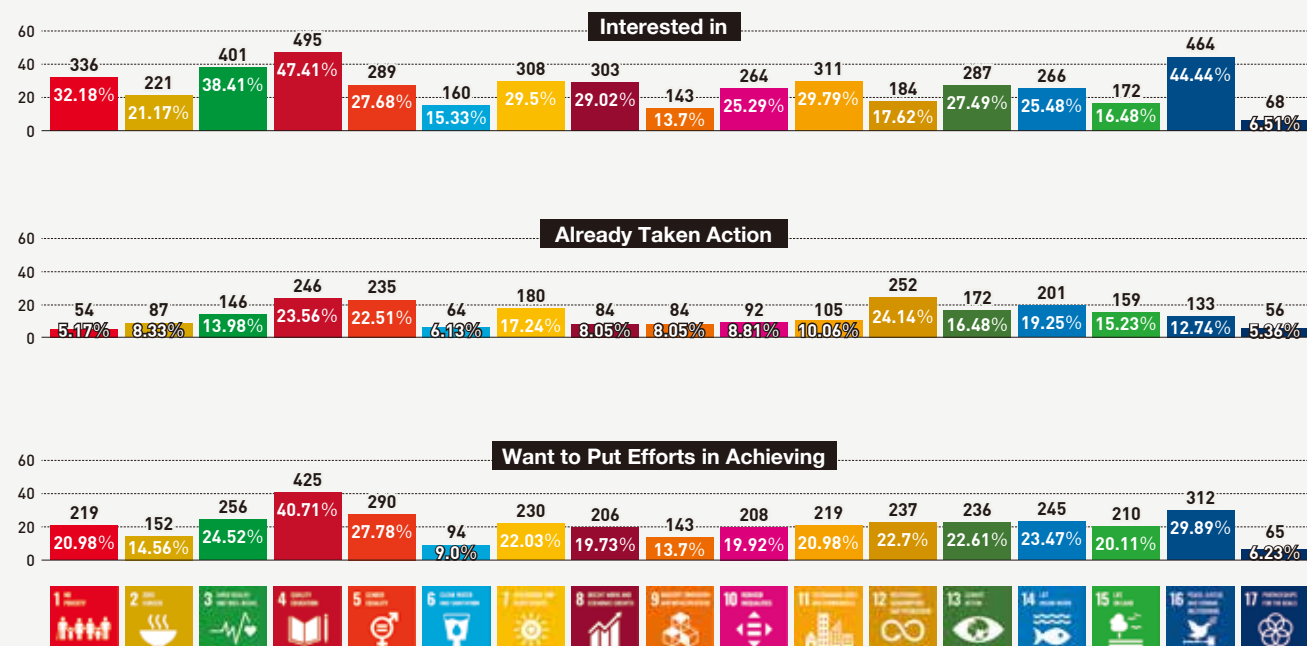
Outline of 2022 survey results

All respondents were asked to select the maximum of five goals on the following:

SDGs which you are interested in

SDGs which you have already taken action

SDGs which you want to put efforts in achieving



Search for researchers on SDGs / Hiroshima University Researcher Guidebook

We have created a easy-to-use system that allows you to search for researchers at Hiroshima University. You can search for the specialized fields and research achievements of about 1,900 researchers belonging to Hiroshima University by “genre,” “SDGs,” “area,” and “phonetic order in Japanese.” You can also search for researchers from each goal of the SDGs.

<https://www.guidebook.hiroshima-u.ac.jp/en/sdgs>



Public Lecture on SDGs at Hiroshima University

The Network for Education and Research on Peace and Sustainability (NERPS) organized the first set of public lecture of the first semester of FY2022 hosted by Hiroshima University, entitled “Understanding the essence of the SDGs and putting them into practice”. A total of three lectures on SDGs were held on May 14, May 21, and May 28, 2022.

The lectures were held in a hybrid format at MIRAI CREA, Hiroshima University's Phoenix International Center, which opened in the fall of 2021 as a center for international activities to promote international, regional, and industrial cooperation. Including online participants, a total of 200 people from a wide range of backgrounds attended the lectures. The Q&A

session was a lively discussion among participants of various generations. Through the three lectures, participants were able to connect their knowledge of the SDGs to their own practices and think together about how we should change our actions towards the realization of a sustainable society.

As NERPS Director Shinji Kaneko stated throughout the lecture, “It is meaningful to send out a positive message of peace from Hiroshima”, peace and the SDGs in Hiroshima are closely linked. We hope that Hiroshima University will continue to provide an opportunity for many people to put the SDGs into practice.

The first lecture May 14, 2022

“Understanding the Essence of the SDGs”

by Dr. Tomomi Yamane

(NERPS Researcher)

After covering the origins and concepts of the SDGs, the dilemma of their implementation, case studies and research were introduced.



The second lecture May 21, 2022

“Sustainable Development of Higashihiroshima through Regional and University initiatives”

by Prof. Shinji Kaneko

(Director of NERPS and Executive Vice President for Global Initiatives of Hiroshima University)

The issues facing the university and the region were introduced, and the “Town &Gown concept” was discussed as a case study of actual initiatives, with participants about the current status and future plans.



The third lecture May 28, 2022

“SDGs from a Global Perspective through Life as a Diplomat”

by Mr. Masatoshi Sato

(Senior Assistant to the Director of NERPS)

By taking up examples of SDGs initiatives from around the world, the session made us think about Japan once again.



Hiroshima University's Efforts to Achieve the SDGs

NERPS Activities

1 – Organizing and hosting of webinar series

Since September 2020, NERPS has been organizing and hosting webinars intended to consider Peace and Sustainability from the perspectives of the global environment, sociopolitics, the economy, and technological innovation.

These webinar series aim to reconsider Peace and Sustainability and discuss new ideas amid the current changes in the global environment, including the COVID-19 pandemic, that is currently occurring around the world. Experts have discussed how resources, technological innovation, immigration, governance, peacebuilding education, conflict mitigation, humanitarian assistance, capacity building, and other factors play roles in achieving the SDGs, especially on Goal 16.

At the first webinar, Professor Jeffrey D. Sachs of Columbia University in the United States—awardee of the Blue Planet Award 2015 and a two times consecutive nominee for TIME's most influential people—was invited as a guest speaker via video participation from New York. To date, a total of 18 NERPS webinars have been conducted.



Results of holding webinars

[Hiroshima NERPS](#)
[YouTube](#)



Date	Speaker	Lecture title	Participants on the day	Video views (As of 2022/9/30)
2020.9.23	Dr. Jeffrey D. Sachs	Sustainable development as a path to peace	180 people	359 times
2020.11.25	Prof. Cullen Hendrix	Promoting Peace through Shared Governance of the Seas	23 people	130 times
2020.12.16	Prof. Paul Heidebrecht	PeaceTech and the Prospects for Critically Engaging Technology to Advance Peace and Sustainability	89 people	89 times
2021.1.28	Prof. Joshua Fisher, Ms. Sophia Rhee	Protected Area Management & Natural Resource Governance-Exploring Pathways for Environmental Peacebuilding	79 people	871 times
2021.2.12	Dr. Florian Krampe	Peace and Sustainability in the Anthropocene	99 people	544 times
2021.2.26	Prof. Ali Cheshmehzangi	Sustaining the City's Continuity and Enhancing Resilience in facing the COVID-19 Pandemic	98 people	136 times
2021.3.18	Dr. Andrea Bartoli	Initiative for Peace in South Sudan-In-sights from the Work of the Community of Sant'Egidio	40 people	120 times
2021.4.9	Prof. Joyashree Roy	SDG framework as core of development diplomacy: Juxtaposing climate action and peace through soft power diplomacy	39 people	192 times
2021.4.15	Mr. Steve Killelea	Ecological Threats, Peace, and COVID-19	58 people	159 times

Date	Speaker	Lecture title	Participants on the day	Video views (As of 2022/9/30)
2021.5.20	Prof. Frank Biermann	Earth System Governance for Sustainable Development and Peace	102 people	227 times
2021.6.17	Prof. Takako Izumi	Disaster Risk Reduction under Conflict Situation	30 people	177 times
2021.7.29	Prof. Richard Friend	Democratising Science and Research to Address Environmental Conflict	27 people	102 times
2021.11.5	Dr. Anders Karlsson	The Power of Data to Advance the SDGs	30 people	120 times
2022.1.27	Dr. Yvette Baninla	The State of Climate Change Research in Africa	44 people	149 times
2022.2.3	Prof. Akiko Yuge	United Nations 75th Anniversary Declaration, "Our Common Agenda", and the SDG	53 people	205 times
2022.5.25	Prof. Dominique Steiler	From Economic War to a Culture of Economic Peace	26 people	95 times
2022.7.27	Prof. Francisco A. Magno	Watershed Conflict and Collaboration in the Philippines	35 people	75 times
2022.9.8	Prof. Ricardo Hirata	Integrated Water Solutions for Cities Resilient to Global Climate Change	50 people	61 times

2 – Start of the transdisciplinary research projects

Transdisciplinary Research Project Aiming to Form International Centers



In June 2020, NERPS had secured four cross-appointment professor positions and invited applications on research projects that contribute to formulating research clusters for peace and sustainability. A total of 23 proposals were submitted worldwide, and four outstanding

proposals were selected. In December of the same year, NERPS started transdisciplinary study projects with four universities and research institutes. Relevant research work is expected to continue for the next 3-5 years.

NERPS Activities

3 – A brief report of Hiroshima International Conference on Peace and Sustainability 2022

The Network for Education and Research on Peace and Sustainability (NERPS), Hiroshima University, successfully held the inaugural "Hiroshima International Conference on Peace and Sustainability 2022 (HICPS 2022)" on March 1-4, 2022, at Hiroshima University Higashi-Hiroshima Campus. The conference was organized in collaboration with 15 institutions*1, which contributed substantively to the conference by, for example, organizing panel sessions and workshops, or chairing breakout sessions.

This hybrid conference included 32 sessions, with nearly 200 participants from 38 countries*2 including Japan ranging from academic researchers, graduate students, and policymakers, to representatives of non-governmental organizations and private companies, who attended and presented their work. Their presentations added up to 127. The conference provided a unique platform for presenting and exchanging knowledge on a wide range of topics related to peace and sustainability in the context of an unprecedented global transformation. In particular, there was a focus on the nexus between peace and sustainability that is currently underexplored in science and policy circles.

The conference was also successful in capacity building as over half of the participants were graduate students and early-career researchers. The Best Paper Award and Best Presentation Award were given to three young researchers, respectively, which were selected by the review committee of the conference. High-quality papers among those presented at the conference are expected to be published in an edited book published by Springer or a special

issue published in an Elsevier journal over the next few months.

In 2020, NERPS started international transdisciplinary research projects on peace and sustainability jointly with three universities and one research institute (Columbia University, University of Denver, University of Nottingham Ningbo China, Stockholm International Peace Research Institute). The progress that the transdisciplinary research projects had made until then was presented at the conference.

On the last day, Prof. Jeffrey D. Sachs, Director of the Center for Sustainable Development at Columbia University, delivered a keynote lecture highlighting the significance of global cooperation and partnership for achieving peace and sustainability and addressing key global challenges such as geopolitical conflicts, the pandemic of infectious diseases, climate change and nuclear disarmament. After the closing session, the willing participants of the conference issued a joint statement protesting Russia's armed invasion of neighboring Ukraine. The statement was reported by several media agencies, such as NHK, on the same day.

NERPS will henceforth hold the international conference on peace and sustainability every year. The HICPS 2022 demonstrated the value of transdisciplinary dialogue that should be sustained in the next conferences. The conversations and collaborations between various stakeholders working on issues related to peace, sustainability, or their nexus will be further facilitated during the conferences.

*1:

- Advanced Consortium on Cooperation, Conflict, and Complexity (AC4), Columbia Climate School, Columbia University, U.S.A.
- The Earth System Governance Project, Copernicus Institute of Sustainable Development, Faculty of Geosciences, Utrecht University, The Netherlands
- The Research Institute for Humanity and Nature, Japan
- Stockholm International Peace Research Institute (SIPRI), Sweden
- University of Nottingham Ningbo China, China
- The Urban Institute, Kyushu University, Japan
- Remote Sensing Technology Center of Japan (RESTEC), Japan
- The Institute for Economics & Peace, Australia
- University of Denver, U.S.A.
- Policy Design Lab, Tohoku University, Japan
- Hiroshima Prefecture & Hiroshima Organization for Global Peace (HOPE), Japan
- North South University, Bangladesh
- United Nations Institute for Training and Research (UNITAR)
- Elsevier

*2:

East Asia: Japan, Peoples' Republic of China
South-East Asia: Cambodia, Indonesia, Malaysia, The Philippines, Thailand, Vietnam
South Asia: Bangladesh, India, Nepal, Pakistan
Oceania: Australia, New Zealand
Europe: Finland, Germany, Ireland, The Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom
North America: U. S. A., Canada
Central & South America: El Salvador, Honduras, Mexico, Panama, Peru
Middle East & North Africa: Afghanistan, Iran, Morocco, Syria
Sub-Sahara Africa: Cameroun, Ghana, Kenya, South Africa

(Note)

At the conclusion of HICPS 2022, the joint statement by willing conference delegates protesting Russia's armed invasion of neighboring Ukraine was issued. Underlined are 14 countries where those delegates were based.



Chair (Prof. Shinji Kaneko, NERPS Director), Co-Chairs (Assoc. Prof. Ayyoob Sharifi & Assoc. Prof. Dahlia Simangan) and members of Secretariat staff



A glimpse of a session



Joint statement protesting Russia's armed invasion of neighboring Ukraine issued
For details: https://nerps.org/2022/03/04/hicps_ukrainestatement/



The keynote lecture delivered by Prof. Jeffrey D. Sachs
For details: <https://nerps.org/2022/03/06/hicpskeynote/>

Hiroshima University's Efforts to Achieve the SDGs

Development that Brings Together the University and the Community

“Sustainable Regional Development and University Reform” led by Community



“Town & Gown Concept” aiming to realize a new regional revitalization model

The “Town & Gown (TG) Concept” is a concept in which the university and the local government in the area where the university is located work together for sustainable regional development and the university reform by sharing a vision of a sustainable future, by building comprehensive, daily, continuous and organizational relationships, by utilizing the administrative resources of the local government and the education and research resources of the university while fusing them. Under the TG concept, the university and the community together can contribute to making Japan dynamic from the regional perspective, realize regional revitalization through the social implementation of science and technology innovation that contributes to the solution of regional issues, and through the formation of a place for regional co-creation for human resource development - industry-academia-government-private partnership ecosystem in collaboration with local governments, universities, private companies, entrepreneurs, investors, and citizens.

The “Town & Gown Office (TGO)” is a promotion organization jointly established by Hiroshima University and Higashi-Hiroshima City as a pioneer of the concept in Japan.



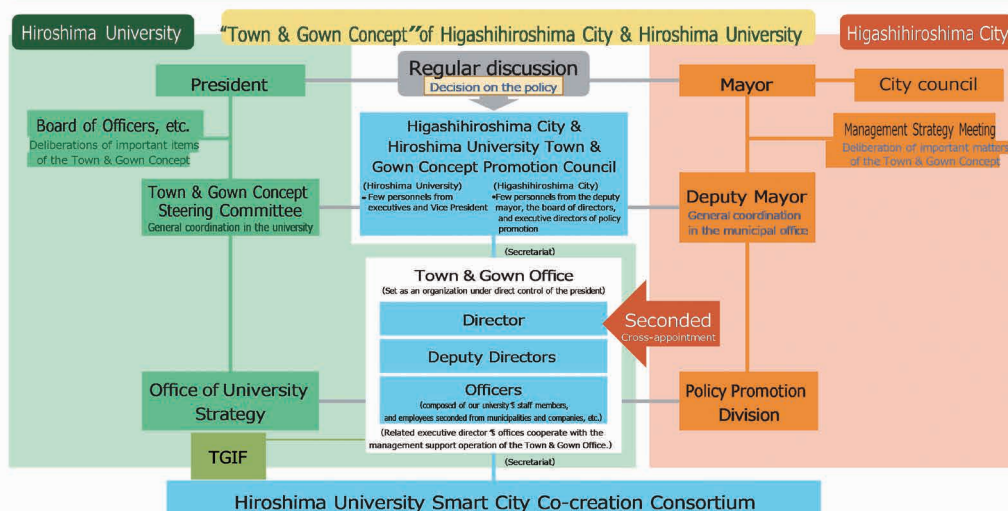
Left: Mayor Hironori Takagaki of Higashi-Hiroshima City,
Right: President Mitsuo Ochi of Hiroshima University

What is the Town & Gown Office?

The “Town & Gown Office (TGO)” is an organization that has been introduced in cities where universities are located mainly in Europe and the United States. The organization promotes cooperation as a hub for the city and universities, aiming to solve issues related to community-building and the achievement of SDGs by a united body of Town (local community) and Gown (universities). Higashi-Hiroshima City and Hiroshima University will work closely

together to solve social issues through TGO with the city providing various administrative data and issues, and with Hiroshima University providing the latest academic knowledge and research capabilities. To this end, both the mayor and the president, the heads of these organizations, share the vision of community-building and have established a system to promote projects in an integrated manner through personnel exchange.

Chart of the “Town & Gown Concept” Promotion System of Higashihiroshima City & Hiroshima University

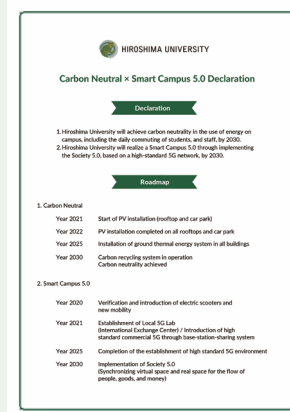


Carbon Neutral x Smart Campus 5.0 Declaration

Hiroshima University aims to practice “Science for Sustainable Development” through a virtuous cycle of global development and regional revitalization, under the founding principle of “A Single Unified University, Free and Pursuing Peace.” Toward the realization of the SDGs and Society 5.0, we have been cooperating with Arizona State University in the United States as well as local governments and are proceeding with initiatives in anticipation of global expansion.

In January 2021, in line with the conclusion of a comprehensive cooperation agreement (Higashi-Hiroshima City and Sumitomo Corporation) regarding the realization of Society 5.0 and smart cities in Higashi-Hiroshima City and surrounding areas, we adopted the “Carbon Neutral x Smart Campus 5.0 Declaration” with the target year of 2030.

Toward 2050 carbon neutrality, it is required for us to develop cutting-edge technologies and put them into practical use for the realization of a green society, and to create advanced decarbonized areas. Aiming to realize a carbon-free society ahead of the rest of the world, we would like to collaborate with local governments and companies in order to increase the value of our university in the world by clearly stating our stance on important issues, including research, education, and global expansion.



Toward 2030 Hiroshima University Carbon Neutrality ~Road to 2030~ : Action Plan (2022~2027)

In August 2022, we drew up “Toward 2030 Hiroshima University Carbon Neutrality ~Road to 2030~: Action Plan (2022~2027)”.

Based on the “Carbon Neutral x Smart Campus 5.0 Declaration” with the target year of 2030 – 20 years ahead of 2050, which is the target year of carbon neutrality that the government of Japan has set, the action plan makes it clear that we will strive to realize a carbon-free society ahead of the rest of the world, clearly stating our stance on addressing important issues such as research, education, and global expansion, in collaboration with local governments and companies.



Higashi-Hiroshima Next-generation University Town-building Plan

Higashi-Hiroshima City has drawn up the “Next-generation University Town-building Plan” with Hiroshima University at the center of the town-building, taking relevant experiences into account. Based on the “Town & Gown Concept”, a new framework of the industry-academia-government partnership will be created, built around the “Hiroshima University Smart City Co-Creation Consortium”, which has been established to make the next-generation university town-building a reality. The framework is expected to develop a system conducive to generating innovation, creating a living environment at the global standard, and helping with human resources development by way of learning and implementation. We will strive to realize a sustainable future society, making good use of the framework.



Hiroshima University's Efforts to Achieve the SDGs

Nationwide Public Relations

Toyo Keizai ACADEMIC: Special Feature on Universities Working on the SDGs Vol.4 ~A New Stage of “the Decade of Action” Accelerating “Solidarity and Collaboration” to Achieve a Sustainable Society (Toyo Keizai Inc., published in July 2022)

In the advertisement article, we discussed the transdisciplinary research “Peace and Sustainability” promoted by NERPS and the results of one of NERPS’ activities “Visualization of SDGs University-Wide Contributions”. The university-wide efforts and continuous activities toward the achievement of the SDGs have led to an increased awareness of each and every faculty member, which has stimulated research related to the SDGs throughout the university, and the accumulated achievements have led to the acquisition of evaluations from external organizations.

In the special feature article, a page dedicated to the university's

diverse solidarity partnerships referred to the efforts and achievements of the “Town & Gown Initiative,” in which Hiroshima University and Higashi-Hiroshima City are working together to develop the city. In addition, talk between Town & Gown Office (TGO) Director Shinji Kaneko (Executive Vice President for Global Initiatives at Hiroshima University and Director of NERPS) and Tatsuo Watanabe (TGO Senior Researcher) on the establishment of the “National Town & Gown Initiative Promotion Council” was featured.



What are the SDGs (Sustainable Development Goals) ?

Even if you know that the SDGs (Sustainable Development Goals) are something that seems to be good for the earth or international goals related to environmental and social issues, probably not many people know the contents in detail. I will briefly explain the origins of the SDGs and each goal of the SDGs.

The SDGs which consist of 17 goals and 169 targets are international goals adopted by the United Nations in 2015. The SDGs aim to realize a sustainable world where no one is left behind by 2030 with the cooperation of all developed and developing countries, companies and individuals. As shown in the table right the SDGs consist of items related to human development / social issues, economic systems, and social issues related to the global environment, as well as the means of implementation.

Specifically, “Transforming Our World: The 2030 Agenda for Sustainable Development” (hereinafter “the 2030 Agenda”) was adopted at the United Nations Summit in September 2015, and came into effect in January 2016. Sustainability issues, which have been discussed separately, and international development issues,

the Millennium Development Goals (MDGs), have been integrated into the 2030 Agenda that includes the SDGs.













The SDGs cover not only developing countries’ development issues, such as poverty alleviation and social development, but also global issues including those of developed countries, such as climate change and sustainable consumption and production. The nature of the SDGs has changed from the MDGs, which were the goals for governments of developing countries and development assistance agencies, requiring the participation of diverse actors, not only governments, but also private and civil sectors. This is a groundbreaking agreement in the aspects of accelerating the efforts of all actors and asking each country to keep track of their progress. However, in order to achieve the SDGs, in addition to cooperation by the international community, developing countries, emerging countries, and developed countries need to change their economic and production / consumption patterns in their respective contexts. The involvement of each and every citizen is also important for transforming our world.

Case of SDGs Implementation

Hiroshima University is engaged in various activities that contribute to achieving the SDGs. We have published these efforts on our website. If you scan the QR code, you can see our

activities by goal and by activity category. In addition, from page 22 onward, we will introduce the characteristic activities of Hiroshima University.







Human development / social issues

  <p>No Poverty</p> <p>End poverty in all its forms everywhere.</p>	  <p>Zero Hunger</p> <p>End hunger, achieve food security and improved nutrition and promote sustainable agriculture.</p>	  <p>Good Health and Well-being</p> <p>Ensure healthy lives and promote well-being for all at all ages.</p>	  <p>Quality Education</p> <p>Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.</p>	  <p>Gender Equality</p> <p>Achieve gender equality and empower all women and girls.</p>	  <p>Clean Water and Sanitation</p> <p>Ensure availability and sustainable management of water and sanitation for all.</p>
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Economic system

  <p>Affordable and Clean Energy</p> <p>Ensure access to affordable, reliable, sustainable and modern energy for all.</p>	  <p>Decent Work and Economic Growth</p> <p>Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.</p>	  <p>Industry, Innovation and Infrastructure</p> <p>Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.</p>	  <p>Reduced Inequalities</p> <p>Reduce inequality within and among countries.</p>	  <p>Sustainable Cities and Communities</p> <p>Make cities and human settlements inclusive, safe, resilient and sustainable.</p>	  <p>Responsible Consumption and Production</p> <p>Ensure sustainable consumption and production patterns.</p>
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Global environment




  <p>Climate Action</p> <p>Take urgent action to combat climate change and its impacts.</p>	  <p>Life Below Water</p> <p>Conserve and sustainably use the oceans, seas and marine resources for sustainable development.</p>	  <p>Life on Land</p> <p>Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.</p>
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Means of implementation

  <p>Peace, Justice and Strong Institutions</p> <p>Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.</p>	  <p>Partnerships for the Goals</p> <p>Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development.</p>
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SDGs in general

  <p>All SDGs</p> <p>Matters regarding SDGs in general</p>

 <p>Research</p>	 <p>Education</p>	 <p>Social contribution</p>	 <p>University operation</p>	 <p>Visualization</p>
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No Poverty

End poverty in all its forms everywhere.

Creating a society where people can listen to the “voices” of the poor

Graduate School of Humanities and Social Sciences

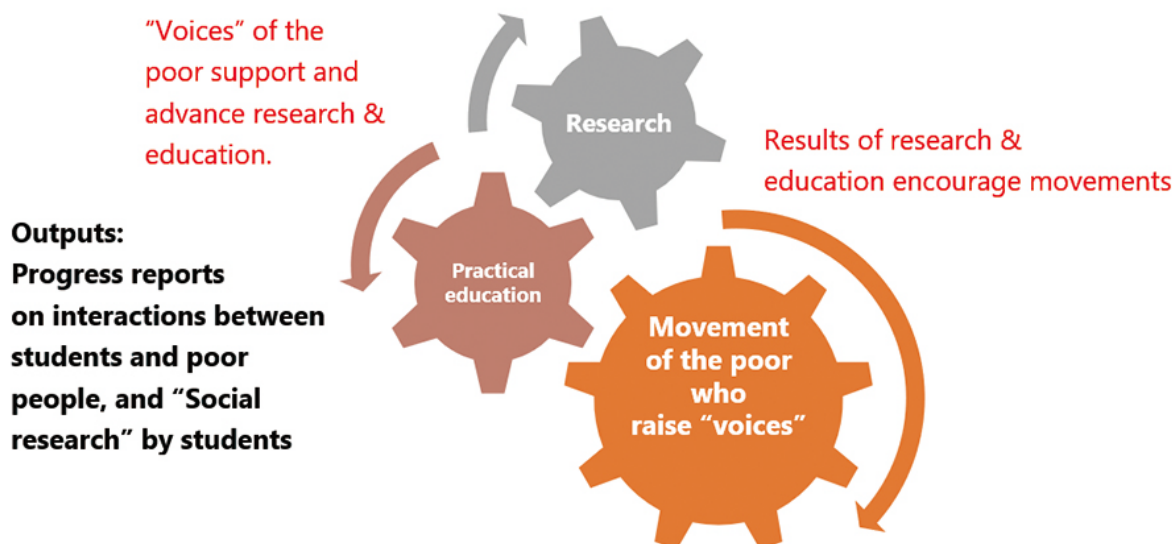
Associate Professor Hiroshi Sasaki



In poverty research, the difficulty of poor people expressing their opinions – that is, giving their “voices” to society – has been pointed out. This is because not only economic hardship is making it difficult, but also society tends to ignore and sometimes suppress their “voices.” We can recall events that took place in Japan in recent years, such as the rise in the bashing of public assistance users and discriminatory remarks by celebrities on SNS toward the poor. Poverty robs people of their “voices”. To overcome this problem, I have been promoting research and education conducted in collaboration with “Seikatsu to Kenko wo Mamorukai (SKM),” an organization of poor people that raise their voices, since 2011. As part of my research activities, I have conducted a regional

organization survey of the SKM and made clear the difficulties when poor people raise their “voices.” Since 2020, I have launched a research project (Grants-in-Aid for Scientific Research) under the theme of the chronology of the movement of the SKM along with several researchers. This research has also been developed as a university’s practical education class (Hiroshima University, School of Integrated Arts and Sciences, Specialized Course “Social Research Exercises I and II”). The above activities are expected to contribute to the creation of a society where the “voices” of the poor can be listened to by revitalizing the activities of each of the three parties: research organizations, higher education institutions, and the organizations concerned with poor people.

Outputs: Grants-in-aid for Scientific Research, academic papers



Outputs:
Progress reports
on interactions between
students and poor
people, and "Social
research" by students

Cooperation of "research," "education," and "movement" in order to create a society where "voices" of the poor can be listened to.



Zero Hunger

End hunger, achieve food security and improved nutrition and promote sustainable agriculture.

Aiming to achieve sustainable food production and solve environmental problems through interdisciplinary plant-related research

Graduate School of Integrated Sciences for Life

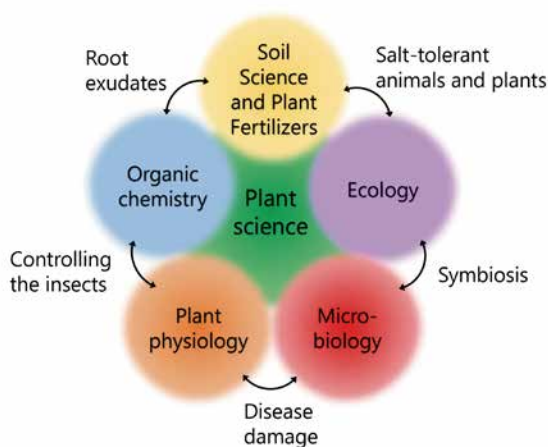
Professor Jun Wasaki (Director of the Research Core for Plant science Innovation)



The Plant Research Core to create a Green Revolution from Hiroshima University that saves the next generation

To achieve food production that supports the world's ever-increasing population, there are many issues that need to be addressed, such as global warming, resource depletion, the need to reduce environmental impact, and lack of suitable farming land. In Japan, the low level of food self-sufficiency is also an important issue, and in order to improve this, it is necessary to increase the added value of crops, to improve yields, and to reduce the labor required. Based on these problems, we envisioned the "Plant Research Core to create a Green Revolution from Hiroshima University that saves the next generation."

At the Plant Research Core, we conduct interdisciplinary research utilizing strengths of



plant-related research at Hiroshima University, aiming to bring about a "next-generation Green Revolution" that solves environmental problems while achieving sustainable food production. In aiming for this, we need to understand and solve these problems in a multifaceted manner not only from the traditional agricultural viewpoint but also by gathering a wide range of knowledge in academic fields related to plant production, such as plant physiology, ecology, microbiology, symbiosis, soil science, and organic chemistry. This aims to revitalize interdisciplinary joint research by researchers at Hiroshima University, who had been limited to individual and small group levels, gathering knowledge, with organic connections centered on this research core.

Necessary application issues include enhancing oligotrophic tolerance, stress tolerance, and functionality. It is expected in these fields that concrete research will proceed through mutual understanding, and at the same time, support from basic research will also encourage research promotion. Therefore, we have conducted joint research while promoting individual research by establishing the "nutrition group" that solves oligotrophic tolerance, the "stress group" that solves cultivation in unsuitable areas for cultivation, and the "functional development group" that aims to increase the added value by improving yield and adding functional components, and the "basic research group" that supports research on a basic research basis.

Greenfield Project through joint research with companies

JFE Steel Corporation and Hiroshima University have established the "Joint Research Course (Phase 2)" with the aim of achieving the SDGs and contributing to society. In this joint research, we are considering measures to effectively utilize chemical elements useful for plant growth, such as phosphorus and silicon, which are unused resources contained in steel by-products.

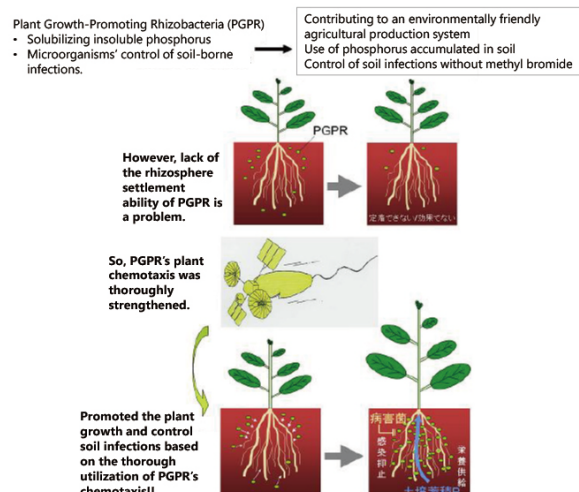
Contributing to the establishment of sustainable agriculture through technological development that utilizes the functions of microorganisms

Graduate School of Integrated Sciences for Life

Professor Junichi Kato



Microorganisms in the environment make full use of their substance sensing function to coexist or infect the host plant. We are developing technologies to elucidate the details of the substance-sensing function of environmental microorganisms, promote their symbiosis (leading to the promotion of plant growth), and control infections (control of plant diseases). This technology helps establish sustainable agriculture with minimal reliance on pesticides and fertilizers.



Ensure healthy lives and promote well-being for all at all ages.

Health project in Bangladesh

Graduate School of Biomedical and Health Sciences

Professor Michiko Moriyama



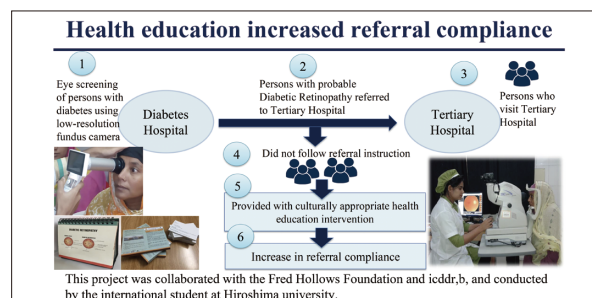
Health education project that utilizes mobile health technology for residents with high blood pressure and chronic kidney disease in rural areas

There are many patients with high blood pressure and many deaths caused by the disease in developing countries. In Bangladesh the self-reported prevalence of hypertension is 12.5%, but it is estimated that one-third of the population has never measured their blood pressure. It has been pointed out that high blood pressure is caused by not only dietary habits, but also because of seawater draining into well water as an impact of global warming in Bangladesh – lowland areas.

In this project, women living in rural areas have been trained as community health workers (CHW), and the residents became aware of their daily salt intake by utilizing food and urinary salt measuring devices developed in Japan. In addition, we regularly measured the residents' blood pressure, etc. using portable medical checkup devices, and provided health guidance through home visits to residents and by using SMS. As a result, we were able to show a high behavior change and blood pressure improvement effect.

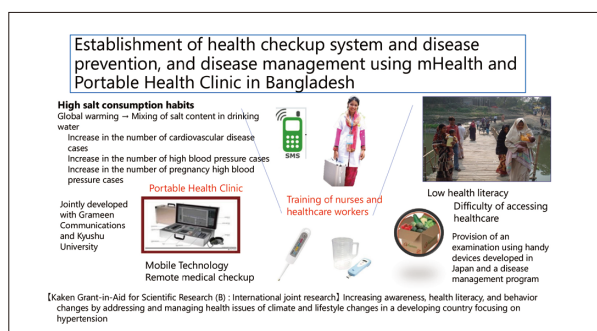
Also, there is no opportunity to routinely screen the renal function (presence of kidney disease) in Bangladesh, and there are many death cases without receiving medical treatment. For this issue, we identified the proportion of people with impaired renal function by measuring the renal function of the residents and their risks using a surveillance system in collaboration with a local research institute (icddr, b (International Centre for Diarrhoeal Disease Research, Bangladesh)). In addition, after widely providing health education on “protecting the kidneys” to local residents, we were able to see significant improvements.

This time, we conducted an educational project, in collaboration with a medical institution in Bangladesh, to encourage diabetic patients to visit a specialized hospital. We used culturally appropriate communication materials that people can understand even in a country with low literacy and provided health education (face to face and over phone), which led to a high consultation rate.



School health project with pilot school nurses
(for the introduction of health examinations and improvement/
prevention of malnutrition (undernutrition and overnutrition)
and intestinal parasites)

Children's health (school health) is the basis for improving national health indicators. In Bangladesh, there are no school nurses or regular health checkup systems. Even today, the major health risks for children are infectious diseases, such as pneumonia, diarrhea, and intestinal parasites, as well as nutritional disorders, mainly undernutrition. With the cooperation of the local Grameen Caledonian College of Nursing, this project will experimentally assign school nurses to multiple elementary schools in an attempt to improve children's nutritional status and reduce cases of infectious diseases. In collaboration with Grameen Communications, we will carry out lifestyle-related / dietary surveys and health examinations for all students at pilot elementary schools and provide them with health education for one year while feeding back the results to the parents of the students. In the COVID-19 pandemic, it is important to improve the hygiene and nutrition of individuals and to prepare a hygienic environment. In this project, we plan to develop school nurses for future assignments by preparing a training curriculum for school nurses on a trial basis and asking teachers and graduate students at the nursing college to adopt the curriculum.



Educational project to prevent blindness caused by diabetic retinopathy

Diabetes is one of the leading causes of loss of eyesight. Bangladesh has a high prevalence of diabetic population, but with its fragile medical system, and underdeveloped eye screening system, many people with diabetes go blind. Lack of awareness and knowledge of diabetic retinopathy has been reported to be the number one reason why many diabetic patients do not follow the instructions to take a retinal screening, which are relayed from primary care medical institutions to specialized hospitals.



Project Research Center for Epidemiology and Prevention of Viral Hepatitis and Hepatocellular Carcinoma

Graduate School of Biomedical and Health Sciences

Professor Junko Tanaka



Project Research Center for Epidemiology and Prevention of Viral Hepatitis and Hepatocellular Carcinoma conducts epidemiological research on the long-term progress of hepatitis virus infection and elimination, as well as on grasping the status of hepatitis virus infection such as hepatitis C and hepatitis B in Japan. The center is conducting research to present basic materials that will be the scientific basis for policy planning, formulation of standards, and administrative measures. In order to achieve the 2030 viral hepatitis elimination goal adopted by World Health Organization (WHO), we are conducting research on the clarification of issues that differ in each municipality area and on measures that should be taken in accordance with the characteristics of each region such as the actual treatment conditions in the region concerned.

It is estimated that 2 billion people are infected with hepatitis B virus (HBV) worldwide, 350 million people are HBV carriers, and about 600 thousand to 1 million people die from HBV-related liver disease every year (as of 2002). Asian and African countries are HBV-endemic areas. In addition to domestic epidemiological research on hepatitis virus infection, our center also conducts the international sero-epidemiological research in Cambodia, Vietnam, and Burkina Faso. From 2016, under international joint research with the Ministry of Health of Cambodia, University of Health Science (Cambodia), WPRO

(WHO Western Pacific Regional Office (Manila)), and CDC (Centers for Disease Control and Prevention) in the US, we conducted a nationwide survey of hepatitis virus infection status throughout Cambodia. In 2018, it was demonstrated that Cambodia had achieved its WHO target of reducing Hepatitis B surface antigen (HBsAg) positive rate for 5-year-old children to 1% or less. In addition, as the infection rates in the mother population and in children with HBsAg-positive mothers in Cambodia were found to be as high as 4.39% and 10%, respectively, from the results of the same survey, the strengthening of the infection control of mother-to-child transmission of HBV was identified as the country's challenge. Since 2019, as part of international joint research with the Maternal and Child Health Center of the Ministry of Health of Cambodia and WHO Cambodia, we have been conducting the sero-epidemiological surveys for pregnant women and their newborn infants at three medical institutions in Siem Reap Province in northwestern Cambodia.

Since 2018, we have also been conducting international joint research with the Clinical Research Unit of Nanoro (CRUN) to investigate hepatitis B virus status in Burkina Faso, which is in West Africa to the south of the Sahara Desert. We will create evidence that contributes to evaluating the effectiveness of measures to prevent mother-to-child transmission of hepatitis B virus.





Quality Education

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

Hiroshima SDGs Consortium

Graduate School of Humanities and Social Sciences

Professor Yoshimichi Yui



The Hiroshima SDGs Consortium Project was accepted as the “MEXT (Ministry of Education, Culture, Sports, Science and Technology) FY 2021 UNESCO Activity Subsidy (Leader Development for Achievement of the SDGs (ESD) Promotion Project)”. The purpose of this project is to improve the teaching skills of school teachers and to train them so that they can develop the global competencies required to achieve the SDGs. We have implemented a spiral-structured teacher training program that combines training sessions, lectures, and workshops for in-service teachers and students who want to become teachers, primary and secondary school education providers in the future. While utilizing human resources centered on the Graduate School of Humanities and Social Sciences, the Board of Education,

teacher training universities in Hiroshima prefecture, companies, ESD activity support centers, and various organizations are collaborating to build a network as a consortium.



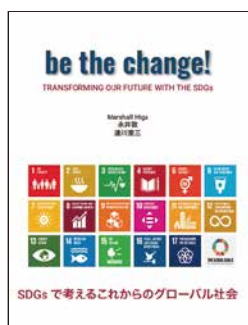
Providing opportunities to learn about the SDGs through language learning –Cultivate the ability to disseminate the SDGs

Institute for Foreign Language Research and Education



Be the Change! Transforming our future with the SDGs, Associate Professor Marshall Higa

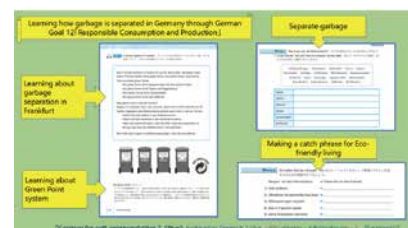
We have developed a full-fledged introductory book on English teaching materials that deals with the SDGs systematically and comprehensively. It is designed to be used in university liberal arts education English classes, and it consists of carefully selected materials that are easy to understand from AFP's video materials so that students can more realistically grasp the contents as their own issues. All English texts were written by the authors, and we prepared high-quality discussion topics so that learners could not only understand the contents but also disseminate them. (Published in February 2022)



eration of various topics related to the SDGs. The courses focus on “peace,” “humanitarianism,” and a “coexistence society” in the global era.

Master German using the SDGs as teaching materials Associate Professor Takako Yoshimitsu, Associate Professor Axel Harting

Students study the circumstances in German-speaking areas under the themes related to topics such as intercultural communications (SDG 10), garbage separation (SDGs 7 and 12), and partnerships (SDG 5). For example, in a class under the theme of “garbage,” students learn, through various tasks, how garbage is actually separated in Germany, which is a country of advanced ecology. Then, based on what they have learned, they have discussions in class to deepen their understanding. In addition, they also learn vocabulary and grammar so that they can understand and think about the SDGs in German, and disseminate them in German on media such as SNS.



Dealing with SDGs-related themes in English classes, Associate Professor Peter Howell

We offer courses to develop the ability to understand and disseminate topics related to the SDGs in English and to acquire basic knowledge and awareness of problems, which will enable students to act in consid-

Hiroshima Prefectural UNESCO Liaison Council

Graduate School of Humanities and Social Sciences

Associate Professor Tadamichi Nagata



The Hiroshima Prefectural UNESCO Liaison Council, which has its secretariat within the Graduate School of Humanities and Social Sciences and School of Education, commends excellent practical activities related to the spread and promotion of ESD / UNESCO Associated Schools done by elementary, junior high and high schools and private activity groups in the prefecture, in order to support the improvement in the practices of ESD (Education for Sustainable Development) led by UNESCO and the Japanese government. Since ESD is considered to be the key to achieving the SDGs, we have been awarding the Hiroshima Prefecture UNESCO ESD x SDGs Grand Prize since the 7th Council in the fiscal year 2021.



Aiming to develop human resources who can design educational visions for next-generation

Educational Vision Research Institute (EVRI)



Assisting the development of curricula and the establishment of new Teacher Training Colleges (TECs) in Cambodia

Educational Vision Research Institute (EVRI), in collaboration with the Hiroshima Peace Contribution Network Council, implemented a JICA Partnership Program (JPP) "Support for social studies



curriculum and textbook development for building a sustainable society in Cambodia" commissioned by the Japan International Cooperation Agency (JICA). Over the course of three years, we worked on improving the social studies curriculum and the expertise of textbook developers, and on developing and practicing a "model unit" with an eye on support for democratization and citizenship education. As a continuation and development of the above-mentioned program, another project was adopted by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) under the scheme of "Dissemination of Japanese-style Education using the Public-Private Collaborative Platform (EDU-Port Nippon)." In this project, we helped to build "Developing and Applying Textbooks System" in Cambodia from the perspective of Japanese-style education that is open to teachers' independent research on teaching materials and children's exploratory learning. Through this initiative, we have promoted the professional development of editors who envisage and edit textbooks from an expert perspective and teachers who make good use of them autonomously.

Since fiscal 2017, EVRI has cooperated with PADECO Co., Ltd. in "Project to Establish Foundations for a Teacher Education College" commissioned by JICA. Through this project, we provide (1) Training for the staff of two Teacher Education Colleges (TECs) to be established in Cambodia, (2) Technical assistance for creating a teacher training curriculum, and (3) Technical assistance for establishing a university management system, etc.



Research and development of inclusive education and peace education

Professor Norimune Kawai, a member of EVRI, organizes "Development Research on Inclusive Education

System at the Secondary Education level", which gained "FY 2020 Practical Research Grant for Healthy Development of Children and Teenagers" supported by Nippon Life Insurance Company Foundation. With an awareness of diversity in a classroom, this project focuses on students who have foreign roots or disabilities and students who have difficulty in learning and in their living, we develop lesson plans and methods for school subjects, which will lead up to their satisfaction and self-confidence in learning.



In collaboration with the Hiroshima Prefectural Board of Education and Hiroshima Global Academy – an integrated public junior and senior high IB school, EVRI has helped teachers to develop their curriculum design skills through elaborating units about "peace" and "Hiroshima."

EVRI has videotaped interviews with peace educators who have promoted peace education in Hiroshima and archived them to contribute to passing on their efforts. Six interview videos of the interviews and four commentary videos are available on the website of EVRI. Four more interview videos will be added during the next fiscal year, making the total number of such videos 10.

In addition, EVRI organizes an annual international seminar: PELSTE (Peace Education and Lesson Study for Teacher Educator) about the principles and methods of peace education and lesson studies. Participants from member universities of the International Network of Educational Institutes (INEI) are invited to exchange their experiences and expectations on how to promote peace education and lesson studies in their respective local contexts.

Support for problem-solving learning to address regional issues, by making use of ICT

Since the fiscal year 2021, EVRI, in collaboration with Higashi-Hiroshima City Board of Education, has carried out the wide-area exchange-type online regional learning, connecting multiple elementary schools in the city, once a month. The project provides schools and classes that vary in their sizes and their surrounding environment with opportunities to think about how to address regional issues, at which participating students interact with each other and with those who are faced with the issues in the field. It also provides teachers with opportunities for their professional development for effective use of ICT.





Achieve gender equality and empower all women and girls.

Creating a university that respects sexual diversity

Research Center for Diversity and Inclusion



For Counseling

- **<LGBT> Counseling Counter**
@ 3rd floor, Student Plaza, Student Services
Email : gakusei-lgbt@office.hiroshima-u.ac.jp
- **Counseling Counter to Address Problems with Classes**
@ Accessibility Center
Email : office@adachi.hiroshima-u.ac.jp
TEL : 082-424-6324
- **Counseling Counter to Address Worry**
@ Counseling Section and Mental Health Section, Health Service Center
Email : mental@hiroshima-u.ac.jp
TEL : 082-424-6186
- **Peer Support Room**
Email : peer@hiroshima-u.ac.jp
TEL : 082-424-6328
- **Counseling Counter to Address Trouble**
@ Harassment Consultation Office
Email : harassou@hiroshima-u.ac.jp
TEL : 082-424-5689

For further information

- **Introduction to Diversity in Gender and Sexuality**
<http://www.diversity.hiroshima-u.ac.jp/eng/intro>
- **Q&A, Booklet and more**
- **Policies and Guidelines at Hiroshima University for Respecting Gender and Sexual Diversity -for LGBT+ Students**

Policies for Gender and Sexual Diversity, HU

- 1. We Respect Gender and Sexual Diversity**
We respect each individual's diversity, such as gender identity, sexual orientation, gender expression, and sex characteristics.
- 2. We Do Not Discriminate on the Basis of Gender or Sexuality**
Placing our cornerstone on gender and sexual diversity and equality, we do not discriminate on the basis of gender or sexuality.
- 3. We Respect Each Individual's Gender and Sexual Autonomy**
We respect each individual's gender and sexual autonomy. Each individual's gender and sexuality, and also whether or not they will disclose them, should be controlled based on their autonomy.
- 4. We Foster an Inclusive Education and Research Environment**
We foster an inclusive education and research environment in terms of gender and sexuality. An inclusive environment here means one in which each individual is respected, enabling them to live as their authentic self without any worry. Fully demonstrate their characteristics, and engage in the production of new knowledge without any hesitation. Gender and sexuality are particularly important elements for establishing each individual's identity. We foster an environment in which all our members can engage in education and research without any worry and unnecessary restraints, irrespective of gender and sexuality.



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Email : diversity-center@hiroshima-u.ac.jp
TEL : 082-424-4559

Design and illustration by Tatsukichi(Hoshino Tatsuki)
URL : <https://tatsukilabo.com/>
Email : tatsukilabo@gmail.com

①The term LGBT falls short for diverse sexualities and genders; however, the term is used in this leaflet to refer to all the sexual minorities for an introductory understanding.

Introduction to Diversity in Gender and Sexuality

Do you know
Lesbian
Gay
Bisexual
Transgender ?



Editorial Team for Leaflet for Diversity in Gender and Sexuality

The Research Center for Diversity and Inclusion, in collaboration with the Accessibility Center, Health Service Center, and Harassment Consultation Office, has been working to ensure that diversity in gender and sexuality is respected in Hiroshima University. We inform the university members of its "Policies and Guidelines at Hiroshima University for Respecting Gender and Sexual Diversity -for LGBT+ Students" (take effect from April 2020).

We also engage in advocacy, distributing our original educational pamphlet to new students every year, and posting more detailed explanations and booklists on the official website of the Research Center for Diversity and Inclusion. Moreover, Introductory University Education, which is compulsory for all students, educates students on this issue. In the training of the faculty members who are newly employed by the university, the guidelines are a must-read.

Development of a program for the empowerment of women to participate in disaster risk reduction activities

Graduate School of Biomedical and Health Sciences

Associate Professor Mayumi Kako



In Japan, which is a disaster-prone country, it is said that there is a large gender gap even in non-disaster ordinary times. To promote women's participation in disaster risk reduction activities, we support regional and community-based disaster risk reduction activities in Hiroshima from the community level. Through the development of a program for empowering women to participate in disaster risk reduction activities, which was launched in 2020, we support the community activities and networking by local practitioners including community practitioners (Bosai-shi) who are active in the region.



Ensure availability and sustainable management of water and sanitation for all.

Methodologies and technologies for wastewater and waste treatment and their advanced utilization, and restoration and creation of the water environment

Graduate School of Advanced Science and Engineering

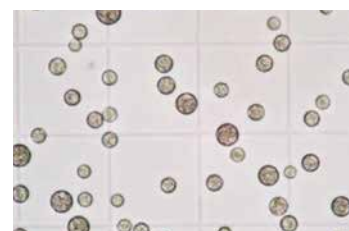
Professor Satoshi Nakai



We are developing research on wastewater and waste treatment and its advanced utilization, as well as methodologies and technologies for the restoration and creation of water environments. For example, we are conducting research on carbon circulation in which products obtained by culturing microorganisms that produce docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA) with the use of wastewater and waste from food manufacturing plants are used as substitute fish oil for the cultivation of marine fish, and research on toughening the reverse osmosis membrane to be used to secure drinking water.



Culturing of oil-producing algae using secondary treated sewage water



A microorganism producing DHA and EPA (Square : 50 μ m \times 50 μ m)

Development of a sewage treatment reactor system applicable to developing countries

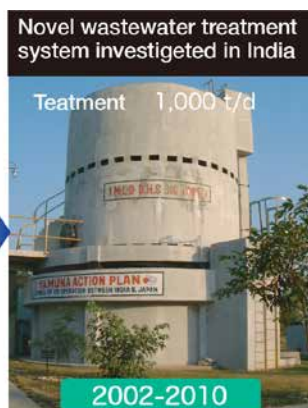
Graduate School of Advanced Science and Engineering

Professor Akiyoshi Ohashi



In sewage treatment, a method using aerobic microorganisms called the "activated sludge method" has become the mainstream in developed countries. However, this activated sludge method is not accepted in developing and emerging countries. It is clear that even if the activated sludge method – an expensive treatment technology that is only realized by spending a lot of money and energy as in the case of Japan – is transferred as it is, it will not take root. Therefore, it is an urgent task to develop a sewage treatment system suitable for the actual conditions of the regional economic structure and social structure, etc. Against this background, we have been engaged in the development of low-cost, energy-saving, and easy-to-maintain sewage treatment Downflow Hanging Sponge (DHS) reactors that can be applied to developing countries.

As a result, the first DHS sewage treatment system in the world was installed in the city of Agra, India in 2014, and the prospects for sewage treatment in developing countries have improved. In addition, I have been involved as a coordinator in the subject-specific training "Wastewater Treatment Technology", which Japan International Cooperation Agency (JICA) provides to Latin American engineers. Most of the trainees want to introduce the DHS system, instead of the conventional activated sludge method, in their own country. They put awareness-raising activities and activities to push the introduction of the DHS system into their action plan after returning to their own countries. However, the system is not yet widespread. The high initial cost for the construction of DHS is a hindrance. Thus, we are developing an improved DHS system in order to reduce the cost.



Ensure access to affordable, reliable, sustainable and modern energy for all.

Toward the use of electric energy without loss

Graduate School of Advanced Science and Engineering

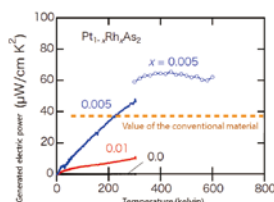
Professor Minoru Nohara



Increase power generated with thermoelectric materials 1.5 times that of conventional generation

In modern society, waste heat is ubiquitous from power plants that use fossil fuels, to automobiles, garbage incinerators, and the remaining hot water in the bathtub. We are working to improve the performance of thermoelectric conversion materials that enable the direct extraction of electric energy from this waste heat, especially to achieve "power factors" that surpass conventional materials. In order to increase the "power factor," which is an index of electric power that can be extracted from thermoelectric materials, it is necessary to achieve both "metallic electrical conduction" and "huge thermoelectromotive force." To this end, it is necessary to create a substance with a unique band structure, such as a "multi-pocket structure" or "pudding-mold-like structure," which have large asymmetry of electron-positive hole excitation. Based on this guideline, we proceeded with research on material development and clarified that power generated with the power

Developed a thermoelectric conversion material with generated electric power 1.5 times that of conventional material



factor of platinum compounds with a pyrite-type crystal structure reached 1.5 times that of conventional materials. In the future, we plan to develop thermoelectric materials using less expensive elements by utilizing theoretical methods based on first-principles calculations.

Toward zero electric supply loss: Search for superconducting materials at room temperature

When electricity is sent from a power plant to a home or a factory, the electrical resistance of the power cables causes transmission loss. That volume has reached about 5% of the total power generated, and the power equivalent to that of several nuclear power plants is lost in Japan as a whole. This loss can be reduced to zero if we use superconductors for the power transmission lines. Superconductivity is a phenomenon in which the electrical resistance of metals and alloys becomes zero at or below a certain temperature. However, there is a problem that the temperature required to move the normal conductivity to superconductivity is very low. We are working on the development of a new material that realizes a superconducting state at a higher temperature. So far, we have developed a substance that moves into a superconductivity state at minus 226 degrees Celsius (absolute temperature: 47 Kelvin), which is the second highest temperature among iron-based superconductors. In addition, we have succeeded in reducing costs by reducing the content of rare-earth materials, such as lanthanum and praseodymium, from the proportion of 25% to 5%. In the future, our goal is to develop substances that show superconductivity at higher temperatures, preferably at room temperature.

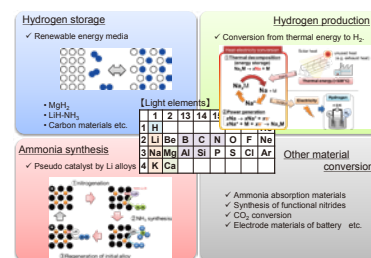
Research and development on the creation of innovative material conversion technology

Natural Science Center for Basic Research and Development

Associate Professor Hiroki Miyaoka



To realize "Carbon Neutral" and establish a sustainable society, it is necessary to use renewable energy efficiently. Mindful of this, research and development of various elemental technologies are underway. Our research group is conducting research intended to create innovative substance conversion technologies that utilize the functions of light elements such as lithium and sodium. Our research is on thermochemical hydrogen production technique from low temperature-thermal energy such as exhaust heat, small and distributed type of ammonia production technique around atmospheric pressure, hydrogen storage materials for energy transportation, and ammonia storage materials.



Contributing to sustainable agricultural production in harmony with the environment through solar sharing

Graduate School of Integrated Sciences for Life

Professor Hirofumi Saneoka



Solar sharing (farming-type solar power generation) is an effort to share sunlight between agricultural production and power generation by setting up braces on farmland, installing solar power generation equipment (solar panels) in the upper space, and cultivating agricultural products under it.

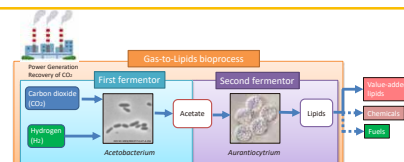
Solar panels for general housing and industrial use are installed on unused land and on the rooftops of buildings, but solar sharing is a new agricultural initiative to generate solar power on farmland. In a situation where farmers have many agricultural problems, such as a shortage of successors, population aging, and an increase in the amount of abandoned farmland, solar sharing can be expected to effectively use fallow land and abandoned farmland, and agricultural management in harmony with the environment based on the creation of new jobs and the introduction of renewable energy, and thus contributes to the achievement of the SDGs.

In the "West Energy Solution / Hiroshima University Solar Sharing Joint Research Course," various crops are cultivated under the solar panels (photo) installed in the precision experiment field of the Graduate School of Integrated Sciences for Life. Based on their growth, yield, and quality evaluation, we examine the selection of crops suitable for solar sharing and their cultivation methods and work on the establishment of a futuristic agricultural production system using solar sharing.

Development of carbon recycling technology

Graduate School of Integrated Sciences for Life

Professor Tsunehiro Aki



We are aiming to develop carbon recycling technology that converts CO₂ emitted from thermal power generation into high-value-added products by utilizing the fermentation function of microorganisms for the purpose of sustainable utilization of limited resources and as a contribution to measures against climate change. Having set up an experimental facility next to the high-efficiency thermal power generation demonstration plant in operation on Osaki Kamijima, Hiroshima Prefecture, we are currently working on the establishment of technology for fermenting and producing lipids as a raw material for health foods, healthcare products, and chemicals with the use of CO₂ that has been separated and recovered at the plant as feed, and on the construction of the related manufacturing processes.

Contributing to the development of a sustainable palm oil industry through economic, social and environmental impact assessments

Graduate School of Humanities and Social Sciences

Professor Shinji Kaneko (Director of NERPS)



Palm oil is contained in many products we use every day (food and daily necessities). While being treated as a bad guy mainly because of the heavy environmental burden in the production process, palm oil, with high production efficiency and people who make a living in the palm oil industry, is indispensable to our lives.

The palm oil industry, which accounts for one-third of the world's edible oil supply, is extremely important as an industry that supplies inexpensive vegetable oil for food and ingredients. At the same time, the palm oil industry generates a large amount of waste biomass, and its sustainability has been questioned. For that reason, the utilization of waste biomass by the palm oil industry, which enhances sustainability, is attracting attention as one of the possibilities of energy use especially as a measure against climate change. On the other hand, the expansion of palm oil production has led to the expansion of oil palm plantations in production areas such as Malaysia and Indonesia and consequent deforestation. In addition, social problems, such as child labor at oil palm plantations have been pointed out, and

the sustainability of the palm oil industry is jeopardized also from a perspective other than waste.

The SATREPS (Science and Technology Research Partnership for Sustainable Development) program accepted in 2019 focuses on old oil palm trees that are discarded after a 25-year production cycle among the unused waste of the palm oil industry. Industry-academia collaboration is working on a transdisciplinary approach to realize the idea of taking old oil palm trees from oil palm tree plantations, recycling them, producing pellets, transporting them to Japan, and using them for power generation as biomass fuel. In addition to technical discussions, this approach includes the tasks of confirming the sustainability and economy of the system that integrates palm oil-producing countries and the Japanese market, with Professor Shinji Kaneko of Hiroshima University as the group leader, by performing LCA (Life Cycle Assessment) analysis and cost-benefit analysis.

Heavy metal wastewater treatment and rare metal recovery using micro organisms

Graduate School of Integrated Sciences for Life

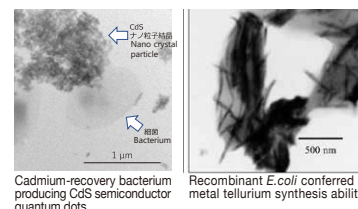
Professor Yoshiko Okamura



The technologies for recovery of metal resource are important for sustainable society. Heavy metals are essential as additives to improve the properties of electronic, magnetic, and functional materials. Rather than calling them "heavy metals", it might be easier to understand their rarity and importance if we call them "rare metals". The reason why they are "rare" is that they exist in relatively small amount in the earth's crust and are expensive to refine. Rare metals are indispensable materials in most manufacturing industries in modern society. Solid metals can be melted, refined and separated into elemental substances, but once rare metals dissolved in wastewater as ions, it requires more energy to extract as elements. Thus, metal ions in wastewater are rarely recycled. Since the bioprocess is a low-energy process and environmentally friendly, it has been used for bioremediation (biological environmental restoration) to recover heavy metals in the environment, but we utilize biomineralization process to recover heavy metal ions from waste as minerals at room temperature and pressure. The recovered metal compounds are solid and can be refined

into elemental metals using less energy, or elemental metals such as metal tellurium synthesized by bacterium

(photo on the right: recombinant *E. coli*), for example; they can be immediately recycled. Such like this, it is expected to develop a technology for recovering rare metal resources from wastewater with low energy consumption by biomineralization. In addition, the metal compounds synthesized by bacteria are the nano-sized particles and they have the potential to be applied to functional materials. For example, highly toxic cadmium ions were converted into CdS nanoparticles by bacteria (photo: left), and the quantum-sized nanoparticles and have semiconductor-like properties. In such ways, we have developed new biotechnologies in order to contribute to the sustainability of rare metal resources and material synthesis by utilizing the diversity of microorganisms and gene resources.



Promote sustained, inclusive and sustainable eco- full and productive employment and decent work

Contributing to the development of highly specialized human resources who can realize innovation

Graduate School of Advanced Science and Engineering

Associate Professor Shin Wakitani (Researcher, Hiroshima University Digital Monozukuri (Manufacturing) Education and Research Center)



Graduate School of Advanced Science and Engineering, Joint Research Course “MBD Basic Course”

In recent years, model-based development (MBD) has been applied not only in the automobile industry but also in the design and development of various products, contributing to the improvement of product development efficiency. However, it still takes more time for all developers involved in these operations to master MBD development methods. Furthermore, it is an urgent task for Japanese industries to accelerate the development of human resources that can freely manipulate models and realize innovation.

In view of this situation, we have formulated a curriculum for developing highly specialized human resources related to MBD, developed teaching materials, and published them as a textbook. In addition, under the industry-academia-government collaboration with the Hiroshima Council for the Promotion of Collaboration between Government, Academia, and Automobile Industry (Hirojiren) and the Hiroshima Digi-

tal Innovation Center (HDIC), we have made these efforts on a large scale as part of “MBD process training” focusing on manufacturing companies in Hiroshima Prefecture.

This curriculum is offered in a lecture format in our university's smart innovation program and has been made actively available to students. In addition, we have established a general incorporated association, “Digication” for the nationwide development of this training. Recently, we have been advocating “Smart MBD” as a new manufacturing platform based on this MBD and are advancing related research.



Investigating the current state of gender in companies

Research Center for Diversity and Inclusion



We have conducted qualitative and quantitative surveys on gender at multiple companies in western Japan, including distribution companies with many female workers and manufacturing companies with few female workers, in collaboration with their personnel officers. These surveys have been conducted as part of the “Initiative for Realizing Diversity in the Research Environment (traction type)” (Ministry of Education, Culture, Sports, Science and Technology (MEXT)'s Human Resource Development Program for Science and Technology), which is conducted by Hiroshima University in collaboration with companies, international think tanks, other universities, and local governments with the aim of fostering professional women.



Social implementation of human augmentation technologies

Graduate School of Advanced Science and Engineering

Professor Yuichi Kurita (Director, Applied Human Augmentation Project Research Center)



The services expected from human-augmentation technologies cover not only the expansion of people's motor, sensory, and cognitive capabilities, the improvement of skills in using tools and machines, and the augmentation of work performance, but also the augmentation of communication, education, training, and medical and nursing care based on the longer-term understanding of the relationship between people and people or people and tools. The mission of the Applied Human Augmentation Project Research Center is: (1) to develop support systems that improve the convenience of daily life based on research seeds related to the understanding, modeling, and application of human sensory-motor properties, (2) to develop human-augmentation technologies that cover social systems conducive to enriching human relationships, and (3) to implement these systems in society in cooperation with other universities, companies, and local governments.

Aiming to realize a working environment where engineers can feel “well-being”

Graduate School of Advanced Science and Engineering

Assistant Professor Takuya Kinoshita



In the construction industry, with the necessity of the improvement of work efficiency and the declining birthrate and aging population, there is an urgent need to train and retain excellent construction engineers. One of the solutions to this problem is to improve the construction site and working environment. Ensuring the “well-being” of engineers is important to this end.

Mindful of this problem, using technology that qualitatively and quantitatively grasps the state of mind of engineers working at the site, we are conducting research to build a theory and system that enable these pieces of information to be applied to construction sites and construction machinery. With this research work, we aim to realize a working environment where engineers can feel “well-being” and people’s minds and construction work can be adaptively maintained. Specifically, we are working to build a “psychologically adaptive smart system” using a database-driven approach as a system that improves the performance of the entire work site centered on people through co-creation activities with companies.



Revealing consumers’ support toward companies contributing to the SDGs

NERPS

Researcher Tomomi Yamane and Director Shinji Kaneko



By 2030, the SDGs aim to realize a sustainable world in which no one is left behind, with the cooperation of all countries, businesses, and individuals. In particular, the active efforts of the private sector are indispensable for achieving the SDGs. Companies are expected to contribute to solving social issues through their core business rather than through their corporate social responsibility such as philanthropy and charity. By doing so, we create a society where private companies remain profitable while prosperity continues. However, if companies embed the SDGs into their core business strategies gaining the support of stakeholders is not clearly understood. If it is clarified that consumers prefer a company that actively works toward the SDGs, companies may further accelerate their contributions to SDGs. On the other hand, pretending to be working on the SDGs even though they are not actually working on the SDGs is called “SDG-wash.” To prevent SDG-wash, it is important for companies to understand the essence of the SDGs and work toward them diligently. It is also necessary for stakeholders to develop an ability to penetrate companies’ SDG-wash and support companies that contribute to the SDGs by embedding sustainability practices into their core business strategy.

Against this background, we conducted a nationwide survey to investigate whether consumers would evaluate companies’ SDGs contributions when choosing a company. We also measured the effect of raising awareness of the SDGs. These research outcomes have been compiled into four research papers and one data paper which have been published in international academic journals. The dataset which is used to conduct research has been made available to the public so that researchers and policymakers can use this dataset to analyze a wide range of topics.

Research highlights

When purchasing products, investing, and job-seeking, consumers choose companies that actively work toward the SDGs.

Consumers support companies to gain benefits from their SDG contributions. However, the support rate is low.

By raising consumers’ awareness of the SDGs, support for companies that gain a profit from their SDG contributions increases.

The younger generation (aged 18 ~ 30) expects society, schools and companies to contribute to the SDGs more than older generations does.

When young people choose a company to work for, while they consider wages and job security important, the support rate of companies that are reluctant to contribute to the SDGs is low even if their expected wages are high.

<https://doi.org/10.7910/DVN/QWB200>
Japan Household Panel Survey (JHPSDGs) 2019-2020



Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

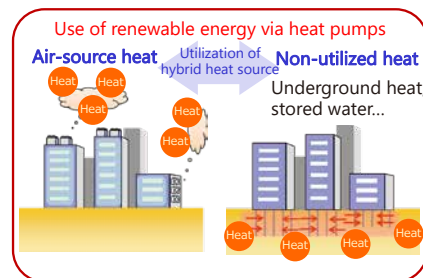
Research related to air conditioning equipment and utilization of unused energy

Graduate School of Advanced Science and Engineering

Associate Professor Sayaka Kindaichi



Improving resource utilization efficiency and introducing clean technology are indispensable for reducing CO₂ emissions. We have conducted research on energy conservation in buildings, especially related to air conditioning equipment and the utilization of unused energy. Recently, a new system on the demand side (building side) toward carbon neutrality is required. For example, we are working on the development of a supply and demand adjustment method that can be applied to existing buildings, such as a method to efficiently store the surplus electricity generated during the daytime from solar panels as chilled water for air conditioning, using a geothermal heat pump.



Self-driving shuttle “HIROMOBI” –Aiming for a smart campus

Graduate School of Advanced Science and Engineering

Professor Akimasa Fujiwara



In March 2021, we initiated the operation of the autonomous driving shuttle “HIROMOBI” on our Higashi-Hiroshima Campus as an initiative for a smart campus where people and goods can freely come and go with mobility services with a low environmental impact. In the autumn of that year, the network was successfully expanded from on-campus use to operating on public roads. In the near future, the third phase will operate a new vehicle that can run faster than the previous model up to the ordinary speed limit.

Promoting sustainable industrialization and innovation through digital manufacturing

Hiroshima University Digital Monozukuri (Manufacturing) Education and Research Center



Development of a technology (material) that achieves both heat insulation and a sound absorption function

We are working on the development of a technology (material) that achieves both heat insulation and a sound absorption function. A material that reduces sound (sound absorbing material) and a material that insulates (insulating material) controls both sound and heat, respectively. If we can develop a technology (material) that can manage both of these functions at a high level and control them at the same time, we will be able to apply it to many industries, such as automobiles, ships, and housing, and to contribute to the reduction of energy consumption.



Vibration spectrum camera

“Visualization of vibration” can be achieved by instantly recognizing vibration information invisible to the human eye at the pixel level and by displaying the results in real-time to visualize only the part that vibrates at an arbitrary



frequency. By performing vibration inspection and monitoring using this technology in a plant, we can make use of it for high-speed and high-precision detection of abnormal operations.

Data-driven smart system

The characteristics of objects and machines change according to changes over time and environmental and operating conditions. Data-driven control is an attempt to realize the maintenance of the same performance against any changes through control that uses a database. The Digital Manufacturing Education and Research Center has conducted research on data-driven smart systems that are constructed by organically integrating data analysis and machine learning that further promoted this control method. In particular, after creating a database of drivers' characteristics, environmental changes, parts deterioration status, etc., based on the interaction between model-based development and data-driven control, which are carried out in automobile development, and utilizing AI technologies, we have conducted research that aims at building a new development platform intended to optimize the control system.



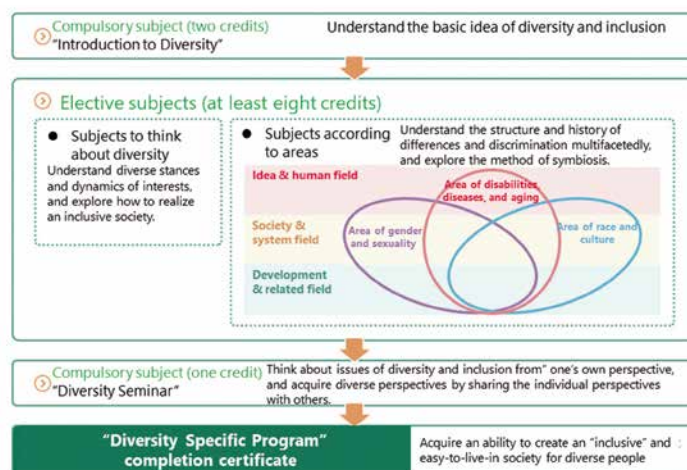
Reduce inequality within and among countries.

A specific program to learn how to solve diversity and inclusion issues

Research Center for Diversity and Inclusion



We offer the "Diversity Specific Program," a program that all Hiroshima university students can take in order to learn how to solve diversity and inclusion issues. The program, which started in 2020, includes a compulsory subject, "Introduction to Diversity" for the basics of diversity, and elective, diversity-related subjects across multiple departments in the university. The students set their own course plans and learn together across disciplines for individual goals.



Refinement of the concept of inclusiveness in a diverse society and examination of its function

Graduate School of Humanities and Social Sciences

Professor Kiriko Sakata



Grant-in-Aid for Scientific Research (B) "Refining the concept of inclusiveness in a diverse society and examining its function" (FY 2021 ~ FY 2024), of which I am the principal investigator, was accepted. For the SDGs, member countries have pledged to "leave no one behind" and there is a great concern about the question of what we should do to include diverse people and utilize their abilities. However, there are very few pieces of social psychological research on the concept and

the effect of inclusion in the world. The purpose of this research is to clarify the components of inclusiveness and to empirically clarify the effect of inclusiveness on individuals and groups. By clarifying what factors can make people perceive to be inclusive in the workplace, school, and community, and how inclusiveness functions in a highly diversified group, we aim to provide insights in order to make a diversified society a happy and beneficial place.

Toward a society that mutually recognizes diversity—Providing guidance to designated schools that established and practice an inclusive education system

Hiroshima University Hospital

Visiting Associate Professor Aiko Kajiume



Inclusive education is an initiative for diverse children to study together in the same classroom. Toward the formation of a symbiotic society, it is important for children to gain experience in recognizing each other's diversity. To this end, first of all, with the purpose of deepening the understanding of developmental disorders by educators, I give lectures to school teachers in workshops and lecture sessions at schools four to five times a year. I believe that it is important for medical care, education, welfare, etc. to work together under the common recognition of how to provide appropriate support for children and their families. In addition, we have been actively involved in social activities, such as the members' activities of the "Hiroshima Prefecture Community Health Measures Council Developmental Disorder Medical Support System Review Special Committee," "Hiroshima Prefecture Developmental Disorder Medical Institution Network Construction Project," and the "Hiroshima Prefecture Screening Function Enhancement Project," which aims to extract cases of child-rearing difficulties and children with developmental disorders in infant medical examinations.





Sustainable Cities and Communities

Make cities and human settlements inclusive, safe, resilient and sustainable.

Creating a resilient and sustainable city through disaster prevention / mitigation research and education

Resilience Research Center



Disaster prevention education

The Resilience Research Center, together with Hiroshima Prefecture and other local governments, supported the development of disaster prevention experience-based VR content using VR technology for disaster prevention education for local residents and at schools and developed teaching materials and methods for disaster prevention education for elementary and junior high schools. At the same time, when the danger of a disaster is imminent, the Center Director keeps in touch with the national, prefectural, and other local governments, and mass media, to take practical measures for disaster prevention and mitigation. In addition, since FY2019, we have held training for local government crisis managers about once a year.



In response to requests from local governments, we provide individual training to those who oversee disaster prevention and carry out lectures that are open to the public. In addition, to commemorate the 3rd anniversary of the establishment of the Resilience Research Center, we held an open discussion "Know the area and protect lives – Evacuation to safety under pandemic while avoiding crowded places such as the emergency shelters". In the discussion, researchers at the Center, government officials, and media panelists presented case studies from their own perspectives and exchanged opinions. Since the contents of the open discussion are useful for future disaster prevention/mitigation activities and disaster prevention / mitigation education, they are published on the website of the Resilience Research Center together with the presentation materials.

Validation of an early detection system for debris flow in mountain streams in cooperation with local communities

In December 2019, we installed debris flow sensors in Kumano Town, Hiroshima Prefecture, where a debris flow disaster occurred during the torrential rain in July 2018. The debris flow sensors were jointly developed by the Resilience Research Center of Hiroshima University and Measurement Research Consultant Co., Ltd. (Hiroshima City). A total of 10 sensors were installed in five locations in the mountain stream on the hillside of Ohara Heights to detect debris flows in real-time. The aim is to monitor the movement of ground and sediment so that government officials and residents can easily check it using a personal computer.



Strengthening collaboration with the Ministry of Land, Infrastructure, Transport and Tourism (MLIT), Hiroshima Prefecture, other local governments, and other organizations for linking research results to practices

Every year, we invite local government officials from Hiroshima Prefecture to attend a seminar where the research results regarding disaster prevention and mitigation measures at Hiroshima University and the disaster mitigation measures by local governments are shared to support their disaster prevention practices. In addition, we have strengthened cooperation with the Chugoku Regional Development Bureau of the Ministry of Land, Infrastructure, Transport and Tourism (MLIT), Hiroshima Prefecture, and other organizations to create a framework for linking research results to actual measures.

Research on the challenges and possibilities of sustainable tourism

Graduate School of Humanities and Social Sciences

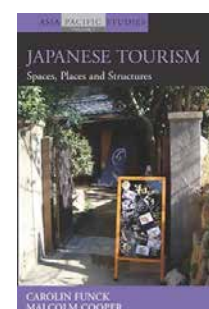
Professor Funck Carolin



Tourism contributes to many SDGs such as economic effects that lead to the alleviation of poverty, protection of natural resources on land and sea, employment and self-employment of women, and securing of water resources. At the same time, there are also problematic issues, such as unstable employment, emissions of carbon dioxide associated with traveling, destruction of nature in mountains and the sea, and commercialization of culture.

In the research so far, in order to objectively and scientifically evaluate tourism development as a regional policy in rural communities, especially islands, we have discussed whether spaces provided by communities can be matched to the needs of tourists and visitors for leisure in the area, after grasping the economic and social activities and the use of spaces. Also, we have analyzed the economic, social and environmental effects of tourist behavior and explored the possibilities and problems of sustainable tourism.

With my graduate students who have conducted research mainly on Japanese islands and international tourism to Japan, we have discussed the possibility of ecotourism, management of natural resources in popular tourist destinations, the ideal tourism industry in which residents and migrants are involved, and indicators to measure sustainability. As an extension of my research, I have participated in committees and projects held by prefectures, municipalities, and NPOs, and have given advice on policies that can utilize tourism as a means of regional revitalization.



Ensure sustainable consumption and production patterns.

Aiming to develop next-generation plastics by making full use of genetic engineering techniques

Graduate School of Biomedical and Health Sciences

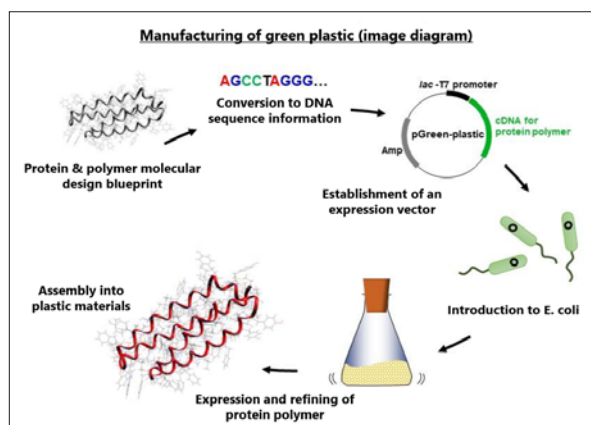
Professor Koichi Kato



Plastic is an indispensable material in our daily lives. On the other hand, however, we have many serious problems, such as the marine plastic problem and the CO₂ emissions associated with the production of plastic and their adverse effects on global warming. Drastic solutions for these problems require a breakthrough related to polymeric materials. Against this background, biodegradable plastics, which are degraded and disappear in nature, are attracting attention. Poly (lactic acid) is a typical example. Since raw materials can be obtained from natural resources such as corn by using fermentation, it can reduce the impact on the ecosystem. However, poly (lactic acid) alone cannot achieve the numerous functions required to replace all conventional plastics. Therefore, the Biomaterials Laboratory, Graduate School of Biomedical and Health Sciences, has conducted research on next-generation plastics (green plastics) based on green chemistry with the aim of expanding the variety of biodegradable plastics.

Although the research has just begun, I am wondering if it is possible to use a protein that has been molecularly designed by utilizing genetic engineering techniques as a component (gene recombination experiment on "creation of protein/polymer": institutional approval.

number: 2020-245). This method has a high degree of freedom in molecular design and can be scaled up in the manufacturing process, so we expect that it can be an attractive method.



Visualization research of marine plastic waste

Graduate School of Advanced Science and Engineering

Associate Professor Yuji Sakuno



There is a strong interest in the problem of marine plastics around the world, as represented by the charging for plastic shopping bags at convenience stores. However, the reality of marine plastic waste is unclear. In our laboratory, as basic research for exploring and visualizing marine plastic waste using remote sensing technology, we have investigated the spectral reflectance characteristics of plastics on the coast and taken up the challenge of plastic visualization research together with local high school students.





Take urgent action to combat climate change and its impacts.

Aiming to mitigate climate change by reducing methane gas emissions from cattle belching

Graduate School of Integrated Sciences for Life

Professor Taketo Obitsu



Methane gas produced in the cow's stomach (reticulo-rumen) and released into the atmosphere through eructation (belching) has a great influence on global warming. We are aiming to develop dairy farming techniques that suppress methane emissions from cow's belching by conducting research, using dairy cows raised in the experimental farm of Hiroshima University, for modifying feeding methods, developing natural materials that suppress methane production, and breeding cows with low methane emissions.



Research on the interaction between aerosol particles and marine ecosystems

Graduate School of Integrated Sciences for Life

Associate Professor Yoko Iwamoto



Some aerosol particles contain nitrogen, phosphorus, iron, etc. When they are deposited on the surface of the ocean, they supply nutrients needed for phytoplankton to the sea surface, which can lead to the proliferation of phytoplankton. In addition, the growth and decline of phytoplankton change the concentration of trace substances in seawater, affecting the formation and composition of aerosol particles of marine origin. Aerosol particles function as the "parasol" of the Earth by directly scattering sunlight and acting as the nucleus of cloud particles. To refine future climate change predictions, it is necessary to learn the physical and chemical characteristics of aerosols originating from the ocean, which occupies about 70% of the Earth's surface. Against this background, we have installed atmospheric observation equipment on campuses, coastal sites, and ships to measure aerosol particles in various sea areas.





Life Below Water

Conserve and sustainably use the oceans, seas and marine resources for sustainable development.

Providing high-quality education internationally as a base for education on marine life

Marine Biological Laboratory, Graduate School of Integrated Sciences for Life



As an education-related joint-use center of the Ministry of Education, Culture, Sports, Science, and Technology (MEXT), we provide inclusive, fair, and high-quality education to all people and promote lifelong learning opportunities. Specific contents include the provision of marine biology courses for elementary, junior high, and high school students, and implementation of the next-generation human resource development project Global Science Campus in which Hiroshima University participates, provision of credit-compatible courses to students of national, public, and private universities nationwide, and provision of cutting-edge science education for university and graduate students from around the world using the Japan Science and Technology Agency (JST) Sakura Science EXCHANGE PROGRAM. In the last case, we visit the Peace Memorial Museum and other related sites in Hiroshima City and conduct peace education specializing in Hiroshima at the same time. To promote opportunities for lifelong education, we hold interview classes at the Hiroshima Learning Center, Open University. In this way, we provide high-quality education internationally, from primary education to secondary education, higher education, and lifelong education.



Hiroshima University SATO Research Center

Graduate School of Advanced Science and Engineering

Professor Shinichi Onodera



The SATO Research Center aims to clarify water resource management in the Seto Inland Sea area (Hiroshima, Okayama, Kagawa, Osaka, Nara), evaluation of flood and sediment runoff due to climate change, and its impact on coastal areas in its activities. In addition, we compare the results with the cases in Indonesia and China as part of our international joint research. Based on the creation of a healthy cycle (including people and

food) between urbanized cities and their surrounding rural areas in Asia, and cases of the Seto Inland Sea basin, which has successful cases, such as satoyama/satoumi, we aim to create a new academic research field that contributes to solving problems in Asian countries.

From the fiscal year 2022, international joint research with Brazil and Canada has started on watershed management in urban and rural areas.





Life on Land

Protect, restore and promote sustainable use of terrestrial combat desertification, and halt and reverse land degrada-

Conservation and utilization of local natural and cultural heritage through ecomuseum

Graduate School of Humanities and Social Sciences

Professor Toshihisa Asano



An ecomuseum deems an entire region as a museum, preserving nature, history, and cultural heritage as museum exhibits and utilizing them for education and tourism. The Hiroshima University Museum is engaged in ecomuseum activities in Higashi-Hiroshima city. We conduct surveys and conservation activities on wildlife, awareness-raising activities to deepen the public understanding, and the development of tourism programs that make use of nature, history, and cultural heritage. In addition to emphasizing on-site activities, we are also producing content related to the Higashi-Hiroshima ecomuseum for the digital museum.

The Hiroshima University Museum YouTube channel

Satoyama conservation in Mt. Ryuu and sake brewing in Saijo



Mechanism of groundwork on Mt. Ryuu



Ecomuseum

The ecomuseum explores and expresses the relationship between the environment and humans in a certain area with the participation of residents, with the aim of contributing to the intrinsic and sustainable development of the local community.



Creating a resilient and sustainable city through disaster prevention education and disaster mitigation research

Miyajima Natural Botanical Garden, Graduate School of Integrated Sciences for Life

Associate Professor Hiromi Tsubota



Reuse of *Vitex rotundifolia* growing in Miyajima and improvement of habitat environment

A plant called *Vitex rotundifolia*, which was cut and discarded for the purpose of maintenance and management of roads and waterways and countermeasures against wild boars in Miyajima, is used for the production of gin from the viewpoint of efficient use of resources. It is offered as a product of Sakurao Brewery and Distillery Co., Ltd. (former Chugoku Brewing), and a part of the sales is used for education and research for the conservation of the natural environment of Miyajima. Since picking the plant is also intended to maintain waterways, we can prepare for flood damage by doing this activity. We also volunteer to pick up trash in order to improve the environment of the *vitex rotundifolia* habitat.



Greening project for forest conservation and prevention of natural disasters in Miyajima

We are engaged in greening projects for forest conservation and prevention of natural disasters in Miyajima, one of the World Heritage Sites. Around Miyajima

Ropeway Terminal (Shishiwa Station), Japanese macaques, which were previously introduced from Shodoshima Island were fed. Currently, there are no monkeys in this area, and because of this, the surrounding vegetation is declining. To restore the original state, vegetation restoration activities have been initiated mainly by related organizations on Miyajima Island. Children and students from a local school, Miyajima Gakuen (Miyajima Elementary and Junior High School in Hatsu-kaichi City) also participate in the activities as part of environmental education.

As a general rule, we hold a plant observation walk for the general public once a month.

Please scan the QR code for information on the event ▼

This is an event continued for more than 40 years and is attended by many ordinary citizens, teachers of elementary, junior high and high schools, and people responsible for environmental surveys and assessments. This event also received the 2010 7th Botanical Society of Japan



Award Special Award (Education) from the Botanical Society of Japan. It is also used for recurrent education for acquiring qualifications such as biological skill tests, and some of the results obtained at the plant observation walk are reflected in publications such as the Flora of Hiroshima Prefecture, Japan.



ecosystems, sustainably manage forests, and halt biodiversity loss.

Examination of proper management of invasive exotic plants

Graduate School of Integrated Sciences for Life

Professor Takayuki Nakatsubo



The invasion of alien species poses a major threat to biodiversity. The progress of global warming may accelerate and exacerbate their impact.

In our laboratory, we have grasped the current situation based on field surveys, focusing on invasive alien plants that are believed to have a particularly large impact on ecosystems and industries. We have also advanced the prediction of the expansion of distribution and the impact of these plants in warming environments by cultivation experiments and models. Some exotic plants used as park trees and horticultural plants can become wild and have an adverse effect on the ecosystem. It is not realistic to use no exotic plants for greening, so risk assessment for each species is required. Based on this idea, we are conducting ecological research on plant species that are highly likely to become wild, and are discussing appropriate management methods.



Deepening understanding of biodiversity through amphibian research and civic education

Amphibian Research Center



Reuse of *Vitex rotundifolia* growing in Miyajima and improvement of habitat environment

Associate Professor Takeshi Igawa

Regarding Anderson's crocodile newt, one of the endangered species of Amami Oshima, Tokunoshima, and northern Okinawa Island, which were registered as World Natural Heritage Sites, and a natural monument of Okinawa and Kagoshima prefectures, we have comprehensively elucidated the genetic diversity within the species, which is essential for the conservation plan. (Igawa et al., 2020). In addition, while continuing the breeding and propagation of this animal within the center as part of the extra-regional conservation project for various endangered and natural monument amphibians including this species, we exhibit living Anderson's crocodile newts for the purpose of raising social awareness of biodiversity.



Genetic research of sex and speciation using wild frogs

Associate Professor Ikuo Miura

Focusing on the populations that make up the species, we aim to elucidate the mechanism by which one species evolves into a new species. One of the points of interest is to investigate the genetic differences between populations in detail and clarify their genetic continuity and discontinuity. We pay particular attention to the boundary area. The second point is to investigate the causes and mechanisms of reproductive isolation. We are investigating

how differences in sex-determining patterns and gonad formation occur, and how mutual recognition of the genome changes in germ cells, focusing on the above points.

Although Japan is an island nation separated from the continent, it has experienced a mass influx through connection to the continent several times.



(Photo by Shintaro, Seki)

In addition, geographical isolation is remarkable in Japan due to many mountain ranges, rivers, and crustal movements. In addition, the population may be reunited after being released from isolation. In this way, repeated geographical isolation and fusion have caused various genetic changes in the population. It is no exaggeration to say that this country is truly an experimental site for evolution. Therefore, the evolution of species in amphibians has been very active and is still in progress. In August of 2022, we discovered a new frog species distributed in Kanto (near Tokyo) and the eastern side (Pacific side) of Tohoku district, which has been named Proto wrinkled frog (*Glandirana reliquia*) (Shimada et al., 2020). The species is very old in origin and has survived from the beginning of the Japanese archipelago's history far before the wrinkled frog (*G. rugosa*) was born. We are sure that this finding will change the phylogenetic history of the amphibians living in the Japanese archipelago.

Holding public exhibitions

Professor Hajime Ogino

Aiming to promote symbiosis between humans and nature, we have held biological exhibitions to deepen the public's understanding of amphibians, which are vulnerable to the effects of environmental degradation.





Peace, Justice and Strong Institutions

Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.

Aiming to become globally recognized research clusters of transdisciplinary research on “Peace and Sustainability”

NERPS



In 2020, NERPS started international transdisciplinary research projects on peace and sustainability jointly with three universities and one research institute (Columbia University, University of Denver, University of Nottingham Ningbo China, Stockholm International Peace Research Institute). A total of six research clusters, including four led by researchers from these partner organizations and two led by researchers at Hiroshima University, were formulated. In the fall of 2020, NERPS published “The 2020 NERPS Science Plan,” which described details of the six projects, and these research projects were officially started, with the aim of making the six research clusters globally recognized research clusters. These four transdisciplinary research projects aim: to investigate the possibilities of managing fisheries conflict through regional fisheries management organizations; to explore the effects of incorporating long-term ecological considerations into peacebuilding in post-conflict societies for sustaining positive peace;

to investigate the effectiveness of protected area management and natural resource governance for enabling protected areas to contribute to enhancing peace and sustainability; and to identify and evaluate ICT-mediated and digital technologies for enhancing the resilience of cities from the perspective of peace and sustainability. Relevant research work is expected to continue for the next three to five years. Each of the research clusters aims to become a research center backed by internationally viable research capabilities in the future and to contribute to the establishment of “Science for Sustainable Development” that is set forth in Hiroshima University’s long-term vision. NERPS hosted the inaugural Hiroshima International Conference on Peace and Sustainability for 4 days from March 1, 2022, on Hiroshima University’s Higashi-Hiroshima Campus. The progress that the transdisciplinary research projects had made until then was presented at the conference.

Peace Building and Prevention of Violent Extremism through Education for African Youth through Teacher Development

Center for the Study of International Cooperation in Education (CICE)



CICE has designed and operated about 10-day field visits and training in Hiroshima, Nagasaki, and Tokyo as part of the training project “Peace Building and Prevention of Violent Extremism through Education for Youth through Teacher Development in the Sahel,” which is conducted by the UNESCO’s International Institute for Capacity Building in Africa (UNESCO-IICBA) with support from the government of Japan. The training was carried out online in the fiscal year 2020. Until the fiscal year 2019, however, CICE had accepted around 30 trainees each year, including senior officials from the African Union and educational administrators from more than a dozen African countries, and had held lectures and workshops at Hiroshima University, provided them with opportunities to visit the Hiroshima Peace Memorial Museum and the Nagasaki Atomic Bomb Museum, and to hold exchanges with junior high schools in Hiroshima and Tokyo, and to visit parliamentarians and Ministry of Education, Culture, Sports, Science and Technology (MEXT). In the fiscal year 2022, the training has been carried out online in the form of 4 webinars with the participation of 34 trainees from 9 African countries.



Support for system construction in developing countries

Center for the Study of International Cooperation in Education (CICE)

Professor Yoko Ishida



“Project for Strengthening Framework of Implementation of SDGs in the Republic of Indonesia”

I have participated in the technical cooperation project entitled “the Project for Strengthening Framework of Implementation of SDGs in the Republic of Indonesia” (March 2019 ~ August 2022), which has been conducted by International Development Center Co., Ltd. and Hiroshima University as a joint venture, and commissioned by Japan International Cooperation Agency (JICA), as an indicators and statistics expert. In this project, we provide technical support for the four initiatives that the Ministry of National Development Planning/BAPPENAS promotes, which are designed to contribute to the achievement of the SDGs by the Indonesian government: 1) Setting of the definitions and target values for the domestic indicators for the SDGs, 2) Formulation of action plans by the central government and the target provincial governments, 3) Development of a monitoring and evaluation system (e-Monev) and 4) Strengthening of cooperation with various stakeholders in the industry, academia, and government.



Development of evaluation systems and human resources for developing country governments

Serving as Vice Chairman of the Japan Evaluation Society, I am involved in the development of evaluation systems and human resources for governments of developing countries. The Ministry of Foreign Affairs of Japan has been holding the “ODA Evaluation Workshop” almost every year since 2001 as an information exchange platform for the implementation of development plans and capacity building in order to support the efforts of governments of developing countries to achieve the SDGs. In the 15th workshop “Responses and initiatives by each country to the SDGs” held in Colombo in 2018, I gave a presentation about the “possibility of strengthening SDGs monitoring and evaluation capacity through international cooperation.” At both of the 17th Workshop in fiscal 2021 and the 18th Workshop in fiscal 2022, which were held online, I served as Co-Chair.



Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development.

Global partnership in the field of international educational cooperation

Center for the Study of International Cooperation in Education (CICE)



Making contribution as Co-Chair of the “SDG-Education 2030 Steering Committee”

From January 2019 to August 2021, Professor Kazuhiro Yoshida co-chaired the SDG-Education 2030 Steering Committee, an international coordinating organization related to the fourth goal of the SDGs, “Quality Education.”

This committee is an international committee consisting of 44 representatives from UNESCO member countries, civil society organizations, international organizations, etc. from around the world, and UNESCO serves as its secretariat. The other co-chair is Stefania Giannini, Assistant Director-General of UNESCO. Prof. Yoshida organized and chaired meetings with the United Nations and other SDGs-related organizations, coordinated and promoted the smooth implementation of various activities, and contributed to promoting SDG 4.



JICA training “Education policy formulation and analytical ability development for improving learning”

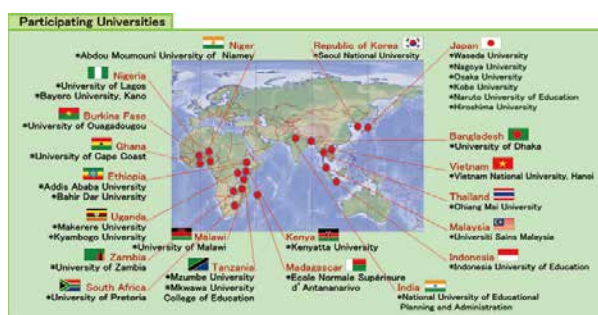
Every year, as part of JICA's international cooperation program for human resource development, CICE designs and operates around one and a half months of training for educational administrators of developing countries. The training aims at formulating educational development plans, and strengthening the capabilities to prepare, implement, monitor, and evaluate a project intended to promote access to education and improve the quality of education.

From 2018 to 2021, CICE provided JICA thematic training “Education policy formulation and analytical ability development for improving learning,” to about 20 trainees every year from more than a dozen countries in Africa and Asia such as Kenya, Ethiopia, Ghana, Egypt, Cambodia and Thailand. In 2022, we also provide online training on the same theme to about 15 trainees from 12 countries.



“Africa-Asia University Dialogue for Educational Development” (AA Dialogue) Network

The Africa-Asia University Dialogue for Educational Development (AA Dialogue) Network has been established to promote international collaborative research, which is related to educational development in developing countries, between universities in Africa and Asia. As its secretariat, CICE has provided a platform for collaborative research and has provided support for the strengthening of the ability to write English dissertations. In 2021, a paper co-authored by member university researchers, “Indicators for the Measurement of Teachers’ Professional Identity across Asia and Africa: A Delphi Study” was accepted by the Journal of Asian and African Studies. Currently, 29 universities from South Africa, Kenya, Vietnam, Malaysia, and Indonesia, etc. which have participated in the AA Dialogue, have conducted joint research on the impacts of COVID-19 on educational sites and children in each country and measures to address the pandemic. The outcome of the joint research has been published, as a special feature, in Vol. 24 (2021) of the Journal of International Cooperation in Education.



Japan Education Forum for Sustainable Development Goals (JEF for SDGs)

For the purpose of exchanging opinions on the importance of autonomous educational development by developing countries themselves and the ideal way of international cooperation to support their self-help efforts, the Japan Education Forum for Sustainable Development Goals (JEF for SDGs) is held annually, co-sponsored by the Ministry of Education, Culture, Sports, Science and Technology (MEXT), the Ministry of Foreign Affairs (MoFA), Hiroshima University, and the University of Tsukuba.

CICE serves as the secretariat of this forum and has been involved in planning and management. The 17th Forum held online in 2020 on the theme of “Girls Education and Innovation”, featured keynote speeches by the Secretary-General of the Ministry of National Education of Senegal and by Professor Emeritus Reiko Kuroda of the University of Tokyo, and a panel session on girls’ education and innovation, followed by a lively exchange of opinions.



SDGs-related Activities by Students and Recent Graduates

NERPS has employed student interns to give an employment opportunity within the Hiroshima University campus to students and to develop human resources that contribute to the achievement of SDGs. Its SNS frequently posts activities carried out by HU students, which are deemed to contribute to the achievement of SDG.

Activities by current students

“Bicycle × Mottainai”- Our slogan

“Reuse Chari Share”

Mr. Sou Takimoto (Junior at School of Education)
Ms. Kana Takagi (Junior at School of Letters)



We carry out activities as members of the group called “Reuse Chari Share”, which is a student body our seniors established following the last year’s start-up challenge. The group is aimed at realizing a society where fewer people waste bicycles. Currently we serve as the managers of the group.

Takimoto is tasked mainly with bicycle maintenance and accounting. During the last summer vacation, he purchased tools for repairing bicycles, and repaired bicycles every morning, acquiring manuals through the Internet. He can feel a sense of achievement when he has succeeded in putting a bicycle in good condition, with the reuse of spare parts taken from a bicycle which is no longer usable. Takagi makes posters and keeps updating “ChariSpo!!” in Instagram - the contents on the recommended spots you can go to by bicycle in Saijo. We enjoy making good use of our skills in order for reused bicycles to be used by many people and for bicycles to be cherished by their owners. We will continue doing our best so that using our service would mean your spontaneous contribution to the achievement of SDGs.

Aiming at solving regional issues from SDGs perspective

“Hitomusubi”

Mr. Kousei Tahara
(Senior at School of Integrated Arts and Sciences)



I carry out activities as a member of the group called “Hitomusubi”, out of my desire to do what only university students in a local region can do.

Hitomusubi means forging a bond of friendship between people, leading to development of sustainable communities. The group carries out various activities with the aim of having human resources, goods, and money circulated within the region resulted from dissemination of attractive features of Higashi-Hiroshima City. My activities include striving to address regional issues and organizing tours enabling university students to deepen their understanding of Higashi-Hiroshima City.

I consider the SDGs as tools, which enable me to take actions, thinking about not only myself and people in my vicinity but also people in the world and future generations. I hope I will be able to take actions with various people and the achievement of the SDGs in mind.

Creating a system to distribute sanitary products

Students’
original project

Mr. Fuuga Ikeda
(Senior at School of Integrated Arts and Sciences)



We have carried out the project, which has been selected as a students’ original project at School of Integrated Arts and Sciences, for 1 year with support from the School.

This project aims at creating a system to distribute sanitary products continuously and free of charge. At first, we planned to make use of IT service. However, this course of action was turned out to be difficult due primarily to global semiconductor shortage. We are now striving to draw up a system in cooperation with the UNIV. CO-OP. This project is an attempt to address “Period Poverty”, which we consider an important problem for all the people regardless of gender.

The SDGs is a framework for “Nobody left behind”. This project is intended to contribute to the achievement of not only SDG 3 (Good Health and Well-being) and SDG 5 (Gender Equality) but also other goals related to poverty, education, sanitation, inequality and sustainable cities. With a view to having none of ourselves and people who are close to us left behind, we will do whatever we can to complete the project.



Internship Report



NERPS 2021 student intern

Mr. Kai Kagitani

(Graduate School of Humanities and Social Sciences, Master's Program
Graduated in March 2022)

This experience helped me to deepen my grasp of SDGs and enabled me to see matters of my interest from the perspective of SDGs.

I wrote my master's thesis on skateboard and carried out field work mainly in Hiroshima Prefecture for 1 year and 4 months.

I researched on interrelationship between people engaged in skateboarding and non-human entities such as goods and the environment, while I joined skateboarders' communities. I found that skateboarders tended not to practice skateboarding at a fixed place but they frequently move one place to another where they practice skateboarding.

Recently, a growing number of skateboard parks has been built often in the context of urban development. Given the multiplicity of places where skateboarders practice, however, it is doubtful that only skateboard parks could be considered the infrastructure that supports skateboarding. Given the highly fluid movements of skateboarders from one place to another, skateboard parks may limit their areas of activities. My master's thesis, therefore, concluded that the multiplicity and highly fluid characteristics of places where skateboarders practice inform sequential nature of the infrastructure that support skateboarding.

As I saw the situation that surrounded skateboarding from the perspective of sustainability, I could grasp the dual nature of skateboard parks. I believe that approaching various issues and problems from the perspective of sustainable development will help us to better grasp complicated causes that have given rise to the issues and problems. Mindful of this belief that my experience at NERPS has given me, and based on my own awareness of issues and problems, I'm determined to strive to seek collaboration, which transcends areas of expertise and attributes, on activities that contribute to realization of peace and sustainable societies.

I experienced internship at NERPS for one year - from April 2021, when I entered the second year of the Master's Program at the Graduate School of Humanities and Social Sciences, to March 2022. My assigned tasks included dissemination of information on SDGs-related activities at Hiroshima University through SNS and NERPS HP, support for compiling SDGs Report 2021, and technical support for the Hiroshima International Conference on Peace and Sustainability 2022.

Compiler of articles on P44-45

NERPS 2022 student intern

Ms. Rika Monzawa (Graduate School of Humanities and Social Sciences, Master's Program)

I have been an intern at NERPS since April 2022. My major assigned task is to disseminate information on the SDGs-related activities through SNS and NERPS HP.

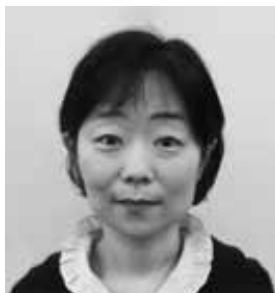
The half-year experience has made me aware that anyone can contribute to solving social issues. Making use of designing and website-updating skills, I can contribute, in even a small way, to the dissemination of the SDGs. As feedback to the dissemination increases, I can feel that my contribution may be limited but not at all insignificant.

To disseminate information on the SDGs-related activities, I need to deepen my understanding of the SDGs. I was able to see the SDGs from a new perspective, making me feel that deeper understanding of SDGs broadened my horizons. I'm committed to contributing to the achievement of the SDGs from a variety of perspective, making good use of my skills. Please visit NERPS HP and SNS as frequently as you can!



Comments from the Stakeholders

Peace Promotion Project Team, Hiroshima Prefecture



Mariko Nishizawa

Associate Director of
International Collaboration of
Peace Promotion Project Team,
Hiroshima Prefecture

The webinar series produced by Network for Education and Research on Peace and Sustainability always features experts working on the front line in different fields. Since such experts share a wide variety of insights with me regarding, for example, the global environmental crises and consequent conflicts, I always enjoy viewing these webinar series.

Today, humans are confronted with various threats, including not only the pandemic currently shaking the world and climate change, but also nuclear weapons, which could instantly reduce all the efforts made so far toward accomplishing the SDGs to nothing.

In 2020 – the year before last, the 75th year of the atomic bombing, Hiroshima Prefecture announced the Hiroshima Initiative (Outline) to help eliminate nuclear weapons as early as possible. Earliest possible elimination of nuclear weapons is a sincere hope of aging A-bomb survivors. The initiative calls on all UN member states, international agencies, and civil society once again to take global action toward eliminating nuclear weapons.

Reference	Hiroshima Initiative https://hiroshimaforpeace.com/en/hiroshima-initiative/
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In addition, in April 2021, we established the Hiroshima Organization for Global Peace (HOPE), whose members include Hiroshima University, as the leading organization to promote the initiative.

Reference	Hiroshima Organization for Global Peace https://hiroshimaforpeace.com/en/about-hope/
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In April 2022, the Hiroshima Organization for Global Peace (HOPE), together with international NGOs and others, established the Global Alliance “Sustainable Peace and Prosperity for All” as a civil society group to work for the abolition of nuclear weapons to be included as a goal in the next UN Sustainable Development Goals (post-SDGs) for the period after 2030.

The Global Alliance, together with organizations involved in diverse fields such as the environment, human rights, and health, will rethink the issue of nuclear weapons from the perspective of sustainability and develop activities such as policy proposals and campaigns toward the year 2030.

If you are interested in problems of the global environment, sustainability, and security issues, you are encouraged to take this opportunity to join this group and work together!

Reference	Global Alliance “Sustainable Peace and Prosperity for All” (GASPPA) https://hiroshimaforpeace.com/en/global-alliance/
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Columbia University



Jeffrey D. Sachs

Director of the Center
for Sustainable Development
at Columbia University
– a world-renowned economics professor,
bestselling author, innovative educator,
and global leader in sustainable development.

The Network for Education and Research on Peace and Sustainability (NERPS) at Hiroshima University is a very inspiring initiative and a most important effort to contribute to the SDGs.

I was greatly honored to be a keynote speaker in its inaugural conference in March 2022 and its webinar series in September 2020 for the 75th anniversary of the Hiroshima and Nagasaki bombings. Currently, we are suffering from the failure of global cooperation to end the Russia-Ukraine war, confront the COVID-19 pandemic, and address the climate crisis, among other pressing issues. It is deeply fitting and gratifying that Hiroshima University is leading a global effort on peace and sustainable development. I am most grateful for this remarkable undertaking, and look forward to working with you to help find pathways to peace and sustainable development.

Higashi-Hiroshima City



Hironori Takagaki

Mayor of Higashi-Hiroshima City

Cooperation-Based Community Development under the Lead of the Town & Gown Office

In March 2020, we established the 5th Higashi-Hiroshima City Comprehensive Plan, which sets forth “An international academic research city, rich in nature, reaching to the future” as our ideal future vision. What underlies this vision are the principles of the SDGs, such as “Nobody left behind” and “Universal values.”

I believe that the accomplishment of this future vision entails the realization of a “Smart city,” where social problems are solved using cutting-edge technology based on integration of the SDGs, which indicate various social problems, and Society 5.0, which advocates the use of technology to address social problems.

To realize this “Smart city,” our city and Hiroshima University established the Town & Gown Office in October 2021, created the Hiroshima University Smart City Co-Creation Consortium, which is based on an industry-academia-government partnership, in March 2022, and initiated a variety of initiatives.

We will continue to take measures and actions that contribute to the realization of a “Smart city,” integrating private companies’ know-how and resources on one hand and our city’s responsibilities as a local government on the other, and making good use of Hiroshima University’s main campus – Higashi-Hiroshima campus, and to promote social implementation of the fruits resulted from such measures and actions in our city and surrounding areas, with the view to contributing to the achievement of SDGs.

In proceeding with these and other various measures and actions, we have high expectations for the contribution of Hiroshima University, which will demonstrate its R&D ability and play a leading and pivotal role.

Sumitomo Corporation



Masahiko Morito

General Manager,
Chugoku (Hiroshima) Office,
Sumitomo Corporation

Toward solving community problems and developing future-oriented communities, since January 2021, Sumitomo Corporation has been working together with Hiroshima University, which is striving to accomplish the truly ambitious target of realizing carbon neutrality by 2030, 20 years ahead of the national government’s target, and with Higashi-Hiroshima City, which is implementing a SDGs future city action plan. We would first like to express our appreciation for this cooperation.

We would like to continue our cooperation with you in solving problems confronted by society, communities, and universities, and thereby strive to develop a community where all citizens can live comfortably regardless of generation, gender, and nationality, where cutting-edge technology is always used and leveraged, and constantly updated, and where a sense of vigor is felt throughout the community due to innovation backed by cooperation between universities and local governments. To do so, we will generate ideas for, for example, introducing renewable energy, addressing energy management that makes good use of electric vehicles and charge / discharge facilities, and establishing a data linkage foundation that leads to having common platform shared by private services and public services, and will discuss how to refine such ideas. While doing so, we would like to cooperate with Hiroshima University and Higashi-Hiroshima City in establishing a framework to allow research, demonstration, and societal implementation to be conducted at universities and in communities.

Indonesia



Laksana Tri Handoko

Head, National Research and Innovation Agency (BRIN) Indonesia
(Co-President of the Hiroshima University Alumni Association Indonesia Chapter)

As one of the alumni of Hiroshima University, I am very excited to see that the University is leading the world in its social contribution to the SDGs. I admire the fact that Hiroshima University is not only a comprehensive research university that engages in excellent academic research in science and technology innovation, but also plays an important and continuous social role for world peace and human happiness for a long time. As the head of BRIN, the science and technology innovation arm of the Indonesian government, I would like to also contribute to the SDGs in collaboration with Hiroshima University in various ways.

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