FY2016 Inter-University Exchange Project CHIBA University

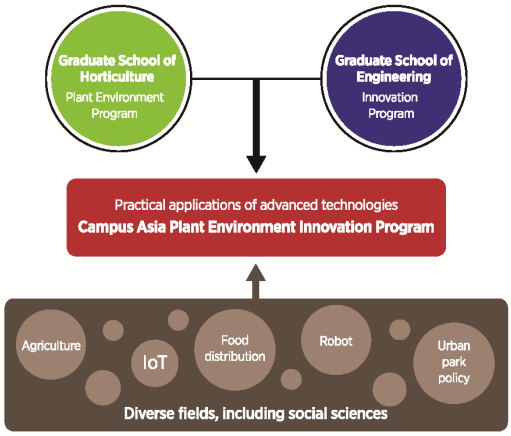
Support for the Formation of Collaborative Programs with Universities in Asia

【Name of project】(Adopted year: FY2016, (Type A-② CAMPUS Asia))

CAPE (Campus Asia Plant Environment innovation program)

【Summary of Project】

As part of Chiba University's efforts to create new interdisciplinary specialized fields, this project realizes practical applications of advanced technologies in plant environments under the partnership between the Japan's only Graduate School of Horticulture and the Graduate School of Engineering. By combining CAPE by the Graduate School of Horticulture and the Innovation Program by the Graduate School of Engineering, students have unique opportunities to study diverse domains (e.g., agriculture, IoT, robotics, AI, etc.) in science and engineering to the social sciences (e.g., food distribution economy, urban park policy, etc.).



【Summary of Exchange program】

① Human resource development for 6th+4th industrialization in cities

The 6th industrialization of agriculture advocated by the Ministry of Agriculture, Forestry and Fisheries aims to revitalize rural and fishery areas with industrial transformations. This program focuses on establishing new businesses for urban farming and greenification by introducing a method of designing services to realize such industrialization in cities. The program seeks to create the 10th (6+4) industry through the addition of service innovation of the 4th industry to the 6th industry, ultimately fostering human resources to support future developments.

② Fostering innovative students with a double degree program in different domains

The Switch Major Double Degree Program (SMDD) allows students to earn two degrees in different domains (agriculture and engineering). They earn a Masters degree in one domain and a doctoral degree in the other.

③ Triple Option Degree Program for diverse and selective degrees

In addition to the double degree (DD) and SMDD, the program creates a new Transferable Degree (TD) where the initial university and the university conferring the degree may differ. The university where a student completes his or her studies confers the degree, while the initial university and the host university each award a diploma for exchange studies.

④ World School of Comprehensive Science to cultivate sophistication at graduate schools

A joint program formed by Chiba University and overseas universities hosts comprehensive science courses, which are available to students outside the specific field of study to cultivate wide-ranging graduate-level sophistication. This program establishes a World School to disseminate information around the globe.

【Global Human Resource on the project】

Industry related to plant environments should realize a 6th+4th industrialization **in cities**. Chiba University has partnered with Tsinghua University, Zhejiang University, and Yonsei University to **cultivate human resources capable of revolutionizing urban farming and greenification in East Asia where food culture based on rice is common.** This is accomplished by utilizing cutting-edge Japanese technologies and creating human resources capable of developing **plant environment innovations**.

【Feature on the project】

This program **strives to foster human resources who will lead the new 6th+4th industrialization in cities** and actualize the flagship double degree (master/doctorate) program in different fields (agriculture + engineering). Because this endeavor requires diverse knowledge, this program seeks to deepen students' interest in horticulture and engineering while allowing students the flexibility to pursue a degree based on their own goals.

【Exchange number】 <TypeA－②>

	2016	2017	2018	2019	2020
Accepted number in Japan	C 12 K 12	C 16 K 15	C 18 K 15	C 22 K 15	C 24 K 10
Accepted number in China	J 10 K 6	J 20 K 16	J 20 K 18	J 20 K 20	J 20 K 20
Accepted number in Korea	J 10 C 6	J 12 C 16	J 18 C 18	J 15 C 20	J 12 C 24

1. FY2016 Progress

【CHIBA University】

【Name of project】(Adopted year: (Adopted year: FY2016, (Type A-② CAMPUS Asia)

CAPE (Campus Asia Plant Environment innovation program)

■ Exchange Programs

In FY 2016, Chiba University, Tsinghua University and Zhejiang University in China, and Yonsei University in Korea each held at least one workshop for a total of five. A total of 263 students (including students not from partner universities) participated. An international symposium where faculty members and students from each university presented their research was held at the Kashinoha Campus, Chiba University in February.
In FY 2017, each university continues to offer workshops as well as aims to increase the number of students participating in long-term study abroad programs.

Chiba University CAPE Winter Workshop in FY 2016

Student-Mobility

○ Outbound

Students were sent to workshops organized by three universities (Tsinghua University, Zhejiang University, and Yonsei University). These short-term workshops were fruitful and well attended. In fact, 55% more students than planned participated, and the feedback from faculty and students alike was positive. Although a long-term program was not established in FY 2016, these workshops have motivated students to seek long-term study abroad programs.

○ Inbound

Chiba University's workshops hosted students from all three partner universities. These workshops were well attended. Student participation exceeded expectations by 45%. Of the almost 100 student and faculty members attending the international symposium in February, 34 were students from our partner universities. FY 2016 saw fewer students participate in long-term programs, but many students at partner universities were identified as potential long-term students.

＜TypeA－②＞

	2016
Accepted number in Japan	C 25 K 10
Accepted number in China	J 26 K 0
Accepted number in Korea	J 5 C 10

■ Forming the University Network with Quality Assurance

High quality workshops, which are in cooperation with partner universities, private businesses, and public offices, are implemented. Quality is ensured by mandating that each partner university send at least one faculty member to each workshop and requiring participants to study before and after each workshop. Afterwards, students who participate in the workshops are given a certificate of completion as well as credits after their work is graded. At Chiba University, all the courses offered in this program are considered graduate-level general education subjects and are registered as common courses among graduate schools.

The joint workshop at Yonsei University, Korea

■ Promotion of Student-Mobility Environment

Each program has more than one faculty member that coordinates the acceptance of students. These faculty members focus on the administration of the program. They support participants by providing sufficient information to ensure that the education and instruction are designed carefully. Additionally, amanuensis leads support by helping students access academic links and active learning zones in the program, prepare for presentation, and help procure necessary equipment and devices.

■ Internationalization of the university
Information disclosure and Publication of outcome

The CAPE project's website (http://design-cu.xsrv.jp/cape/index.html) includes descriptions of the workshops and their results. A CAPE-related large symposium was held in February, and a demonstration on the CAPE plant factory research at the Kashinoha Campus was held to share information with the public. The research conducted during the workshop held at Yonsei University in January will be reported in the field of design education at the October IASDR conference held at the University of Cincinnati.

■ Good Practices

Despite the short length of the six-month program in FY 2016, workshops were held at all partner universities. More students than originally planned participated in exchanges.

2. FY2017 Progress

【CHIBA University】

【Name of project】(Adopted year: (Adopted year: FY2016, (Type A-② CAMPUS Asia)
CAPE (Campus Asia Plant Environment innovation program)

■ Exchange Programs

In FY 2017, we conducted 11 programs (Excellent Summer Winter Programs) with partner universities, namely six at Chiba University, three in China, and two in South Korea, to promote student mobility and studying abroad. A total of 310 students (103 Japanese, 121 Chinese, 74 Korean, and 12 from other countries) participated. With an emphasis on industry-academia-government practical programs, we benefited from cooperation with KLITE, a lighting manufacturing company based in Zhejiang, China; KT (Korea Telecom), the largest telecommunication company in South Korea; and Chiba City Hall. In addition to deepening the relationships with our partner universities and companies, these exchange programs drastically advanced our education, research, and internship activities.

2017 Summer program in South Korea

Student-Mobility

＜TypeA－②＞

	2017
Accepted number in Japan	C 25 K 14
Accepted number in China	J 20 K 7
Accepted number in Korea	J 18 C 25

○ Outbound

We dispatched our students to join the short-term programs conducted at Tsinghua University and Zhejiang University in China and Yonsei University in South Korea. A total of 20 students participated in three programs carried out in China, while 18 students joined two programs in South Korea. The program themes included the design of plant factories, beehives for observations at home, and landscaping for wetland restoration considering biodiversity. Moreover, we sent a graduate student to South Korea for nine months.

○ Inbound

Chiba University hosted six programs in which we welcomed 42 Chinese students (20 were from partner universities), 42 South Koreans (12 from partner universities), and 6 students from other countries. The themes discussed during the programs included plant factory design, landscape design for urban greening, and information design. We also received six Chinese and three South Korean mid-to-long term trainees.

■ Forming the University Network with Quality Assurance

Programs with partner universities are composed of the two elements: workshop-style intensive sessions at our partner universities and a series of four to five sessions. Program participants receive a certificate of completion from the host university and earn credits. At Chiba University, we launched six subjects in the Master's program and four in the Doctorate program by including these subjects as part of the new liberal arts education program at the Graduate School.

■ Promotion of Student-Mobility Environment

Faculty members of Chiba University work with their counterparts at partner universities to facilitate the acceptance and dispatch of foreign students. Chiba University benefits from such cooperation with amanuenses to obtain support for matters not related to the educational content, to use academic links and active learning zones during the programs, to prepare for presentations, and to arrange for necessary equipment. At overseas host universities, we have strengthened the functions of the IEC (International Education Cooperation) office at Zhejiang University (Hangzhou City, Zhejiang Province, China). In FY 2016, we also opened an IEC office at Yonsei University, South Korea, to promote additional exchange activities.

■ Internationalization of the university

Information disclosure and Publication of outcome

Information about the CAPE (Campus Asia Plant Environment innovation) project and the achievement of workshops is available online (http://design-cu.xsrv.jp/cape/index.html). In addition, we distributed brochures on all these programs in English. On the Nishi Chiba Campus, as part of our efforts to disseminate information, we also demonstrated our research on urban beekeeping, which constitutes part of the project, and encouraged visitors to participate in practical experiences such as collecting honey. During the IASDR (International Association of Societies of Design Research) congress held at the University of Cincinnati last October, we presented on design education. Moreover, we presented the results of our workshops at a public symposium held at Yonsei University in January.

Brochures by program

■ Good Practices

Both in Japan and abroad, we actively promote time-shift internships linked with the courses at our university. Partner companies, who supervise these activities, include KLITE (China), KT (Korea Telecom, South Korea), and Chiba City Office (Chiba). This program enables students to realize a deeper understanding about their training and improve their learning efficacy.

3. FY2018 Progress

【CHIBA University】

【Name of project】(Adopted year: (Adopted year: FY2016, (Type A-② CAMPUS Asia)

CAPE (Campus Asia Plant Environment innovation program)

■ Exchange Programs

<Final presentation at Alibaba during the FY 2018 workshop >

The only Graduate School of Horticulture in Japan and the Graduate School of Engineering have partnered to form the Campus Asia Plant Environment Innovation Program (CAPE). CAPE realizes practical applications of advanced technologies in plant environments by combining the Plant Cultivation Environment Program of the Graduate School of Horticulture with the Innovation Program led by the Graduate School of Engineering. CAPE provides students with unique opportunities to study diverse domains ranging from science and engineering (agriculture, IoT, robotics, and AI) to social sciences such as the food distribution economy and urban park policies, regardless of their major. For example, they can create new specialized fields through the integration of arts and sciences pursued at Chiba University. In addition to establishing joint programs such as PBL programs and inner-campus internship programs, we strive to set new goals based on the review of past programs in FY 2018. Moreover, we have created digital archives and are examining the possibility of using them online to continue these programs.

Student-Mobility

○ Outbound

We dispatched our students for short-term programs implemented by Tsinghua University and Zhejiang University in China and Yonsei University in South Korea. A total of 22 students participated in three programs that took place in China, and a total of 14 students joined two programs conducted in South Korea. The themes discussed during these programs included plant factory design for appreciation at home, beehive design, and landscapes for wetland restoration that take account of biodiversity. Moreover, we sent graduate school students to Tsinghua University for six months and undergraduate students to Zhejiang University for one month.

＜TypeA－②＞

	2018
Accepted number in Japan	C 14 K 12
Accepted number in China	J 24 K 10
Accepted number in Korea	J 10 C 10

○ Inbound

Chiba University hosted four programs in which we welcomed a total of 30 students from China (including 10 from partner universities) and 40 from South Korea (including 12 from partner universities). The themes discussed during these programs included plant factory design, landscape design for urban greening, and information design. Moreover, we received seven Chinese and two Korean mid-to-long term trainees.

■ Forming the University Network with Quality Assurance

We aim to foster professionals equipped with a variety of capabilities by building diversified graduate curricula adapted to the needs of students. To this end, we set up curricula and courses so that students can obtain several degrees or a major and a minor at the same campus. Our intent is to train professionals who will lead innovation (with Masters or Doctorates) by granting double degrees in different fields (e.g., agricultural science & engineering). Our new structure allows students to obtain minor degrees in both the Masters and Doctoral programs in order to foster professionals with multidisciplinary capabilities, diversified perspectives, profound knowledge, and exceptional experience. The first students finished the course in FY 2018. We also have the Triple Option Degree Program, which integrates the graduate curricula in the program and allows students to choose from various degrees, including one from an overseas university. Students can choose the program that best meets their needs and goals. Consequently, they can change their field of expertise and their affiliated university, which not only allows students to change majors but also enhances learning efficiency.

■ Promotion of Student-Mobility Environment

Each participating university has an IEC (International Education Cooperation) office. This office has become an important institution to support inbound and outbound students. Additionally, it ensures rapid and adequate measures in emergency situations, including illness and injury while abroad. The IEC gives students peace of mind while studying away from home. To increase the number of students participating in study abroad programs, the IEC frequently hosts guidance and consultation sessions about our short-to-long term overseas study programs.

When receiving international students, each project has at least one faculty member in charge of program execution. The IEC provides enough information and support so that students can receive personalized education and guidance during program participation. In addition to faculty members joining and managing the programs, at least one faculty member accompanies the participating students to verify that they are achieving good learning outcomes. Moreover, when dispatching students to partner universities, we conduct programs with the support of the partner universities, including accommodations through mutual negotiations on the basis of student exchange agreements.

■ Internationalization of the university
Information disclosure and Publication of outcome

<Program brochures >

We actively conduct PR activities in South Korea and China to increase the number of universities That join our project. Recently, we concluded partnership agreements with seven universities in South Korea. We now have more than 30 Korean partner universities. In China, we recently concluded exchange agreements with four universities. In particular, we have set up a common DD (double degree) program with Nanjing University of the Arts, and we received Chinese students for the CAPE program in October 2018. In terms of information disclosure and outcomes, we established our website in FY 2016. Today, we disseminate information about our programs around the world. We also post the results of the Plant Environment Designing Program, the predecessor of the CAPE program, to help understand the evolution of our projects. All information is published in English and disclosed using the latest technologies, including program presentations in an online video format, social media, and real-time transmissions to students using smartphones.

■ Good Practices

The workshops held under this project aim to realize a 6th + 4th industrialization through the addition of service innovation of the 4th industry to the 6th industrialization as advocated by the Ministry of Agriculture, Forestry and Fisheries. Each workshop is sponsored by a company and focuses on a specific theme with an emphasis on research and best practices.

For FY 2018, Alibaba (Chinese online market company) and KT (Korean telecommunication company), which are leaders in service innovation of the 4th industry, were selected as company sponsors. A number of programs were conducted called the Excellent Summer (Winter) Programs, and research projects were developed based on the lessons learned from the Programs. Participants solved issues from practical perspectives using state-of-the-art information as well as comments and instruction from company experts. Moreover, they achieved practical learning by increasing knowledge in their internship programs.

4. FY2019 Progress

【CHIBA University】

【Name of project】(Adopted year: (Adopted year: FY2016, (Type A-② CAMPUS Asia)

CAPE (Campus Asia Plant Environment innovation program)

<A tripartite workshop in the summer of 2019 Zhejiang University>

■ Exchange Programs

"Plant Environment Innovation Program" is a program to implement programs to put advanced technologies into practical application in the plant environment and to carry out a PBL-based program using practical design thinking through the collaboration for Japan's only Graduate School of Horticulture and the Graduate School of Science and Engineering.

Combining the horticultural environment program implemented by the Graduate School of Horticulture with the design innovation program by the Graduate School of Science and Engineering, the program is, beyond each field of study, implemented to produce new specialized fields through a combination of the humanities and sciences for which Chiba University aims by learning a wide variety of fields, including social sciences, such as food distribution economics and urban park policies, as well as science and engineering fields, such as agriculture, IoT, robot, and AI.

In 2019, we launched liberal arts education at graduate school as World School by offering the subjects of the integrated course at graduate school. As a result, the students can now acquire extensive knowledge from the basics to the advanced level, making it an effective program.

■ Student-Mobility

○ Outbound

Students were dispatched to all the programs held at Tsinghua University, Zhejiang University (China), and Yonsei University (Korea) on a short-term basis. A total of 17 students and a total of 5 students were dispatched to two programs in China and one program in Korea, respectively. The themes of the programs were the design of plant factories for ornamental use at home, the design of beehives, and the landscape of renewing wetland with an eye to biodiversity. Also, graduate students were dispatched to Zhejiang University for four months.

○ Inbound

Chiba University accepted ten students from China (including four students from partner universities) for its one program. The themes were the design of plant factories, the landscape design for consideration of urban greening, and information design. Also, two students from China and one student from Korea were accepted over the medium to long term.

<Type A-②>	2019
Accepted number in Japan	C 6 K 1
Accepted number in China	J 17 K 8
Accepted number in Korea	J 5 C 19

■ Forming the University Network with Quality Assurance

To foster innovative human resources (master's/doctorate degrees) in the double degree program of different fields (agriculture + engineering), curriculums and courses are provided for the students to obtain multiple degrees or degrees with a major and a minor. In particular, minors are designed so that students can obtain them at both master's and doctorate programs. Approximately 5 students are expected to obtain at the end of project. Through these initiatives, we will train up an interdisciplinary type of human resources who have the targeted knowledge and experience as well as diverse perspectives and capabilities.

A triple-option degree program has been established with a view to the adjustment of curriculums at graduate school to the program and the attainment of degrees of overseas universities, and students who will choose the program are expected to enroll at the university. This program allows students to change their specialty and university at which they study during a period from enrollment to graduation, contributing to more effective learning, including a switch in their major. It is meant to cultivate diverse human resources by building a variety of curriculums at graduate school that meet student needs.

■ Promotion of Student-Mobility Environment

International Exchange Center (IEC) offices located in each overseas university are an important organization to support the dispatch of students and the acceptance of international students. They offer quick and appropriate support to students not only in their study but also in emergencies, such as illness or injury, in their campus life abroad, making it possible for students to study abroad at ease. Also, they made various efforts to provide guidance and consultations to make the information on short-term and long-term overseas education well known, and many more students were able to access the information. During a period of the acceptance of students, more than one faculty member supervises and implement each project.

During their study under the program, sufficient information and support were provided to the students in a way that could achieve comprehensive education and guidance. While the students studied abroad, more than one faculty member accompanied them, and the faculty members paid attention to the operation of the program and checked to see if the students made achievements in their study. Besides, in the cases of the dispatch to partner universities, the program was carried out while receiving assistance from partner universities, such as accommodations, provided consultations with them based on the student exchange agreements.

■ Internationalization of the university Information disclosure and Publication of outcome

<Program website >

The project has been actively conducting its public relations activities in Korea and China, and universities participating in the project have been growing in number. Consequently, Seoul National University (Korea) and the National University of Singapore (Singapore) joined the workshops and educational programs carried out under the project, and the students attending the program broadened their expertise on a global scale. As for information disclosure and achievements, the home page was set up in 2008, and the information on every program implemented has been delivered to the world. It also contains the achievements of the plant environment designing program, a predecessor of the current program, so that the development of the project can be understood.

Every content is transmitted in English as well, and the information is delivered in the most advanced manner through the introduction of the program in videos, the delivery of the information using a social network, and the smartphone-compatible, real-time information transmission to students. http://www.chiba-u.ac.jp/campusasia/cape/

<A part of the achievements of the projects sponsored by companies>

■ Good Practices

Workshops under the project aim to create "the tenth sector of industry," which is obtained by adding "service innovation of the quaternary sector of industry" to "sixth sector industrialization" recommended by the Ministry of Agriculture, Forestry and Fisheries of Japan. Therefore, the workshops are carried out as research and practical programs for which companies provide themes and act as a sponsor. One of the achievements is that some students wishing to study on a long-term basis have started to appear, triggered by a short-term workshop. Furthermore, there were some cases where these achievements developed into researches.

Especially, China's Alibaba and Zhejiang University have a wide variety of research partnerships, and a part of the project is incorporated into their joint research. Multiple Japanese companies also show an interest in it, and joint research is scheduled to begin after 2020, contributing to the broadening of research fields of graduate students.

5. FY2020 Progress

【CHIBA University】

【Name of project】(Adopted year: (Adopted year: FY2016, (Type A-② CAMPUS Asia)
CAPE (Campus Asia Plant Environment innovation program)

■ Exchange Programs

〈 2020 Zhejiang University online WS 〉

"Plant Environment Innovation Program" is to carry out a PBL-based program using practical design thinking and to put advanced technologies into practical application in the plant environment through the collaboration for the only Graduate School of Horticulture in Japan and the Graduate School of Science and Engineering. The program is beyond each field of study, creating new specialized fields through a combination of the humanities and sciences for which Chiba University aims by learning various fields ranging from social sciences, such as food distribution economics and urban park policies to science and engineering fields, such as agriculture, IoT, robot, and AI. In 2020, we carried out to combine intensive courses, workshops, and tutorials focusing on online programs to prevent coronavirus infection. The participating students were able to acquire both specialized knowledge and practical skills.

Student-Mobility

	2020
Accepted number in Japan	C 7 K 41
Accepted number in China	J 6 K 0
Accepted number in Korea	J 34 C 0

○ Outbound

This year, all programs are being implemented mainly online. 7 students from Chiba University, 26 from Zhejiang University, 20 from Yonsei University, 10 from SUTD, 14 from Milan Institute of Technology and 6 faculty members participated in an online short-term program held at Zhejiang University (China). The theme is the 36H DESIGN HACKATHON Near Future Solution, which was collaborated with Alibaba. Alibaba and Zhejiang University have implemented various research partnerships, and some of the projects have been incorporated into the joint research.

○ Inbound

Chiba University hosted an online short-term program with 6 students from Chiba University, 6 from Zhejiang University, 6 from Yonsei University, and 6 faculty members. The theme was Co-designing with Plants (AI program learning and design), and we proposed a combination of actual plant growth response and AI program learning. In addition, as an online program, a joint class between Yonsei University and CAPE was held by 41 students from Chiba University, 28 from Yonsei University, and 2 faculty members.

〈 2020 Chiba University online WS 〉

■ Forming the University Network with Quality Assurance

In this project, we have actively recommended students to take minor programs. We will train up multidisciplinary human resources who have be targeted knowledge and experience as well as diverse perspectives and abilities. We have also set up and developed multiple degrees in the university, such as double degree of program in different fields (agriculture + engineering, agriculture + academia), and there are curriculums and courses that can obtain major and minor degrees. We are continuously developing and building triple-option degree program (three degree program: double degree, joint degree, and continuous (switch) degree) that can be obtained from a variety of degrees. This program contributes to more effective learning, including a switch in their major. It is meant to cultivate diverse human resources by building a variety of curriculums at graduate school.

■ Internationalization of the university
Information disclosure and Publication of outcome

IEC offices set up at each university play an extremely effective role under the Corona disaster. It is an indispensable asset for the continuous operation of global programs such as this project. Not only is it used for improving student service and faculty meetings, but it also has a strong base, which has improved the credibility of programs from companies, governments, and embassies. On the other hand, short-term programs are difficult for students to experience the university, so we are promoting the spread of the online programs and publicizing the university. We explain and guide Chiba University's programs online, including workshops. We are also publicizing the continuation of this Campus Asia Plant Environment Innovation after the end and are actively encouraging the acceptance of foreigners and the dispatch of Japanese students.

■ Promotion of Student-Mobility Environment

Every content of this project is transmitted in English as well, and the information is delivered in the state-of-the-art manner, including the introduction of the program in footages, use of social networks, and real-time information transmission to students using smartphones. https://www.chiba-u.ac.jp/campusasia/cape/

Universities participating in the project have been growing in number and, consequently, Seoul National University (Korea) and the National University of Singapore joined the workshops and educational programs carried out under the project, and the students attending the program broadened their expertise on a global scale. As for information disclosure and achievements, the home page was set up in 2016, and the information on every program implemented has been delivered to the world. It also contains the achievements of the plant environment designing program, a predecessor of the current program. Especially, China's Alibaba and Zhejiang University have a wide variety of research partnerships, and a part of the project is incorporated into their joint research. Multiple Japanese companies also show an interest in it, and joint research is scheduled to begin after 2021.

■ Good Practices

Workshops under the project aim to create 6th+4th=10th industry by adding "service innovation of 4th industry" to "6th industrialization" recommended by the Ministry of Agriculture, Forestry and Fisheries. Since 6th+4th industrialization of agriculture includes both traditional primary and advanced tertiary industries, it is necessary to create new businesses. Since there are few opportunities for students to experience these through internships, it is known that universities need to work together with companies to establish new internship programs. We expect the results of study in such a program and have agreed with students to resume it after next year.