Fiscal Year 2020

Visualization of Contribution to the Adaptation by Japanese Companies in Developing Countries

Summary Report

March 2021

Ernst & Young ShinNihon LLC

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- Abbreviations -

Abbreviation	Description
COP	Conference of the Parties
COVID-19	Coronavirus Disease 2019
CTCN	Climate Technology Centre and Network
ESG	Environmental, Social and Governance
EY	Ernst & Young ShinNihon LLC
GCF	Green Climate Fund
METI	Ministry of Economy, Trade and Industry
NDC	Nationally Determined Contribution
SDGs	Sustainable Development Goals
UNFCCC	United Nations Framework Convention on Climate Change

Chapter 1. Overview of the project

1.1 Background

In recent years, international negotiations on climate change issues have focused more and more on international efforts in the area of adaptation to climate change impacts, in addition to mitigation. Since the decision to establish the Cancun Adaptation Framework was made in the Cancun Agreements at COP16 in 2010, discussions in the area of adaptation have been progressing, including the establishment of the Adaptation Committee and the formulation of national adaptation plans. In addition, Article 7 of the Paris Agreement adopted in December 2015 also mentions the need to set global targets for adaptation and adaptation actions, and it is expected that detailed discussions on the scope of adaptation and the formulation of methods to measure the effects will continue to progress. In addition, funding from the Green Climate Fund (GCF), a multilateral fund under the United Nations, will be distributed equally to mitigation and adaptation according to the decision of the Board of Directors of the GCF.

In 2020, the Paris Agreement entered its implementation phase, and countries began to act toward reducing emissions and adapting to the impacts of climate change based on their Nationally Determined Contributions (NDCs). Also, in 2020, while the global economy was hit by the spread of the new coronavirus (COVID-19), European and some other countries have begun to advocate "green recovery", focusing on economic stimulus measures with an emphasis on the environment in order to recover from COVID-19, and it can be said that the trend toward environmental, social, and governance (ESG) investment has accelerated worldwide. In response to the trend toward ESG investment, the importance of analyzing the risks and opportunities of climate change and incorporating them into management strategies has been recognized. While many companies are working on mitigation that contributes to decarbonization and carbon neutrality as a business opportunity, adaptation to climate change is more of a response to the risks of climate change on their business activities. The recognition of adaptation as a business opportunity is less advanced than that of mitigation. In Japan, which is vulnerable to the impacts of climate change, the private sector has developed a number of technologies and services that contribute to adaptation. There is a great potential for the development of adaptation businesses that contribute to adaptation to climate change in developing countries through the use of these technologies, experiences, and know-how cultivated in Japan and the development and continuation of businesses that see solutions for social issues caused by climate change as a business opportunity.

The Ministry of Economy, Trade and Industry (METI) has been conducting various activities to promote Global Warming Adaptation Business, including preparation of the "Prospect of Global

Warming Adaptation Business" by the committee for "Adaptation Business Revitalization", various surveys, compilation and expansion of case studies on good practices for adaptation, preparation of a global warming adaptation business guidebook for new businesses, and holding seminars in Japan and abroad.

1.2 Objective

Based on the results of the past projects, this project aims to investigate the possibility of Japan's contribution to climate change adaptation projects in developing countries and how Japan should tackle the field of climate change adaptation, in order to further revitalize climate change adaptation businesses. Table 1-1 shows the activities conducted this year to achieve the objectives of this project.

Table 1-1 Activities of the Project

Objective	Activities
Improve understanding and awareness of adaptation business by Japanese companies	**Update of Climate Change Adaptation Good Practice** • Increase the number of cases and deepen the content of adaptation good practices from previous years. • Create a "Column Article" that includes information to increase understanding and interest in the adaptation business.
Promote market understanding in order to promote and expand adaptation business	**Research on market trends and needs for adaptation business in developing countries** • Identify adaptation needs of developing countries. • Survey on the status of adaptation-related initiatives implemented by international organizations and developing country governments. • Study on the possibility of utilizing the schemes of international organizations.
Visualize the effects of adaptation business and attracting investment	**Visualization of contribution and consideration of methods for dissemination** • Investigate ways to visualize the contribution of adaption business. • Consideration of measures to attract investment in the adaptation business and measures to promote it.
Internationally disseminate information of Japan's activities	**Online workshops with developing countries** • Introduce Japan's activities and contributions to developing country government officials and international organizations. • Introduce good practice cases and discussion with stakeholders in developing countries aiming to develop projects for adaptation business.
Raise awareness of adaptation business opportunities for Japanese companies	**Online seminar in Japan** • Raise awareness among Japanese companies that there are business opportunities in the adaptation sector. • Introduce good practice examples to improve understanding and raise awareness of adaptation business.

Source: EY

Chapter 2. Study on Market Trends and Visualization of Contributions to Promote and Expand Global Warming Adaptation Business

2.1 Update of Climate Change Adaptation Good Practice

Since FY2016, METI has been compiling the "Climate Change Adaptation Good Practice by Japanese Private Sector" (hereinafter referred to as "the Good Practice") every year in order to disseminate and share information of adaptation business activities by Japanese companies in developing countries.

This year, four new practices were added into the Good Practice (practice number 8, 21, 25, and 28), and one practice was changed to another project (practice number 34) [Attachment 1: Climate Change Adaptation Good Practices by Japanese Sector]. In addition, the format of the Good Practice was revised. For Japanese version of the Good Practice, two column articles and one feature article were included.

Table 2-1 List of Climate Change Adaptation Good Practices in FY2020

No.	Title	Company name	Remarks
1	Development of anti-disaster information system for utilizing forestry preservation project	Kanematsu Corporation / Hitachi Ltd.	No update
2	Examining the Earth as "Earth Doctor"	Kawasaki Geological Engineering Co., Ltd.	No update
3	Water projects for realization of cooperative and rich society	Kubota Corporation	No update
4	Protecting society and infrastructure from slope disasters	Kokusai Kogyo Co., Ltd.	No update
5	Protecting local community from threat of high tide and sea level rise	TAISEI CORPORATION	No update
6	Methodology for prevention of soil surface erosion with soil algae (BSC methodology)	Nippon Koei Co., Ltd.	No update
7	Disaster risk reduction by river water level alarm system	Unimation System Inc.	No update
8	Functional Paving Materials Made from Waste Roof Tiles and Bricks to Reduce Urban Flooding and Heat Island Effect	ECOSYSTEM Inc.	Newly added
9	Introducing a resilient hybrid power generation control system against environmental changes	Kyudenko Corporation	Updated

10	Greater resilience in anti-disaster infrastructure through the world's first "Typhoon Power Generation" and communications satellite	Challenergy Inc.	Updated
11	Mitigating damage to energy supply system in times of disasters	Panasonic Corporation	No update
12	Contributing to sustainable agriculture through "Bio-cycle"	Ajinomoto Co., Inc.	No update
13	Greater harvest through compost soil improver	Kawashima Co., Ltd.	Updated
14	Greater resilience and higher income through "Agriculture sustainable for 100 years and beyond"	On The Slope Co., Ltd.	Updated
15	Circular model in the manufacture and sale of apparel added with social and environmental value of afforestation project	Sunford Co., Ltd.	No update
16	Adapting to changing cultivation environment for traditional crops	Dari K Co., Ltd.	No update
17	Generating energy and farming at one place with Solar Farm® technology	Farmdo Group	Updated
18	Circular-economy business model established through organic soil afforestation to prevent flood and protect eco system	from far east inc.	No update
19	Rejuvenation of arid areas through high-molecule film farming method	Mebiol Inc.	Updated
20	High quality mung beans production in salinized lands	euglena Co., Ltd.	No update
21	Smart agriculture achieving a cultivation system resilient to climate change	OPTiM Corporation	Newly added
22	Paints for sustainable life	Kansai Paint Co., Ltd.	Updated
23	Mitigating impact of frequent forest fire on plants and animals	Shabondama Soap Co., Ltd.	No update
24	Preventing spread of infectious diseases associated with climate change	Sumitomo Chemical Co., Ltd.	Updated
25	Bicycle-type water purification system for securing a clean water supply	Nippon Basic Co., Ltd	Newly added

26	Curbing damage from floods through ICT	FUJITSU LIMITED	No update
27	Facilitating countermeasures against climate change through Big Data	Remote Sensing Technology Center of Japan	No update
28	The world's lightest & most compact X-band weather radar enables real-time monitoring of local extreme weather	FURUNO ELECTRIC CO., LTD.	Newly added
29	Securing sufficient and clean water through ion exchange membrane	AGC Inc.	No update
30	Development of a tourism city through water treatment	Sanicon Co., Ltd. / Accrete Co., Ltd.	Updated
31	Contributing to the reduction of non-revenue water and stable supply of safe water by detecting leaks from buried water pipes	Suidou Technical Service Co., Ltd	No update
32	Curbing flood damage and solving water shortage with rainwater storage system	SEKISUI CHEMICAL CO., LTD.	No update
33	Stable supply of water with high turbidity raw water compatible water purification equipment	Tohkemy Corporation	No update
34	Securing sustainable water resources through water-saving plants	JGC Holdings Corporation	Project changed
35	Realization of Stable Water Treatment by Underwater Mechanical Aerator and Agitator	Hanshin Engineering Co., Ltd.	No update
36	Producing safe drinking water from saline and highly-turbid surface water	Mitsubishi Chemical Aqua Solutions Co., Ltd.	Updated
37	Addressing water pollution caused by floods	Yamaha Motor Co., Ltd.	Updated
38	Minimizing financial losses caused by extreme weather events	Sompo Holdings, Inc	Updated

Source: EY

2.2 Study on Market Trends and Needs of Adaptation Business in Developing Countries

A study was conducted as follows to examine the possibility of Japan's contribution to adaptation measures in developing countries. Firstly, the overall trend of adaptation business potential in developing countries was grasped based on materials prepared and published by each developing country (Table 2-2). Secondly, more detailed surveys were conducted on adaptation needs and efforts to meet them in selected nine countries where Japanese companies are expected to advance, and

clarified businesses and technologies that are expected to spread and develop in the countries (Table 2-3).

Thirdly, support schemes of international organizations that can be utilized for the development and implementation of adaptation businesses were reviewed. The organizations include, among others, the Climate Technology Centre and Network (CTCN) and the GCF. Finally, in concluding the study, some methods were examined for promoting adaptation businesses by Japanese companies using the above-mentioned support schemes. Methods and examples of adaptation business promotion using (1) technical support, (2) financial support, and (3) combination of technical and financial support by international organizations were reviewed and some were suggested as helpful and effective for adaptation business in developing countries.

Table 2-2 Needs for adaptation measures by region and adaptation business area

Region/ Number of countries surveyed	Adaptation business area						
	Resilient Infrastructure against Natural Disasters	Sustainable Energy Supply	Food Security & Strengthening Food Productive Base	Health & Sanitation	Climate Monitoring & Early Warning	Secure Resources & Sustainable Water Supply	Climate Change Finance
Asia	12	2	16	8	8	17	1
20 countries	60%	10%	80%	40%	40%	85%	5%
Eastern Europe & Central Asia	1	1	5	1	2	3	1
8 countries	13%	13%	63%	13%	25%	38%	13%
Latin America & the Caribbean	8	3	11	6	9	13	2
19 countries	42%	16%	58%	32%	47%	68%	11%
North Africa & the Middle East	4	0	7	1	1	7	1
8 countries	50%	0%	88%	13%	13%	88%	13%
Oceania	2	2	6	4	2	6	0
9 countries	22%	22%	67%	44%	22%	67%	0%
Sub-Saharan Africa	21	9	42	9	18	40	3
48 countries	44%	19%	88%	19%	38%	83%	6%

* Upper row: Number of countries that mention matters related to the area in their NDC; Lower row: Percentage

26-50%	51-75%	76-100%

Source: EY

Table 2-3 Adaptation businesses and technologies that are in high demand in the nine countries surveyed

Area / Rank	Resilient Infrastructure against Natural Disasters	Sustainable Energy Supply	Food Security & Strengthening Food Productive Base	Health & Sanitation	Climate Monitoring & Early Warning	Secure Resources & Sustainable Water Supply	Climate Change Finance
1st	Resilient road systems (4)	Suppression of fluctuations in power generation output (3)	Increasing crop resilience and productivity (6)	Managing disease risks associated with climate change (5)	Early warning systems (8)	Water supply infrastructure (4)	(No business or technology mentioned by multiple countries)
2nd	Building construction / Flood-proofing of accommodation/ Disaster preparedness plans (2 for each)		Crop diversification and new varieties (4)		Climate scenario development (4)	Seawater desalination / Irrigation efficiency/ Integrated Water Resources Management/ Hydrological modelling/ Ecosystem monitoring/ Climate change vulnerability assessment (2 for each)	
3rd			Improved cultivation techniques/ Aquaculture management (2 for each)		Climate change vulnerability assessment (3)		
4th					Climate change monitoring/ Disaster risk assessment tools (2 for each)		

* Only businesses and technologies that are mentioned by more than one country are listed. The number in parentheses is the number of countries (out of nine) that have mentioned the business/technology.
* Nine countries include Bangladesh, Cambodia, Ethiopia, Philippines, Sri Lanka, Viet Nam, Thailand, Brazil, and Fiji.

Source: EY

2.3 Consideration on Visualization of Contributions and Measures for Dissemination

In the case of mitigation business against climate change, the contribution of the business can be visualized by calculating the amount of greenhouse gas emission reduction. On the other hand, in the case of adaptation business, it is difficult to establish a single visualization indicator because the

contribution is diverse and covers a wide range of business fields.

However, in order to promote adaptation businesses, it is important to visualize the contributions and appeal to the governments of developing countries, local partners, market players, and investors. Therefore, in this project, the "Guide to Visualizing the Contribution of Adaptation Businesses" was established (Japanese only) which states visualization steps and applicable indicators collected from some indicator data sets by other organizations. In addition, two individual cases from the Good Practice were analyzed for the visualization following the guide.

Regarding the measures for dissemination of adaptation business in developing countries, it is effective to (1) formulate good practices (successful cases), (2) increase the number of players (private sector) based on the good practices, and (3) stimulate the adaptation needs of developing countries. In addition, good practices (successful cases) can be further disseminated by business expansion.

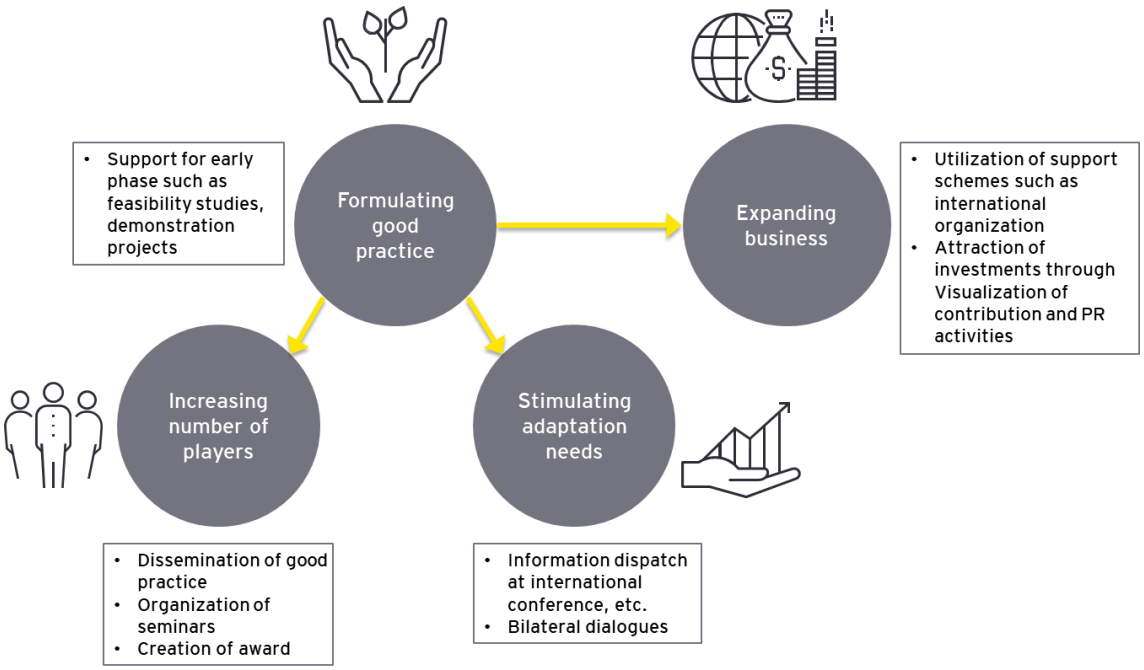

Figure 2-1 Measures for dissemination of adaptation business

Source: EY

Chapter 3. International and Domestic Information Dissemination of Japan's Activities

3.1 International Information Dissemination

This year, with the aim of taking the first step toward the formulation of concrete projects for adaptation business in developing countries, we decided to narrow down the target countries and themes where there are clear needs for adaptation and where Japanese companies have technologies and services that can contribute to those needs, and to disseminate information to the target audience. The information dissemination was to be held in the form of an online workshop for a small number of people and closed to the public, with the aim of conducting an exchange of opinions that would lead to the formulation of concrete projects among government officials, research institutions, and Japanese companies engaged in the target areas.

The target countries for the workshop were Bangladesh and Vietnam, based on the results of the survey on needs in the field of adaptation in developing countries as described in 2.2 and the countries where the companies are operating in the good practice case studies. The theme was decided to be resilient urban development and urban flooding, which are common issues in both countries, and three companies with related technologies were invited.

The online workshops were attended by representatives of the CTCN and the GCF, which are the technical and financial support mechanisms of the United Nations Framework Convention on Climate Change (UNFCCC) that provide useful assistance in the formulation of future adaptation business projects, to introduce their support schemes and case studies in the field of adaptation to developing country officials and Japanese companies.

The workshops for Bangladesh and Vietnam were held on February 9 and March 2, respectively, with 21 participants in each meeting. This was the first time this year that the workshop was held online due to the pandemic of COVID-19. All the officials from both Bangladesh and Vietnam who were requested to participate attended the workshops, and active discussions took place. Follow-up interviews were also conducted with participants who had shown interest in the technologies introduced in the workshops. We believe that they were very useful meetings as a starting point for discussions on the introduction of the technologies in both countries in the future.

Table 3-1 Online Workshop Agenda for Bangladesh

Workshop on "Private Sector Contribution to Climate Change Adaptation" in Bangladesh			
Date: Feb 9th, 2021			
Time		**Agenda**	**Presenter**
Bangladesh	**Japan**		
10:00	13:00	Opening Remarks	Ministry of Economy Trade & Industry (METI)
10:05	13:05	Introduction of Participants	All
10:10	13:10	Japan's Climate Change Policy	METI
10:20	13:20	Bangladesh's adaptation programs and needs	Ministry of Environment, Forest and Climate Change
10:30	13:30	Introduction of good practices 1: Compact weather radar	Furuno Electric
10:40	13:40	Introduction of good practices 2: Water storage, flood prevention	Sekisui Techno Molding
10:50	13:50	Introduction of good practices 3: Urban Heat Island mitigation paving materials	ECOSYSTEM
11:00	14:00	Q&A	All
11:10	14:10	Break	All
11:15	14:15	Introduction of CTCN's support mechanism	CTCN
11:25	14:25	Introduction of GCF's support mechanism	GCF
11:35	14:35	Discussion on next steps for implementation of adaptation projects through private sector's participation	All
11:55	14:55	Closing Remarks	METI

Source: EY

Table 3-2 Online Workshop Agenda for Viet Nam

Workshop on "Private Sector Contribution to Climate Change Adaptation" in Viet Nam			
Date: Mar 2nd, 2021			
Time		**Agenda**	**Presenter**
Vietnam	**Japan**		
13:30	15:30	Opening Remarks	METI
13:35	15:35	Introduction of Participants	All, Facilitation by EY
13:40	15:40	Japan's Climate Change Policy	METI
13:50	15:50	Key features of the National Adaptation Plan (NAP) for the period 2021 - 2030, and the resources needed for the implementation of NAP	Ministry of Natural Resource and Environment (MONRE)
14:00	16:00	Assessing the Impact of Climate Change on Vietnamese Businesses	Vietnam Chamber of Commerce and Industry (VCCI)
14:10	16:10	Introduction of good practices 1: Compact weather radar	Furuno Electric
14:20	16:20	Introduction of good practices 2: Water storage, flood prevention	Sekisui Techno Molding
14:30	16:30	Introduction of good practices 3: Urban Heat Island mitigation paving materials	ECOSYSTEM
14:40	16:40	Q&A	All
14:55	16:55	Break	All
15:00	17:00	Introduction of CTCN's support mechanism	CTCN
15:10	17:10	Introduction of GCF's support mechanism	GCF
15:20	17:20	Q&A	All
15:30	17:30	Discussion on next steps for implementation of adaptation projects through private sector's participation	All
15:55	17:55	Closing Remarks	METI

Source：EY

Figure 3-1 Pictures from Online Workshop for Vietnam

Source：EY

3.2 Domestic Information Dissemination

On November 26, 2020, a webinar titled "Climate Change Adaptation Business With and Beyond SDGs - Creating Overseas Business Opportunities through Climate Change Adaptation in an SDG Society" was held via live streaming for the purpose of raising awareness of adaptation business opportunities in developing countries among private sector stakeholders.

In this webinar, we invited Professor Hiramoto, Director of the SDGs Promotion Center at Kanazawa Institute of Technology, as an expert to deliver a keynote speech titled "SDGs at a Turning Point and Trends in Adaptation Businesses as the Key to the SDGs". Professor Hiramoto explained the future trend of the SDGs and the relevance of the pandemic of COVID-19 to market expansion in global health (SDG Goal 3) and adaptation areas (SDG Goal 13). He also introduced examples of adaptation businesses that take advantage of the new SDGs trends (circular economy, DX, regeneration) created by green recovery in Europe.

In this webinar, three companies, namely OPTiM Corporation, Furuno Electric Co., Ltd. and Sekisui Chemical Co., Ltd. presented their case studies as good practices to develop climate change adaptation business in developing countries. The agenda for the webinar is shown in Table 3-3.

Table 3-3 Webinar Agenda for Domestic Information Dissemination

Time	Contents	Presenter
14:00-14:05	Opening Remarks	METI
14:05-14:25	Keynote Speech SDGs at a turning point and the trend of adaptation business as a key factor	Professor Hiramoto, Director of the SDGs Promotion Center at Kanazawa Institute of Technology
14:25-14:35	Prospects and Expectations for Climate Change Adaptation Business	METI
14:35-15:20	Introduction of good practices of adaptation business in developing countries	
	①Development of smart agriculture business using AI and IoT - Creation of technology to make global food production sustainable	OPTiM Corporation
	②Introduction of Small X-band Weather Radar and its Application Case - Providing Local Weather Monitoring Technology for Extreme Weather Phenomena Caused by Climate Change	Furuno Electric Co., Ltd.
	③"Peace of mind that lasts into the future" to support the foundation of LIFE provided by adaptation business	Sekisui Chemical Co., Ltd.
15:20-15:40	Panel Discussion	**Moderator** Professor Hiramoto **Panelist** OPTiM Corporation Furuno Electric Co., Ltd. Sekisui Chemical Co., Ltd.
15:40-15:50	Q&A	
15:50-16:00	Closing Remarks	METI

Source: EY

Figure 3-2　Pictures from Webinar for Domestic Information Dissemination

Source：EY

Chapter 4. Toward the next year and beyond

The year 2020 marks the start of the implementation of the Paris Agreement, and driven by the green recovery from the COVID-19, discussions on climate change have increased around the world, and the trends toward ESG and SDGs have advanced rapidly. In Japan, the carbon neutral declaration by Prime Minister Suga has accelerated the private sector's efforts to address climate change. Particularly in the area of mitigation, there are many companies that have taken advantage of the growing interest in climate change to develop services, and many companies that have taken the initiative in launching carbon neutral and RE100 initiatives to increase their corporate value. On the other hand, as interest in carbon neutrality and decarbonization in Japan has been growing, combined with the fact that traffic to and from overseas was cut off due to the pandemic of COVID-19, there has been a tendency to focus on domestic mitigation.

With the start of the implementation period of the Paris Agreement, addressing climate change is no longer secondary to economic development in developing countries. In particular, the national strategies of countries vulnerable to the impacts of climate change, such as Bangladesh and Vietnam, where on-line workshops were conducted this year, have incorporated climate change adaptation into the existing regulatory frameworks, and efforts are being made to mainstream climate change adaptation. Estimates of the economic risks to the country from climate change impacts have also been made, and adaptation measures have been recognized as an important issue for national growth. In Japan, which is also vulnerable to the effects of climate change and prone to disasters, various technologies and services have been developed based on the experiences. For Japanese companies that have those technologies and services, it is a business opportunity to develop their own technologies and products that contribute to adaptation in developing countries.

It can be said that business interest in the risks and opportunities of climate change impacts has greatly accelerated in 2020. Taking advantage of this trend, it is important to continue to promote and raise awareness of adaptation business opportunities among Japanese companies in the next fiscal year and beyond.

Attachment

Attachment 1: Climate Change Adaptation Business Good Practice by Japanese Private Sector

(1) Climate Change Adaptation Good Practices by Japanese Private Sector (March 2021)

Climate Change Adaptation Good Practices

by Japanese Private Sector

March 2021

METI
Ministry of Economy, Trade and Industry

This booklet was compiled as part of the Ministry of Economy, Trade and Industry of Japan's "Fiscal Year 2020 Study on Countermeasures for Issues related to Climate Change (Visualization of Contributions of Japanese Companies in Adaptation Fields in Developing Countries)" by Ernst & Young ShinNihon LLC, the project consultant.

Introduction

This booklet is presented as part of the "Fiscal Year 2020 Study on Countermeasures for Issues related to Climate Change (Visualization of Contributions of Japanese Companies in Adaptation Fields in Developing Countries)" by Ministry of Economy, Trade and Industry of Japan.

The global community has been facing more extreme and frequent weather events and natural disasters than in the past, as seen in the torrential rains, record heat and frequent wildfires, and these disasters impacting people's lives and livelihoods, economies, societies, infrastructures and other broad areas in a variety of ways. To address climate change, "measures for adaptation to climate change" are considered important as an approach to reducing the impacts of climate change which are already emerging and to preparing for potential risks, in addition to taking "mitigation measures" as an approach to curbing greenhouse gas emissions.

We believe that, for any country, engagement of the private sector in the climate change adaptation activities is necessary for its sustainable growth, and therefore we have been promoting participation of the private sector to such adaptation activities overseas. This booklet specifically showcases the good practices of Japanese companies' adaptation business in developing countries across a range of fields, including the fruits of support by the Ministry of Economy, Industry and Trade to date.

We hope that this booklet will help grasp image of adaptation business and ultimately contribute to the development of new business by the companies seeking such opportunity in developing countries.

Lastly, we would like to extend our cordial appreciation to all the companies for their cooperation on development of this booklet.

March 2021

Global Environment Partnership Office,
Industrial Science and Technology Policy and Environment Bureau,
Ministry of Economy, Trade and Industry of Japan

Explanatory Notes

In this booklet, each good practice is organized into seven promising areas in which the Japanese private companies can make an international contribution in the field of adaptation. Some good practices fall into more than one field.

In addition, this booklet colors the Sustainable Development Goals (SDGs) by the United Nations that are closely related to each good practice.

7 Promising Areas of Adaptation

- Resilient Infrastructure against Natural Disasters
- Sustainable Energy Supply
- Food Security & Strengthening Food Productive Base
- Health & Sanitation
- Climate Monitoring & Early Warning
- Secure Resources & Sustainable Water Supply
- Climate Change Finance

Related SDGs

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Sustainable Development Goals (SDGs)

1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS

1. Development of anti-disaster information system for utilizing forestry preservation project

Kanematsu Corporation http://www.kanematsu.co.jp/
Hitachi Ltd. http://www.hitachi.co.jp/

Adaptation Challenge Frequent forest fire and decrease in forest area due to climate change such as El Nino have led to deterioration of the function of eco system and rise in disaster risks in Indonesia.

Contribution The eco system recovery through forest conservation projects by Kanematsu reinforces physical response capacity to weather events and mitigate disaster risks. In addition, disaster information system built by Hitachi utilizing a flood simulator called DioVISTA/Flood contributes to minimizing the impact of disasters on human, etc.

Project Detail

Country | Indonesia

■ Background

Kanematsu launched a project in Boalemo Prefecture, Gorontalo Province 2011 to raise profits of local farmers suffering from loss of forests caused by forest fire and thereafter shifting from corn to high-quality cacao farming. In 2015, the project was adopted as the "REDD+ Project using Joint Crediting Mechanism (JCM)" and then the pilot project was materialized, under which initiatives are taken to reduce the greenhouse gas emissions to the targeted 86,000 CO2 ton annually for the entire project. A new value chain was established where cacao beans are produced for export to Japan through agroforestry, contributing to greater adaptability of local producers by raising their income. In 2018, the project was adopted as the "Feasibility Research Project towards Overseas Development of High Quality Infrastructure" by the Ministry of Economy, Trade and Industry of Japan and initiatives were launched for introduction of a flood simulator. Combining the disaster prevention information system and REDD+ Project, the project is expected to grow as a mitigation/adaptation cross-cutting project.

■ Business Model of the Project

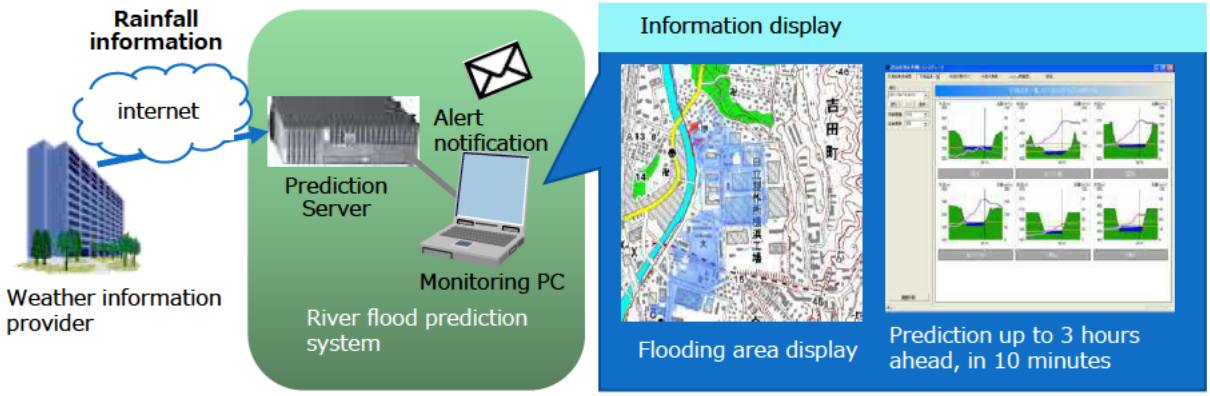
The project is executed in collaboration with a major local conglomerate, the Gobel Group which is a partner in the REDD+ Project. The Group helps in the sales coordination/management of disaster prevention information system to the prefectural governors and local heads of Gorontalo Province. In addition, the project is pursued through network of various partners, including, Pasco Co., Ltd, map data provider and Tokyo Food Co., Ltd. for sale of cacao in Japan.

▲Implementing Agroforestry

Related SDGs

Product & Technology

DioVISTA/Flood: A software developed by Hitachi Power Solutions Co., Ltd. for simulation of floods which is used extensively for prediction of inundation areas by local governments, preparation of flood hazard maps by the central government and prefectures, and quantification of flood risks by insurance companies. The software is equipped with user-friendly functions such as 3-dimention GIS and high-speed simulating calculation functions using the patented technology of Dynamic DDM to enable non-experts to conduct a high level of simulation.



▲DioVista/Flood System Overview

Key to Success & Challenges for Further Development

- The project is supported by a strong partnership with the local partner Gobel Group having an extensive network with public and private sector stakeholders.
- Raising awareness for disaster prevention is imperative for further growth.

Profile of Project Company

Kanematsu Corporation was founded in 1889 as a general trading firm under the motto of "Contribution to society through creation of business". The Company strives to become a company that grows together with customers and incessantly aims for the creation of business. Setting "Environment, Society and Governance" as the key management principle, the Company considers climate change business as its management foundation and promotes REDD+ activities as part of the climate change business such as forest conservation, sustaining lives of local residents, and bio diversity conservation. In addition, the Company incorporates climate change adaptation as part of the environment policy.

Hitachi Ltd. was founded in 1910 and is one of the largest industrial electronics companies both in Japan and in the world. The Company promotes its founding strength of operation/control technology and social innovation projects incorporating IT and cutting-edge digital technology to solve social challenges and create new value. As an innovation partner in the IoT era, the Company strives for social innovation projects in areas of electricity/energy, industry/distribution/water, urban and finance/society/healthcare.

2. Examining the Earth as "Earth Doctor"

Kawasaki Geological Engineering Co., Ltd. http://www.kge.co.jp/

Adaptation Challenge Disasters triggered by floods and landslides on account of climate change and frail soil foundation attributable to the tropical monsoon climate bring considerable damages.

Contribution Kawasaki Geological Engineering Co., Ltd. has contributed to the establishment of a disaster-resilient public infrastructure through its unique technology and knowhow that have effectively been translated into landslide disaster prevention and mitigation.

Project Detail

Country | Vietnam

■ Background

The Project was selected for the "Climate Change Adaptation Effect Visualization Project" by the Ministry of Economy, Trade and Industry of Japan from 2013 to 2015. Despite its initial plan to cover the entire Great Mekong Subregion which is highly vulnerable to climate change, the Project was first launched in Vietnam where the framework of project execution was established earlier than any other country.

■ Business Model of the Project

A local representative office was set up in 2014 for the launch of consulting services and raising awareness of the government and corporations. The Project successfully secured a deal from EVN (Electricity of Vietnam). Also Kawasaki Geological Engineering implemented a study in relation to landslides and structured the evacuation/warning arrangements and proposed landslide prevention countermeasure method in landslide-hit Dalat, a sightseeing spot in Vietnam through. In the future, the Company intends to expand the business in Vietnam through technical/business tie-ups or capital alliance.

▲Local situation where measures for landslide prevention is required

Related SDGs

Product & Technology

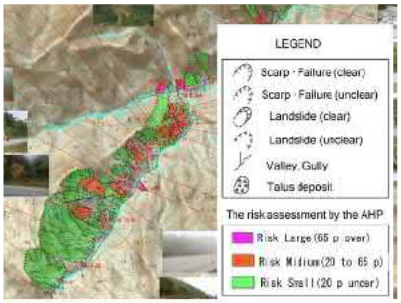
The Company renewed its existing technologies both in terms of hardware and software for the prevention and mitigation of incline disasters and enabled the technologies to be operated successively and sustainably in Vietnam.

Monitoring System: Exploration and measurement technologies, prediction technology of incline disasters, various analysis technology, prediction technology of incline disasters, assessment technology of potential outbreak of incline disasters using AHP (Analytic Hierarchy Process).

Early Warning System: Design technology of landslide evacuation warning system leveraged on various measurement devices.

Bundling of Disaster Prevention and Mitigation Technologies: The technologies above bundled with helicopter laser measurement, satellite image processing and other geomorphic analysis technologies offered by its partner, Nakanihon Air Service Co., Ltd. as well as the GIS (Geographic Information System) technology for general management of the aforesaid.

▲Emergency Survey and Installation of Monitoring Post for Prevention of Landslides



▲Illustration of Landslide Hazard Map

Key to Success & Challenges for Further Development

- Support from local construction consulting company through the relationship built on the feasibility study contributed to the successful project from EVN.
- In Vietnam, demands for prevention and mitigation works have been increasing steadily.
- Going forward, while continuing its efforts of raising awareness and developing engineers on a long-term basis, the Company plans to develop the business by focusing on the service orders as well as for the outsourcing demands from other companies for employee training and technical assistance to cope with the challenges including risk management for different business practices..

Profile of Project Company

Kawasaki Geological Engineering Co., Ltd. was established in 1943 as Japan's pioneer in geological survey. The Company upholds hands-on approach and offers a comprehensive package of survey, analysis, reporting and consulting leveraged on the geophysical exploration and field measurement technologies. Based on the corporate philosophy of "Examining the Earth (Earth Doctor)", the Company's business scope stretches from land surface, underground, rivers to oceans across the Earth and provides diagnosis and consulting on each symptom for the establishment of a safe and affluent society. The Company also acts as a geological consultant overseas in the fields of ocean and energy, soil and geophysical exploration, disaster prevention and environmental survey. It also conducts soil exploration and natural environmental assessment besides incline disaster prevention mainly in Vietnam.

3. Water projects for realization of cooperative and rich society

Kubota Corporation http://www.kubota.co.jp/

Adaptation Challenge Frequent floods and droughts as well as water contamination due to climate change seriously affect society and economy of many developing countries that are highly vulnerable to climate change.

Contribution Kubota contributes to resilient infrastructure and supply of secure and safe water through its technologies, such as pipes used for water supply and sewage water facilities, drainage and irrigation pumps, water treatment membranes and wastewater treatment plant, which serve as adaptation measures against floods and water pollution.

Project Detail, Product & Technology

■ Background

Country | UAE (Abu Dhabi), Bangladesh, Thailand, Vietnam, Myanmar, etc.

Kubota is tackling to solve the problems of developing countries through the products and technologies developed in Japan, such as pipes, pumps, and water treatment.

■ Business Model of the Project

Kubota conducts design, construction and supply products for water related project in developing countries etc.

<Project Showcases>

Abu Dhabi: Ductile Iron Pipe that supply secure and safe water under harsh environment

In Arab countries where 70% of the land is desert, household, industrial and agricultural water depends on desalinized seawater. The highly-durable ductile iron pipes supply safely this precious desalinized water throughout the region.

Bangladesh: Dual purpose pump station for Flood and Droughts

In Bangladesh, rivers cover 10% of the land surface and the land is only 9m above sea level or below. In such environment, flooding during the rainy season and droughts during the dry season are a major problem.

Thus, a project was launched to surround a specific area by levees, Kubota pumps were installed in the pump station that drains and draws water. Since the project was launched, agricultural harvest in this area has doubled. Kubota pump is thus contributing to the infrastructure for both flood prevention and agricultural development.

Thailand: Drainage pumps that contribute to the reconstruction from the flood.

The 2011 Thailand floods that occurred mainly in the Chao Phraya River basin, Japanese government dispatched the Kubota's mobile pump trucks, and engineers of Kubota were dispatched as an international emergency disaster relief team.

The pumps can empty a 25m-pool filled with water in just 10 minutes, weighing 95% less than conventional pumps. The feature of its high mobility enabled quick recovery from flood in various parts of Thailand.

Related SDGs

Project Detail, Product & Technology (Continued)

Vietnam: Johkasou (Wastewater treatment tank) that improve hygienic environment in developing countries.

Poor hygiene is posing serious threat to developing countries where rapid urbanization outpaces the development of sewage facilities.

Kubota contributes to the improvement of hygiene and reinforcement of urban infrastructure in developing countries utilizing Johkasou that enable the treatment of sewage on site.

Myanmar: Water Purification and Treatment Plant that environmental friendliness through comprehensive water solution.

Kubota has built water infrastructure including water purification plant, wastewater treatment plant and water supply system in the first SEZ in Myanmar, to which Kubota has exported agricultural machinery and irrigation pumps for over 60 years.

These technologies have significantly contributed to the Thilawa SEZ in terms of harmony with surrounding environment and sustainable economic growth of Myanmar.

▲Ductile iron pipe

▲Dual purpose pump station

▲Drainage works by the Japan Disaster Relief Team

▲Johkasou in hospital

▲Water purification plant built in Zone A, industrial park in the Thilawa SEZ

Key to Success & Challenges for Further Development

- Kubota strives to explore market opportunity in areas of "food, water, environment" as the common global agenda through its long-established brand strength and close-knit network with local community.
- In Myanmar, Kubota has supported industrialization for years and been engaged in activities to build capacity in the area of water environment while supporting and training engineers.

Profile of Project Company

Established in 1890, Kubota Corporation is Japan's largest manufacturer of agricultural machinery. The product line-up also includes small construction machinery, small industrial engines, pipes, pumps and environment-related plants. Under the corporate philosophy of "Contribution to society through business", Kubota has been delivering what society truly needs in the form of products, technologies, and services including increased food production and saving labor through agricultural machinery. Kubota also upholds "For Earth, For Life" and setting SDG's, the world's common themes, as its compass. Kubota Group will keep striving to realize the abundant living environment and development of society through tackling the global challenges in the area of "Food"," Water" and "Environment". In the area of water environment, Kubota aims at solving challenges through the provision of total solution services including individual equipment to after-sale systems diagnosis services leveraged on IoT.

4. Protecting society and infrastructure from slope disasters

Kokusai Kogyo Co., Ltd. https://www.kkc.co.jp/

Adaptation Challenge Frequent slope disasters due to torrential rain triggered by climate change pose serious threats to socio-economic activities in many developing countries where technical know-how for measures against slope disasters is not readily available.

Contribution Kokusai Kogyo, with its expertise in disaster risk reduction utilizing geospatial information and technical slope disaster management, is contributing to the establishment of resilient infrastructure and of systems for monitoring and early warning in developing countries. These measures are the concrete countermeasures for heavy rainfall disasters caused by climate change.

Project Detail, Product & Technology

■ Background

Country | Ethiopia, Brazil:, Bhutan

With the increasing frequency of natural disasters in recent years many developing countries are facing these disasters. Kokusai Kogyo is providing support for the development of sustainable national infrastructure in these developing countries, utilizing its disaster risk reduction measures built on the geospatial information technology developed in Japan, which is frequently struck by natural disasters.

▲Expert advisors conducting a survey of Landslide points along the Abay River Gorge

■ Business Model

As an example, to counter slope disasters, Kokusai Kogyo has introduced both physical infrastructure initiatives such as river works (sabo dams), and 'soft' initiatives such as real-time measurement system and hazard mapping as well as the organization of the administrative structure required for early warning/evacuation systems and the drafting of manuals. Projects in developing countries mainly consist of ODA projects by the Japan International Cooperation Agency (JICA) and other profit-aimed SDGs activities.

▲ Local training for developing hazard maps.

<Project Showcases>

Ethiopia: Measures for the management of river gorge slopes (physical and 'soft' measures)

Route 3 is a major highway in Ethiopia running through one of the country's largest granaries which also serves as a crude oil pipeline from South Sudan. The highway turns into an obstacle to economic activities during the rainy season that triggers frequent landslides along the route passing through the Abay River Gorge. Kokusai Kogyo participated in the JICA ODA project for developing countermeasures against landslides. Measures implemented include the streamlining of relevant administrative structures, preparation of handbooks, emergency countermeasures against landslides (surveys, decisions about countermeasure work and construction) and mid-to-long term countermeasures (surveys/analysis, design, construction/maintenance and management).

Related SDGs

Project Detail, Product & Technology (Continued)

Brazil: Support for overarching reinforcement of landslide disaster management ('soft' measures)

Damage from landside disasters is on the rise in Brazil due to the expansion of habitats into disaster-risk areas under rapid urbanization and the impact of climate change. Kokusai Kogyo participated in a technical cooperation project of JICA and implemented measures such as the assessment of landslide disaster risks in the pilot area and urban expansion planning based on the assessment, preparation of disaster prevention manuals, and the reinforcement of comprehensive disaster response built on structural measures against mudslides and rockslides. The project was awarded the United Nations Sasakawa Award for Disaster Reduction in 2017. Kokusai Kogyo currently seeks to introduce the project outside the pilot areas through manual-based training.

Bhutan: The Project for Capacity Development on Countermeasures of Slope Disaster on Roads (physical and 'soft' measures))

Bhutan is mostly made up of steep mountainous areas and most roads face steep slopes. Frequent slope disasters caused by the increasing occurrence of extreme weather events hinder economic activities. Kokusai Kogyo participated in a technical cooperation project of JICA and implemented 'soft' measures such as the inspection/diagnosis of slope disasters, establishment of a slope disaster risk reduction database and ex-ante traffic control, as well as physical measures such as countermeasures for road slope failures and debris flow disasters, resulting in the overall improvement of road slope disaster prevention technology in Bhutan.

▲Installation of monitoring sensors for ex-ante traffic control as components of a smartphone-based road information system

Key to Success & Challenges for Further Development

- Contributing factors to growth in business include growing the demand for disaster risk reduction measures in the target countries, recognition of high quality disaster risk reduction technologies from Japan, the effects of slope disaster countermeasures that are easy-to-visualize, and the implementation of ODA projects.
- Inefficient communication due to the lack of coordination among relevant government agencies in the target countries was improved by supporting relationship building through the clarification of tasks, regular meetings, technology transfer among groups and organized training in Japan.
- In June 2018, a joint venture was established with a Taiwanese local partner. Through the localization of business, Kokusai Kogyo strives for profit-aimed SDGs activities with the key focus on local communities, mainly in Southeast Asia.

Profile of Project Company

Kokusai Kogyo Co., Ltd. is the core subsidiary of the Japan Asia Group. Since its establishment in 1947, Kokusai Kogyo has utilized its geospatial information technology in the fields of construction consultancy, geological/marine survey, disaster risk reduction/mitigation, and environmental energy. Under the Group Mission of "Save the Earth, Make Communities Green" and regarding climate change as a solution for social challenges, Kokusai Kogyo is engaged in various adaptation and mitigation activities, including disaster risk reduction and social infrastructure. Kokusai Kogyo is a member of the United Nations Global Compact (UNGC) since 2013 and a private sector group of the United Nations Office for Disaster Risk Reduction (UNDRR) since its inception in 2011.

5. Protecting local community from threat of high tide and sea level rise

TAISEI CORPORATION http://www.taisei.co.jp/

Adaptation Challenge Island nations are vulnerable to high tides due to insufficient height above sea level and are at the brink of submersion due to rising sea level associated with global warming.

Contribution TAISEI CORPORATION builds robust yet eco-friendly seawall in such vulnerable areas. In addition to enhancing disaster preparedness, the Company plays a key role in socioeconomic infrastructure and secure lives and assets of island people. Building robust seawall serves as an adaptation measure in the field of infrastructure.

Project Detail

Country | Maldives

■ Background

Male Island in the Maldives has been repeatedly hit by high tides due to flat landscape which is only 1.5 meters above sea level. Unusually high tides in 1987 and 1988 wrecked existing seawall structures and residences, paralyzed government operations and the total damage was worth 6 million US dollars. The Island is also at the brink of submersion due to the sea level rise associated with global warming. The Maldives is heavily dependent on the import of construction materials and much of the concrete aggregate was delivered from neighboring Malaysia and Singapore. Water for construction and domestic use by workers came from desalinated sea water. To conserve natural environment from adverse effects of construction, the Company set out self-disciplinary principles and refrained from coral stone mining. All such efforts bore fruit at the time of major earthquake off Sumatra in December 2004 when the Island had no human casualty and very little collateral damage which significantly contributed to saving human life and maintaining key government functions.

■ Business Model of the Project

The Japanese government offered grant aid to support the construction of seawall. TAISEI CORPORATION took on the construction of breakwater along the south coast of Male Island in 1987 which stretched 6 kilometers around the Island as robust seawall.

▲Bird's-eye view of Male Island

Related SDGs

Product & Technology

- Sloped revetment using ripraps and tetra pods
- Vertical seawall using concrete blocks and caissons (large concrete or steel boxes used in construction of seawall and other underwater structures or underground structures) and others

The traditional seawall built by the government of Maldives is made of piled coral mass coated with mortar and is vulnerable to wave pressure. Thus the Company applied the above-mentioned technology to build a staunch and durable seawall for long use which helps to mitigate maintenance burden while enhancing disaster preparedness.

▲Visual Illustration of Seawall

Key to Success & Challenges for Further Development

- High-quality infrastructure was developed through the construction of eco-friendly seawall reflecting local demand. Next focus is to improve cost-competitiveness and technological differentiation for further development.

Profile of Project Company

TAISEI CORPORATION was founded in 1873 and established itself as one of five super general contractors, with unique strength in large-scale construction and civil engineering works including skyscrapers, airports, dams, bridges and tunnels. Its core competence lies in technology and close-knit group structure built on its early presence overseas. The Company won the submarine tunnel project under the artificial "Palm Island" off Dubai with much credit to its groundbreaking proposal outshining European and American competitors. The Company was also highly accredited for its consideration on environmental aspects by local community (catching fish feared to be affected by construction works beforehand and releasing them upon completion, or restoration of seaweed bed). Under the group philosophy of "Creating a Vibrant Environment for All Members of Society", TAISEI CORPORATION, through its construction activities, strives for the development of high-quality social infrastructure and improvement of the living environment in harmony with nature. The company recognizes "the realization of a sustainable and environment friendly society" as a material ESG initiative.

6. Methodology for prevention of soil surface erosion with soil algae (BSC methodology)

Nippon Koei Co., Ltd. https://www.n-koei.co.jp/

Adaptation Challenge Nippon Koei (NK), in collaboration with Public Works Research Institute (PWRI), has developed a technology for protection of slope surface erosion with soil algae in order to control sediment of red soil into the rivers and coasts in the Southwest Islands of Japan.

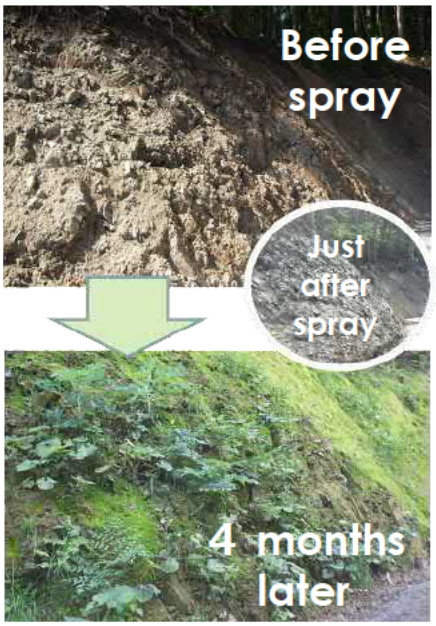
Contribution The eco system recovery through forest conservation projects by Kanematsu reinforces physical response capacity to weather events and mitigate disaster risks. In addition, disaster information system built by Hitachi utilizing a flood simulator called DioVISTA/Flood contributes to minimizing the impact of disasters on human, etc.

Project Detail

Country | Nepal

■ Background

In the course of a research on prevention of sediment discharge from mountains into rivers and coasts in Okinawa prefecture of Japan , the following two findings were identified and a patent was issued to NK and PWRI in 2009 based on the research results: (1) Observation at the site found out the soil sediment from slope with developed soil algae is limited, (2) Based on (1), in collaboration with PWRI, it was demonstrated that sediment yield from a field covered by soil algae reduced by 1/10～1/20 of the one from a field without soil algae. After issuance of the patent, in collaboration with Nikken Sohonsha Co., Ltd. based in Gifu prefecture, which has technology of cultivation of algae, commercialization of the products was realized In the course of a research on prevention of sediment discharge from mountains into rivers and coasts in Okinawa prefecture of Japan , the following two findings were identified and a patent was issued to NK and PWRI in 2009 based on the research results: (1) Observation at the site found out the soil sediment from slope with developed soil algae is limited, (2) Based on (1), in collaboration with PWRI, it was demonstrated that sediment yield from a field covered by soil algae reduced by 1/10～1/20 of the one from a field without soil algae. After issuance of the patent, in collaboration with Nikken Sohonsha Co., Ltd. based in Gifu prefecture, which has technology of cultivation of algae, commercialization of the products was realized.



▲BSC資材

■ Business Model of the Project

Planning and implementation service including production and sales of algae material, site evaluation etc.

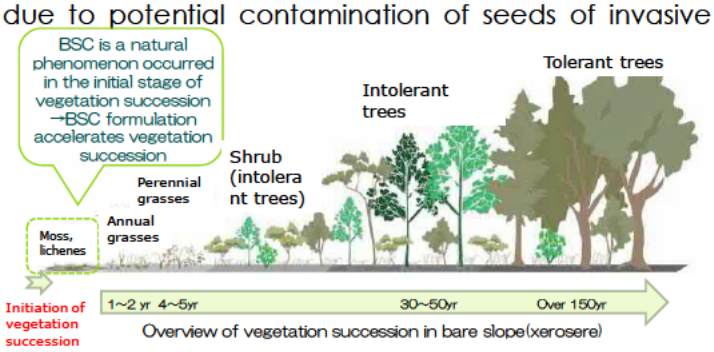
Related SDGs

Product & Technology

1) In the initial stage of vegetation succession, soil surface is covered by a sheet of algae, moss and lichens, namely Biological Soil Crust (BSC). This formulated BSC makes soil condition preferable for vegetation growth. It can be observed that following formulation of BSC, grasses and trees come out. The methodology applies this phenomenon by spraying soil algae liquid on slope methodology, and it enables to shorten time period of formulation of BSC by two weeks to one month and accelerate natural vegetation succession.

2) Soil algae applied in this methodology is cosmopolitan species, habituating globally from the north to south pole. Besides, since it is hermaphrodite and increases by clonal proliferation, this methodology has no risk on genetic disturbance. Thus it can be applied in those areas which do not accept intrusion of invasive species such as nature parks, although the conventional methodology for slope protection and vegetation recovery such as seed spray methodology is not allowed to be applied in such area due to potential contamination of seeds of invasive species.

3) This methodology does not need to cast cement on slopes nor to put up a wire lath net, but need only to spray liquid of soil algae on the slope surface using conventional spraying equipment, which is easier than the conventional methodologies.



Key to Success & Challenges for Further Development

After a joint research with PWRI in Japan, a collaboration with another company which has technology of algae cultivation has been started for mass production of soil algae materials. The result of the collaboration was to reduce the product cost lower than the conventional methodologies in a certain growth condition. This methodology does not utilize invasive species nor cement, but cosmopolitan soil algae. Hence, it can be applied even in areas which do not accept the conventional methodologies such as nature parks. Besides, this methodology has advantage in the cases requiring rapid vegetation recovery and slope restoration. Since 2019, a demonstration of this methodology outside Japan has been implemented in Nepal for slope protection along a road that NK has been supported in construction and management over decades.

Challenges: (1) Completion of patent processes in other countries (2) Application of the methodology to agriculture (3) Cost saving

Profile of Project Company

Since its establishment in 1946, and in over the 160 countries and regions, NK has provided engineering consulting services on development and construction, as well as technology evaluation, design and construction of varieties of infrastructures, production and sales of machinery for electricity generation systems. NK is composed of 5 segments: domestic consulting, overseas consulting, electricity engineering, Urban & Spatial Development Division established since 2017, and Energy Business Division since 2019. Various projects related with adaptation to and mitigation of climate change have been implemented both in Japan and overseas.

7. Disaster risk reduction by river water level alarm system

Unimation System Inc. https://www.unimation.co.jp/index.html

Adaptation Challenge In Philippines, measures to prevent or reduce disaster is an urgent issue because Philippines is affected by climate events such as typhoons. Especially, frequent occurrence of river water flooding due to undeveloped sewage system and lack of technology and institutional capacity for disaster management cause serious disaster risk.

Contribution River Water Level Alarm System of Unimation System Inc. can send alert of occurrence of river water flooding to local people, collect information of river water level, and control/forecast occurrence of flooding for wide area in high disaster risk area. The Alarm System of Unimation System Inc. contributes to prevention of disaster and reduction of disaster risk for local residents even though it is worried that typhoon becomes larger with higher frequency due to climate change.

Project Detail

Country | Philippines

■ Background

Unimation System Inc. (herein after Unimation) is a specialized company dealing in equipment for disaster prevention such as River Water Level Alarm System, Flood Warning Unit for Road, and Flood Warning System and has been selling the equipment in Japan. After the major flood disaster in Thailand in 2011, Unimation found that its technology and products are in need in countries outside Japan, and hence started thinking about developing its business abroad. Afterward, they has joined Grassroots Technical Cooperation Project (City of Iloilo, Philippines) using JICA Business Model Formulation Survey and JICA Verification Survey ("Establishment of Disaster Prevention System using River Water Level Alarm System in Philippines" in Cebu City and Talisay City etc. in Metro Cebu) and examined their business development in developing countries where seriously causing disaster such as flooding.

■ Business Model of the Project

Unimation implemented the Project in cooperation with concerned government staff and other stakeholders through JICA scheme. Unimation aims at expanding services in Southeast Asia from Metro Cebu in Philippines with consideration for advantages for sales promotion such as large population, strong initiative for inviting foreign investment, and rather short distance from Japan.

▲River Water Level Alarm Syster

▲Image of Setting of Alarm System

Related SDGs

Product & Technology

River Water Level Alarm System: The equipment continuously monitors water level of river and when a preset trigger level (6 levels of water level can be set) is reached, warning signals are instantaneously released by rotating warning lights, sirens and speakers, as well as by emails sent to pre-registered email addresses. Lead time of alarm can drastically shorten because the equipment sounds the alarm by itself. Moreover, the system lower cost than other alarm system because server is not necessary for the system.

Flood Warning Unit for Road: The equipment uses a the sensor which can be installed in narrow place such as side of road and can call attention in the place where water is retained easily such as under path, elevator pit, and drainage ditch. Even if communication system stops due to disaster, the system can detect current water level and increasing water level of current location and display, warning signals, and alarm can be activated and pedestrians and cars can be alerted.


▲Flood Warning Unit for Road

By installation of the abovementioned equipment, alarm of flooding and evacuation signal are given and human damage can be minimized. Moreover, required maintenance for the equipment is only cleaning its cover. The cost for establishment of disaster prevention system tends to be lower than other large scale systems.


▲Installation of Alarm Unit (City of Iloilo)


▲Installed Alarm Unit (City of Iloilo)

Key to Success & Challenges for Further Development

- To promote development of the business in Philippines, Unimation installs River Water Level Alarm System and also cooperate with another company (company skilled at radio wireless) and is able to propose more effective solution for needs in the site. It's effective to cooperate with another company for developing business in developing countries because integrated solution including various equipment and technology is often required.
- In developing countries, needs of disaster prevention is bigger, however, installation of equipment is often difficult because of cost. Initial and maintenance cost of Unimation's equipment is lower than other company's. However, to develop sales channel in Southeast Asia, it's necessary to produce equipment in Philippines and develop low cost model.

Profile of Project Company

Since the foundation of the company in 1979, Unimation specializing in disaster prevention products, has manufactured, sold, and developed its flood early warning system, and also developed a website related to flood early warning system along with management services. Unimation sells and produces River Water Level Alarm System, Flood Warning Unit for Road, Flood Warning Sensor, ultrasonic sensor etc. and contributes for prevention and reduction of disaster in local areas in Japan.

8. Functional paving materials made from waste roof tiles and bricks to reduce urban flooding and heat island effect

ECOSYSTEM Inc. http://eco-system.ne.jp/index_eng.html

Adaptation Challenge Torrential rains, typhoons and hurricanes have been occurring more frequently due to climate change. In urban areas, ground surfaces are paved with asphalt and concrete, making it difficult for water to seep into the ground and be absorbed. Therefore, urban flooding occurs when rainfall and water levels exceed sewage treatment capacity. Moreover, rising temperatures will exacerbate the heat island effect, causing health problems and ecological changes.

Contribution ECOSYSTEM contributes to reducing urban flooding and the heat island effect by paving the ground with waste roof tiles and bricks that have permeability and water retention properties.

Project Details

Country | Vietnam

■ Background

Ceramic products such as roof tiles and fired bricks, which are used as raw materials for pavement, are found in many parts of the world, especially in Europe, Southeast Asia, and South America. In order to capture this market, ECOSYSTEM is considering expanding overseas. In Vietnam, it is conducting a feasibility study with support from the Ministry of the Environment, Japan.

■ Business Model of the Project

In Vietnam, construction waste materials and substandard products from tile and brick factories are disposed of as industrial waste in landfills or illegally dumped. However, local partners will contract with ECOSYSTEM to purchase plants manufacturing paving materials, procure waste tiles and bricks, reuse them, and sell them to private companies and public organizations. Since plants manufacturing paving materials can be assembled locally, ECOSYSTEM plans to contract with a local company for local plant assembly and maintenance in the future.

▲Discarded roof tiles and bricks

▲Waste roof tiles and bricks

Photo credit: SATREPS Vietnam Project (Dr. Kawamoto, Saitama University)

Related SDGs

Product & Technology

Waste roof tiles and bricks are crushed by crushers to produce gravel and sand products, which are then used as gardening materials, tile chips, and paving materials. Since tiles and bricks are porous, water-permeable and water-retentive pavement materials using these materials can reduce urban flooding and the heat island effect. In addition, a ready-mixed concrete plant is usually required for pavement construction, but since it is expensive, ECOSYSTEM developed a low-cost, mobile, vehicle-mounted manufacturing plant called Mobacon. Because paving material needs to be applied before it hardens, paving material produced at fixed ready-mixed concrete plants can only be used within a radius of 1.5 hours. However, Mobacon makes it possible to manufacture paving material at the same location where it is used, thus eliminating limitations on the work area.

▲Waste roof tiles and bricks

▲ Vehicle-mounted manufacturing plant (Mobacon)

▲Road paved with waste roof tiles and bricks

Key to Success & Challenges for Further Development

- Although it is common to recycle construction waste into paving material, using waste tiles and bricks adds value by producing porous material with water-permeable and water-retentive properties, in addition to enhancing the landscape.
- Tiles and bricks are heavy materials and are manufactured by local manufacturers for local consumption. However, considering that manufacturing techniques vary among manufacturers, it is important to distinguish the level of local products to be recycled.

Profile of Project Company

Established in 1994, ECOSYSTEM started its recycling business in 1997 when the company reused contaminated sea sand as paving material in the Nakhodka oil spill. ECOSYSTEM, with a corporate philosophy under which it aims to create ecosystems, has a wealth of knowledge and experience in the recycling of roof tiles and bricks, including tile chips. In Japan, the company is engaged in the disposal of waste roof tiles (intermediate industrial waste disposal business), roof tile paving, franchising of Mobacon, and internet sales of roof tile chips and others.
In 2018, ECOSYSTEM won the Grand Prize at the SDGs Business Contest, Global Innovator Award at the SDGs Business Awards, and Grand Prize at the Ishikawa Eco Design Awards.

9. Introducing a resilient hybrid power generation control system against environmental changes

Kyudenko Corporation http://www.kyudenko.co.jp/

Adaptation Challenge Power supply in remote islands is often dependent on regional grids through diesel generators due to a lack of massive power transmission network and therefore the power supply is not stable and chronically tight. In addition, remote islands are highly vulnerable to natural disasters on account of geographical characteristics. To counter these issues, it is imperative for them to be equipped with a resilient electric power system against diverse weather conditions.

Contribution Hybrid power generation control system introduced by Kyudenko Corporation is an on-grid system that overcomes the unstable supply of solar power and enables self-sustained and stable power supply. In addition, EMS (Energy Management System) enables the optimal control of renewable energy supply while countering abrupt meteorological and environmental changes.

Project Detail

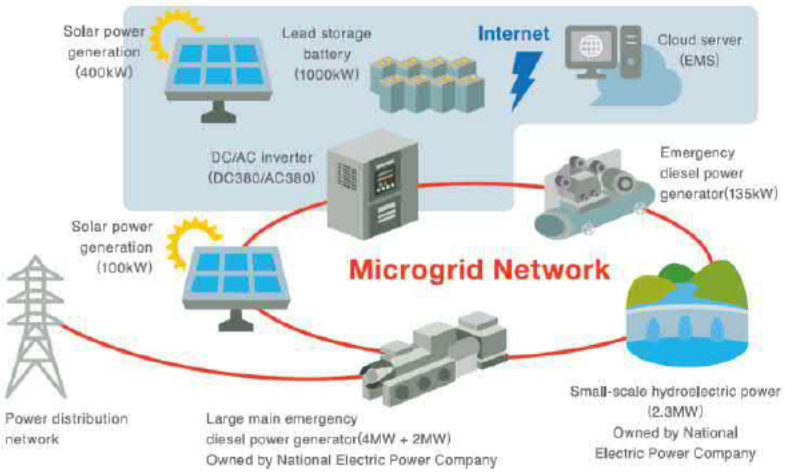
Country | Indonesia

■ Background

In the western side of Sumba Island, the Agency for the Assessment and Application of Technology Indonesia (Badan Pengkajian dan Penerapan Teknologi: BPPT) carried out demonstration tests of a hybrid power generation plant comprising solar power generation facilities, redox flow cells and emergency diesel power generators, where power generation and storage failed and stable power supply for the microgrid was insufficient. Upon visit in October 2015 to the technology center of Huis Ten Bosch and microgrid developed by Kyudenko mainly leveraged on renewable energy, the officials from BPPT requested for the introduction of the plant. In addition, the Project was selected for the "Low Carbon Technology Innovation Project 2016" by the Ministry of Environment of Japan in July 2016 and demonstration project was conducted for 3 years.

■ Business Model of the Project

As part of the future business strategy, the project will be extended into an EPC project where Engineering, Procurement and Construction are carried out by a local entity upon order from power companies.



▲Overview of Microgrid Facility in Sumba Island, Indonesia

Related SDGs

Product & Technology

By introducing EMS where technologies for the generation and storage of renewable energy power are remotely controlled, a self-sustained and stable power supply is ensured for certain duration of time and at certain volume. Further, operation & management (O&M) method will be established based on the power output and meteorological data collected.

Power storage system: Lead cell will be used. Lead storage cell is affordable but short-lived as its life is less than half the life of lithium-ion storage cell, however, the Company developed a lead storage cell control system by controlling charge and discharge that doubles or more the life of lead storage cell.

EMS subsystem: Equipped with functions that allow the forecast of appropriate capacity based on weather patterns and system degradations check as well as fault detection based on local track record, it supports stable and sustainable facility operation. The system helps achieve lower facility and running costs.



▲Demonstration facility in Sumba Island, Indonesia

Key to Success & Challenges for Further Development

- The Project owes much of its success to the existing close relationship with local government authorities that enabled the development of a customized system that suits the local environment and requirement while minimizing costs.
- For the staged introduction of an on-grid hybrid power generation control system to the diesel grids in 600 sites in remote islands, the Company will obtain SNI (Indonesian National Standard) license via BPPT while approaching the presiding Ministry of Energy and Mineral Resources for the introduction of its plan.
- At present, the company is working on EMS improvements for existing power plants, as well as large-scale power generation projects using renewable energy as the core power source in several locations in Indonesia.

Profile of Project Company

Kyudenko Corporation was established in 1944. In 1964, the Company launched air conditioning pipe installations ahead of its counterparts and thereafter aggressively diversified its management by delving into the environment, information, telecommunication and renewal services. The Company takes the environment-related services to be the 4th pillar of its businesses following power distribution, electricity and air conditioning and promotes the conventional wind power and solar power generation services while extending the business fields leveraged on its unique energy-saving technology. In July 2015, the Company built a power generation system using solar and wind power in the premises of the technology center and villas of the Huis Ten Bosch in Sasebo-city, Nagasaki and developed EMS to efficiently control the supply and demand of energy. The power transmission wire of the Kyushu Electric Power Co., Inc. has been detached since February 2016 and the electricity demand from the premises of villas has partially been covered with a stable supply of renewable energy generated under EMS.

10. Greater resilience in anti-disaster infrastructure through the world's first "Typhoon Power Generation" and communications satellite

Challenergy Inc. https://challenergy.com/

Adaptation Challenge The Philippines is an island country in the Southwestern Pacific and is one of the most vulnerable countries to climate change, experiencing severe typhoons every year. In remote islands, delays in dissemination of disaster information and disaster recovery is a serious issue coupled with shutdown of power supply and communications after typhoons.

Contribution It is urgently needed to establish resilient infrastructure, stable energy supply, weather monitoring and early warning system. The Project in combination of the Magnus Wind Turbine and satellite communication serves as an adaptation in the field of energy and communication.

Project Detail

■ Background

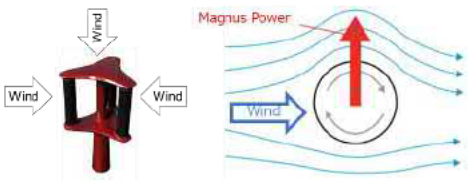
Country | Philippines

Challenergy Inc. has, since its inception targeted island countries in the Pacific where severe typhoon damage is/will be feared due to climate change, and mountainous countries where installation of the conventional wind power generators is difficult. In 2018, the Company launched field tests of its 10kW prototype in the Ishigaki Island. In 2017, a feasibility study in the Philippines in collaboration with SKY Perfect JSAT Corporation under the "Climate Change Adaptation Effect Visualization Project" funded by the Ministry of Economy, Trade and Industry of Japan (METI) in 2017 was conducted. A joint venture company in the Philippines was launched in January 2019. Technology demonstration in Batanes Island, the north-most island of the country, and mass production of 10kW models is scheduled in 2021.

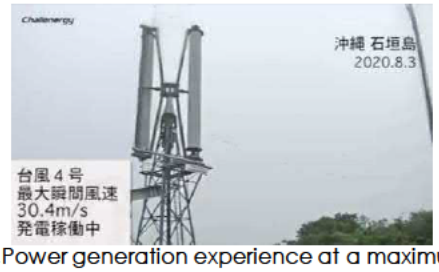
■ Business Model of the Project

The project mainly targets areas where electricity and communications infrastructure are poor and provides sustainable energy and reliable communication system in combination with highly resilient, environmentally friendly and affordable wind power generation with satellite communication. The project has been executed in collaboration with the following partners.

- Communications satellite, disaster communications infrastructure: SKY Perfect JSAT Corporation
- Philippines' joint venture partner: Natures Renewable Energy Development (NAREDCO)
- Marketing partner: State-run power company, public oil company, real estate development company, etc.



▲ Magnus x Vertical Axis Wind Turbine (left) and Magnus Effect (right)



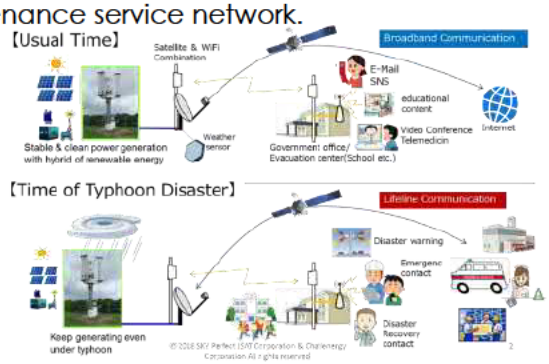
▲Power generation experience at a maximum instantaneous wind speed of 30.4m/s.

Related SDGs

Product & Technology

Magnus x Vertical Axis Wind Turbine (Challenergy): The product rotates using the "Magnus force" generated at the time of turbine rotation in the currents, as opposed to the conventional "Horizontal Axis Propeller Style" widespread in other areas, especially Europe. The turbine rotates even with mild wind and will not over-rotate even with typhoon and thus the turbine achieves the wind speed suitable for power generation. Power can be generated with wind from all directions. Magnus turbine is capable of producing power in times of strong or turbulent wind, leading to low failure rate, thereby improving capacity utilization rate.

Satellite Communications Technology (SKY Perfect JSAT): The technology is widely utilized as a communication infrastructure in digitally-divided areas due to its wide coverage and consistency in the broadcast of data and as a communication service in disaster-hit areas due to its flexibility and durability. The operation status and servicing/maintenance timing of the magnus wind turbine will be monitored real time using satellite communications for the establishment of a maintenance service network.



◀Magnus x Vertical Axis Wind Turbine 10kW Prototype (Ishigaki City, Okinawa)

Key to Success & Challenges for Further Development

- Magnus wind turbine is characterized by greater power generation capacity under different wind speed situations and low breakdown ratio. These specifications differentiate it from conventional wind power and solar power generators and establishes itself as a remote power generation tool in remote islands and mountainous areas that are not connected to the main transmission grid making power supply difficult. The challenges are how to visualize the merits in life cycle costs to rationalize its prices as compared to existing wind and solar power technologies.
- The technology will be marketed overseas as a package of energy and communication services in consideration of limited public funds for disaster-related services.

Profile of Project Company

Challenergy Inc. was founded in 2014 as a start-up under the vision of "Innovating wind power generation for supply of safe and secure electricity for all humans". The Company strived for the development of the "Magnus x Vertical Axis Wind Turbine" without propellers that can generate power even in strong wind of typhoons and is in the midst of field tests in Okinawa with an aim to launch mass production models for sale in 2020. In 2018, the company was selected as a "J-Startup" company, which is a support program for Japanese startup under METI. In 2018 and 2019, it has exhibited its technology in COP 24 and 25 as an innovative measure of adaptation and mitigation in Japan Pavilion. And also the Project was introduced in the G20 Ministerial Meeting on Energy Transitions and Global Environment for Sustainable Growth in Karuizawa, Japan in 2019. Mass production of 10kW models is scheduled in 2021.

11. Mitigating damage to energy supply system in times of disasters

Panasonic Corporation https://www.panasonic.com/jp/home.html

Adaptation Challenge Increase in natural disasters associated with climate change affects people's lives significantly by damaging energy infrastructure, destabilizing supply network, and obstructing educational and medical activities.

Contribution Panasonic Corporation provides stand-alone power generation for emergency utilizing environmentally-friendly renewable energy such as "Solar LED Lights", "Solar Storage" and "Power Supply Containers". It serves as an adaptation measure in the field of energy to mitigate the threat to people's health and life due to the lack of access to power in times of major disasters.

Project Detail

Country | Uganda

■ Background

In 2006, then Uganda's Minister of State for the Vice President's Office visited Japan and toured the Company's solar facility (Solar Ark by SANYO), leading to the request from the Vice President for cooperation later on. Research and development was launched using its unique strength of energy storage and energy generation technology now known as "Solar Lanterns". The Company commenced "100 Thousand Solar Lanterns Project" in February 2013 aiming at donating 100 thousand solar lanterns to developing countries by 2018 when the Company marks its 100th anniversary. Since the project's inception, a total of 102,716 solar lanterns have been donated to 30 countries of regions mainly in Asia and Africa.

■ Business Model of the Project

Panasonic Corporation provides Solar Lanterns or Solar Storage to be utilized for the programs by international organizations and NGOs in Asia and Africa where increase in disasters associated with climate change is feared to adversely affect life and environment of local community. In Indonesia, "Power Supply Containers" have been provided by the Company for remote islands through grant assistance for grassroots project by the Embassy of Japan in Indonesia to support children's education. Providing emergency power supply contributes to crime prevention and sustained education at night or blackout, or swift medical checkup and treatment in malaria-prone tropical regions.

Related SDGs

Product & Technology

Panasonic Corporation offers an array of energy supply tools including the following.

・"Solar Lanterns", an affordable solar LED lighting for low-income household while meeting the demand of non-electrified community for greater brightness.

・"Solar Storage", a small power storage system with LED lighting using nickel-metal hydride battery with an expected life of five years and is capable of charging up to three smart phones or seven mobile phones.

・"Power Supply Containers", a stand-alone photovoltaic power package capable of generating approximately 3kW of electricity.

▲Solar Storage

▲Brightness for Local Community (Ethiopia)

Key to Success & Challenges for Further Development

Next challenge is to achieve further dissemination in local market through cooperation with partners extending bulk sale projects in the target areas such as international organizations and NGOs while taking under consideration the utilization of public finance schemes.

Profile of Project Company

Panasonic Corporation was founded in Osaka in 1918 by Konosuke Matsushita, upholding the philosophy of extending life with easy access to electricity throughout the world. Since then the Company has taken on a wide range of initiatives. The Company has encouraged adaptation efforts as part of its project in alleviating the impact of climate change through its products, services and solutions while providing support for the growth of business activities under its CSR commitments including this project based on its corporate philosophy, "Make contributions to the progress of society and the well-being of people through our business activities" which has been committed since its foundation. The Company won the Good Design Award 2013, IAUD Silver Award 2013 under Social Design Category and iF Product Design Award 2014 for its Solar Lanterns and the Good Design Award 2015 for its Solar Storage.

12. Contributing to sustainable agriculture through "Bio-cycle"

Ajinomoto Co., Inc. https://www.ajinomoto.com/

Adaptation Challenge Frequent forest fire and decrease in forest area due to climate change such as El Nino have led to deterioration of the function of eco system and rise in disaster risks in Indonesia.

Contribution The eco system recovery through forest conservation projects by Kanematsu reinforces physical response capacity to weather events and mitigate disaster risks. In addition, disaster information system built by Hitachi utilizing a flood simulator called DioVISTA/Flood contributes to minimizing the impact of disasters on human, etc.

Project Detail

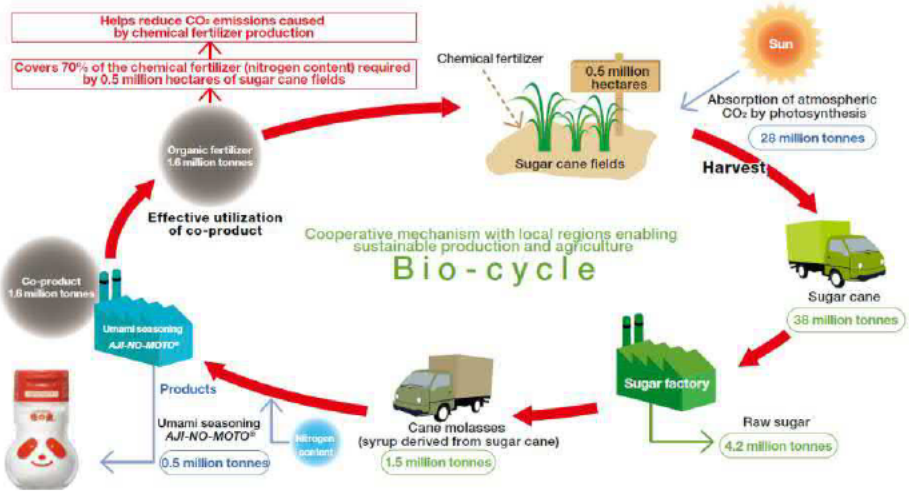
■ Background

Country | Brazil

The Ajinomoto Group has implemented "Bio-cycle" in its factories worldwide since 1960's, including the factory in Brazil, the biggest factory worldwide since the Company entered into Brazilian market, to secure the stable local procurement of ingredients for amino acid.

■ Business Model of the Projec

"Bio-cycle" is a business model where resources are recycled for the recovery and reinforcement of natural resource capital. In Brazil, 99% of the byproduct (co-product) derived from amino acid fermentation process has successfully been recycled through the sale to local farmers as feed and organic fertilizer which will eventually be returned to farmland. In May 2012, a biomass boiler has been introduced as a step to "fuel bio-cycle" using bagasse, achieving stable procurement of energy used in the factory, approximately 40% of which is biomass fuel in 2014.



▲Description of "Bio-cycle":
The chart assumes worldwide annual production of approximately 0.5 million tonnes of the umami seasoning AJI-NO-MOTO® by the Ajinomoto Group using only sugar cane.

Related SDGs

Product & Technology

Bio-cycle: A regional Co-product, left upon the isolation of amino acid from agricultural produce using resource-saving fermentation technologies, is utilized locally as fertilizer and feed. In Brazil, resource has repeatedly been recycled where Co-product derived from the process of isolating amino acid from molasses procured from sugar factory, is processed into organic feed and returned to sugarcane or grape plantation for their growth. The Company has expended this scheme to coffee farms since 2016.

Resource-saving fermentation technologies: Resource-saving and recycling-oriented fermentation technologies that reduce the use of sugar and other ingredients as well as discharge of water using cutting-edge bio technology.

▲A Grape Farmer in Brazil

▲Coffee farm

Key to Success & Challenges for Further Development

- Bio-cycle has become a norm in Brazil, a major agricultural country, where the use of fertilizer is common and there is sufficient domestic demand for the sale of Co-product as fertilizer. Bio-cycle has also gone beyond a mere resource recycling business and generated a diverse range of community-based benefits to the entire region such as products, byproducts, employment, consumption and lifestyle.
- The Ajinomoto Group aims to achieve "a ratio of renewable energy usage of 15% and higher" and promotes the expansion of Bio-cycle to the energy field through the production of biomass fuel using nonedible parts of fermentation ingredient.

Profile of Project Company

Ajinomoto Co., Inc. is a global food company founded in 1909. The Company has enlarged its business territory into the feed, medical and pharmaceutical, and chemical field based on amino acid and centered on bioscience and fine chemical technologies on top of condiments and processed food. It's one of the world's largest amino acid producers through fermentation in its 18 factories stretching over 9 countries of Asia, Europe and America. The Ajinomoto Group has encouraged sustainable production focused on the recovery and reinforcement of natural resource capital and establishment of a supply/value chain through the introduction of "Bio-cycle" in various parts of the world since 1960's. "Bio-cycle" is positioned as a business activity contributing to preserve "Food Resources and Biodiversity", a core of the group's long-term environmental vision. The Company won the "Minister's Prize, the Ministry of Agriculture, Forestry and Fisheries" under the "Eco Products Awards" in 2016 and has throughout been selected for "FTSE4GOOD" since 2004 and "DJ Sustainability Index" since 2014.

13. Greater harvest through compost soil improver

Kawashima Co., Ltd. http://www.kawashima.jp/

Adaptation Challenge Aggravating water shortage due to increasing incidents of drought has wreaked havoc on agricultural production and led to the decline of self-sufficiency ratio of the country's food supply. Many developing countries where much of the working population consists of farmers are under vulnerable environment and it is an urgent socio-political issue to raise the agricultural productivity.

Contribution Through introducing Kawashima Co., Ltd.'s compost plants and assisting the establishment of an organic fertilizer supply system by producing high-quality compost processed from household waste and agricultural waste materials, will bounce the harvest while improving soil conditions and ultimately solve the issues surrounding food security and poverty.

Project Detail

Country | Sri Lanka

■ Background

Sri Lanka has been plagued by increasing household waste brought by economic development and transformed lifestyle. Household waste is dumped and left open in disposal sites, causing issues of foul smell, poor hygiene and contamination of underground water. The remaining life of disposal sites is getting shorter as well. Approximately 55% of the household waste is garbage, an organic waste material. Recycling garbage as compost through aerobic fermentation effectively reduces the volume of garbage. The Project was selected for the "Verification Survey with the Private Sector for Disseminating Japanese Technologies (SME Verification Survey)" by Japan International Cooperation Agency (JICA) in 2013 and started operation in April 2017. Since then, 9 plants were delivered to the government of Sri Lanka in the first phase of construction, and additional second phase of construction has been promoted in 2020.

■ Business Model of the Project

Kawashima Co., Ltd. exports the equipment manufactured in Japan to local governments. Local partner companies of Kawashima provide maintenance, manage operations and supervise project execution.

▲Compost plant

▲9 system are under construction

Related SDGs

Product & Technology

Compost Plant "RA-X": A screw-shaped auto mixer that mixes organic waste material for even aeration and maintains aerobic fermentation at high temperature for effective production of high-quality compost. The device is affordable and easily maintained.

"BX-1": An active microorganism feed that deodorizes and turns mud, sludge and animal wastes into compost. Its main ingredient is rice bran and it accelerates fermentation of compost while curbing odor during the fermentation process.

Both "RA-X" and "BX-1" are an unique technology of Kawashima and the former has been patented (Patent Number: 3607252). A project based on the both technology has been registered as Clean Development Mechanism (CDM) project in 2011.

▲Screw-shaped Compost Plant "RA-X"

▲Vegetable cultivated using compost

Key to Success & Challenges for Further Development

- Support from JICA through its SME Verification Survey was imperative for a new technology to prove its past achievement which is a must-have for its introduction.
- The Project turned into business through the successful establishment of relationship with local government and demonstration of technological and economic superiority.
- In the installation of the initial compost plants, Japanese construction company gave technical guidance to local installers.
- Kawashima implemented capacity building programs for local counterparts through the relationships with various partners including Kawasaki City Government, which provided guidance in the food waste sorting, successfully building up a supply chain for recycling food wastes.
- Compost plant business has increased local employment of women and contributed to solving the issues of poverty of women, which facilitates its local acceptance.
- The Company plans to extend the Project into Asia over a medium to long term.

Profile of Project Company

Kawashima Co., Ltd. was established in 1987 and developed "RA-X", a compost plant in 2000. The Company manufactures and sells the plant and upholds the corporate mission to establish a recyclable society through its eco-friendly technology.

14. Greater resilience and higher income through "Agriculture sustainable for 100 years and beyond"

On The Slope Co., Ltd. https://www.on-the-slope.com/

Adaptation Challenge Agricultural output in the Southeast Asia is feared to dip 5 to 30% by 2050 due to climate change. In Lao Republic, it is an impending challenge for agriculture to gain more resilience which accounts for approximately 30% of its GDP and is principle livelihoods of more than 65% of its nationals.

Contribution On the recognition that "insufficient knowledge and technology on agricultural system" and "lack of objective information regarding vulnerability assessment" are adaptation challenges to vulnerable countries, On The Slope Co., Ltd. strives for a business model to ensure long-term agricultural sustainability in local community through local production utilizing climate resilient species and guidance on harvest method while ensuring the stable profit return through domestic and overseas marketing channels.

Project Detail

■ Background

Country | Uganda, Lao Republic, Myanmar, Philippines, Nepal

The Company with an aim at business in developing countries since its inception, launched the "Uganda Organic Project" in 2012. Under the project, the crops extend from locally produced "Shea butter" to sesame in dry regions as well as "Vanilla beans" through agroforestry. In 2016, the Company launched the "Mekong Organic Project" which was supported as the "Climate Change Adaptation Effect Visualization Project" by the Ministry of Economy, Trade and Industry (METI) of Japan and subsequently the Company promoted the coffee production system through agro-forestry instead of traditional forest burning by ethnic tribes in the mountains . As the Company launched the "Beyond the Sea Coffee" project, the project area is expanding since 2018 to Myanmar, Philippines and Nepal.

■ Business Model of the Project

The project focuses on the sale of the "Environmental Premium Merchandize" produced based on environmentally-friendly, small-scale agricultural system that accommodates local climate, soil quality, historic and cultural context and thus contributes to the adaptation to climate change. The marketing channels extend from the Internet retail sales to wholesale of raw beans to roasters. Saffron Coffee was appointed as local partner in 2016 which is the sole company in the project area equipped with coffee refinery and processing facilities as well as export license.

◀Laos Forest Coffee

◀Coffee Beans

Related SDGs

Product & Technology

Production technology: Organic farming, agroforestry: Under the project, Japan's high and versatile crop related technology is transferred through close-knit communication with producers. The technology is selected from a viewpoint of effective utilization of regional resources and applicability to different species while understanding the level of technology and knowledge of local farmers, regional soil environment and varying climate conditions.


▲Coffee Plantation in Forests

Example: Agro-forest management (pruning method to accommodate change in the rainfall pattern and temperature, and shading), measures against pests, technology guidance on fertilization that raises soil water retention and productivity, and cultivation of new farm land.


▲Cultivation as Part of Life

Marketing system: "Farm to Table": Under the system, agricultural produce will be marketed as environment premium merchandize for export to Japan. The system aims to secure stable sales by constant purchase by consumers with whom a relationship has been built upon understanding of the "Story of production sites and producers" through detailed explanations.


▲Guidance for Local Farmers

Key to Success & Challenges for Further Development

- The project contributes to greater income of farmers based on close communication with farmers and preliminary research for the selection of crops and cultivation technology that accommodate regional conditions and by aiming at producing higher quality products through detailed cultivation guidance.
- Collaboration with influential farmers is expected to generate ripple effect.
- In production, the project is in pursuit of collaboration with private sectors and research institutions for the establishment of a quantitative benchmark for the judgment of fermentation and maturity level.
- The project successfully diversified the range of merchandize by transforming the coffee bean flesh that is usually wasted into dried "Cascara" in syrup.
- In developing sales network, the project has built relationships that encourage constant purchase of highly value-added merchandize by appealing to consumers and raising their awareness of the "Story" of production sites and producers.

Profile of Project Company

Founded in 2009. With the company concept of "agriculture sustainable for 100 years and beyond", the company aims to create sustainable agriculture and realize sustainable society. Considering the merits and demerits of not using pesticides and fertilizers, the company sells agricultural products that are grown without environmental burden, and also provides the support to new farmers who want to engage in such type of farming. In addition, the company develops various business both in Japan and overseas, including the operation of the restaurant named "OyOy" which serves dishes with its own vegetables, and "Beyond the Sea Coffee" which provides coffee cultivation advice, imports and sells in Asia. In 2018, the company was selected as a Regional Future Driving Company by the Ministry of Economy, Trade and Industry.

15. Circular model in the manufacture and sale of apparel added with social and environmental value of afforestation project

Sunford Co., Ltd. http://www.sunrallygroup.co.jp/group/sunford/

Adaptation Challenge Anti-flood measures are imperative for addressing frequent serious damages from floods and typhoons caused by climate change in Cambodia where forest cover dropped from 73% in 1965 to 54% in 2015, and vulnerability to floods is growing.

Contribution Sunford Co., Ltd. as a member of the afforestation project initiated by from far east inc. (Reference: Case Number 17), strives to curb floods through afforestation as part of agroforestry, prevent wind damage, curb land disasters and revive the eco system in order to contribute to greater production capacity of agricultural crops.

Project Detail

■ Background

Country | Cambodia

Sunford Co., Ltd. joined the "Forest Wisdom" project consortium led by from far east inc. in 2016. Under the plan to launch afforestation and organic cotton farming in Cambodia, the Company successfully planted 1,000 cotton plants in an area of 0.5 ha collaboration with far east inc. Survey started in 2017 under the "Climate Change Adaptation Effect Visualization Project" by the Ministry of Economy, Trade and Industry of Japan and pilot marketing was launched in 2018. Non-woven fabric product will be produced in 2020 and will be full-fledged from 2022 together with cotton spun fabric products.

■ Business Model of the Project

The project revolves around afforestation of the land for curbing floods while cultivating organic cotton through agroforestry. Clothing made from the cotton will be marketed in Japan with added social and environmental values regarding safety and support for SDGs/Climate Change Adaptation Measures. Profits will be re-invested into afforestation and this circular business model will be established. Afforestation and cotton cultivation will be carried out by Institute for Khmer Traditional Textiles (IKTT) which also contributes its dying skills. The Company also collaborates with far east inc. for the sale of clothing utilizing their "minna de mirai o (Together for the Future)" brand. In addition, in order to market Company's own brand "AXF", a new technology "IFMC." developed in collaboration with Teikoku Pharmaceutical Co., Ltd. and Tokyo City University, intensive marketing initiatives are launched in sports apparel as to achieve higher added value.

▲Growth of Cotton in the Fields

▲Cotton before Harvest

Related SDGs

Product & Technology

Agroforestry: A method of afforestation and developing a forest while cultivating agricultural crops. Not only the root of woods keep soil from flowing out, but fallen leaves create a nutrition cycle which, as a result leads to greater crops. Flood curbing effect and business feasibility are concurrently achieved.

Organic products (Organic soil improvement technology, natural dye color skills): Agricultural productivity was enhanced through the technology to improve the organic soil adopted by the consortium. Further, introduction of sophisticated dying skills using natural dye color in traditional Khmer textile technology creates competitive edge in terms of quality of the organic cotton products.

Branding of social and environmental value and recycling business model: Sale in Japan after adding social value to the products and profits generated will be re-invested into afforestation.

◀Seeds Removal from Cotton Harvest (Left)

◀"minna de mirai o" Brand T-shirts for Pilot Marketing (Right)

Twisted yarn by ASANONENSHI (Left)▶

Non-woven fabric by pearl stick (Right)▶

Key to Success & Challenges for Further Development

- After the successful production of raw material, technical collaboration with ASANONENSHI CO.,LTD for spun yarn and Pearl Stick Co., Ltd. for non-woven fabric is being promoted. We aim at contributing to the SDGs with companies in Gifu Prefecture.
- Sales of miscellaneous goods starts in 2020 and commercialization is planned in 2022. Thus processing, product development, expansion of cultivation land, and cooperation with the local government is planned in 2020.

Profile of Project Company

Sunford Co., Ltd. was founded in 1984 as a core company under the Sunrally Group, an apparel manufacturing and sales company in Gifu. Sunford Co., Ltd., upon spin-off, focused on business targeting teenagers. Under the strategic theme in its mid-term plan of "Contribution to SDGs through fashion", the Company strives to contribute to SDGs by utilizing nationwide distribution network through major apparel distributor. The primary focus is on "promoting consumers' health" and "climate change adaptation measures".

16. Adapting to changing cultivation environment for traditional crops

Dari K Co., Ltd. http://www.dari-k.com/

Adaptation Challenge Irregular rainfall due to abnormal weather associated with climate change causes serious impact on agricultural products and erratic weather such as downpour and drought reduces crop yield.

Contribution Dari K Co., Ltd. promotes conversion from traditional agricultural products to high-quality cacao in Indonesia which requires less water and fertilizer. It serves as an adaptation measure in terms of sustainable food supply and stronger agricultural production base to promote weather-consistent agriculture and production of value-added crops which contributes to greater income of farmers.

Project Detail

Country | Indonesia

■ Background

The Project was selected for the "Preparatory Survey for BOP Business*" by Japan International Cooperation Agency (JICA) in 2014, and the "Climate Change Adaptation Effect Visualization Project" by the Ministry of Economy, Trade and Industry of Japan in 2015.

*Current: Feasibility Survey for SDGs Business

■ Business Model of the Project

Some regions in Indonesia are feared to suffer from reduced harvest of traditional crops due to a decline in rainfall. The Company aims to enhance adaptation capability of small farmers by encouraging conversion to cacao production which requires less water and fertilizer while mitigating vulnerability to climate change through adoption and permeation of high-value added cacao agroforestry. Having established a local subsidiary, PT. Kakao Indonesia Cemerlang (KIC) in 2016, the Company takes on specific measures such as raising cacao farmers' awareness, introducing fermentation technology and securing exit through the purchase of fermented high-quality cacao beans in order to establish a framework for added value at the upstream of supply chain and greater income of farmers. Also, the Company strives to improve the negative reputation of cacao grown in Indonesia through direct import and processing to produce high-quality chocolate products.

▲Local farmers

Related SDGs

Product & Technology

Dari K directly imports cacao grown in Indonesia, process and sell the final chocolate products. In Indonesia, cacao beans have been shipped without undergoing the process of "fermentation" which is imperative for tasty chocolate. To produce cacao beans in Indonesia that satisfy the quality requirements of the Japanese market, Dari K started with instilling the importance of fermentation to local cacao farmers. Subsequently, Dari K provided hands-on guidance on fermentation technology and directly bought from local farmers the fermented high-quality cacao beans as part of the initiatives to improve their revenue environment. At the same time, in order to rid the negative reputation of "poor quality without fermentation" labelled on Indonesian cacao beans and to raise the public awareness as high-quality cacao beans, Dari K imports Indonesian cacao beans for its own production and sale of chocolate merchandise. In addition, Dari K has started to hire Indonesian women actively for sorting operation of cacao beans, and also has promoted primary producers' diversification into processing and distribution (sixth sector industrialization). Furthermore, Dari K has been trying biogas generating system by using cacao husk.

▲Quality Assurance by President & CEO Keiichi Yoshino with Local Staff

▲Checking Growth of Cacao Trees

Key to Success & Challenges for Further Development

Challenges ahead are to establish a value chain where farmers, chocolate manufacturers and consumers equally find value in. Further development will be sought through the achievement of following Triple Wins:

(1) Farmers obtain knowledge and skill on how to grow high-quality cacao and enjoy higher income.

(2) Dari K, as chocolate manufacturer, secures the procurement of high-quality cacao beans.

(3) Consumers go beyond "donation" and spend on authentic high-quality products.

Profile of Project Company

Dari K Co., Ltd. was founded in March 2011 to manufacture and sell chocolate and other cacao-related products as well as for import and wholesale of cacao beans. The Company was acknowledged by Kyoto City in April 2016 as one of the "Enterprises to sustain upcoming 1000 years" and by the Ministry of Economy, Trade and Industry of Japan in May 2016 as one of the "VIBRANT (HABATAKU) Small and Medium Enterprises 300". In May 2017, Dari K won the "Engagement Award", under SDGs Business Award 2017 awarded by Kanazawa Institute of Technology and BoP Global Network Japan.

17. Generating energy and farming at one place with Solar Farm® technology

Farmdo Group https://farmdo.com/farmland.html

Adaptation Challenge In the agricultural sector, climate change causes (1) production instability, (2) shifting of suitable production areas, (3) soil degradation due to flooding and salinity increase, (4) water shortage, etc. Farmdo Group supports the adaptation to climate change by deploying the Solar Farm® technology internationally which was developed in Japan.

Contribution In a project in Mongolia, local farmers, including many women, have been trained for cultivation both in Japan and in Mongolia. Farmdo Group also contributes to the capacity building of local people through regular technical training on the operation of solar power plant.

Project Detail

Country | Mongolia, Chile

■ Background

Farmdo Group has been developing stores to sell agricultural products directly to processing and delivery systems, and profitable cultivation systems to increase farmers' income and revitalize local economies. As a solution to the growing number of abandoned agricultural land in Japan, Farmland, a members of the group, has owned approximately 180 solar PV sites including about 80 Solar Farm® as of September 2020. International business is currently being expanded to the following two countries, and also being discussed towards business development in other Asian countries such as Malaysia and India.

[Mongolia] Established a joint venture in 2013; Conducted the 5th JICA Preparatory Survey (BoP Business Promotion Survey) in 2013, and was adopted twice in 2015 and 2016 for JCM model project. Its construction was completed. It operates a 10.3MW Solar Farm® with a total of 28 ha.

[Chile] Establish a joint venture in 2019; Adopted for JCM equipment subsidy project in 2019, and 3MW solar power plant is under construction in Nuble, scheduled for completion at the end of 2020. In 2020, applied for JCM model project. Adding to 3MW solar power plant on farmland in Valparaiso, the company is working with Ministry of Agriculture Chile to build a pilot plant of the Solar Farm® , with the aim of spreading to wide range of small and medium-scale farmers.

▲ Solar Farm® in Mongolia

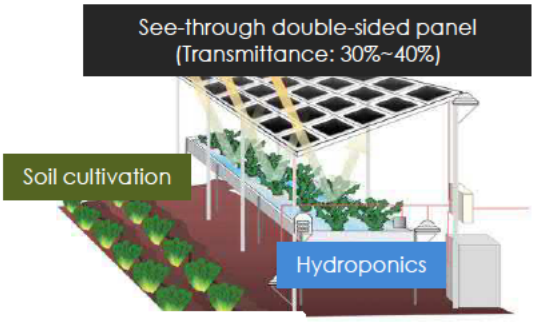
■ Business Model of the Project

Farmdo Group will invest and transfer technology through education and training, and develop solar PV sites with value-added agricultural practices. The profit of the project is distributed to the farmers and the local communities.

Related SDGs

Product & Technology

The combination of agriculture and solar Generation by Solar Farm®, or "Hybrid Agriculture" contribute to renewable energy supply, local agriculture production and sales, and food self-sufficiency ratio. Development of solar panels that can maximize the power generation by appropriate transmittance and double-sided power generation. Use of IoT and sensors for controlling farming that can adapt to climate change in regions with different climates. Hydroponics is effective in places where topsoil is lost due to heavy rainfall or where salinization has occurred, and water-saving agriculture can be pursued. The company is also practicing a labor-saving agricultural method in Japan by combining drop irrigation system, palm grove culture medium (solar growback), and weed prevention sheets, and seek to diffuse this technology overseas.



▲Hydroponic cultivation

▲Soil cultivation

◀isolation cultivation

Key to Success & Challenges for Further Development

- Keys to success are follows:
  - Sustainable system that contributes to local economy by local production for consumption
  - Technology that can produce highly value-added agricultural products, such as safe, fresh, and tasty vegetables, with efficient sales channel
  - Capacity building of local residents by creating local employment and education and training opportunities
  - Deep commitment to business implementation by self-investment
- Challenges for further development are (1) establishment of a price-competitive cultivation management system in each region, climatic conditions and climate change, and (2) business model with the investment partner for the extension of solar farms.

Profile of Project Company

In Farmdo Group, Farmdo Co., Ltd. (development of agricultural products direct sales office and sales of agricultural materials), Farmclub Co., Ltd. (produce and sale of agricultural products and tourist farm), Farm Land Co., Ltd. (development of solar power generation and Solar Farm®)) implement each business and have a corporate philosophy of contributing to the improvement of farmers' income through the effort of all group companies. Established local subsidiaries in Mongolia in 2013 and Chile in 2019. In particular, we are aiming to support adaptation to climate change with Solar Farm® internationally. Solar Farm® technology is patented in Japan, USA, China and Taiwan. In 2013, selected as a regional future leader by the Ministry of Economy, Trade and Industry. In 2017, President Iwai received the polar star order of Mongolia. The activities in Mongolia was highlighted in Annual Report on the Environment in Japan 2019 (White Paper). Utilizing the Joint Crediting Mechanism, Solar Farm® has been promoted in Mongolia and Chile, with the goal of expanding to 30 sites in 10 countries in 20 years.

18. Circular-economy business model established through organic soil afforestation to prevent flood and protect eco system

from far east inc. http://minnademiraio.net/

Adaptation Challenge Frequent drought, flood, typhoon and landslide due to climate change damages the eco system and agricultural industry, which is a key industry in many developing countries.

Contribution Afforestation activity with utilizing organic soil improver by from far east inc. serves for windbreak, prevents landslide and promotes the recovery of eco system as well as contributing to greater productivity of agricultural produce and medical/pharmaceutical ingredients.

Project Detail

Country | Cambodia

■ Background

The Company has operated beauty school in Cambodia since 2013. In collaboration with IKTT (Institute for Khmer Traditional Textiles) for the procurement of dye materials, it developed a comprehensive vegetation plan as adaptation project based on IKTT's forest recovery project called "Traditional Forest" to grow plants for preventing flood. The Company has expanded the business through implementation of the "Climate Change Adaptation Effect Visualization Project" by the Ministry of Economy, Trade and Industry of Japan from 2014 to 2016.

■ Business Model of the Project

The Company has established a circular economy business model in the villages of Cambodia branded "Forest Wisdom" under which afforestation, product development, sales in Japan market (through about 700 shops of Aeon, Tokyu Hands, etc.) as high value-added and re-investment into the environment are carried out. Stable supply of ingredients has been established through the reinvestment of profits into the expansion of afforestation areas.

▲Business Model of the Project

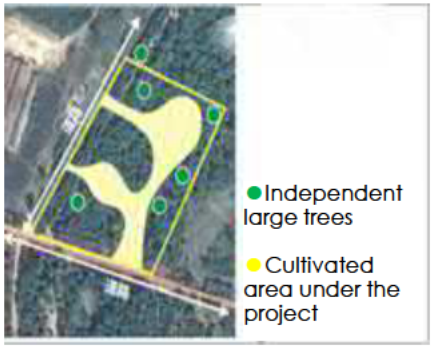
▲Vegetation in the project

◀Products for Japan Market:
(Top Left) Moringa Tablet
(Bottom Left) Moringa Oil
(Right) Organic Shampoo

Related SDGs

Product & Technology

- The Company produces beauty merchandize including cosmetics and hair coloring products. Via its corporate website and effective marketing strategy, distribution network of about 700 shops has been established with major domestic retailors.
- The Company has started selling overseas mainly in China.



◀Vegetation plan

◀Afforestation

◀Cultivation

◀Cultivated plants

◀Oil extraction

Key to Success & Challenges for Further Development

- The Company utilized IKTT's local network and its own expertise as well as the relationship through the MOU entered into with Angkor Thom County to establish circular economy business model that provides local assistance with profits generating.
- While a part of the ingredient processing has been localized, it intends to introduce distillers to the local operation to produce high value-added products leading to higher income of farmers and further development.
- It has expanded planted area through cultivating part of the crop fields along with Sunford Co., Ltd. (Reference: Case Number 15).

Profile of Project Company

from far east inc. was founded in 2003 as a developer and distributor of beauty merchandize. With the management philosophy of "delivering emotional and physical happiness from Japan to the World" the Company introduces high standard technologies accumulated in the Japanese beauty industry to developing countries for the establishment of business together with local community that substantiates "environmental protection = economic development". The Company has launched through its own E-commerce website and domestic retailers in Japan the sale of natural cosmetic products under the "minnade mirai o" (together for the future) brand using the ingredients procured from "Forest Wisdom" project launched in Cambodia in 2014. The achievement of the Project was presented at COP21 held in Paris in 2015. The Project won "SDGs Business Award 2017 Grand Prize" in May 2017, the first initiative organized by the Kanazawa Institute of Technology and BoP Global Network Japan.

19. Rejuvenation of arid areas through high-molecule film farming method

Mebiol Inc. https://www.mebiol.co.jp

Adaptation Challenge Shortage of water and soil egradation triggered by climate change affect the stable food supply and food quality.

Contribution Mebiol Inc. developed a high-molecule film farming method called "Imec®" that enables the production of highly-nutritious agricultural crops under harsh environment as well as creating jobs for local community. The technology serves as an adaptation measure by contributing to greater economic capacity for stable food supply and stronger production base.

Project Detail

Country | UAE, China, etc.

■ Background

The Company was founded in 1995 by Dr. Yuichi Mori who engaged in research and development of membrane/hydro-gel materials used for dialysis and other medical and pharmaceutical products in an attempt for application to agriculture. Approximately ten years were spent for the development of "Imec®", a film farming method to produce safe and highly nutritious agricultural crops. The business in Japan expanded mainly among new agricultural ventures and new entrant farmers. "Imec®" that enables "Agriculture by anyone, anywhere" is increasingly recognized to meet the demand of farmers for recovery and rejuvenation of their farms severely hit by major earthquakes in Japan, or to meet the demand of areas overseas not suitable for farming. The method is accredited for its water-saving effect in desert areas of Middle East and is also becoming popular in China where soil/water contamination is a major concern.

■ Business Model of the Project

The Company is a fabless company with a key business focus on R&D and marketing, sourcing revenues from royalty payments for the patented "Imec®" technology with patent registered in 130 countries. For overseas business, "Imec®" is exported from Japan and farm facilities are procured locally. Sales and cultivation advices are provided by local agents.

▲Chairman Dr. Mori with "Imec®"

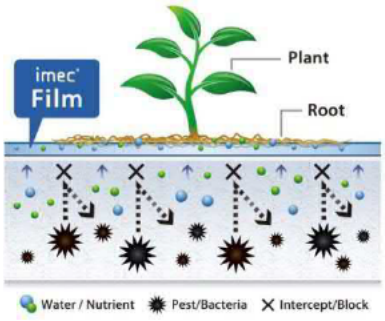
▲Tomato farming by local people

▲Tomato farm in Dubai Desert

Related SDGs

Product & Technology

"Imec®": A sustainable agricultural technology for the production of safe and highly nutritious agricultural crops by applying the membrane and hydro-gel technology developed for medical and pharmaceutical purposes into agriculture. High-molecule films enable the cultivation of diverse agricultural crops such as fruits and leaf vegetables on the films. In March 2018, the technology was newly registered as the "Sustainable Film Farming" on the Sustainable Technology Promotion Platform (STePP) of the Tokyo Office of the United Nations Industrial Development Organization (UNIDO). The main features of Imec® are as follows.



▲"Imec®" Film

- No-soil farming: Only water and nutrients penetrate the nano-sized pores on the films and thus the infiltration of disease-causing germs and viruses will be prevented while saving water.
- High water retention: The films, retaining ample water but keeping dry surface, control the nutrition value (sugar concentration, etc.) of vegetables. Water and fertilizers are much saved as compared to conventional farming methods as the anti-seeping sheets help retain the water and fertilizer supplied from seeping externally.

▲Simple and Affordable "Imec®" System consisting of fluid supply equipment and Cultivation Bed

Key to Success & Challenges for Further Development

Simple and versatile technology

- The technology can be introduced so long as water and power source are provided, and compared to conventional hydroponic culture, it greatly curbs the consumption of water, fertilizer, electricity, heavy oil and labor costs, leading to low-cost and highly profitable farming business.
- The technology can be marketed throughout the world regardless of business environment.
- Despite the need for installation of a water purification equipment along with the technology, the technology well maintains profitability due to low water consumption.

Profile of Project Company

Mebiol Inc. was founded in 1995 as a R&D venture for the purpose of utilizing hydro-gel materials in the agricultural field. In the domestic market, cultivation of high-quality tomato is in a full-fledged operation using "Imec®" which enables high profitability, and the total cultivation area stretches to 40 hectares. In overseas markets, the company launched business in the Middle East, China, Brazil and so on. The company was awarded the "Special Mention Award" of the "University-originated Venture Award - Award for Academic Startups –" by Japan Science and Technology Agency (JST) in 2016, the "Small and Medium Enterprise Agency Director-General's Award" of the Japan Venture Award by SME Support Japan in 2017, the "Japan Techno-Economics Society Chairman's Award" by the Japan Techno-Economics Society in 2018, and "The International Award: Innovative Ideas and Technologies in Agribusiness" by UNIDO ITPO Italy in 2019.

20. High quality mung beans production in salinized lands

euglena Co., Ltd. http://www.euglena.jp/

Adaptation Challenge The issue of soil salinization due to the influx of salt water into rivers and underground water on account of the rising sea level and coastal erosion triggered by climate change are gaining significance.

Contribution By engaging in mung beans production utilizing agricultural technology based on appropriate cultivation management in regions affected by soil salinization, euglena Co., Ltd. has contributed to improving lives of local residents through reducing poverty by generating job opportunities for farmers, increasing income and enhancing nutrition with cultivation technology for better crop yield and quality of mung beans.

Project Detail

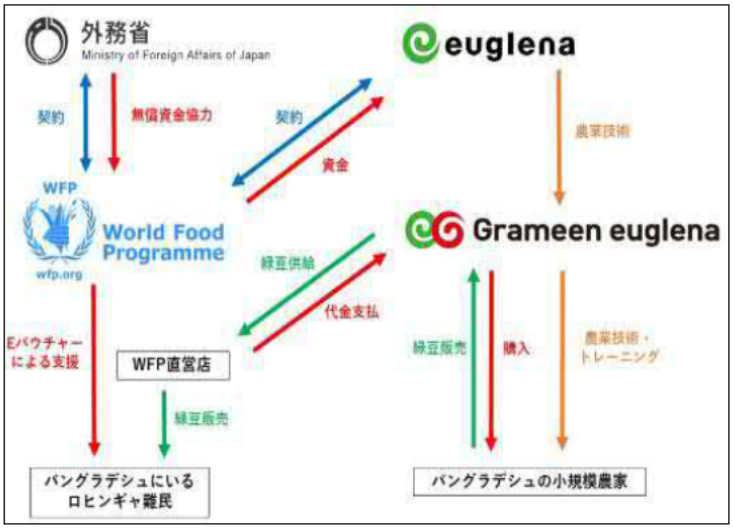
■ Background

Country | Bangladesh

In Bangladesh, euglena Co., Ltd. established a joint venture (currently Grameen euglena) with Grameen Group in 2010. The trigger of business creation was that Mr. Yukoh Satake, Co-CEO of Grameen euglena visited to village area of Bangladesh by study tour and conducted a field survey there. A trial cultivation of mung beans also started in the same year. Through implementation of the "Climate Change Adaptation Effect Visualization Project" supported by the Ministry of Economy, Trade and Industry of Japan from 2012 to 2015, the large-scale cultivations and exports to Japan have started since 2012.

■ Business Model of the Project

Grameen euglena guides farmers on cultivation method, sells mung beans in Bangladesh, and sorts mung beans to meet required quality in Japan to supply mung beans to Japanese bean sprout producers. The project has also started a food support for Rohingya refugees inflowing from Myanmar to Bangladesh through the collaboration with World Food Programme (WFP). Grameen euglena purchases mung beans from contract farmers and utilize the products for food support to Rohingya refugee. The necessary activity costs will use a portion of the grant provided by WFP agreed with Ministry of Foreign Affairs of Japan.



▲Business model

Related SDGs

Product & Technology

- Business model: Sowing seed, Plowing, calcium fertilizer, review of seeding period
- Technical training for process of harvested crop: Drying method by farmer, Sorting method
- Verifying effect of rotating crop: Survey by the field and conditions, survey of root nodule bacteria by the harvest period

▲Sorting mung beans

▲Packing mung beans

Key to Success & Challenges for Further Development

- Success of the Project is largely attributable to its community-based style such as the launch of a Joint venture with local partner which helped to nurture trust with the government of Bangladesh as well as the establishment of a value chain through the development of sales network in Japan.
- The number of contract farmers involved in the Project exceeded 8,600 in 2019 with stable growth. The harvested products have been also utilized for food support to Rohingya refugees since 2019.
- The Project eyes the diversification of crops and harvest areas for further growth of business while contributing to better global environment at the same time.

Profile of Project Company

euglena Co., Ltd. was incorporated in 2005 with the corporate philosophy of "Make People and the Earth Healthy". The Company strives to solve the global food and environmental issues through its business activities such as the research and development, production and sale of microalgae euglena (Japanese name: Midori-mushi (green bug)). The scope of business of the Company leveraged on the technology stretches from healthcare (food and cosmetics) to energy and environment (bio diesel fuel and bio jet fuel). Mung bean project in Bangladesh is one of the businesses which represents its aim of sustainable development of human and the earth. President Mitsuru Izumo of euglena Co., Ltd. was selected as Young Global Leader 2012 by the World Economic Forum (Davos Forum) and won the Prime Minister's Award under the First Nippon Venture Award 2015 as well as the Minister of Education, Culture, Sports, Science and Technology under the Sixth Technology Management and Innovation Award.

21. Smart agriculture achieving a cultivation system resilient to climate change

OPTiM Corporation https://www.OPTiM.co.jp/

Adaptation Challenge Changes in weather patterns and temperature due to climate change make it difficult to ensure the same harvest patterns and crop yields that were previously achieved with conventional farming methods, experience and knowledge. Also, with the rise in temperature, there will be a greater physical burden of farming in extremely hot weather under a blazing sun.

Contribution OPTiM builds resistant cultivation systems by monitoring growth status, determining and analyzing the results, and deciding how to respond to the situation through the combined use of AI, IoT, and robots. This also results in more efficient work and shorter hours working in extreme heat.

Project Details

Country | Vietnam, Indonesia

■ Background

In Vietnam, OPTiM and Vietnam Posts and Telecommunication Group (VNPT Group) signed a MOU for a business alliance to develop AI services and a smart agriculture business. They aim to ensure resilient cultivation systems by introducing pinpointed application of pesticides and fertilization technology in Vietnam, which is a major agricultural country. OPTiM also aims to expand remote operation services in Indonesia under JICA's demonstration program.

■ Business Model of the Project

In Vietnam, VNPT Group serves as OPTiM's local partner to facilitate business collaboration with local logistic companies using its existing network throughout the country. In order to expand its Smart Agri-food Project, which has already been successful in Japan, to Vietnam, OPTiM plans to first demonstrate the technology.

In Indonesia, OPTiM will introduce Optimal Second Sight, a remote operation service provided to agriculture authorities in Boalemo, Gorontalo, and promote understanding through demonstration and workshops with an eye to future expansion of the services.

▲Aerial application of pesticides by drone

Related SDGs

Product & Technology

OPTiM's business involves building cultivation systems resilient to climate change by monitoring growth conditions, determining and analyzing results, and deciding how to respond through the combined use of the following AI, IoT and robotics technologies:

- Pinpointed application of pesticides, and fertilization technology: AI (deep learning technology) is used to analyze field images captured by drones to detect and monitor pests and growth conditions, aiding in Optimal application of pesticides and fertilization.
- Remote operation service, Optimal Second Sight: Allows local workers to share images captured by smart glasses and smartphones with experts, who then provide support by utilizing instruction technology patented by OPTiM.
- Farm work recommendation application: Information necessary for farm work decision making is sent using Optimal Second Sight, images from drones, environment data, etc.

Additionally, OPTiM carries out a Smart Agri-food Project to support farmers concerned about startup costs and skills related to new technologies. This project offers technologies to farmers at no cost. OPTiM purchases products from the farmers, brands them to add value, and then sells them in supermarkets and online. Although the project is currently only implemented in Japan, OPTiM aims to expand this business model to developing countries.

▲Farm land management application

▲Smart rice, a self-produced brand

Key to Success & Challenges for Further Development

- OPTiM has made it easier for farmers to adopt technology by making its profit point the in-house sale of harvested crops, rather than the sale of technology to the farmers. The branding is based on the idea of creating products that end users want, and the distribution network is generated by OPTiM.
- Further technological development is needed to make business sustainable in terms of cost effectiveness.

Profile of Project Company

OPTiM was established in 2000 as an IT venture company, and listed on the 1st section of the Tokyo Stock Exchange in 2015. Since 2015, under the slogan of "becoming a key player in the fourth industrial revolution," OPTiM has been providing solutions to various industries based on AI/IoT platform development, DX, and mobile device management services by collaborating with various companies. In the agriculture business, OPTiM focuses on smart agriculture technologies utilizing AI, IoT and robotics to achieve "fun, cool, and profitable agriculture."

22. Paints for sustainable life

Kansai Paint Co., Ltd. https://www.kansai.co.jp/

Adaptation Challenge Malaria poses serious threats to society and economy in Africa and in Zambia where 33% of the population contracts malaria, it is feared to proliferate with the rise in temperature due to climate change.

Contribution While it is a national goal of the government of Zambia eradicate malaria by 2021, "KANSAI ANTI-MOSQUITO PAINT" developed by Kansai Paint Co., Ltd. is expected to reinforce its prevention as an effective tool of vector control (elimination of pests that transmit infectious diseases). Prevention of growing infectious diseases due to climate change is an adaptation measure, contributing to protecting people's lives, enhancing safety and security in society as well as creating healthy economy.

Project Detail

Country | Malaysia, Indonesia, Zambia etc.

■ Background

In 2013, the Company's subsidiary in South Africa developed and sold anti-mosquito paint leveraged on the tendency of mosquitos to stay on walls and ceilings. The product was subsequently launched in Malaysia and Indonesia in 2014 and 2015 respectively where dengue fever posed serious social threats. In 2017, a field research was launched in Zambia supported by Japan International Cooperation Agency (JICA) with a view towards market penetration in the future. Upon approval of the US Environmental Protection Agency (EPA) in April 2018, the Company has been set to meet global demand. In September 2018, the product obtained an approval by the Zambian government and was sold for the first time in Africa. The Company could start to sale in Uganda also from Jan. 2019, where a government approval was already obtained as well as Kenya and Tanzania as part of the global growth initiatives in the future.

■ Business Model of the Project

The Project is based on public-private partnership with the local government agencies of Zambia, supporting organizations such as JICA and other stakeholders. The Paint was developed taking advantage of the nursery environment and behavioral characteristics of mosquitos. Through the public-private partnership, its effectiveness has been demonstrated to gain greater trust. The Paint was launched for sale as a solution to social challenges upon approval of the governing authorities.

▲Conducting Workshop

Related SDGs

Product & Technology

"KANSAI ANTI-MOSQUITO PAINT" is a product to counter infectious diseases spread by mosquitos. Synthetic pyrethroid ingredient contained in the Paint acts on the nerve system of mosquitos and maintains insecticide effect. The Paint forms anti-mosquito coating once painted on the walls and acts on mosquitos staying on the surface. The anti-mosquito effect stays for at least 2 years. Safety is not a concern as humans and most mammals are able to digest and discharge the ingredient, and therefore the Paint is suitable for most places such as residential, public and commercial estates. The product is expected as a new item to prevent infectious diseases in addition to the conventional vector control such as mosquito net, preventive medicine and application of insecticide. Availability of color choices will facilitate the expansion into interior decoration market, and further into global market.

▲Workmen on training

Key to Success & Challenges for Further Development

- The Company's approach revolves around the pursuit of solution to social challenges faced by many people.
- The product is safe and sustainable in a sense that it simply adds anti - mosquito function to indoor walls.
- The Company has built partnership with local governments, global organizations, NGOs and supporting groups.
- The Company has also established a business model that is compatible to local background.

Profile of Project Company

Kansai Paint Co., Ltd. was founded in 1918 as a manufacturer and seller of diverse range of paints. The Company is ranked 8th largest worldwide for the entire range of paints, and is one of the 5 leading companies in the field of automotive paints. As the second pillar following automotive paints, the Company strives for the reinforcement of construction paints and one of its products for the domestic market named "ALES MUSHIYOKE CLEAN" was awarded the "Best Nikkei Sangyo Shimbun Award" in 2015 which, organized by Nikkei, is accorded to superb products and services. The Company has accelerated its overseas marketing with key focus on Asia, Middle East and Africa where demand for construction paints is growing among the mass target zone of emerging mid-income consumers and it has secured the largest market share in Africa. Under the corporate philosophy of "Supporting human and social development through products and services by fully utilizing technology and human assets built on the paint business", the Company aims at maintaining sustainable contribution to society through its business.

23. Mitigating impact of frequent forest fire on plants and animals

Shabondama Soap Co., Ltd. https://www.shabon.com/

Adaptation Challenge Rise in temperature associated with climate change is said to accelerate dryness in mountainous areas and forests, making them prone to forest fire which triggers air pollution and adversely affect the health of people in a wide range. Loss of forests also aggravates the collapse of ecosystem, impairs food production base due to the impact on food chain and transformation of harvest environment as well as extinction of plants and animals as a resource for pharmaceutical supplies.

Contribution Shabondama Soap Co., Ltd. developed soap-based extinguishing agent without synthetic surfactant agent, used as an eco-friendly yet high-performance fire extinguishing agent which is a foam mixed of water and air that performs quick fire extinction with much lesser water consumption as compared to purely water-based fire extinguisher. Curbing loss of forests associated with climate change serves as adaptation measure in the field of health & sanitation, food security & strengthening food production base.

Project Detail

Country | Indonesia

■ Background

Forest fire in dried peat land is extremely hard to put out and lasts long due to its high content of carbon. Indonesia, where almost half the world's tropical peat land belongs to, is named "Global Powder Keg" and forest fire poses a strong threat to the country. Shabondama Soap conducted a study and demonstration project in 2013 under Japan International Cooperation Agency (JICA) program to demonstrate fire extinguishing agent for peat land in Indonesia.

■ Business Model of the Project

Its sale started in 2015 for major local supplier of fire extinction machinery and materials. Shabondama Soap conducted a market survey in Indonesia from 2016 under JICA program. The Company strives to conserve the habitat of plants and animals through the measures against peat land haze hazard caused by forest fire in dry season, and protection of forests by means of fire extinction. The Company eyes the possibility of local production in future.

Related SDGs

Product & Technology

Soap-based extinguishing agent is mainly made of less-poisonous soap. It not only dissolves fast but is also friendly to ecosystem as its surfactant effective vanishes upon combination with naturally-abundant minerals such as calcium and magnesium. It is highly credited for fast absorption and having no need to be washed away especially in case of architectural fire incident. In 2007, the product received Minister for International Affairs and Communications Award by the Cabinet Office, Japan, for its distinguished achievement in industry-academia-government collaboration. It also attracts much attention as a prospective contributor in countering forest and peat fire in vast land of Southeast Asia, Russia and Australia.

▲Soap-based extinguishing agent

▲Fire extinction

▲Project Briefing to Local Affiliates

Key to Success & Challenges for Further Development

- The soap-based product has widely been accepted in local market for its environmental friendliness and immediate effect in solving the cross-border issue of haze hazard caused by forest fire.
- Stronger cost-competitiveness through local production is the next challenge to achieve a greater share on local market.

Profile of Project Company

Shabondama Soap Co., Ltd. was founded in 1910 as "Morita Hanjiro Shoten" (Shabondama Soap Co., Ltd. since 1975). Since 1974, through its efforts to develop products that are kind to both people and the environment, the Company produce and sell additive-free soaps containing no chemical or synthetic additives. In 2001, upon request from regional fire department in Kitakyushu recognizing the need for fire extinguisher with consumption of less water, which was triggered by the lessons learned from the Great Hanshin Awaji Earthquake where damaged water pipelines aggravated fire disasters, the Company launched a joint development project with the University of Kitakyushu and commercialized soap-based fire extinguishing agent which has been in the market since 2007. Soap-based foam extinguishing agent business in Indonesia meets its corporate philosophy of contributing to society and conservation of planet's environment through its business activities.

24. Preventing spread of infectious disease associated with climate change

Sumitomo Chemical Co., Ltd. https://www.sumitomo-chem.co.jp/

Adaptation Challenge Rising temperature associated with climate change is feared to transform and expand the habitat of infectious disease vector and host organism, leading to the outbreak of infectious diseases and increase in the number of patients in new territories.

Contribution Sumitomo Chemical Co., Ltd.'s "Integrated Vector Management (vector pest eradication)" based on the strong technology of the Company serves as adaptation measure in the field of health and sanitation.

Project Detail

Country | Tanzania

■ Background

"Olyset® Net", a mesh screen woven with insecticide agent against malaria, was developed in an attempt to help contain the serious outbreak of malaria in Africa by applying the conventional technology used for mesh screen in factories as bug shield. In response to the World Health Organization (WHO) recommendation of mosquito net woven with insecticide agent as opposed to its conventional approach of encouraging diffusion of insecticide agent, the Company filed the product with WHOPES, an evaluation scheme under the WHO group in 2000, and was granted its recommendation as the world's first mosquito net with long-lasting effect. Since then, the product developed into an integrated solution as the "Integrated Vector Management" in collaboration with a range of technologies including space dissemination and larva prevention, etc.

■ Business Model of the Project

Collaboration with public bodies: Based on recommendation by international organizations, such as WHO and developing country governments, "Olyset® Net" is supplied to more than 80 countries through international organizations including the Global Fund and United Nations Children's Fund (UNICEF). Production is carried out locally near consumers through collaboration with overseas companies. The product produced locally by a joint venture with a Tanzanian company and has contributed to the development of local economy through the creation of job opportunities backed by maintaining production capacity to meet global demand together with the production base in Asia.

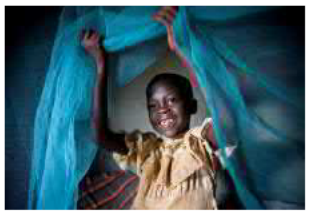
Related SDGs

Product & Technology

Mosquito-repelling net with long-lasting effect (Olyset® series): To counter malaria, the net is made of polyethylene woven with pyrethroid insecticide that gradually releases agent through "Control-Release" technology, which is more durable than polyester and the repellant effect lasts more than three years. The product includes Olyset® Net to Olyset® Plus with intensified effect.

New active residual diffusion agent (SumiShield® 50WG): To counter malaria, the product is a residual diffusion agent for indoor use that contains clothianidin as the effective agent. The product effectively works on malaria vector mosquito which is resistant to the conventional pyrethroid or carbamate-type residual diffusion agent with great residual effect.

Spray agent (SumiPro®EW): To counter dengue and zika, the product is composed of metofluthrin, a highly-active agent to knock down mosquitos (Eminence®/SumiOne®) and cyphenothrin with a strong fatal effect (Gokilaht®-S) as well as PBO, a synergist for augmented effect. The product is suitable for dense and small spraying or smoking , and far reaching.



◀Child elated with "Olyset® Net"

Photographs © M.Hallahan

Larva prevention agent with long-lasting residual effect (SumiLarv®2MR): To counter dengue and zika, the product has an effect to prevent mosquitos to emerge from pupas. It has a long-lasting residual effect compared to conventional products.

◀Manufacturing Factory of "Olyset® Net"

Photographs © M.Hallahan

Key to Success & Challenges for Further Development

- Extensive introduction of Olyset® Net was achieved by promptly responding to the policy change of WHO as part of the anti-malaria measures and swiftly obtaining its recommendation, as well as by making proposals to the developing country governments including its approval process.
- Top management commitment enabled "Local first" principle which led to mass production structure through cooperation with local companies that led to the creation of a unique distribution structure.
- Despite the difficulty in the effective protection of products with patent due to competing products, the Company aims at a greater market share under the Sumitomo Chemical brand by exerting a range of technologies based on the accumulated data on ecosystem and environment in each region.

Profile of Project Company

Sumitomo Chemical was founded in 1913 for the purpose of mitigating impacts of pollution by producing fertilizer from sulfur dioxide, a byproduct of copper refinery process. Since then, the Company has been working to create economic value and social value in an integrated manner. The Company and its over 100 group companies currently supply an array of products worldwide to support many industries and people's lives and is the world's largest supplier household pesticide ingredients. The Company is engaged in "Sumika Sustainable Solutions", the in-house product certification scheme to recognize environmental contribution including adaptation and is a recipient of the GBC Health Business Action on Health Awards 2012 and the Minister of Foreign Affairs' Award under the Japan SDGs Award 2018 for its dedication to social and environmental activities including "Olyset® Net".

25. Bicycle-type water purification system for securing a clean water supply

Nippon Basic Co., Ltd http://www.nipponbasic.ecnet.jp/

Adaptation Challenge Due to the impact of climate change, it is becoming increasingly difficult to obtain drinking water. At the same time, there is a greater awareness about the importance of washing hands with clean water to reduce the spread of viruses.

Contribution Nippon Basic's bicycle-type water purification system contributes to securing a clean water supply by purifying river water. The equipment is operated without the use of electric power, thus providing access to safe water even in areas where power is not supplied.

Project Details

Country | Bangladesh

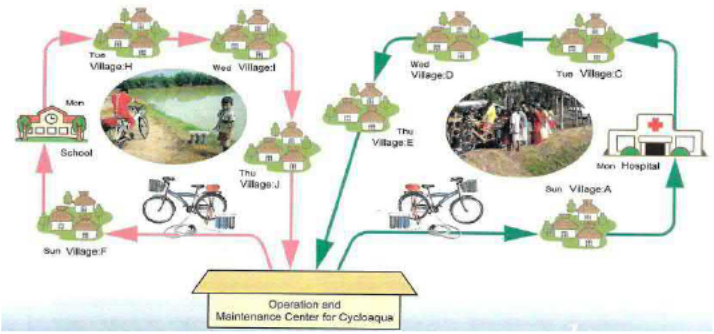
■ Background

To secure drinking water for emergencies, Nippon Basic previously produced a bicycle-type water purification system (Cycloclean) in Japan; however, as the company's manufacturing staff grew older, domestic production became difficult. After its product was adopted for JICA's BOP business promotion survey and a program for supporting overseas expansion of SMEs, the company launched a survey in Bangladesh and disclosed its techniques to a local bicycle manufacturer. With the support of a fund, Nippon Basic began local production of Cycloaqua to export products to Japan.

■ Business Model of the Project

Currently, Nippon Basic is involved only in the production side in Bangladesh; however, it also plans to sell its product locally in the future. The company aims to first sell the system, and then replacement filters consisting of 3 layers (pre-filter, hybrid carbon filter, and MF hollow fiber membrane filter) on a regular basis. The company imports MF hollow fiber membrane filter from Japan since it cannot be procured locally. Because the filters are expensive for local residents, Nippon Basic aims to teach locals how to maintain filters by cleaning them with a detergent specially developed by its local partner to extend the useful life of the filters.

▲Cycloaqua



▲Operation diagram of Cycloaqua

Related SDGs

Product & Technology

To purify water with Cycloaqua, a bicycle mounted with the product is pedaled, causing a pump in the box on the backseat to draw river water and filter it into drinking water. Bicycles with built-in pump boxes are produced in Bangladesh. Nippon Basic succeeded in lowering the cost of production of the Bangladesh model by 75-80% by downgrading the pump.

The water purification element consists of 3 layers (pre-filter, hybrid carbon filter, and MF hollow fiber membrane filter) and is able to purify 20-30 tons of river water per unit.

▲ Cycloclean (former product name) purifying water for distribution among local residents affected by flooding

Key to Success & Challenges for Further Development

- Business is being developed with trusted local business partners.
- People will recognize the value of the product by using it, but it is difficult to encourage people to make the initial purchase, so a free trial is needed. Another challenge is funding.
- The company believes that product development from the viewpoint of locals is key, and accordingly targets local production for local consumption. It may also be necessary to downgrade the product to allow for low-cost development.

Profile of Project Company

Nippon Basic was established in 2005. Its main products are a compact water purification system and compact desalination system. Domestic customers (e.g., apartment managers and gyms) buy bicycle-type water purification systems to secure drinking water in the case of an emergency. The company is now shifting its business focus to developing countries with limited access to drinking water.

The company also sold its compact desalination system (Desaliclean 9000) to Oxfam, and that product supported local residents in securing drinking water in the southernmost point of Bangladesh, where sea water entered the river due to global warming. In addition, Nippon Basic collaborates with Oxfam to teach proper handwashing techniques to local people with water purified using Cycloaqua to prevent the spread of COVID-19.

26. Curbing damage from floods through ICT

FUJITSU LIMITED http://www.fujitsu.com/jp/

Adaptation Challenge Floods caused frequently by abnormal weather conditions trigger overflow and inundation of rivers in areas with poor sewage/wastewater infrastructure as well as damage to agricultural crops and health such as infectious diseases caused by polluted water. In addition, widespread overflowing of heavy metal substances from mines upon heavy rainfall has become serious problem in areas where mining is the major industry.

Contribution "FUJITSU Cloud Service K5 IoT Platform", an IoT data utilizing infrastructure, is an cloud service catered to IoT that supports fast structuring of IoT system, secure data management, and stable data collection. Combining the Platform with various sensor technology, such as the water quality measurement sensor enables grasping of the changes in river and water quality, leading to early prevention measures to respond to expected damages in linkages with disaster analysis solutions.

Project Detail

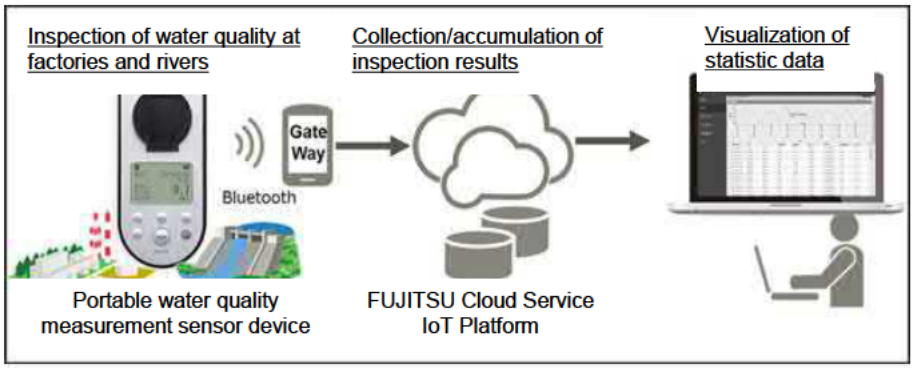
Country | Vietnam

■ Background

As part of the Company's core Cloud business, the Company promotes collaborative business in various areas including energy, environment, medicine and transport. One of the examples of utilizing the FUJITSU Cloud Service K5 IoT Platform (IoT Platform) is the collaboration with OPTEX Co., Ltd., a global supplier of sensor devices for industrial use for industrial and river water quality measurement carried out between 2015 and December 2018 in China and Vietnam. By measuring the river water using the portal sensor and then transmitting the detected information (data) to the "IoT Platform" for analysis, real-time collection of water quality information, which conventionally could only be obtained through physically visiting the area, was made possible.

■ Business Model of the Project

Establishment of the new business model through provision of cloud-type IoT data utilizing infrastructure service to government agencies as well as measurement and sensor service providers.



►Visual image of "FUJITSU Cloud Service IoT Platform" for measuring water quality

Related SDGs

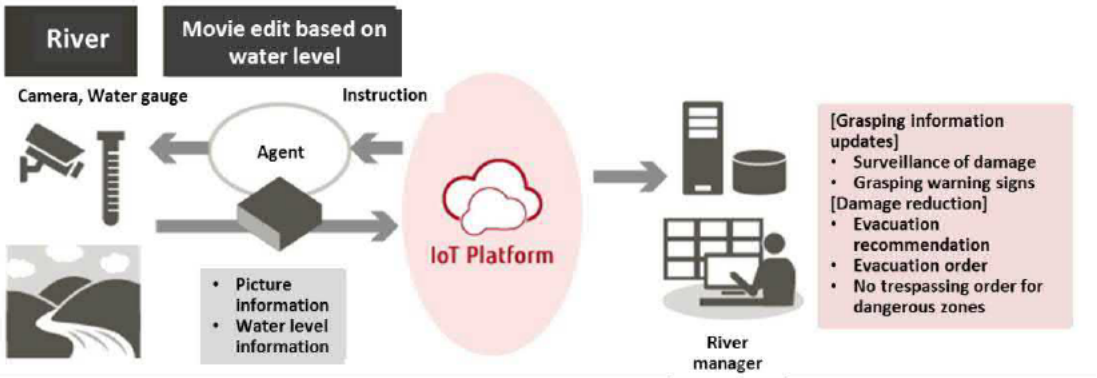
Product & Technology

"FUJITSU Cloud Service K5 IoT Platform", an IoT data utilizing infrastructure has the following features.

Quick IoT system development: Basic functions required for IoT are provided together as a set (data management, maintenance and search, access restriction, event detection and notification, etc.).

Secure data management: Access authority can be established for accumulated data in detailed classification, enabling secure data sharing and utilization between users and their clients.

Supporting stable data collection: Fujitsu's unique technology for optimization of system as a whole enables efficient and stable data collection amidst fluctuation in data traffic.



▲Visual image of utilizing "FUJITSU Cloud Service K5 IoT Platform for the management of rivers

Key to Success & Challenges for Further Development

- It has been difficult to collect data from widespread areas using the conventional water quality testing method because collected water needs to be brought to lab for testing, requiring labor and time. By combining the portable water quality measurement sensor with "FUJITSU Cloud Service K5 IoT Platform", data collection and analysis is made easy and quick, meeting the demands of developing countries for affordable water quality measurement and data analysis.
- In addition to water quality measurement, "FUJITSU Cloud Service K5 IoT Platform" can be applied through quick system development and process development of information (data) collection to fast wide ranging areas, such as goods production sites, and agriculture.

Profile of Project Company

FUJITSU LIMITED, established in 1935, is an ICT service provider in various fields. The Company is also a comprehensive solution provider ranging from the development, manufacturing, and sale to servicing and operation of the latest, high-spec and high-quality products and electronic devices that underpin the ICT services. Under the mid-to-long term environmental vision until 2050 titled "FUJITSU Climate and Energy Vision", the Company is a front-runner in its own "decarbonization" through ICT and presses ahead with mitigation of climate change and adaptation by offering the know-how on decarbonization and its digital technology to clients and society.

27. Facilitating countermeasures against climate change through Big Data

Remote Sensing Technology Center of Japan https://www.restec.or.jp/

Adaptation Challenge Changes in the pattern of rainfall and temperature particularly pose a serious threat to developing countries of which the economy is mostly dependent on traditional agriculture.

Contribution The eco system recovery through forest conservation projects by Kanematsu reinforces physical response capacity to weather events and mitigate disaster risks. In addition, disaster information system built by Hitachi utilizing a flood simulator called DioVISTA/Flood contributes to minimizing the impact of disasters on human, etc.

Project Detail

Country | Thailand, Myanmar

■ Background

RESTEC has operated the satellite observation for over 35 years as a remote-sensing specialist agency, ranging from receiving and processing of the Earth observation data, development, revision and verification of the ground systems and data provision for users. As international cooperation is inevitable in conducting observations on a global scale, RESTEC has been engaged in various international activities through partnership with organizations, such as the Japan Aerospace Exploration Agency (JAXA) and Asian Development Bank, including assisting Thailand for flood observation in response to the major flood that struck Bangkok in 2011 and providing information on food supply and agricultural meteorology for Asian countries. In 2014, in cooperation with Sompo Holdings, Inc (Reference: Case Number 34) that had already launched "Weather Index Insurance" for farmers in Thailand, RESTEC successfully addressed the issue of poor infrastructure for weather observation and lack of historical meteorological data that had hindered the development of such insurance and developed one in Myanmar. The "Weather Index Insurance" utilising the rainfall estimates taken from satellite data is the first-of-its kind activity by a Japanese entity.

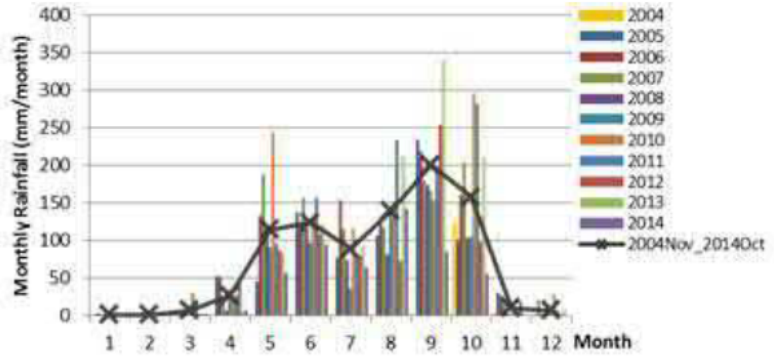
■ Business Model of the Project

RESTEC offers statistic processing of the rainfall data from JAXA satellites (GSMaP data) for "Weather Index Insurance" project in Myanmar by Sompo Japan and contributes to visualisation of the data. The next step is offering the a smart-phone application for local farmers.

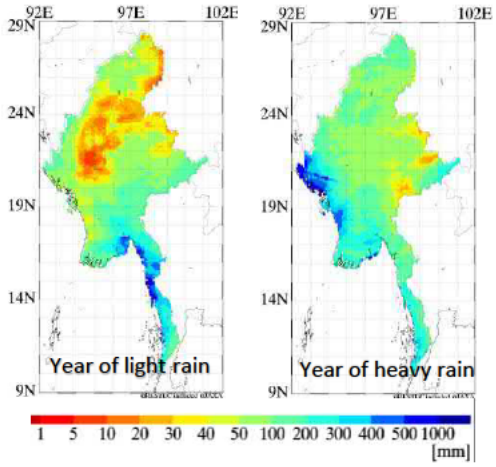
Related SDGs

Product & Technology

The observation equipment (sensors) loaded on satellites, applied with the remote-sensing technologies that enables remote observation of the Earth's surfaces, provides users with the data collected from satellites, aircrafts, automobiles, observation towers, ships and buoys and makes contributions across such fields as forestry management, water resource management, food safety and security, disaster observation, and national land management.



▲Comparison of monthly cumulative rainfall at discretionary areas in years from 2004 to 2014, displaying the differences from the annual average rainfall of each year.



▲Cumulative rainfall map for the month of May in Myanmar, showing the differences of year 2005 with less rainfall and year 2010 with more rainfall

Satellite rainfall data are adopted for monitoring of monthly cumulative rainfall and comparative analysis with past data. Visualized results will be provided to users.

Key to Success & Challenges for Further Development

For greater awareness across the private sector and social impact, the forthcoming initiatives will be as follows:

- Highlighting the value of remote-sensing data to the society through the extended deployment of applications which will facilitate the infrastructure incorporating both tangible and intangible elements.
- Contributing to the achievement of Society 5.0 and SDGs through a business model established on 4Cs – Customer Value, Cost, Convenience and Communication.

Profile of Project Company

RESTEC was established in 1975, and launched the operation of image analysis equipment in 1976 and satellite data distribution business in 1978. Since then, RESTEC has consistently built up a range of remote-sensing technologies ranging from the operation of satellites to the receiving, processing, and analysis of observation data. Based on these technological capabilities, RESTEC has aggressively pressed ahead with developing human resources through training and cooperating with other agencies on international projects. By providing users with the data collected from satellites, aircrafts, automobiles, observation towers, ships and buoys through the remote-sensing technologies, RESTEC strives to contribute across a range of fields including forestry management, water resource management, food safety and security, disaster observation, and national land management.

28. The world's lightest & most compact X-band weather radar enables real-time monitoring of local extreme weather

FURUNO ELECTRIC CO.,LTD. https://www.furuno.com

Adaptation Challenge Due to the impact of climate change, localized weather disasters are becoming more frequent and extreme in many parts of the world. Intense urban precipitation, river flooding, and landslides are causing greater harm to humans, infrastructure and industry, as well as negatively impacting the economy.

Contribution Furuno's compact X-band weather radar can quickly and precisely detect local weather changes that have been difficult to observe with conventional large radar systems, contributing to reducing the damage caused by localized heavy rainfall disasters. In addition, the low-cost and lower-power consumption design of the radar will enable use in developing countries and municipalities that have had difficulty in introducing weather radars.

Project Details

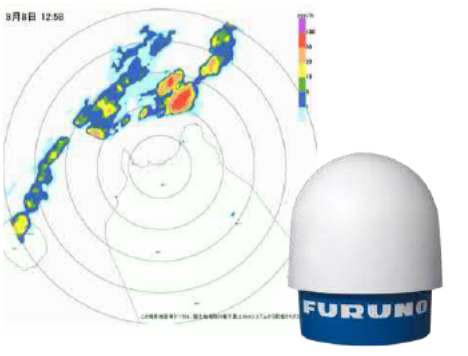
Country | Vietnam, Indonesia, Singapore, etc.

■ Background

Since Furuno successfully commercialized the world's first practical fish finder in 1948, it has maintained the leading global market share in marine radar technology. In 2008, sudden and localized torrential rain caused the Tsuga River in Kobe to rise sharply, resulting in a water-related accident. To prepare for such disasters, Furuno started R&D of a compact radar in 2009. Since its launch in 2013, around 90 units have been in operation in Japan and abroad as of 2020.

■ Business Model of the Project

Sudden floods and landslides caused by short-term localized heavy rains are a frequent occurrence in developing countries located in the tropics. Furuno will promote the introduction of compact X-band radars and provide weather observation and disaster prevention monitoring solutions to governments and municipalities in developing countries that have had difficulties in introducing conventional large radars due to the costs. It will create new markets and applications by enabling simple, low-cost installation and operation.



▲Meteorological monitoring system

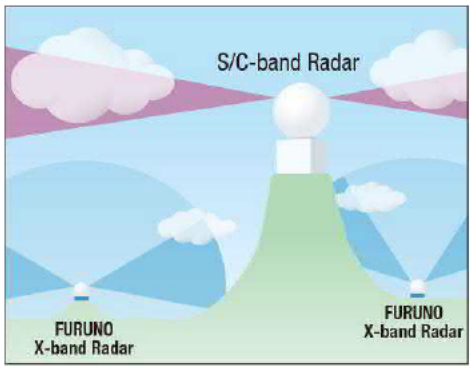
Related SDGs

Product & Technology

Furuno's compact X-band weather radar is the world's smallest and lightest weather radars at about 1 m in diameter and 68 kg. Not only does it save space and allow for installation by hand in existing buildings, but it also significantly reduces installation costs and construction time. Unlike conventional C-band radars, it allows for precise observation of rainfall in a narrow observation area. It can be installed in urban and mountainous areas and enables responses to local disasters such as torrential rains. In addition, the low-cost, low-power consumption design will allow it to be introduced to governments, municipalities, research institutes, and private companies in developing countries.

▲Installation by hand

▲Installation example (Vietnam)



▲Comparison with large radar

Key to Success & Challenges for Further Development

- Furuno's compact X-band weather radar is advantageous over other products due to its small size, light weight, and a design that allows for easy installation and maintenance.
- The product has a potential market in developing countries due to its low-cost and low-power consumption design and ability to be operated using household power sources.
- Although the cost is lower than conventional products, governments of developing countries and local governments have limited financial resources.

Profile of Project Company

Since being the first in the world to commercialize a fish finder in 1948, Furuno has provided many world-first and Japan-first products in the field of marine electronics based on its unique ultrasonic and electronic technologies. With sales offices in more than 80 countries around the world, the company has built a solid position and brand as a comprehensive manufacturer of marine electronics equipment on a global scale. Furuno integrates the knowledge, experience, skills, and know-how cultivated in its business with the three core technologies of sensing, signal processing, and information and communication technologies to provide solutions not only for the marine industry, but also for various industrial sectors.

Furuno's Meteorological Observation System won the Best Resilience Award in the corporate and industrial category at the 2017 Japan Resilience Awards, which is sponsored by the Resilience Japan Promotion Council.

29. Securing sufficient and clean water through ion exchange membrane

AGC Inc. http://www.agc.com/

Adaptation Challenge Issues surrounding water have increasingly become serious worldwide caused by water shortages due to drought and other meteorological phenomena as well as rise in salt content in underground water. At the same time, drainage regulations have been tightened to protect the surrounding environment and secure the quality of water.

Contribution AGC Inc.'s water purification system, where water is purified and desalinated using ion exchange membrane, will ensure stable supply of water suitable for agriculture and drinking and contribute to better health and sanitation of the surrounding environment and residents.

Project Detail

Country | Israel, China, India

■ Background

In response to enquiry from an Israeli public organization plagued by high level of salt content in well water exceeding World Health Organization (WHO) benchmark in the late 1990's, the water purification system was installed in more than 10 sites. Subsequently the demand rose in China where drainage regulations have been tightened and the system was introduced together with ZLD (Zero Liquid Discharge) facilities to purify water and recover valuables such as sodium sulfate at industrial plants. Activities are under way for the system to be installed in India where shortage of water caused by drought and contamination of underground water are getting increasingly serious.

■ Business Model of the Project

AGC has designed the electrodialyzer at the heart of the system and exports the core technology ion exchange membrane. The electrodialyzer and accessory units are manufactured by local engineering partners and delivered as a system to the clients such as government agencies and private companies.

◀Electro Dialysis Purification System

Related SDGs

Product & Technology

Electro Dialysis Purification System: By combination of electricity and ion exchange membrane developed by AGC called "SELEMIONTM", ionic substances dissolved in water are separated for desalination. Water is then ensured safe to drink or suitable for daily life and agriculture. The system is characterized as follows:

・ Resource-saving: Ion exchange resin used in soft-water equipment loses its performance upon buildup of hard substances during use. The system requires no regeneration process for the removal of hard substances to recover the performance and therefore the dosage of medical agent can be cut significantly.

Energy-saving: Water is utilized more efficiently than the conventional RO (Reverse Osmosis) process and power consumption is less as high-voltage pump is not required.

Countering unstable power environment: Powered by direct current and leveraged on solar panel system, the system can be installed on a site where power source is limited.

▲Water treatment image

Key to Success & Challenges for Further Development

- The products have been widely accepted by local communities due to the customized system that meets the local requirements and regulations.
- The Company strives to raise cost efficiency through various measures, such as the creation of value chain in China based on the recovery of valuable materials and improvement of local production ratio which will remain a key for greater cost competitiveness for future development.

Profile of Project Company

AGC Inc. was founded in 1907, extending an array of business globally in 4 fields of glass, electronics, chemical products and ceramics. The Company has the world's top share in float plate glass, automobile glass, quartz materials for stepper lens and fluorine resin. Upholding "Look Beyond" as the group vision, the Company strives to contribute to a "better earth and society" through all the projects and social activities under which energy-saving and energy-generating products have aggressively been developed and supplied. "SELEMIONTM" is regarded as one of high value-added products and services that provide safety, security, and comfort that contribute to society. The Company has been incorporated into several SRI indexes such as MSCI Global Sustainability Indexes and FTSE4Good Index Series.

30. Development of a tourism city through water treatment

Sanicon Co., Ltd. http://www.sanicon-group.com/
Accrete Co., Ltd. https://www.accrete-inc.com

Adaptation Challenge Water pollution and its shortage frequently caused by climate change pose threats to regional water resources and industrial development.

Contribution Water purification technology of Sanicon and Accrete contributes to the provision of safe and secure water by maximizing the underground water resources of each region.

Project Detail

Country | Vietnam

■ Background

Sakai City and Binh Dinh Province of Vietnam have enjoyed a long-term exchange, such as interaction between local companies and student exchange through Consulate-General of Vietnam in Osaka. The Provincial delegation, with perspectives to develop economically while protecting environment, visited the water purification and treatment facilities that Sakai City-based Sanicon Group has planned, designed, installed and maintained, which led to the provision of guidance on maintenance and operation in the Province. Among them, CONSTRUCTION JOINT STOCK COMPANY 47 (CC47), a major local company in the growing tourism industry was planning a water purification project for well water in their hotel premises to ensure the supply of safe water at their own hotels, and was keen to introduce the technology of Sanicon. Thereafter in May 2017, well-water purification facilities were introduced to Seagull Hotel by leveraging on the water supply knowhow of Sanicon and water purification technology of its group company Accrete, which enabled the supply of safe and secure water for tourists and paved a way for sustainable development of the local economy. Based on this experience, the local community has begun to consider the use of water purification system in general hospitals and schools.

■ Business Model of the Project

Upon site visit in Vietnam by a mission consisting of the Osaka Chamber of Commerce and Industry, the Kansai Bureau of Economy, Trade and Industry (METI-KANSAI) and Sakai City, a local entity was established in Ho Chi Minh City in 2008 aimed at business with Japanese companies operating in Vietnam. In 2014, a wholly-owned local entity of Sanicon was established in Hanoi and in 2017, another wholly-owned local entity was established in Qui Nhon City, Binh Dinh Province for import of core technology from Japan and delivery of equipment to Seagull Hotel, as well as providing guidance on construction, maintenance and management. Engineers are dispatched regularly from Japan for sales promotion and providing technology guidance.

▲The view of the area with rising sea level

▲Seagull Hotel along beautiful coast line

Related SDGs

Product & Technology

UF membrane (Ultrafiltration membrane) water treatment: The treatment successfully eliminates germs and viruses. By creating parallel flow to the membrane surface, turbid substances and colloids in the water supplied to the membrane are reduced to prevent them from accumulation on the membrane surface while being filtered which is called the cross flow filtration method. As compared to more common and affordable RO membrane (reverse osmosis membrane), the method enables reuse of 95% of the water to be filtered with greater power efficiency of the pumps and longer durability and thus is fit for use in developing countries. Also, UF membrane is capable of leaving hardness and ion levels at the optimum level so local flavor is maintained while safety is assured, as opposed to RO membrane that removes salt and ion to the extreme.

Guidance on maintenance and management method: A comprehensive flow of construction, ordinary maintenance and operation is based on the Japanese method for sustainable supply of safe water including orderly maintenance around the septic tank and water supply facility, opening/closing of covers, existing water receiving tank and resin coating of the inner surface of the elevated water tank, etc.

▲Water purification equipment

▲Team of Japanese and Vietnamese engineers

Key to Success & Challenges for Further Development

- Strong connection with Binh Dinh Province established through a long-term exchange between the Province and Sakai City facilitated the establishment of local entity and granting of license. In addition, acceptance of technology was mainly because of the construction, maintenance and management guidance provided at the same time.
- In Binh Dinh Province, demand for water infrastructure is rising for large resort facilities and village areas but the key for water purification technology to gain awareness is to raise awareness for the need of water treatment technology, maintenance and management. The project is focused on the sale of equipment system that accompanies a contract of maintenance and management simultaneously.

Profile of Project Company

Sanicon Co., Ltd. was established in 1972 upon reorganization of the former Kansai Water Treatment Plant Management Center founded in 1970 as part of the expansion of their business, and started construction, maintenance and management of water supply and treatment facilities as its main business. The Company launched technology cooperation with Vietnam in 1997. In 2006, Accrete Co., Ltd. was established as a subsidiary which focuses on development of optimal system making use of various water treatment technologies. Under the corporate motto of pursuing the optimal solution for securing, purifying and recycling limited water resources which is imperative for life while aiming for the preservation of sustainable global environment, the Company strives to protect human health, and seek security and safety of people's living through its projects both in and outside Japan.

31. Contributing to the reduction of non-revenue water and stable supply of safe water by detecting leaks from buried water pipes

Suidou Technical Service Co., Ltd http://www.suidou-tec.co.jp/

Adaptation Challenge Technology and products on water leakage inspection by Suidou Technical Service Co. Ltd (STS) enable to inspect and identify water leakage on the buried water pipe which is main cause of Non-revenue Water (NRW). Improvement of the NRW contributes to adaptation for reduction and deterioration of the water resource due to the climate change.
In the case of low water pressure or hurly water supply, leakage hole of the water pipe can take up alien substances and cause tap water contamination. In addition, underground leakage can cause secondary disasters such as road collapse.

Contribution Contribute to the stable management of water utilities and the supply of safe and secure water to users.

Project Detail

■ Background

Country | India, Vietnam

India: By utilizing the JICA Project Formulation and Dissemination/Demonstration scheme between 2013 and 2017, it has contributed to reduction of water leakage rate, improvement of water supply service, soundness of water supply business for Bangalore Water Supply and Sewerage Board as counterpart organization. After the end of the project, a NRW countermeasure department was set up within the department. Subsequently, in 2017, with the support of the JETRO Specialized Program and JETRO Bangalore Office, STS received a direct contract from the Karnataka State Government to conduct training on water leakage surveys for the staff of the Waterworks Bureau. Currently, STS aims to expand its business in India in partnership with a local infrastructure company.

Vietnam: From 2013 to 2016, through a public-private partnership between JICA and Yokohama City Waterworks Bureau, STS participated in the "Safe Water Supply Project in Vietnam with Private Technology in Yokohama" and implemented a project for Hue Water Corporation in Vietnam. The corporation highly valued STS's leak detection technology and concluded an MOU with STS. STS is currently providing training on water leakage surveys to other water utilities in Vietnam in cooperation with Hue Water Supply Corporation, to improve the operation of water utilities by reducing non-revenue water, and to ensure safety and security in provision of water in Vietnam.

■ Business Model of the Project

The following three businesses related to water leakage investigation are core overseas businesses; (1) Provision of on-site water leakage investigation service by STS investigators, (2) Conducting training for measure on non-revenue water for water utilities, and (3) Sales of "L-sign", a water leakage monitoring device. In addition to the above two countries, it has been exhibited at domestic and overseas exhibitions.

Related SDGs

Product & Technology

- Water leakage survey including detection and location of potential leaks from buried pipes by sound hearing using water leak survey equipment by investigators
- Training for human resources development to reduce non-revenue water, including technology transfer of water leakage investigation
- Provision of L-sign & L-Chaser, water leakage monitoring equipment In the adaptation business in developing countries, the focus is on technology transfer of intangible assets, such as knowledge, sound hearing technology, know-how, and processes for actually detecting leaks locally, rather than providing equipment. If local staff can acquire STS's survey technology, NRW due to water leakage can be reduced. NRW reduction is equivalent to additional water resources development, which not only makes efficient use of water resources but also minimizes environmental impact. Energy efficiency in water intake, water treatment and water transfer can be improved, which can contribute to mitigating climate change.

▲Water leakage monitoring equipment L-sign / L-chaser

▲Water leakage survey training

▲Identified water leakage point

Key to Success & Challenges for Further Development

- First of all, utilizing subsidy schemes of government agencies and local governments such as JICA, JETRO, IDEC, and the Yokohama City Waterworks Bureau, they implemented projects internationally and built trusting relationships with government agencies of partner countries.
- In addition, it has taken an approach to collaborate with local private companies and work toward continuous project formulation for water utilities. Utilizing the Ministry of Economy, Trade and Industry's internationalization internship project, the company accepted an intern from Indonesia in 2019 for further development. The intern will be hired from 2020 to expand business in Indonesia. Aiming for diversity management.

Profile of Project Company

Suido Technical Service Co., Ltd. was established in 2002 as a specialized company for water leakage investigation. Its goal is to create a sustainable society where everyone can receive the benefits of water with peace of mind by contributing to the sustainable supply of safe and secure water through our business activities. Its mission is to provide a stable supply of safe water through prevention from water leakage.

In 2018, STS was selected by the Ministry of Economy, Trade and Industry's Small and Medium Enterprise Agency as "300 small and medium-sized enterprises and small businesses in 2018."

32. Curbing flood damage and solving water shortage with rainwater storage system

SEKISUI CHEMICAL CO., LTD. https://www.sekisui.co.jp/

Adaptation Challenge Water shortage brought upon by drought due to climate change results in damage in agricultural production. At the same time, increase of extreme weather events leads to growth in flood damage.

Contribution "CROSS-WAVE", a rainwater storage system developed by SEKISUI TECHNO MOLDING CO., LTD., a subsidiary of SEKISUI CHEMICAL CO., LTD., contributes to the reduction of flood damage at heavy rain. In addition, a rainwater storage stores rainwater and is used as a rainwater tank.

Project Detail

Country | India

■ Background

In India, factories must be built equipped with mandatory rainwater storage facilities to counter chronic water shortage. Against such background, the Company entered into the overseas market in 2010 and achieved 10,000 over deals both in the domestic and overseas markets as of 2020. Rainwater, in general, is stored in a pond created on the factory premises but CROSS-WAVE which can be installed underground of the parking space, etc. meets the demand of many project owners. The Company has also extended projects in overseas countries such as Taiwan and Indonesia where the typhoon induces serious flood damage. ASEAN is eyed as the next target.

■ Business Model of the Project

A local subsidiary of the Sekisui Chemical Group leads the projects in each country through collaboration with local consulting firms and sells the products through distributors. The products are manufactured locally in India and imported from Japan in other countries.

▲Installation of CROSS-WAVE

Related SDGs

Product & Technology

CROSS-WAVE: Rainwater storage systems that enable recycling of rainwater by controlling the influx of rainwater to the sewage pipes and rivers at heavy rain, used as plastic materials to store rainwater in underground storage tanks for recycling or control of outflow. The systems have following advantages as compared to the concrete storage tanks.

- Short construction period and affordable cost.
- Recycled plastic materials that contribute to low emission of carbon dioxide in the product lifecycle.
- Load capacity design that enables the use of land above for parking space, etc. while preventing land subsidence.

▲CROSS-WAVE

- High porosity that creates underground space to retain water for the outflow control and effective use of rainwater, as well as slow release of rainwater upon temporary storage after torrential rain to prevent overflow. Rainwater in the storage can be used to water fields and flush toilets.

Key to Success & Challenges for Further Development

- The Product has successfully been adopted in India as a result of close cooperation with local governments at the onset of drafting standards.
- The Company strives to build close relationship with local governments through collaboration with consulting firm familiar with local affairs.
- Another reason for the Product to be readily accepted by countries is its resilience and simplicity for construction work and maintenance that originate from the product properties.
- Towards further achievements, the next challenges are to streamline the standards to expand local production and to ensure the introduction of high-quality products as well as the methods for performance evaluation.

Profile of Project Company

SEKISUI CHEMICAL CO., LTD. is a leading resin manufacturer founded in 1947, with a growing array of products ranging from daily sundries such as cellophane tape and plastic pail to pipe materials that underpin both the public and private infrastructure, high-performance materials for electronics and transport equipment, medical products and the revolutionary unit-constructed housing called "Sekisui Heim". With prominent technology and quality, the Company heads the development as a frontier in the fields of "residential and social infrastructure creation" and "chemical solutions" under the Group Vision as part of its contribution to better lives of people and environment worldwide. The Company also advances environmental contribution as a center of business based on the SEKISUI Environmental Sustainability Vision. CROSS-WAVE is internally certified as "the Environment-contributing Product" which facilitates the adaptation to climate changes as well as to intensification of natural disasters. The Company has been selected as one of "Most Sustainable Corporations in the World Index (Global 100)" for three consecutive years since 2018, for which the World Economic Forum (WEF) ranks 7,500 major companies around the world.

33. Stable supply of water with high turbidity raw water compatible water purification equipment

Tohkemy Corporation http://www.tohkemy.co.jp/index.html

Adaptation Challenge In developing countries where water supply facilities are not provided, rainwater, river (surface water), groundwater, etc., which are not treated for water purification, are used as domestic water, and are exposed to health hazards such as diarrhea and conjunctivitis. In addition, there is a concern that the increase in turbidity due to the increase in rainfall or the depletion of water resources due to the decrease in rainfall will become more severe due to the effects of climate change.

Contribution Tohkemy's high-turbidity raw water-compatible water purification system can purify ultra-highly turbid water stably and efficiently, providing a stable supply of domestic water and improving the health and sanitation of residents by improving water quality.

Project Detail

Country | Laos

■ Background

From 2015 to 2018, JICA promoted, demonstrated, and commercialized the project (support for small and medium-sized enterprises). Demonstration Project for Spreading and Demonstrating Water Purifiers for Raw Water. The purpose of this project was to provide a stable supply of safe water, correct regional differences in water supply services, and purify stable and inexpensive surface water, which becomes extremely turbid in rainy weather. Through this project, Tohkemy's high turbidity compatible water purification system (1000m3 / day: equivalent to about 6,600 people) has been installed and is operating as a tap water supply system in Paksan City.

▲Children are happy with purified water

▲River water with high turbidity

▲Paksan district water purification system building

▲High turbidity raw water compatible type water purification equipment

■ Business Model of the Project

This is a public-private partnership with the Lao government, Lao government officials, JICA, and other stakeholders. The government will promote the standardization of reasonable equipment that meets local needs while utilizing public funding schemes such as JICA, and will consider business development in Laos and other developing countries in the future.

Related SDGs

Product & Technology

Tohkemy's high-turbidity raw water-purifying water purification system consists of a fiber filtration system (Acti Fiber) and a sand filtration system. With this device, it is possible to purify river water with a turbidity of more than 1000 NTU, which is often found in areas with a rainy season, to a WHO standard of 5 NTU or less.

The features of the high turbidity raw water compatible water purifier are as follows.

- Fiber filtration technology for small and high turbidity (patented)
- Reduces desalination cost to about 1/3 compared to coagulation sedimentation facility
- Installation space is compact and on-site installation time is shortened

▲High turbidity raw water compatible type water purification equipment

◀High turbidity raw water compatible type water purification equipment

▲Stakeholders drinking water purified by the device

Key to Success & Challenges for Further Development

- Established Lapon Company Limited in Laos in 2011 as a local partner company. It is possible to cooperate for the smooth implementation of projects in Laos.
- Demand for water treatment technology is increasing in areas where water services are not yet established. In particular, securing and stable supply of domestic water for residents is an urgent issue, and the need for high-turbidity raw water-compatible water purification equipment is increasing, especially in developing countries.
- In the future, we will not only utilize public funding schemes such as ODA, but also expand our sales channels in Laos and other developing countries as our own business.

Profile of Project Company

Tohkemy Co., Ltd. (Headquarters: Osaka City) is a manufacturer and distributor of water treatment materials and equipment, including filter materials for water treatment, chemical injection pumps, stirrers, control equipment, and small equipment. Since its establishment in August 1965, the company has manufactured and sold filtration media and water treatment unit products, as well as constructed and maintained water purification plants, etc. in Japan. In addition to Laos, South Korea, Taiwan, China, Indonesia, Thailand, Malaysia, India, Brazil, Russia, the Philippines, Vietnam, etc. have been delivered products (including delivery via plant manufacturers or trading companies).

34. Securing sustainable water resources through water-saving plants

JGC Holdings Corporation https://www.jgc.com/en/

Adaptation Challenge In regions where there is expected to be less rainfall and longer dry seasons in the future due to climate change, it is becoming a challenge to cope with declining freshwater resources such as river water and groundwater. Moreover, in closed water areas with minimal ocean currents, over-dependence on seawater will lead to increased seawater temperature and salinity.

Contribution JGC is proposing a water-saving plant that combines the selection of service water, waste water, cooling water and heat transfer systems with the reuse of waste water to reduce water intake and drainage, taking into account constraints on water sources and the overall water balance of the plant.

Project Details

Country | Oman, Saudi Arabia, Indonesia, etc.

■ Background

JGC Group builds plants and facilities around the world in a wide range of fields, including oil & gas, energy infrastructure such as power plants and steel & metal plants, industrial infrastructure, and social infrastructure such as hospitals and environmental facilities.

In areas where there are concerns about future restrictions on water resources and the risk of depletion, client needs for water conservation are high and the concept of a water-saving plant reduces the long-term impact on the surrounding water environment, helping clients to realize their capital investment plans. Water treatment is an energy-intensive process in plants and is an important factor when designing a plant.

■ Business Model of the Project

JGC provided FEED (Front End Engineering Design) and EPC (Engineering, Procurement, Construction) services for an oil refinery plant in Oman. The plant treats waste water generated during the oil refining process to bring it below discharge water quality standards, and partially reuses it as irrigation water for the plant. JGC also provided water-saving plants in Saudi Arabia and Indonesia. Many of the clients are state-owned companies and private oil majors.

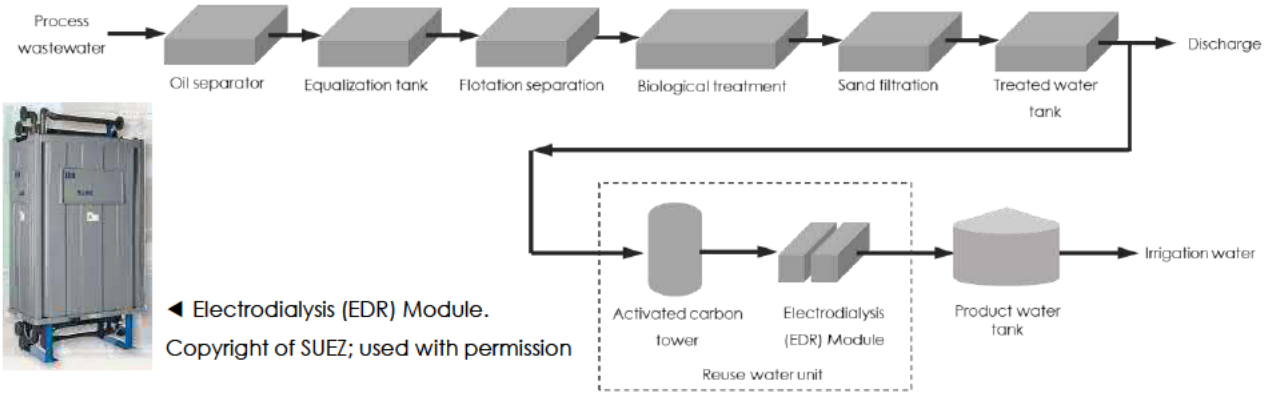
▲Oil refinery plant in Oman

Related SDGs

Product & Technology

In the oil refinery plant in Oman, advanced removal of organic compounds such as phenol and soluble salts such as sodium and chlorides are required in order to reuse the waste water from the oil refining process for irrigating the plant's green areas. For this purpose, a reuse water unit consisting of an activated carbon adsorption tower and electrodialysis module was installed. This advanced treatment allows 30-40% of the planned wastewater to be reused as irrigation water for the plant. The installation of this water reuse system also contributes to the use of sustainable water resources by reducing the amount of seawater intake and waste water discharge required for water desalination.

System flow of wastewater treatment



◀ Electrodialysis (EDR) Module.
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Key to Success & Challenges for Further Development

- In addition to water conservation to reduce the impact on the environment, JGC also provides clients with economic benefits such as reducing water treatment costs.
- As the risk of climate change becomes more apparent, it is expected that there will be greater awareness about the need to secure and sustainably use water resources, and the need to conserve water and reuse wastewater.

Profile of Project Company

Since its establishment in 1928 as Japan's first engineering company, JGC has expanded its business domain from oil and gas to infrastructure, and has conducted more than 20,000 projects in over 80 countries around the world. JGC is now engaged in comprehensive engineering, functional materials, and consulting businesses, mainly in the fields of energy, society and lifestyle, and industry. Under the corporate slogan of "MISSION DRIVEN," JGC aims to solve sophisticated and complex issues in order to achieve a sustainable society. Based on the idea that engineering is essentially a business activity that contributes to environmental conservation, JGC is contributing to reducing environmental impacts, manufacturing low-carbon and environmentally-friendly high-performance materials, and commercializing environment-related technologies.

35. Realization of stable water treatment by underwater mechanical aerator and agitator

Hanshin Engineering Co., Ltd. http://www.hanshin-pm.co.jp/

Adaptation Challenge Exhaustion of water resource due to expansion of the desertification and drought under climate change is a serious issue worldwide.

Contribution Hanshin Engineering realizes high efficient and stable water treatment through technology of underwater mechanical aerator and stirrer. Especially, by introducing the technology in developing countries with serious climate change impact, the technology supports securing water resources and stable provision of water as well as improvement of regional living environment and health / sanitation.

Project Detail

■ Background

Country | Malaysia, Indonesia, Philippines, etc.

Hanshin Engineering Co., Ltd. provides water treatment technology such as underwater mechanical aerator and stirrer in the public works of Japan. The underwater mechanical aerator and stirrer has been has installed at some 1,000 locations with some 11,000 facilities, which is approximately half of the water treatment plants in Japan. Also, since the market in Japan became matured, business started in 2010 in Southeast Asian countries where are expected for economic growth in near future. So far, the underwater mechanical aerator and stirrer have been has installed in the wastewater treatment facilities in Chine, Taipei, Thailand, Malaysia, Indonesia, the Philippines.

(1) Advanced waste water treatment and resource recycling in palm oil factory in Malaysia in Malaysia

The underwater mechanical aerator and stirrer was introduced in the wastewater treatment plant of the palm oil factory in Malaysia by utilizing the Pilot Project under FY2013 Supplementary Budget Scheme for the Small and Medium Enterprises Overseas Expansion Support Project. The technology accomplished treated water quality at BOD20mg/L. In addition to upgrading the wastewater treatment, it was contributed to carbonization of sludge, conversion to fuel, and composting for resource recycling.

▲Wastewater treatment plant in palm oil factory in Malaysia

(2) Activities in rubber glove manufacturing plant in Malaysia and aquaculture facilities in Thailand

"Development of energy-saving underwater mechanical aerator and agitator for the wastewater treatment system in ASEAN region" was implemented under the Subsidy Scheme for Carbon Dioxide Emission Control (Project for Creating Innovation of Low-carbon Technology for Developing Countries) in FY2017 and FY2018. Under the project, the following are examined; improvement of performance of the products, which is the improvement of transfer performance of oxygen as air supply function, long life of the products through improvement of motor bearing and development of motor cooling mechanism, and stable use of the products with development of alien substance entrapment prevention mechanism.

■ Business Model of the Project

Profitable network is structured though cooperation with local governments, private companies and other stakeholders. Also, approaches to end users in both overseas and Japan are promoted by cooperating with an engineering company who well knows the situation of local water treatment.

Related SDGs

Product & Technology

Underwater mechanical aerator and stirrer "Aquarator®" are functionable for both aerobic and anaerobic tanks. In the aeration process, the air which is supplied from blower is refined through the proprietary structure and gas-liquid mixing solution is spread all over the reaction tank. Some features are shown below.

- High efficiency of oxygen dissolution and high energy efficiency (Energy-saving at max. 30% is realized by renewing from existing air diffuser to the Aquarator®.
- Since the sludge does not remain at the bottom of tank with good condition, wastewater treatment process become stable.
- Less maintenance activity. No clean up activity by removing the sludge in the water tank.

▲Aquarator® by Hanshin Engineering Co., Ltd.

▲before aeration

▲just after aeration

▲under aeration

Key to Success & Challenges for Further Development

- Unique quality service can be provided with high precision product development based on technology and know-how, and abundant achievements and experiences in Japan, which have been accumulated for more than half a century.
- Demand of water treatment technology is increasing in the developing countries due to serious depletion of water resources with effect of climate change. Highly efficient and stable water treatment technology like Aquarator® can respond to such demand.
- International business is successfully utilizing the support project by Team E-Kansai in addition to public financial scheme such as commissioned projects of JICA project and subsidiary scheme of GEC.
- Accumulation of experience with public schemes, effects of promotion and networks structured though frequent site visits are huge advantages.
- Hanshin Engineering will extend sales network by structuring personal connections further and improve sales and production system so as to provide high-quality products, technologies and services.

Profile of Project Company

Hanshin Engineering was established in Nov. 1950. Head office is located in Osaka City. Manufacture and sales of gear reducers, equipment for river facilities, equipment for water treatment, and equipment for industrial equipment. After the underwater mechanical aerator and stirrer "Aquarator®" was developed in 1975 first in the world, its manufacturing and sales were started. A number of the "Aquarator®" have been installed in Japan, and currently there are distributors in China, Thaipei, Malaysia, Thailand, and Indonesia.

Hanshin Engineering recognizes that conservation of global environment is the most significant issue common to mankind; therefore, many of our corporate activities aim to protect the global environment and contribute to society on environment. Especially, Hanshin Engineering contributes to the environmental measure toward the climate change through development and sales of water treatment and water regulation machinery.

Hanshin Engineering will deepen cooperation with local partner companies, improve production system such as increase of production amount and shortening of production duration, and actively promote international business.

36. Producing safe drinking water from saline and highly-turbid surface water

Mitsubishi Chemical Aqua Solutions Co., Ltd. https://www.mcas.co.jp/

Adaptation Challenge In several counties in South-east Asia such as Myanmar and Vietnam, reversal of sea water (salt intrusion into river surface water) has become increasingly serious during the dry season due to low water level in rivers caused by climate change. In addition, surface water becomes extremely turbid during a prolonged rainy season and is not suitable for drinking without treatment.

Contribution The water purification technology of Wellthy Corporation leveraged on available water sources enables the provision of safe drinking water and serves as an adaptation measure in the field of secure resources and stable water supply.

Project Detail

Country | Myanmar

■ Background

In Myanmar, where salt intrusion into surface water has become a serious issue, surface water must be used as tap water in future due to water stress caused by urbanization and growing restrictions on the use of well water in Yangon and other urban areas. Considering such situation, Mitsubishi Chemical Aqua Solutions Co., Ltd. has conducted a pilot utilizing the Company's water treatment technology. The Company has introduced a water treatment system addressing the issue of both highly turbid river water during the rainy season and saline water during the dry season so that safe drinking water is provided throughout the year. The system is loaded with "WeLLDAS", a remote monitoring system developed by the Company which enables the monitoring of system operation and water quality both from Japan and Myanmar. Upon a year-long pilot, it is confirmed that drinking water can be provided throughout the year.

■ Business Model of the Project

The Company established a joint venture in 2017 named "MW Aqua Solutions Co., Ltd." to provide services in Myanmar with a key focus on water treatment engineering (EPC), water quality analysis and environmental consulting. Water quality analysis is conducted utilizing the expertise and technology as a water quality analysis agency certified by the Ministry of Health, Labor and Welfare of Japan and by dispatching experts in water quality analysis from Japan who train and guide local personnel on a daily basis. Not only internally, but the Company also contributes to building up the capacity of local government officers who are engaged in water quality analysis work.

MWAS
MW AQUA SOLUTIONS

▲Training on water quality analysis was given to a public water analysis lab in Myanmar

Related SDGs

Product & Technology

Water treatment System: The system is characterized by a customized design in combination of appropriate pre-treatment technology and membrane filtering technology according to the quality of raw water to enable safe drinking water to be secured irrespective of water source.

Remote monitoring system "WeLLDAS": The system is loaded in the water treatment system and contributes to the optimization of maintenance and management operations by checking operation of the water treatment system, responding to changes in water quality, and utilizing accumulated data.

Consistent management structure: The technology enables consistent operation ranging from the water quality analysis to maintenance and management. The same operation structure has also been established in Myanmar.

▲Water treatment system introduced to Myanmar

▲Visualizing local situation through remote monitoring system

▲Water quality analysis lab operating in Myanmar

Key to Success & Challenges for Further Development

- Stable collection of data on equipment operation and water quality for about a year in Myanmar through field tests using the water treatment system became great asset in launching operation in Myanmar.
- Experts were dispatched and facilities were introduced from Japan in the establishment of a joint venture company where daily operation is currently run together with 11 local personnel.
- Experts were dispatched and facilities were introduced from Japan in the establishment of a joint venture company where daily operation is currently run together with nine local personnel.
- The next stage is to explore new customers and markets for further growth in addition to water treatment projects using high-salinity surface water.

Profile of Project Company

Being a group company of the Mitsubishi Chemical Holdings Group, the Company plays a key role as a total solution provider in the field of water resource issues. The Company strives for the realization of a sustainable society through the development and provision of diverse solutions on water resources. The Company aims at establishing a resilient social infrastructure by providing safe water to cater to individual demand through its long-established water treatment technology to treat groundwater, etc. The Mitsubishi Chemical Holdings Group promotes corporate activities under a unique management method of "Management of Sustainability (MOS)" that ranges from the development of technology and provision of products and services that contribute to sustainability to the improvement in production technology, and promoting water treatment projects in Myanmar as sustainability projects are considered as one of our business strategies.

37. Addressing water pollution caused by floods

Yamaha Motor Co., Ltd. https://global.yamaha-motor.com/

Adaptation Challenge Increase in floods associated with climate change has aggravated pollution of water source, raised the number of sick people due to poor health, and hindered socioeconomic growth.

Contribution Introducing "Yamaha Clean Water Supply System", a small-sized water purifier developed by Yamaha Motor Co., Ltd. as an adaptation measure in villages of Asia and Africa will contribute to supporting resilience building of the regions.

Project Detail

Country | Indonesia, Madagascar, Senegal, Mauritania, etc.

■ Background

Based on the home water purification system developed by Yamaha Motors Co., Ltd. In the 1980s following the complaints from the company's expatriate families that "tap water was murky and had rusty smell", the prototype of the present system, was sold and operated on experimental basis. Thereafter, the company developed the system suitable for villages and has introduced it to various regions in Asia and Africa.

■ Business Model of the Project

The system has been introduced by local governments and NGOs to medical and educational facilities and rural areas in countries vulnerable to water pollution such as Indonesia, Madagascar, Senegal and Mauritania, drastically reducing the outbreak of diarrhea, fever and other illnesses. The system has freed residents of their water drawing labor and enabled them to shift their activities toward production and learning. The system has led to creation of new business , such as water delivery and ice making in some cases.

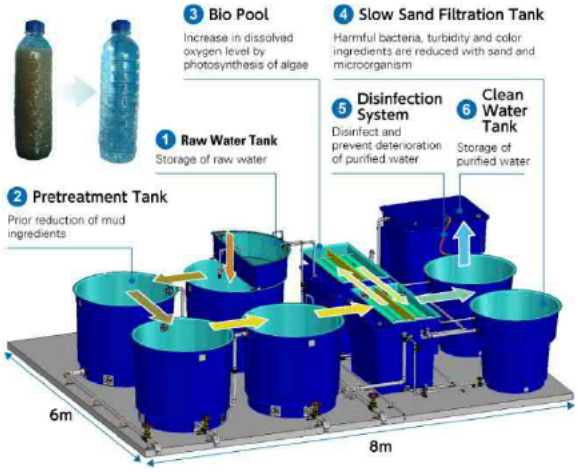
▲Yamaha Clean Water Supply System

▲A happy child

Related SDGs

Product & Technology

"Yamaha Clean Water Supply System" purifies water through "Slow Sand Filtration" using sand and gravel. Physical dirt and rubbish in the surface water pumped up are removed through "Pretreatment Tanks" filled with sand and gravel. Photosynthesis by the algae which naturally forms inside the tanks increases the density of oxygen dissolved in the water and enhances water treatment by microorganism. The system's requiring no coagulants or membranes enables self-sustained operation and maintenance by local community without the need for advanced technology and high costs for operation and maintenance.



▲System Outline

Key to Success & Challenges for Further Development

- The barriers to introduction is overcome by advance education on sanitation and maintenance procedure in addition to realizing low running cost and easy maintenance.
- Realizing co-benefit by encouraging self operation by local partners through setting up "water committees". The committee would contribute to creating local jobs through launching new businesses such as water sales business and mobile phone charging service in areas with no grid electricity but equipped with solar panels.
- The company has achieved a sustainable business model through the establishment of framework contributing to the overall development of regional society and economy.

Profile of Project Company

Yamaha Motor Co., Ltd. was set up in 1955 as a motorcycle manufacturer. Since then the company not only pursues values in existing markets, but it has engaged in "Social Value Creation Business", represented by Yamaha Clean Water Supply System, which creates new markets through effort to resolve social issues taking sustainable economic growth and environmental preservation into consideration. The company has entered into African market in the 1960s and launched an array of projects including motorcycle delivery of vaccines and doctors, promotion of employment through the development of motorcycle taxi business, guidance on the method of fishing and management of catch for modern fishery while introducing outboard motors. The company also promotes local manufacturing of fishing boats made of FRP (Fiber-Reinforced Plastics) as a replacement for wooden ones in a bid for industrial development, job creation, safe operation, and minimizing deforestation, all of which have contributed to the development of African nations. "Yamaha Clean Water Supply System" won the Good Design Award 2013.

38. Minimizing financial losses caused by extreme weather events

Sompo Holdings, Inc. https://www.sompo-hd.com

Adaptation Challenge The insurance product is an effective mean of minimizing financial risks and also an adaptation measure in the field of risk finance associated with climate change.

Contribution Sompo Holdings, Inc. has been providing the Weather Index Insurance aiming at reducing agricultural business risks associated with extreme weather in Southeast Asian countries, where agriculture is a key industry that is vulnerable to climate change.

Project Detail

Country | Thailand

■ Background

Sompo Holdings Group, in cooperation with Japan Bank for International Cooperation (JBIC), has carried out studies on risk finance approach to address climate change since 2007. Weather Index Insurance was launched for sale in 2010 in Northeast Thailand.

■ Business Model of the Project

Weather Index Insurance is an insurance product that pays out a contractually predetermined insurance amount when a weather index – such as temperature, wind speed, rainfall, or hours of sunshine – fulfills certain conditions regardless of actual losses. It enables a rapid claim handling and contributes to an immediate disaster restoration without a site investigation for a loss assessment.

In addition, it lowers the costs of loss assessment and realizes affordable insurance products for local farmers. Therefore, the product is highly evaluated as an effective mean for small farmers in terms of rapid claim handlings and clear liabilities.

Related SDGs

Product & Technology

Utilizing expertise acquired by weather derivatives products, Sompo Holdings Group, in cooperation with JBIC, has carried out studies on risk finance approach to address climate change since 2007. Weather Index Insurance was launched in 2010, which is aimed to compensate rice farmers in Northeast Thailand for shortfall in crops caused by drought.

Sompo International Holdings Ltd., which is responsible for the group's overseas insurance business, launched the AgriSompo initiatives as an integrated platform to offer agriculture insurance globally in 2017. Sompo Holdings Group launched a parametric weather insurance program for longan fruit farmers in Chiang Mai, Thailand in 2019, and expanded its sales area to Lampang and Nan in 2020. (Longan fruit is one of the major Thai agricultural exports.) This insurance program was developed using satellite data with technology provided through AgriSompo.

▲Hearing survey (Myanmar)

▲Briefing session (Thailand)

Key to Success & Challenges for Further Development

Sompo Holdings group develops insurance products and services through engagements ad collaborations with various stakeholders. In 2018, the group participated in a pilot project for a development of weather index insurance in Myanmar as a technical advisor and continues to hold dialogs with local farmers, Myanmar Agricultural Development Bank, and local agriculture bureaus on local weather situation and demands for insurance.

Profile of Project Company

Sompo Holdings, Inc. was established on 1 April 2010 as a holding company with a merger of Sompo Japan Insurance Inc. and Nipponkoa Insurance Co., Ltd., developing a range of businesses centered on the domestic P&C insurance, overseas insurance, domestic life insurance, and nursing care and healthcare business.
The group is aiming to "contribute to the security, health, and wellbeing of our customers and society as a whole by providing insurance and related services of the highest quality possible", as stated in its Group Management Philosophy, throughout business operations based on the Group CSR Materiality identified to address global social issues.

Attachment 2: Presentation Materials of International Information Dissemination (Bangladesh)

(1) METI / Japan's Climate Change Policy
(2) Furuno Electric Co., Ltd. / FURUNO Weather Radar
(3) Sekisui Techno Molding Co., Ltd. / Plastic underground stormwater storage "CROSS-WAVE"
(4) ECOSYSTEM Inc. / Aiming for Sustainable Urban Development!: Turn construction waste into functional pavement using recycled bricks and roof tiles!
(5) CTCN / CTCN's support mechanism
(6) GCF / Introduction to the GCF

METI
Ministry of Economy, Trade and Industry

Japan's Climate Change Policy

March 2021

Ministry of Economy, Trade and Industry

Japan's Climate Policy under the Paris Agreement

- Paris Agreement: Calling for "holding the increase in the global average temperature to **well below 2°C** above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C"
- IPCC special report in 2018: **Global emissions in 2050 would have to fall to zero to limit the temperature rise to 1.5°C.**

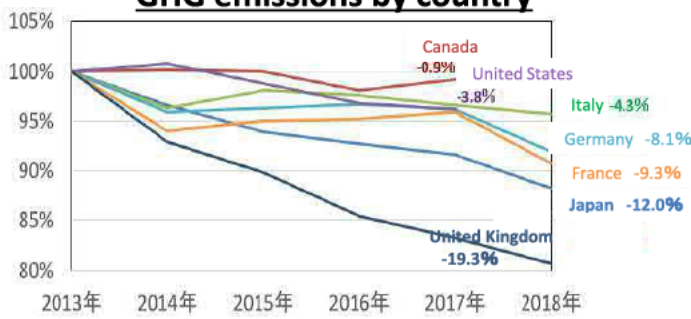
⇒ **If Japan is to achieve its long term goal on the premise of the existing technologies, drastic actions are required. Therefore, disruptive innovation that enables the early introduction of the new technology with reasonably acceptable cost is absolutely necessary.**

⇒**This lead to the development of the Environment Innovation Strategy in January 2020.**

Ambition of NDC

	Compared with 1990	Compared with 2005	Compared with 2013
Japan	-18.0% (2030)	-25.4% (2030)	-26.0% (2030)
U.S.	-14 to 16% (2025)	-26 to 28% (2025)	-18 to 21% (2025)
EU	-55% (2030)	-52% (2030)	-44% (2030)
China	-65% of carbon dioxide emissions per unit of GDP by 2030 compared to 2005 achieve the peaking of carbon dioxide emissions around 2030		

GHG emissions by country



The Long-term Strategy under the Paris Agreement

- ✓ Accomplish "decarbonized society" as early as possible in the 2nd half of this century
- ✓ Take measures towards the reduction of GHGs emissions by 80% by 2050
- ✓ Realize "a virtuous cycle of environment and growth"

Declaration of Carbon Neutral

- Prime Minister Suga declared that Japan will aim carbon-neutral by 2050.

Policy Speech by the Prime Minister to the 203rd Session of the Diet(Oct 26th)

< Realizing a green society>

▪We hereby declare that by 2050 Japan will aim to reduce greenhouse gas emissions to net-zero, that is, to realize a carbon-neutral, decarbonized society.

▪Addressing climate change is no longer a constraint on economic growth. We need to adjust our mindset to a paradigm shift that proactive climate change measures bring transformation of industrial structures as well as our economy and society, leading to dynamic economic growth.
▪The key here is revolutionary innovations, such as next-generation solar cells and carbon recycling. We will accelerate research and development aimed at realizing utilization of such technologies in society.

Green Growth Strategy (Dec 25, 2020)
Points of the 5 Policy tools

Grant funding	✓ ***Green Innovation Fund*: 2 trillion yen** over 10 years ✓ Stimulate **15 trillion yen** worth of private R&D and investment.
Tax incentive	✓ Tax incentives to stimulate **1.7 trillion yen** worth of private investment over 10 years.
Guidance policy on Finance	✓ Formulate guidelines for transition finance and establish a scheme for **long-term funds with an interest subsidy (1trillion yen in 3 years** in business scale basis) to attract global ESG investment.
Regulatory Reform	✓ Consider regulatory reform in areas such as **hydrogen, offshore wind power, and mobility/batteries**. ✓ Discuss issues concerning carbon border adjustment and related policies with a view to ensuring global level playing field
International Collaboration	✓ Cooperation with various players, including both developed and emerging countries, on **innovation policy**, **joint projects** including third countries, **standardization and rule-making,** and providing wide variety of **solutions toward de-carbonization** ✓ World wide promotion efforts through "**Tokyo Beyond-Zero Week**"

Annex2 . 14 Growth Sectors (and action plans)

Energy

Offshore wind power
Wind turbines, parts, floating wind turbines

Ammonia fuel
Combustion burner (as fuel in transition period to hydrogen-powered society)

Hydrogen
Turbines for power generation, hydrogen reduction steel-making, carrier ships, water electrolyzers

Nuclear power
SMR (Small Modular Reactor), nuclear power for hydrogen production

Transport/Manufacturing

Mobility and battery
EV (electric vehicle), FCV (fuel cell vehicle), next generation batteries

Semiconductor and ICT
Data centers, energy-saving semiconductors (demand-side efficiency)

Maritime
Fuel-cell ships, electric propulsion ships, gas-fueled ships

Logistics, people flow and infrastructure
Smart transportation, drones for logistics, fuel-cell construction machinery

Foods, agriculture, forestry and fisheries
Smart-agriculture, wooden skyscrapers, blue carbon

Aviation
Hybrid electric, Hydrogen-powered Aircraft

Carbon Recycling
Concrete, biofuel, plastic materials

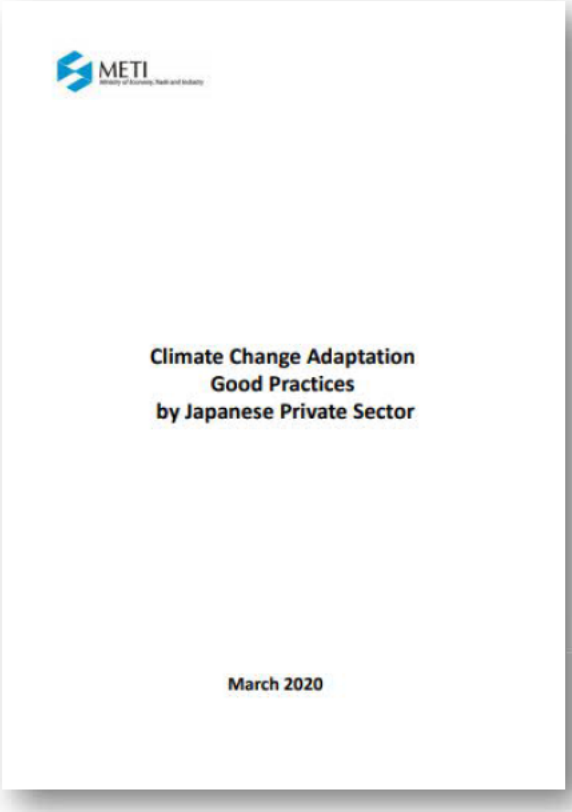
Home/ Office

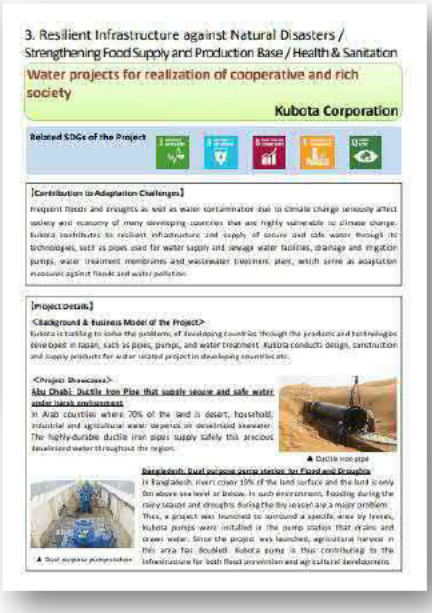
Housing and building, Next generation PV
(perovskite solar cell)

Resource circulation
Biomaterials, recycled materials, waste power generation

Lifestyle-related industry
Local decarbonization business

Collection of Good Practices





https://www.meti.go.jp/policy/energy_environment/global_warming/adaptation_goodpractice_FY2019ENG.pdf

FURUNO Weather Radar

February 2021

Yusuke Mizutani
System Solutions Business Unit
FURUNO ELECTRIC CO., LTD.

Features

- Compact and light weight (1 m/65 kg)
- Easy installation
- Real time observation for localized weather
- Competitive costs of installation and operation (Suitable to build multiple radars network)
- Low power consumption (Household power)

World compact/light weight Weather radar

Compact size enable to install on top of existing building and to save costs and period for installation

Space-saving for Installation

FURUNO

FURUNO

- No heavy machinery, tower, building for radar installation
- Solid State technology

S-band radar

- Building/Tower with control room
- Big size Antenna Radome
- Klystron and Solid State technology

Antenna radome

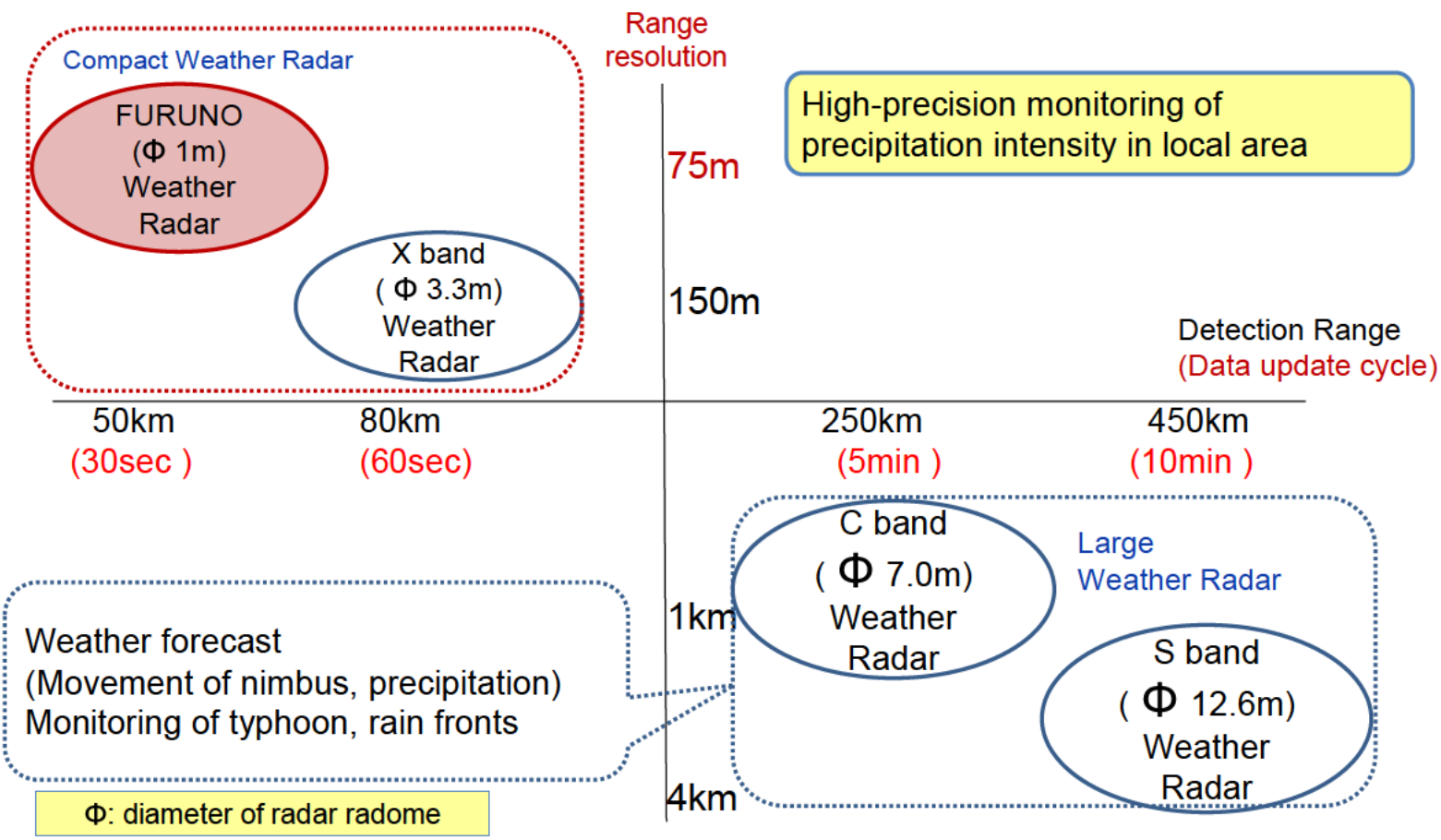
Signal Processing Unit

S-band radar @Vinh

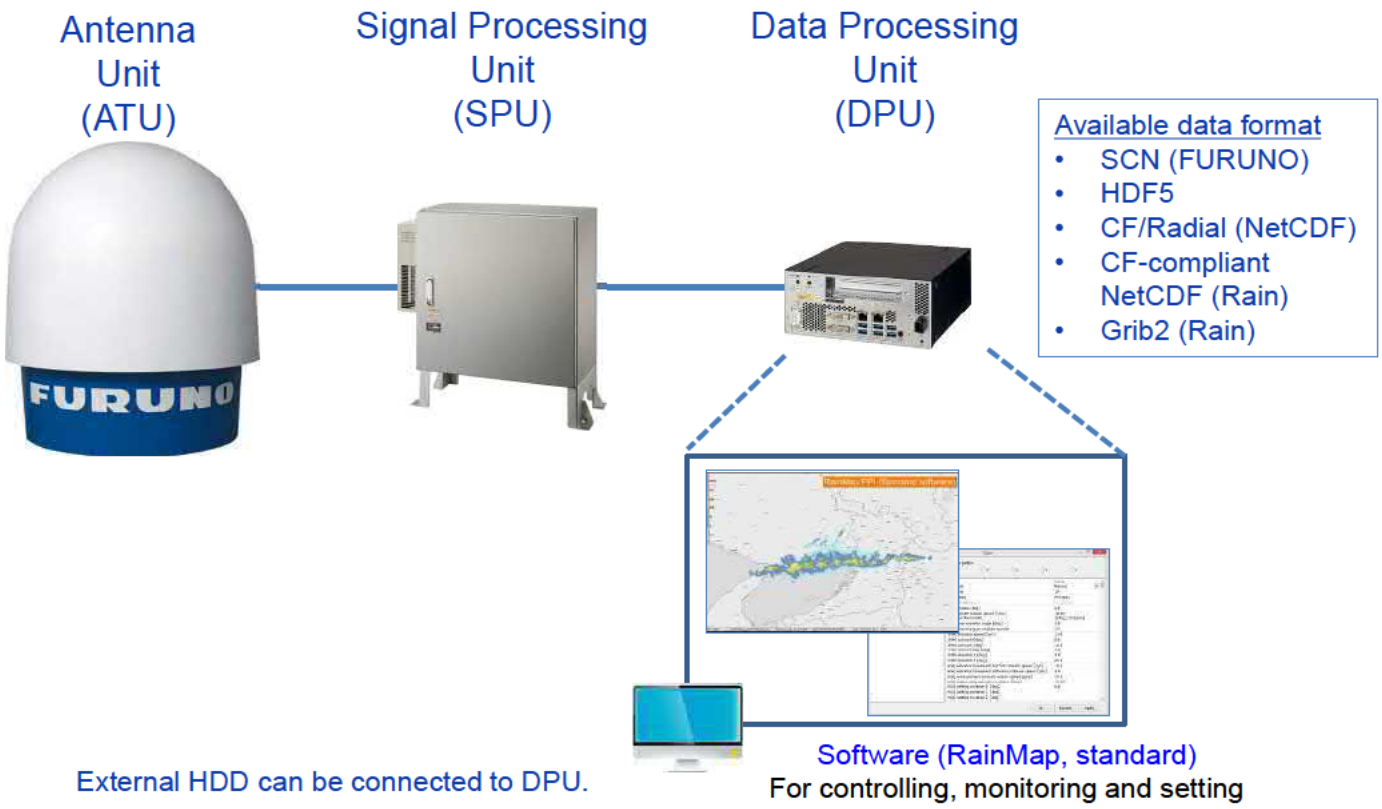
Ref: B007 ベトナム国　気候変動による自然災害対処能力向上計画(2011年～2017年) – 株式会社国際気象コンサルタント (intermetcon.com)

Comparison conventional radar & FURUNO

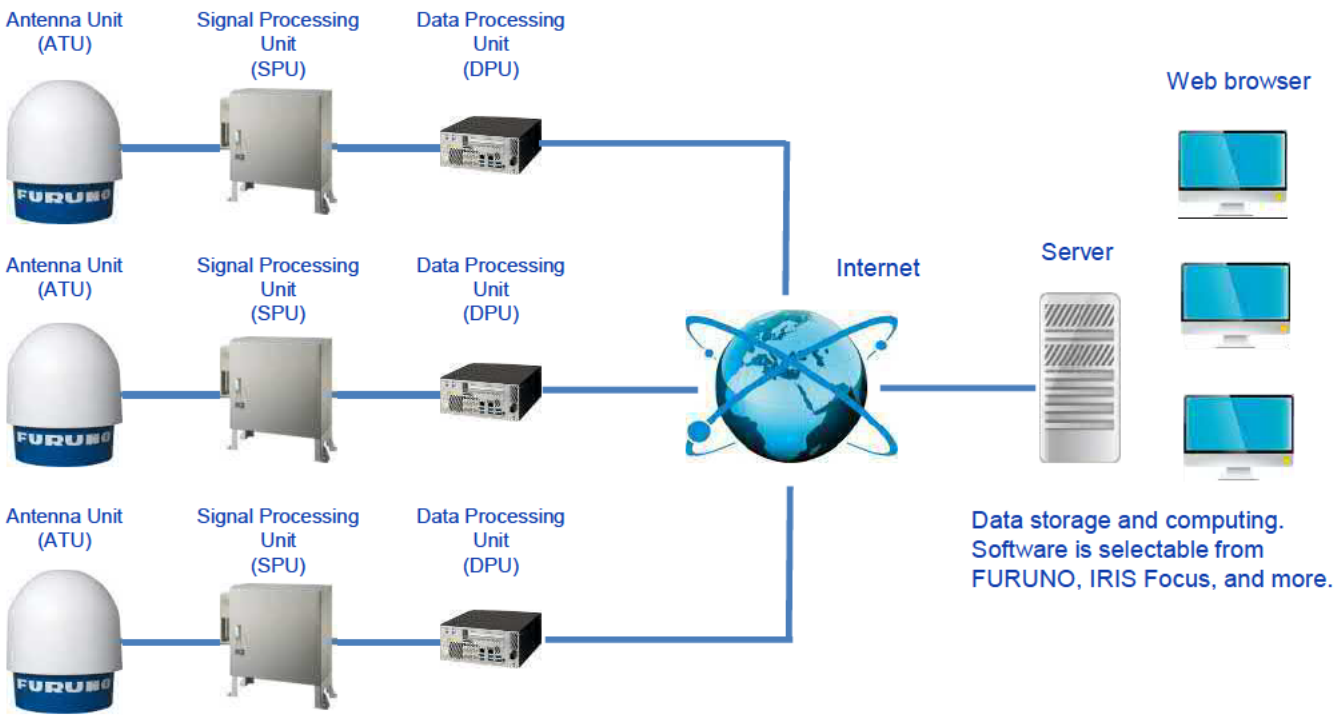
FURUNO



Standard Configurations (WR2120)



Multiple-radar Configurations (WR2120)



Multiple-radar system

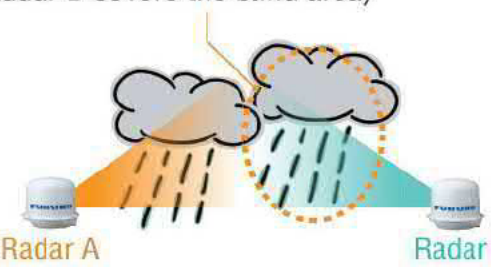
FURUNO

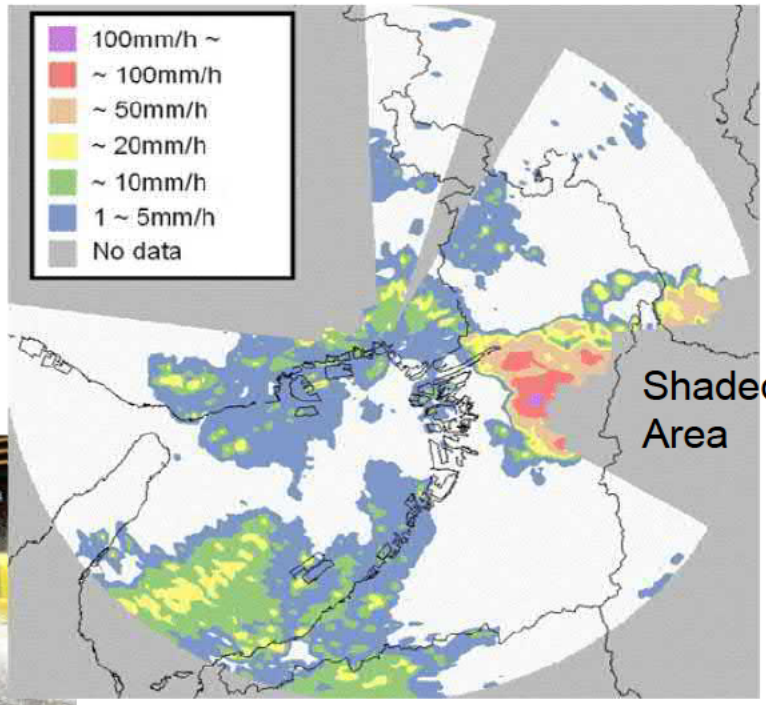
Heavy rain will block transmitted signals behind the area.

→Need other radars to cover the blind area

Blind area of Radar A

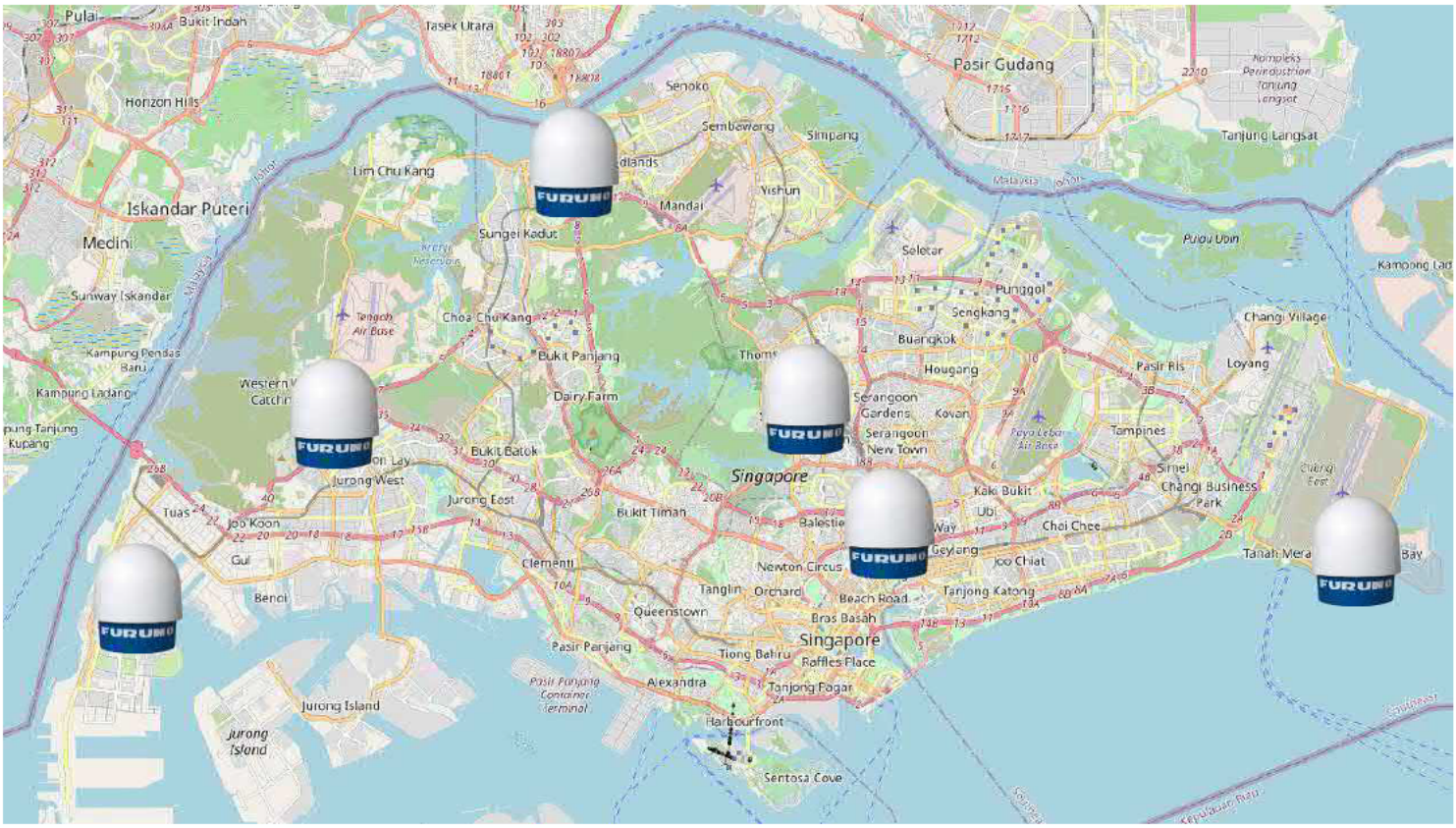
Signal power attenuation due to heavy rain
(Radar B covers the blind area)



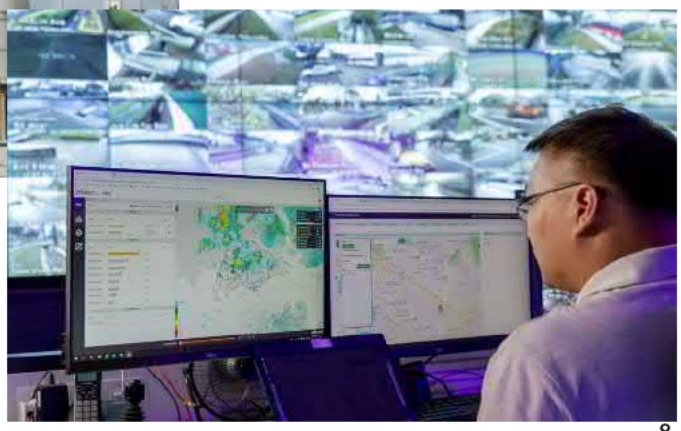


Usage example in Singapore

FURUNO



Usage example in Singapore

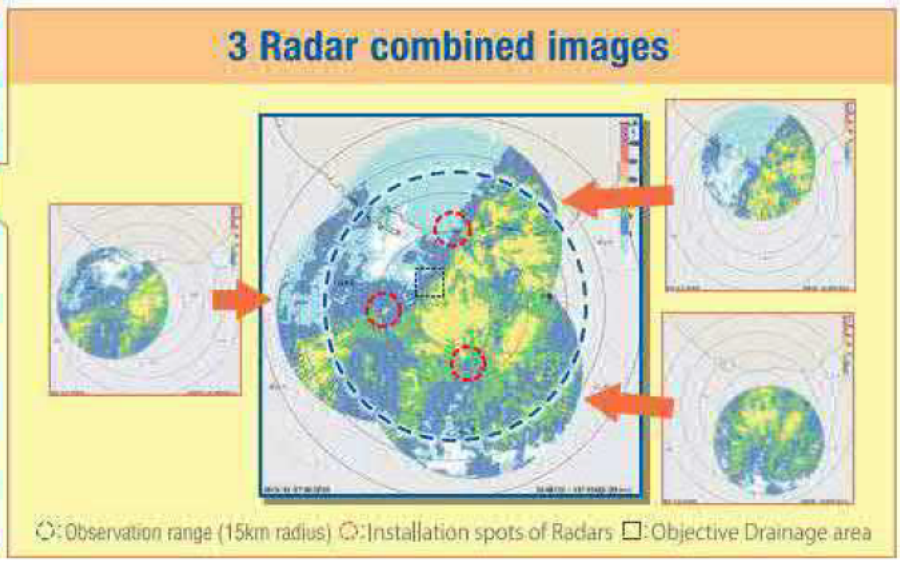


Ref: Public Utilities Board (PUB)
https://www.pub.gov.sg/news/FeaturedStories/07022001

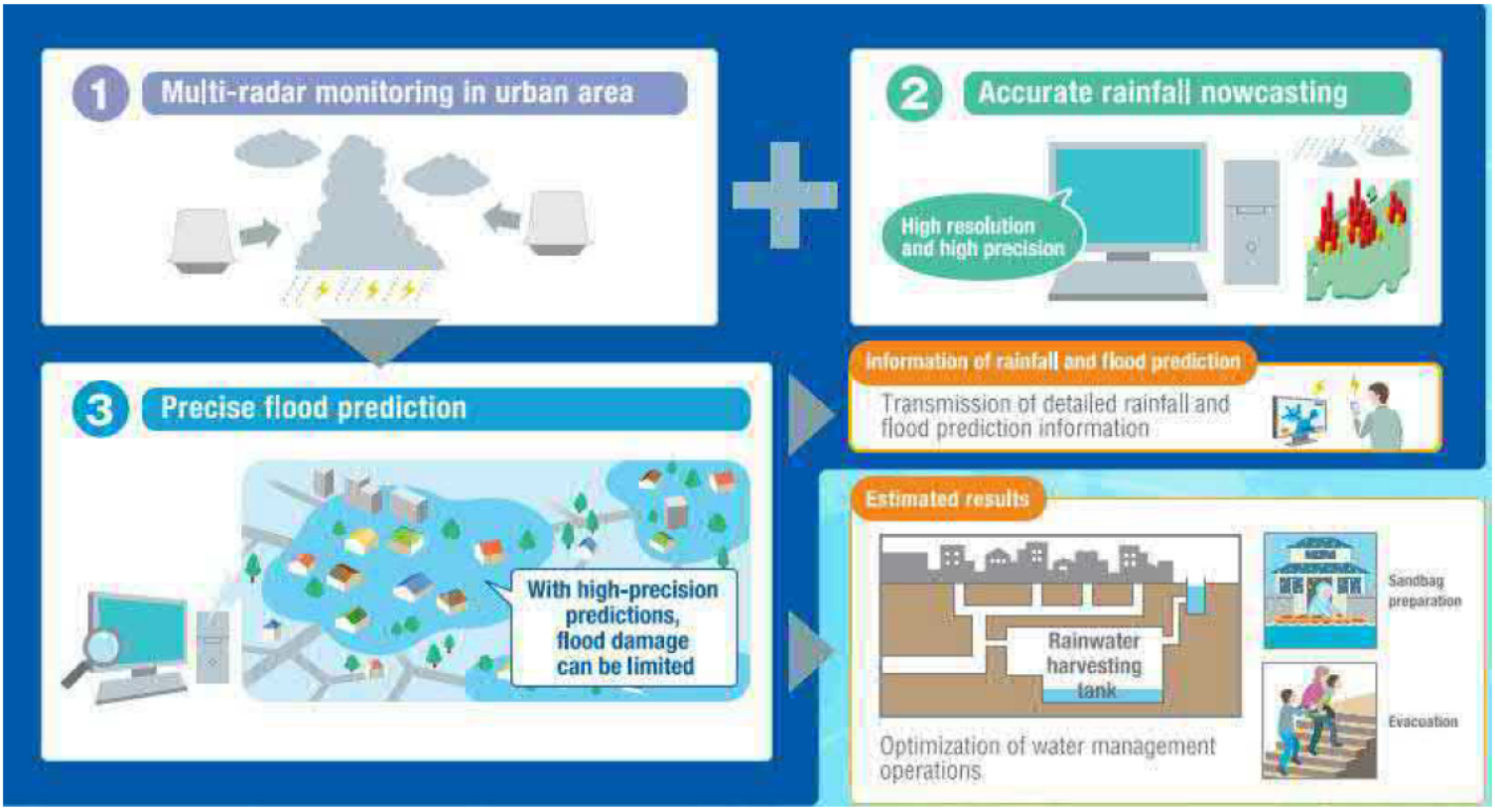
Usage example in Japan

FURUNO's Multi-radar system

- In the Japanese cities of Fukui and Toyama, set of 3 Radars have been installed



Usage example in Japan



Usage example in Vietnam

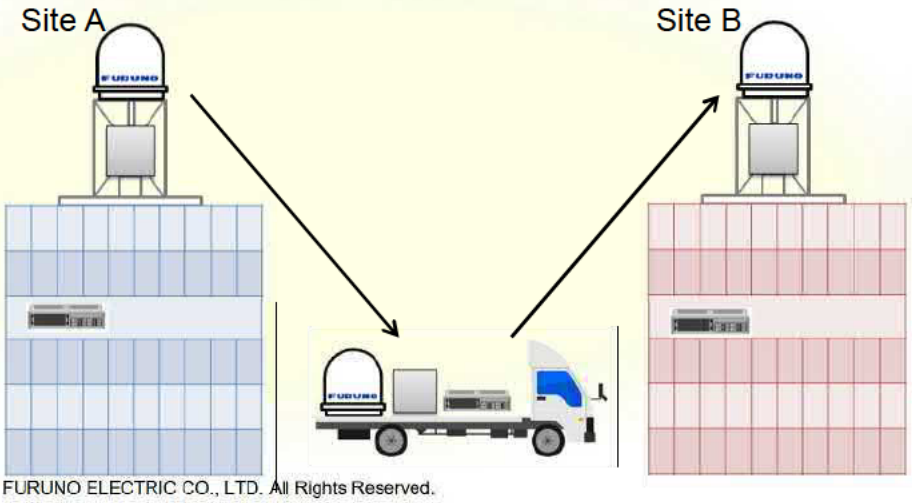
End customer : Institute of Geophysics (IGP)
Installation site : Hanoi
(Vietnam National University of Agriculture, Vietnam Academy of Science and Technology)

Transportability

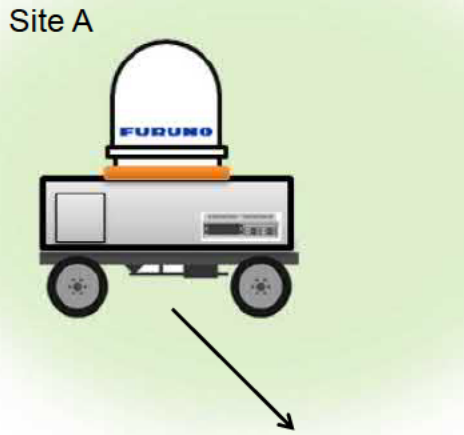
- Ruggedized design
- Quick release cable
- Isolation vibrator (for ATU and SPU)

  Meets MIL-STD-810G Test Method 514.7 ANNEX C Category 4 Secured Cargo, Common carrier (US highway truck vibration exposure) Test1
- Case for transportation (for ATU and SPU)

Relocation

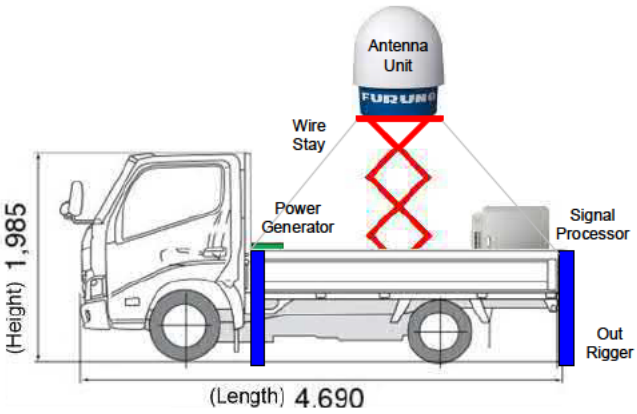


Transportable platform

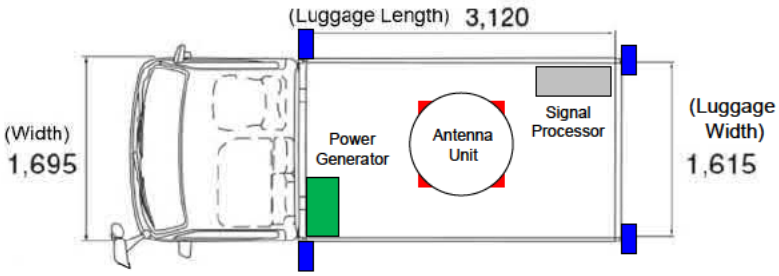


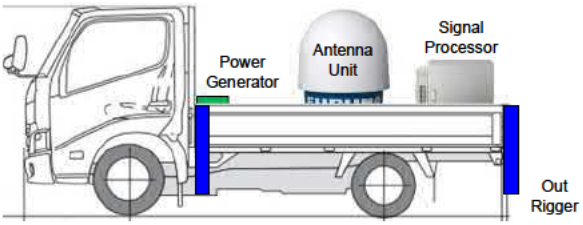
Transportability – Optional Tools

- Vibration isolator
- Case



During Observation





During Travel

SMALL WONDER

Contact:
E-mail: wr-business@furuno.co.jp
Phone: +81 (0)798 63 1270

Web:
FURUNO's meteorological monitoring and analysing system | System Solution | FURUNO

Plastic underground stormwater storage

“ CROSS-WAVE ”




Sekisui techno molding co ltd

SEKISUI

Contents

1. Introduction

SEKISUI TECHNO MOLDING CO.,LTD
Corporate Profile

Overview

- Name : SEKISUI TECHNO MOLDING CO.,LTD.
- Date founded : Aug, 1962
- Capital : 200 million JPY
- President : Mikiya Idehara
- Number of Employees : 481 (in the year ended March 2015)
- Net Sales : 15,517 million JPY (Consolidated ;For the ending March 2014)

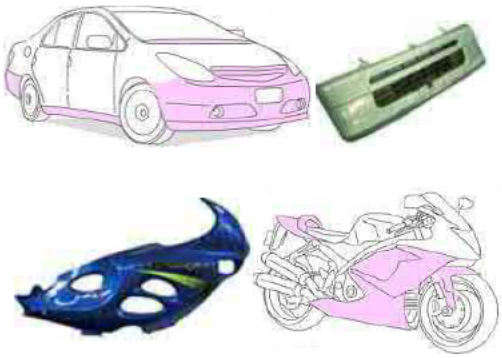
SEKISUI CHEMICAL CO.,LTD
- SEKISUI TECHNO MOLDING CO.,LTD
- SEKISUI MEDICAL CO,.LTD
- SEKISUI FILM CO,.LTD
- ⋮

Foreign group factory

◇Japan

◇India

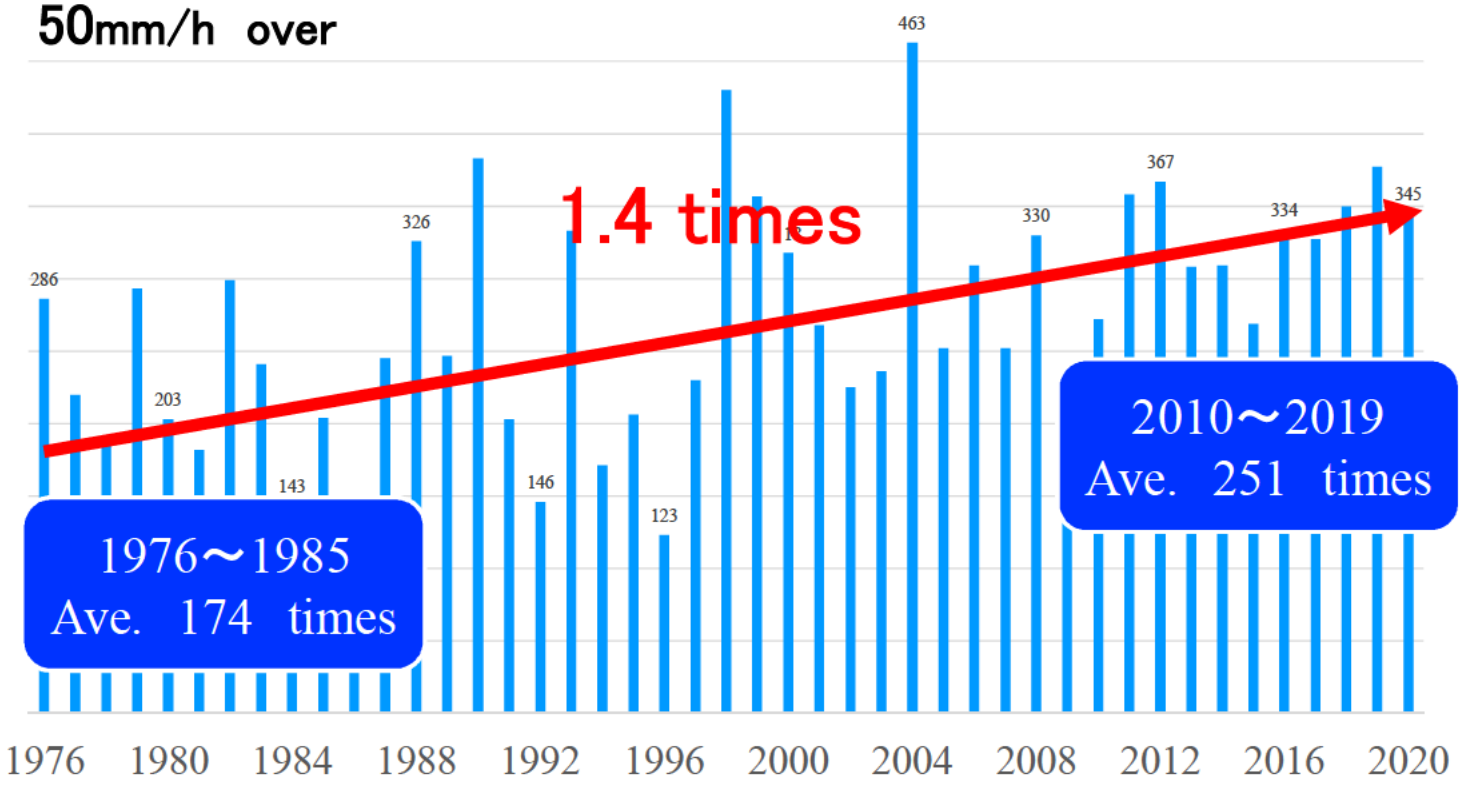
◇Indonesia

Resin Molded automobile products	Variety of Products For Transportation & Packaging	Stormwater storage system "CROSS-WAVE"
	 Folding Container	
Light weight, high strength and good design can be achieved by material , molding and die technologies	We offer a line-up of high quality and variety of products.	It contributes to preventive measures against flooding of cities and guerrilla rainstorm as well as effective utilization of rain water.

2. Necessity of plastic underground storage.

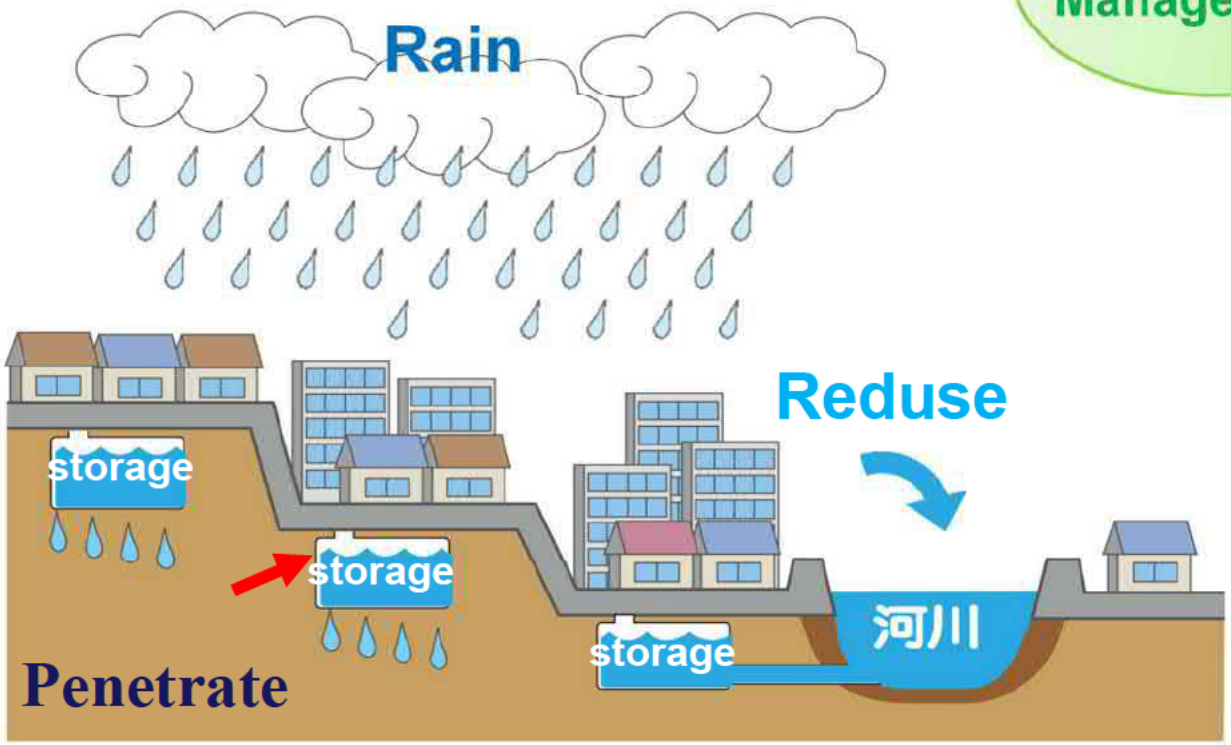
Records of heavy rain in Japan

Literature : Japan Meteorological Agency



Mechanism of urban development

Urban Flood Management



Necessity of plastic underground storage.

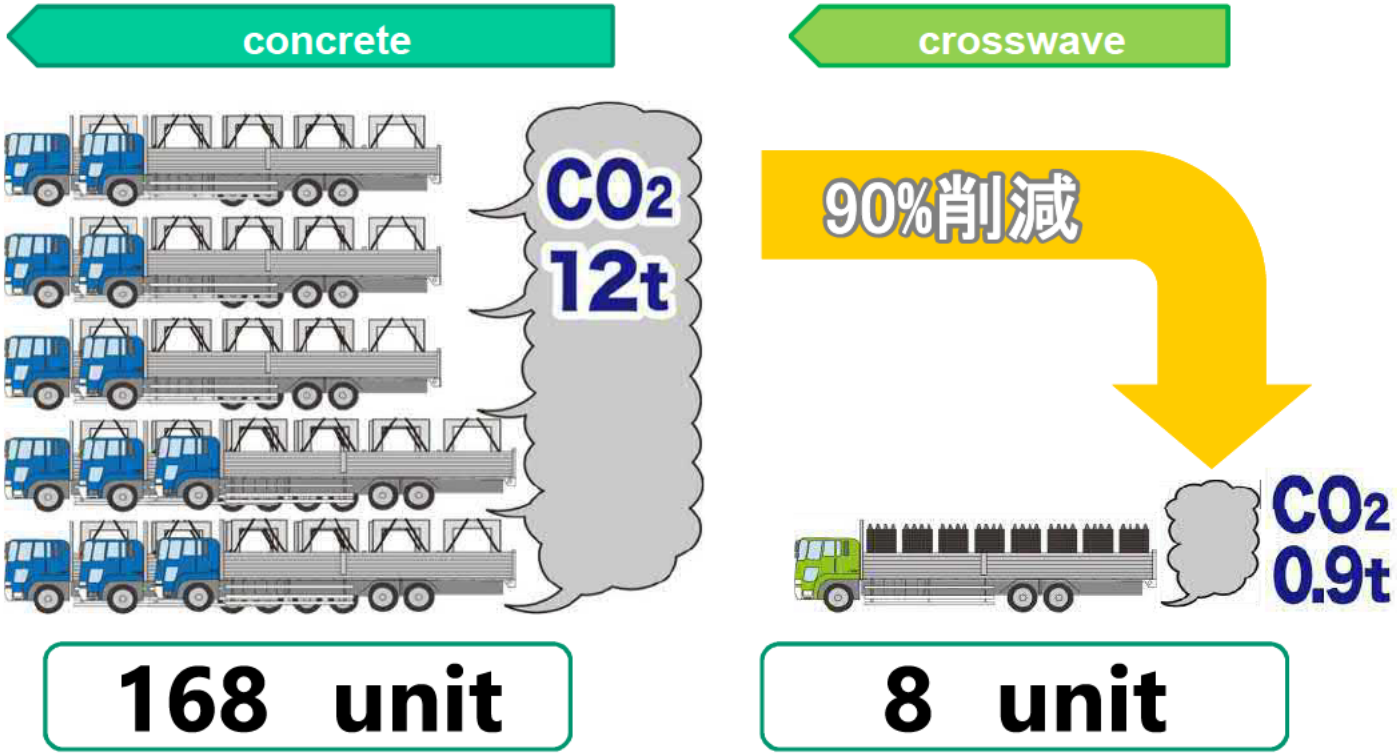
1）It's need to urban flood control measure by heavy rain frequently.

2）Compared to concrete,
Environmental-friendly, Low cost.

SEKISUI

Compared to concrete（1,000㎥） −1 CWH in japan

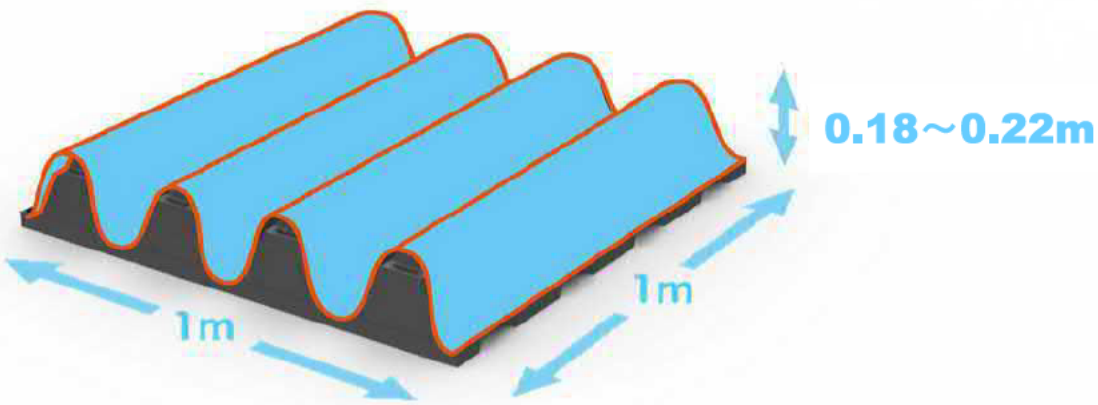
CO_2 decrease （90% over）…track decrease



3. What is the CROSS-WAVE?.

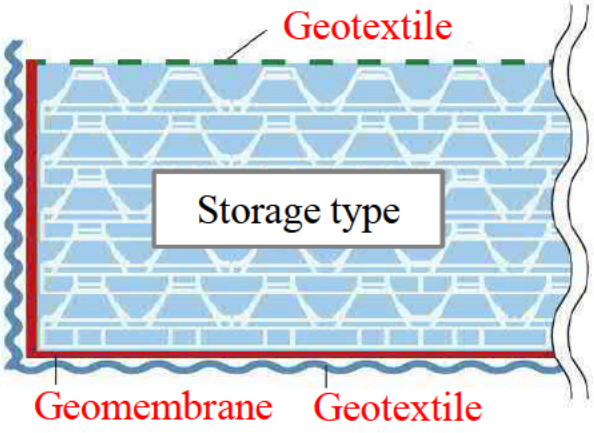
SEKISUI

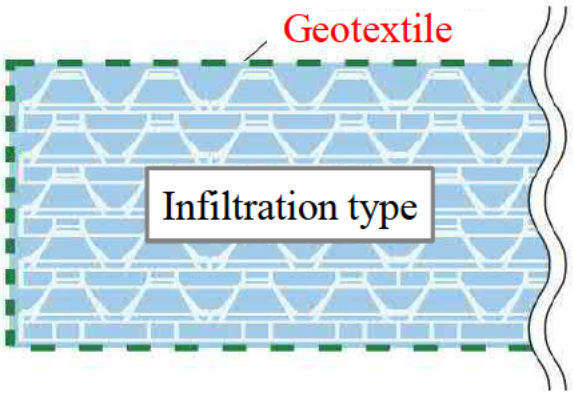
CrossWave
1m × 1m
Waveform



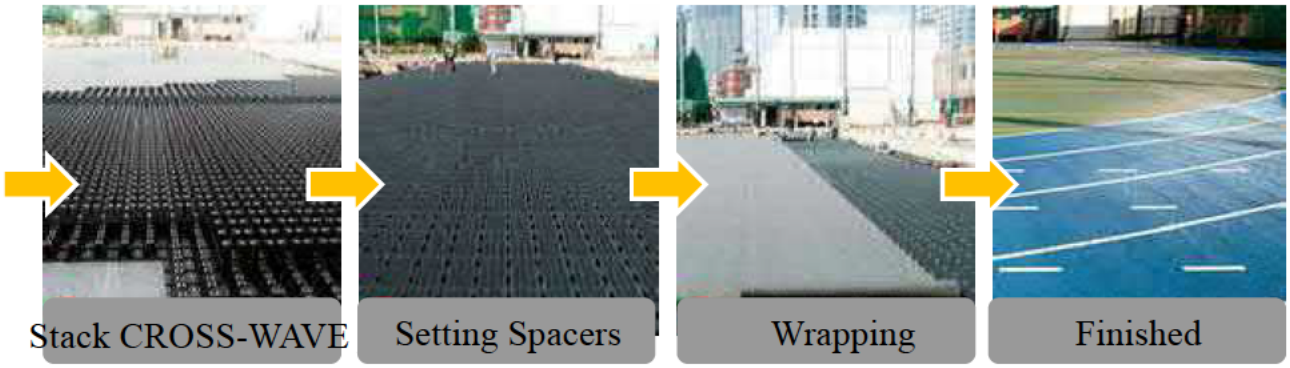
Structural pattern for a water storage

There are following patterns according to the purpose.





Construct process



MOVIE

Please see the video at the following website.

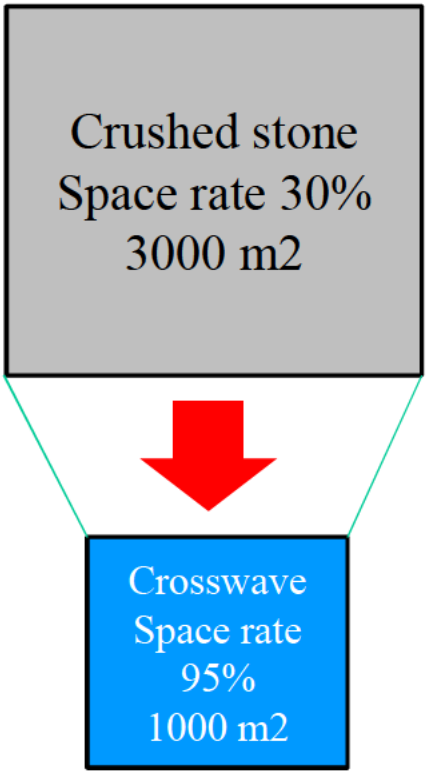
【URL】 https://sekisui-cw.co.jp/method/index.html

■Features ①

・High porosity

1) 95% of space can be maintained by intersecting it at 90 degrees and piling it up

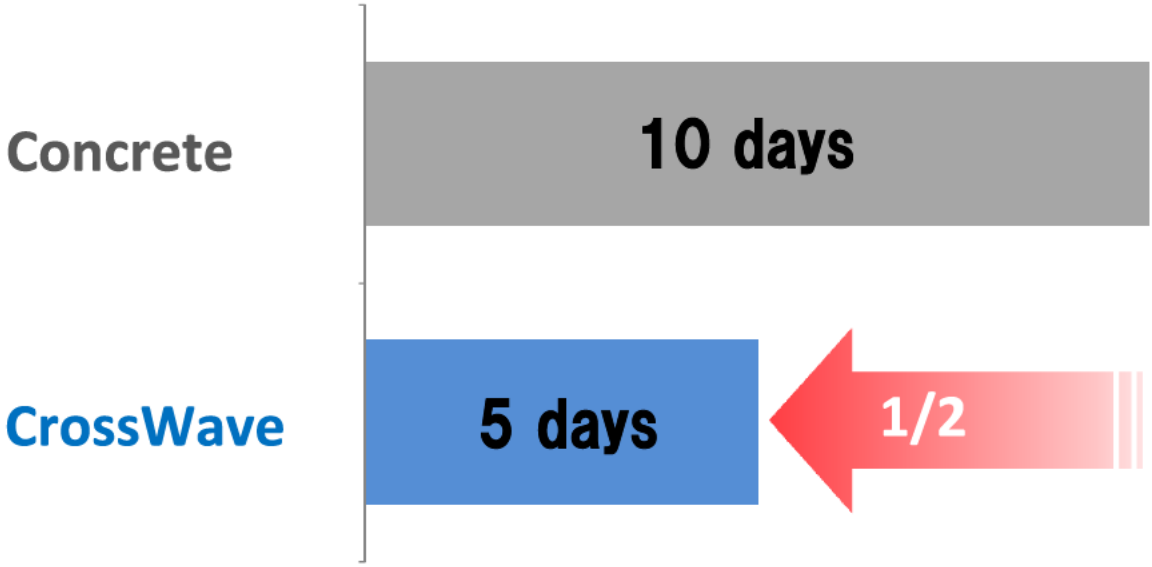
2) Reduce the amount of digging and can make a big volume of storage in compact space



■Features ②

・Fast installation

・Construction is quick
due to simply stack.



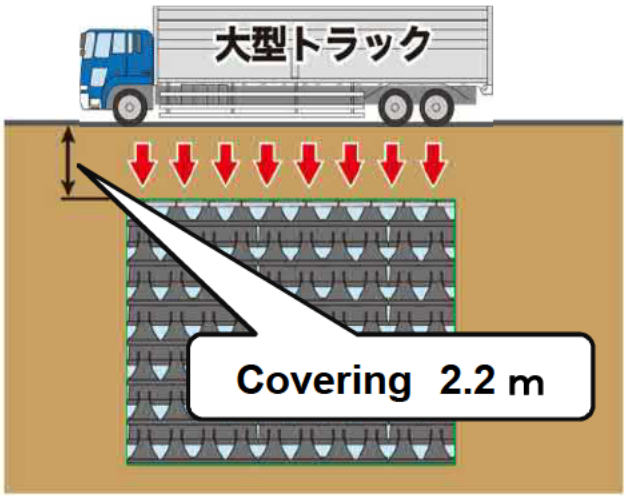
SEKISUI

■Features ③

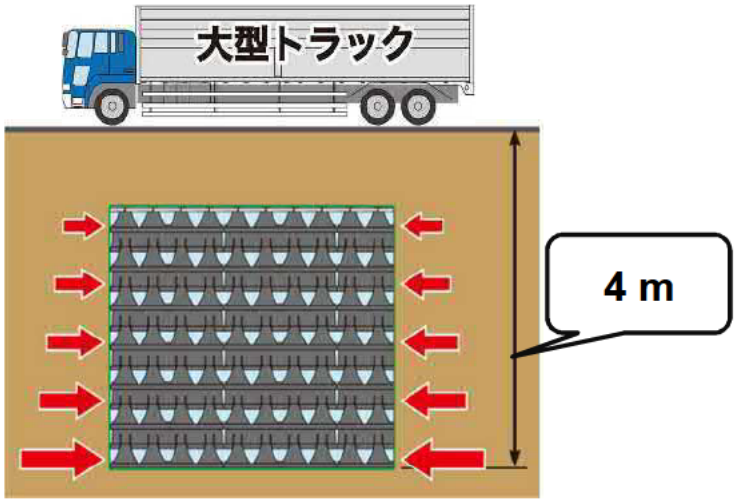
・Heavy load

・T25 vertical loading and 4m depth.

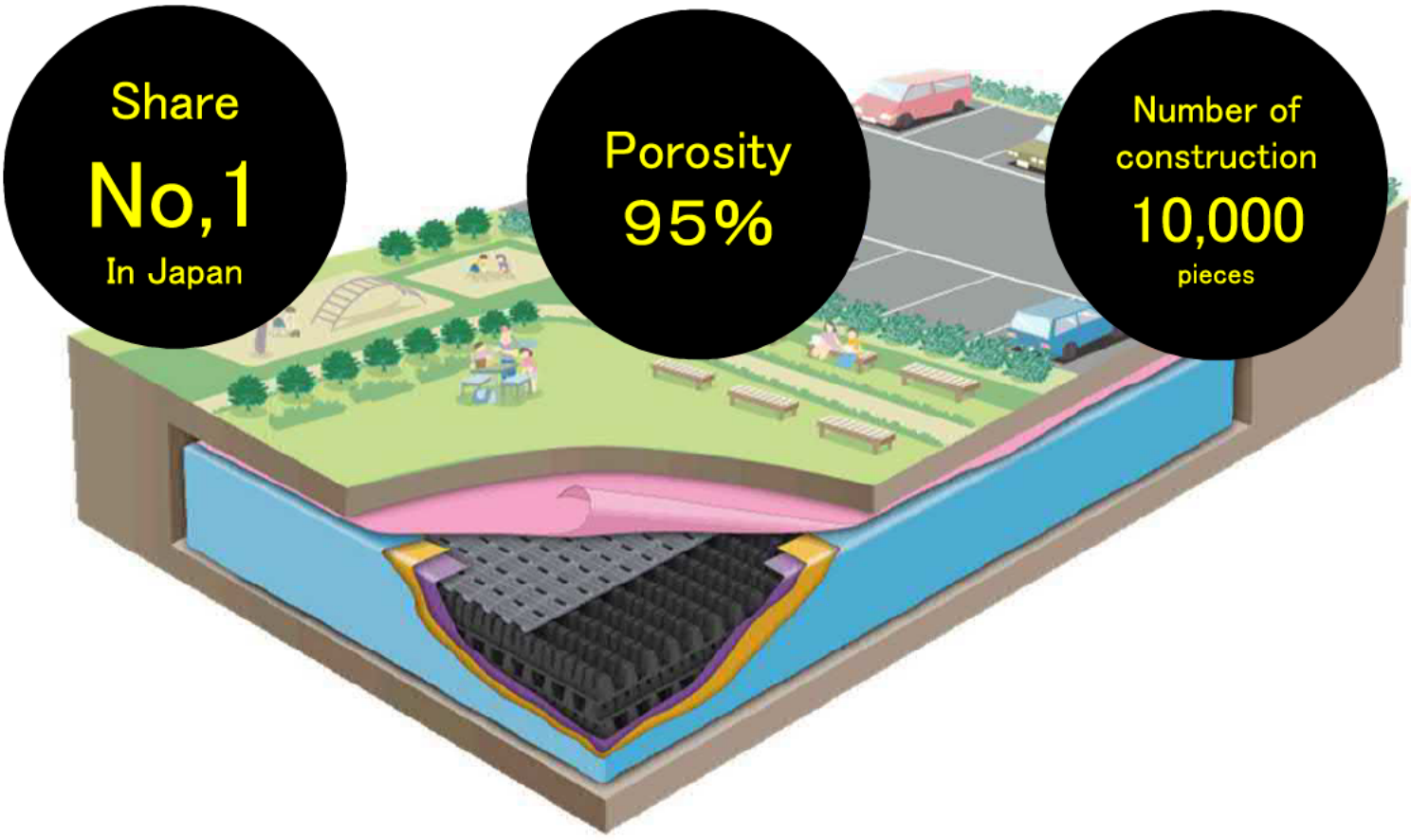
Vertical stress



Horizontal stress



4. Job reference.



Construction case

parking

Playground

Park

■Example(1)　Development guidelines　(funabashi city in Japan)

Development area (m3)	Regulated storage (m3)
0.03≦A＜0.5	600A
0.5　≦A＜1.0	800A
1.0　≦A	1300A

Example

1300 m3（guideline）× 2.0 ha（site area）

＝2,600m3　（Responsibility volume）

Thank you for your attention.

Climate Change Adaptation

AIMING FOR SUSTAINABLE URBAN DEVELOPMENT!

Turn construction waste into functional pavement using recycled bricks and roof tiles!

Recycle roof tile and soil
ECO SYSTEM Inc.

G I S

Goal	**To make cities around the world more recycle-oriented.**
Issue	**In a developed city or a developing city in the future...** As urbanization progresses, and the ground is covered with concrete and asphalt, there are increasing risks of the 'heat island' phenomenon and heavy rains causing urban flooding.
Solu-tion	We are working to provide solutions by offering the following: ① Permeable paving materials ② Water-retaining pavement materials ③ Know-how and technology to produce the above ④ Pavement material manufacturing equipment

(mobile plant)

11 SUSTAINABLE CITIES AND COMMUNITIES

Actually ...

In Japan, people are having trouble with the processing of Waste Roof Tiles (WRT).

Destruction of WRT

About 1 million tons of WRT are generated every year in Japan.

Most of this ends up in Landfills.

Convert WRT to construction materials!

WRT available in large quantities

Processing (crushing)

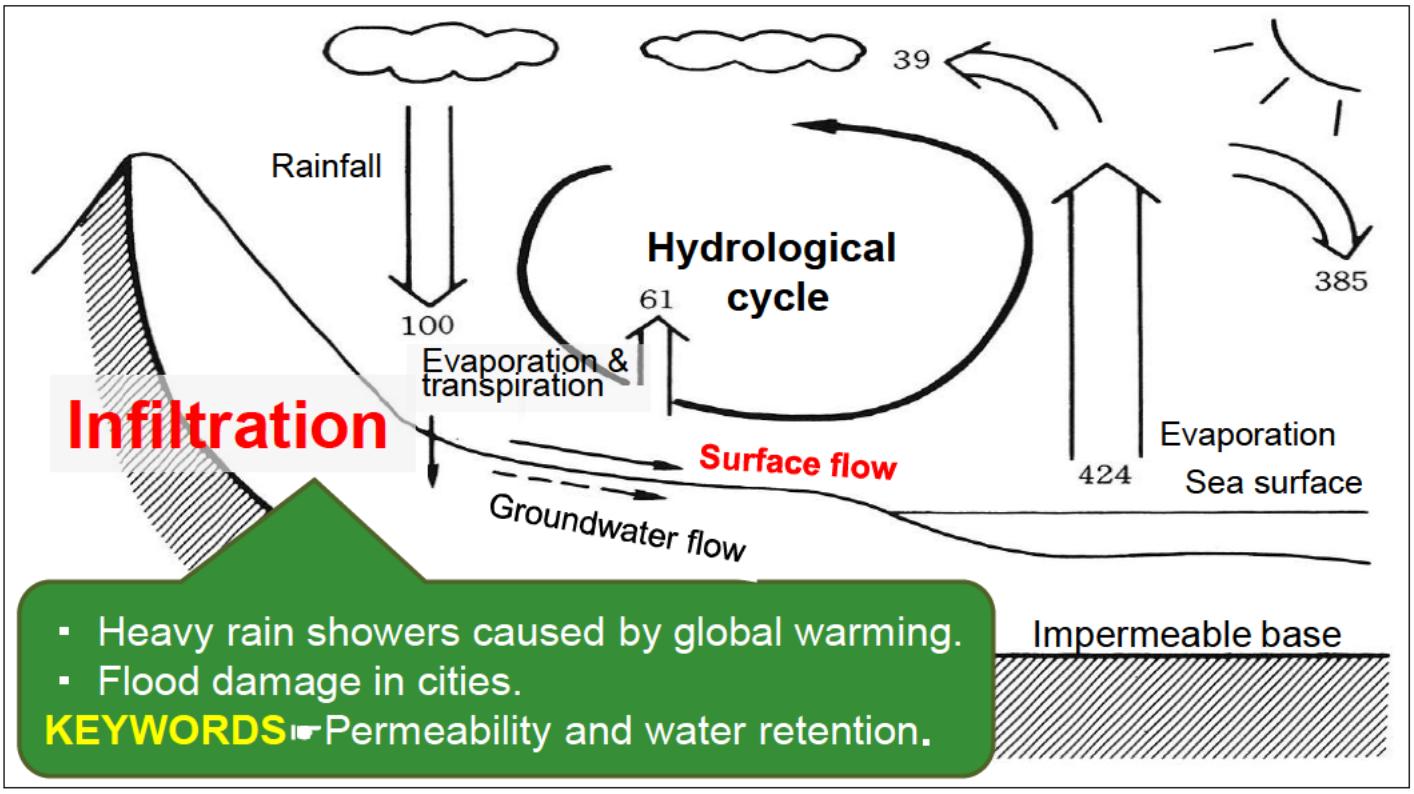
Gardening material

Paving material

Grades and Uses for Crushed Recycled WRT			
Sand	Gravel and Chips		
	S	M	L
			

Features of roof tile pavement material

The Water Cycle



- Heavy rain showers caused by global warming.
- Flood damage in cities.

KEYWORDS☛Permeability and water retention.

Recycled roof tile pavement

Recycled roof tile pavement

Roof tile pavement is “COOL”

Ishikawa Prefecture

Ready-mixed concrete plant

Recycled WRT Paving Material
(Permeability & Water Retention)

Cool paving material

Improve the local environment with recycled WRT paving material!

Cool paving materials in use all over Japan

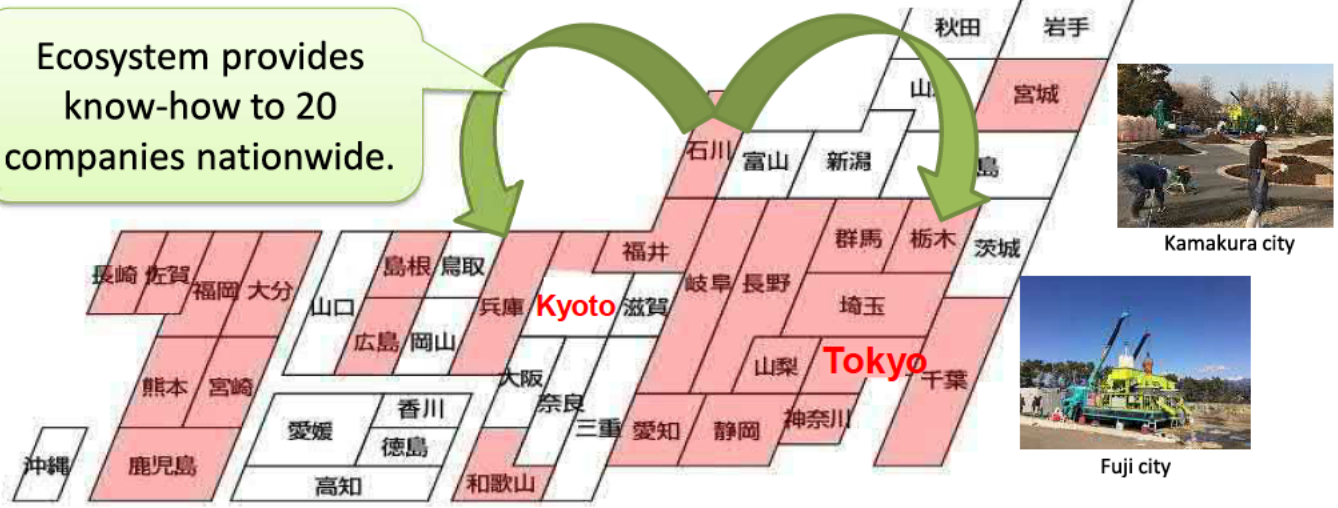
Nationwide Network

About 1 million tons of WRT generated annually in Japan.

Roof tiles crushed all over Japan.

On-board ready-mixed concrete plant.
「MOBICON」

Ecosystem provides know-how to 20 companies nationwide.



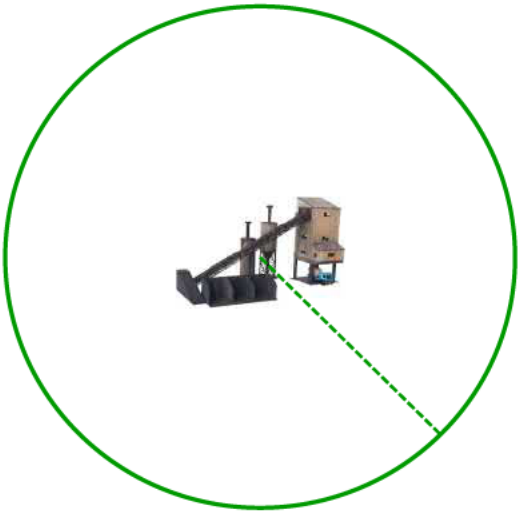
Kamakura city

Fuji city

Recycle roof tiles produced locally for local consumption.
Improve the local environment of all Japan with roof tile pavements.

Concrete plant revolution!

Normal ready-mixed concrete plant.



Concrete must be used within 1hr. & 30min. after production. In other words, the trade area is within about 1 hour from the plant.

On-board ready-mixed concrete plant. "MOBICON" (Mobile Concrete Plant)

Excellent mobility, no trade area limitations!
Automatically manufacture various concretes in small lots, regardless of time and place!

Roof tiles and bricks＝Ceramic products

Both roof tiles and bricks are made
by firing clay at high temperatures.
If it is fired, our know-how can be utilized.
Japan disposes of more roof tiles than bricks.

Ceramic products are found all over the world.

Ceramic products are used all over the world.
In particular,
Europe makes heavy use of both roof tiles and bricks,
which are hard and can be recycled
as pavement aggregates.
There are many roof tiles and bricks
used in Asia and South America as well.

Instances of roof tiles and bricks in Southeast Asia

All over Singapore,
there are tile-roofed houses.

Suburbs of Bandung, Indonesia.
Tile-roofed and brick houses.

House under construction.
Walls are brick.

Non-fired bricks are increasing as an environmental measure (CO2 reduction, etc.).

Brick factory in Cambodia.
(Pavement brick)

Non-fired brick factory in Vietnam.
(Non-fired brick = concrete block)

A brick factory emitting
black smoke.
There are many pre-modern facilities
and there may be child labor.

Status of roof tile and brick waste in Vietnam

Year	Amount of waste discharged
2004	15,000,000 Ton
2019	25,000,000 Ton

Photo credit: SATREPS Vietnam Project
(Dr. Kawamoto, Saitama University)

Very increasing !

Construction waste that increases dramatically
with the development of the city.

Status of roof tile and brick waste in Vietnam

This construction waste is unsightly unsanitary and dangerous.

Brick and concrete material, which accounts for most of the construction waste, is illegally dumped, even in urban areas.

VIỆT NAM THẾ GIỚI KINH DOANH CÔNG NGHỆ GIÁO DỤC SỨC KHỎE GIẢI TR

Trang chủ / Việt Nam

Rác thải xây dựng đang 'bức tử' hồ nước ở Thủ đô

→ Construction waste is "killing" the capital lake.

Tiền Phong 20/04/2016

Share

Dọc bên hồ Đầm Hồng (quận Thanh Xuân, TP Hà Nội) ngập tràn rác, phế thải xây dựng gây ô nhiễm môi trường, tràn xuống lối đi dân sinh.

→ The suburbs of Lake Damhong (Tan Suan District, Hanoi City) are flooded with garbage and construction waste, causing environmental pollution.

Hồng rác và phế thải xây dựng tràn ngập hai bên đường.

Nhiều đoạn rác tràn xuống lòng đường gây mất vệ sinh, ảnh hưởng đến cuộc sống của người dân.

Nhiều khu vực đống phế thải cao như núi gây mất mỹ quan.

Khi đi qua khu vực trên, rác thải chất cao hơn đầu người.

Đầm Hồng ngập rác thải.

An excerpt from an article about construction waste.

Feasibility study in Vietnam

Ministry of the Environment
Government of Japan

Overseas expansion of Japan's recycling industry
Commercialization promotion business

TRƯỜNG ĐẠI HỌC XÂY DỰNG
National University of Civil Engineering
Cơ sở giáo dục đại học đạt chuẩn kiểm định quốc tế

2018～2023

SATREPS

JST JICA

Improve feasibility through cooperation.

MOU
12.2020

NDA
12.2020

Saitama University

Recycle roof tile and soil
ECO SYSTEM Inc.

Crushing and performance testing












Make cities around the world recycle-oriented future cities


Waste material from building demolition.


Brick & Roof Tile Factory
Manufacturing processes generate about 5 to 7% defective products, which then become waste.

Large amount of ceramic waste

Landfill disposal site, or Illegal dumping?

A fixed plant has high installation & operating costs.

Crush and Particle size adjustment.

Local Partner Company

On-board ready-mixed concrete plant. [MOBICON]
It can also be used as a non-fired brick manufacturing machine.



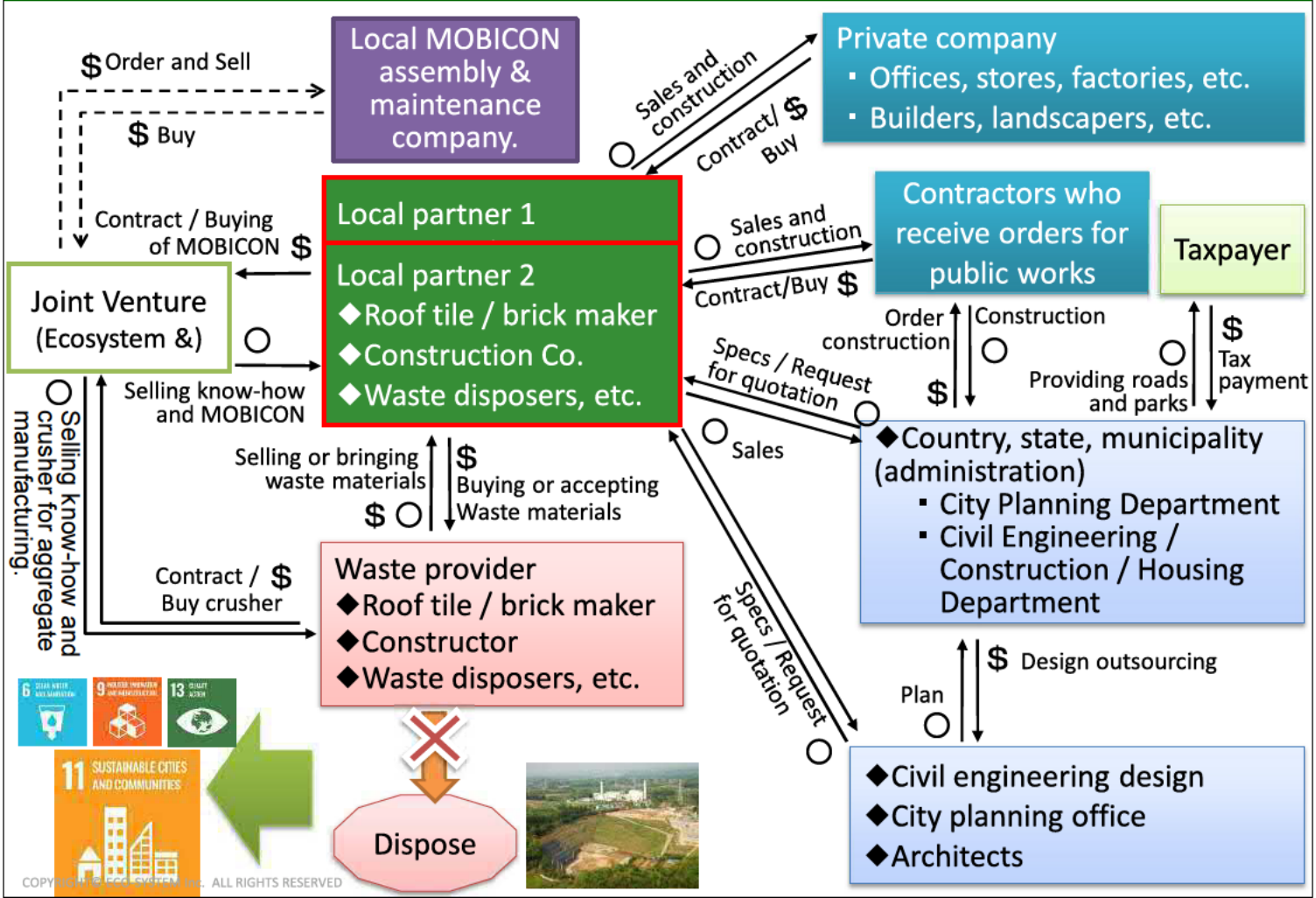
A recycle-based future city where water circulates.

We can also manufacture and supply special ready-mixed products for infrastructure maintenance, responding to every demand.

N A B C

Needed	**All over the world by;** 1. Roof Tile & Brick (ceramic industry) manufacturers 2. Construction contractors 3. Ministries and agencies, such as municipalities 4. The taxpayers
Approach	Ceramic waste recycling know-how produces permeable, water-retentive pavement, **just like the soil**, using **MOBICON**.
Benefit/ Cost	1. Waste roof tiles and bricks produce cool concrete pavements and are less expensive than ordinary landscape paving materials. 2. Specialty concretes can be easily manufactured using MOBICON, making it easy to generate new business. In addition, less water is required for cleaning, which reduces the environmental load. 3. MOBICON requires only about 1/5 of the capital investment needed for a typical ready-mixed concrete plant. MOBICON is assembled locally, which promotes local employment.
Competitors	Fresh concrete and asphalt producers and products. Manufacturer of regular ready-mixed concrete plants and mobile ready-mixed concrete plants.

Business Model



Milestone

Company Philosophy

We are creating an ecosystem.
We pursue the material and intellectual
growth of all our stakeholders through our joint efforts.
We contribute to the advancement of society and humankind.

ECOSYSTEM Inc. 「Overseas Expansion Plan」

2019～2022	2023～2026	2027～2030	
JJ 22 (Feasibility study)	OSEM 26 (Business development)	SDGs 30	Next medium to long-term plan

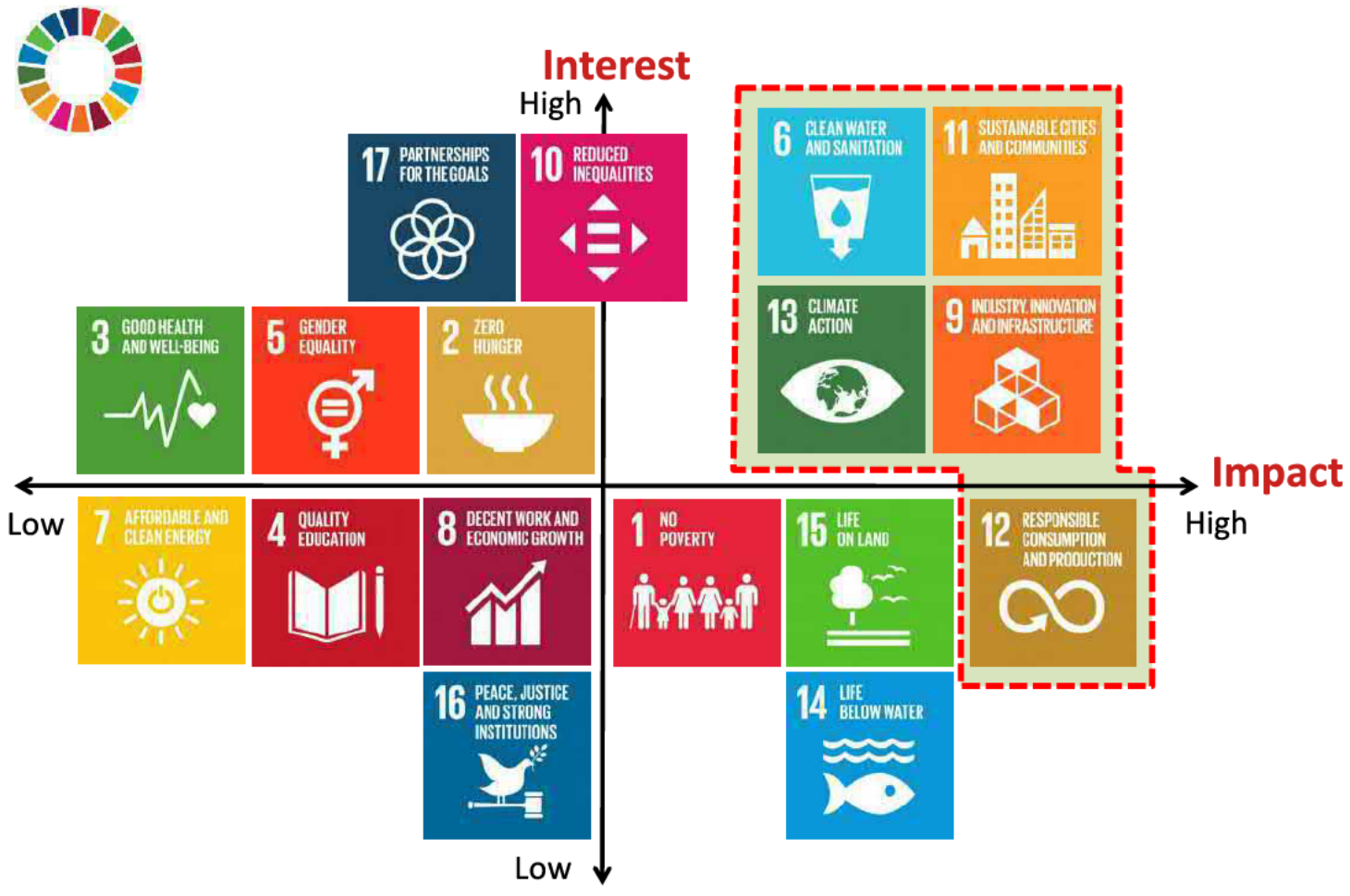
1st phase
- Survey of possibilities
- Development of know-how
- Development and improvement of MOBICON

2nd phase
- Establishment of local corporation
- Start business
- Sale of MOBICN

3rd phase Final stage
- Expand to neighboring countries
- Expand to Europe

Aiming for stock listing

Our SDGs Mapping

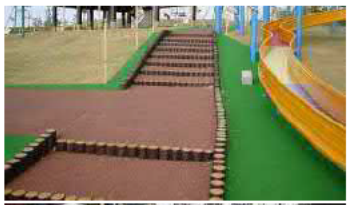


Company Profile & Mission Statement

Recycle roof tile and soil
ECO SYSTEM Inc.

Ecosystem Roof tile

- Establishment — 1994/12/15
- Capital — 19.8 million yen
- Web —https://www.eco-system.ne.jp/
- Contact — info@eco-system.ne.jp
- 6 employees (20 groups in total)
- Company permission / license
  - Industrial waste disposal industry (waste roof tile)
  - Construction industry (civil engineering / paving work industry)

"ECO SYSTEM"

In addition to our company name,

it is at the heart of our philosophy.

Starting in 1994,

as a pioneer of WRT recycling,

this company has worked to protect the

global environment and to create a more

beautiful ecosystem for future generations.

I have taken the initiative,

through the recycling of WRT,

to improve the global ecosystem.

That is our mission.

CLIMATE TECHNOLOGY CENTRE & NETWORK

CTCN

Workshop on "Private Sector Contribution to Climate Change Adaptation"

CTCN's support mechanism

2 March 2021

Ho-Sik Chon

Adaptation Specialist, Asia-Pacific

Climate Technology Centre and Network (CTCN)

Mission: *To promote the accelerated development and transfer of climate technologies at the request of developing countries for energy-efficient, low-carbon and climate-resilient development*

UN Framework Convention on Climate Change Technology Mechanism

Hosted by:

UNFCCC Technology Mechanism

Climate Technology Centre and Network (CTCN)

CTCN
CLIMATE TECHNOLOGY CENTRE & NETWORK

Mitigation
REDUCE GHG EMISSIONS

Agriculture
Carbon Fixation & Abatement
Energy Efficiency
Forestry
Industry
Renewable Energy
Transport
Waste Management

CTCN Services

TECHNICAL ASSISTANCE

KNOWLEDGE SHARING

COLLABORATION & NETWORKING

Adaptation
STRENGTHEN CLIMATE RESILIENCE

Agriculture & Forestry
Coastal Zones
Early Warning & Environmental Assessment
Human Health
Infrastructure & Urban Planning
Marine & Fisheries
Water

Countries Receiving Technical Assistance

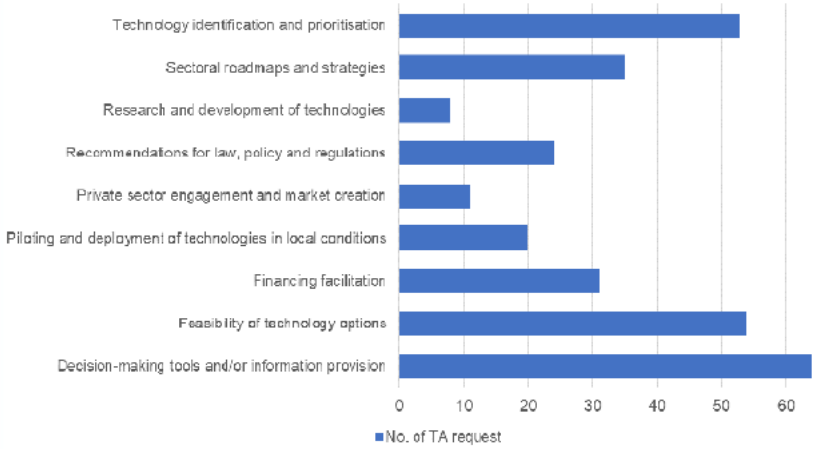
100+ countries

as of 31 Jan. 2021

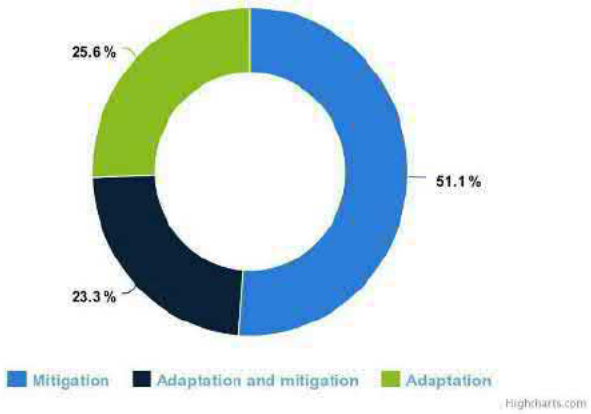
- **226 technology transfer interventions**
- **30% TA requests from Asia-Pacific**

CTCN technical assistance requests at a glance

Type of CTCN technical assistance



Mitigation / Adaptation requests



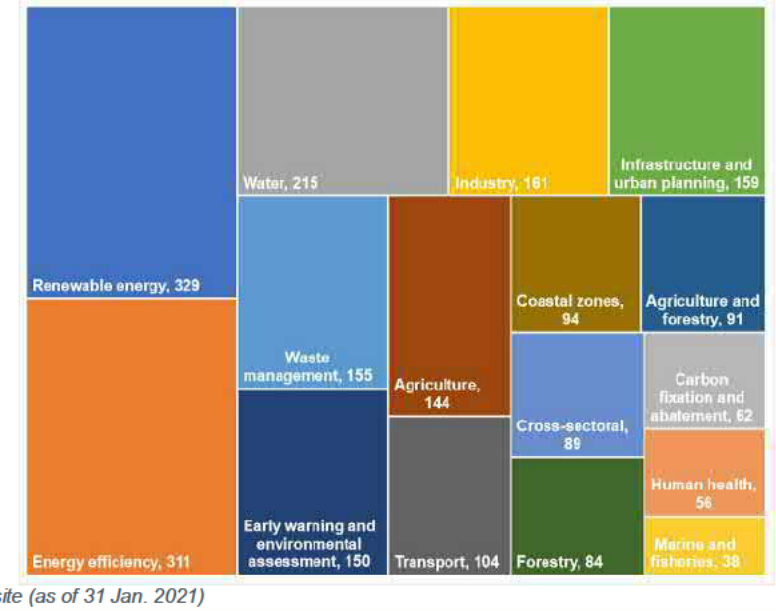
Source: CTCN website (as of 31 Jan. 2021)

Engagement of the Network Members

624 organizations work with CTCN

Type of Network Members	Percentage (%)
Private sector organisation	49.5
Research and academic institution	20.6
Non-governmental organisation	10.9
Not for profit organisation	7.0
Public sector organisation	6.8
Intergovernmental organisation	2.1
Partnership	1.3
Financial institution	0.7
Initiative	0.7
Regional organisation	0.2
Others	0.2

Technical expertise of Network Members



Source: CTCN website (as of 31 Jan. 2021)

Process of the CTCN technical assistance

1. Interested parties in developing countries contact their national focal point (National Designated Entity, NDE) to request technical assistance.
2. The NDE confirms the alignment of the request with its national climate priorities and passes it along to the CTCN.
3. The CTCN collaborates with the NDE and applicants to develop a tailored technology transfer plan.
4. The Climate Technology Centre selects a Network Member to implement the technology solution.

Engagement of Japan in the CTCN services

- As a donor country, **Japan supports CTCN operations, including technical assistance**
- **Pro bono support** *(Ministry of Economy, Trade and Industry, METI)*
  - (Thailand) Benchmarking energy & GHG intensity in Thailand's metal industry
  - (South Africa) Substantial GHG emissions reduction in the cement industry by using waste heat recovery combined with mineral carbon capture and utilization
- **Participation of Japanese Network Members as implementers of the CTCN technical assistance**
  - (Laos) Developing a power to gas masterplan in Lao PDR
  - (Nauru) Ocean energy technical pre-feasibility study
  - (Palestine) Technology Road Map for Palestine's implementation of climate action plans
- **Japanese Network Members contribute to information sharing on climate technologies** via the **CTCN knowledge platform**

Network Members in Japan

GEC
NEDO
Deloitte.
RITE Research Institute of Innovative Technology for the Earth
一般財団法人 日本環境衛生センター JAPAN ENVIRONMENTAL SANITATION CENTER
IGES
OECC
NIPPON KOEI LAC

Source: CTCN website (as of 31 Jan. 2021)

CTCN technical assistance for adaptation in Asia-Pacific

- Coastal zones sector
  - (Kiribati, Marshall Islands, Palau & Solomon Islands) **Capacity development to address risks in coastal**

    Development of the bathymetric (standardised bathymetric grids and digital elevation grids) and the wave models for four Pacific island states would provide a coastal modeling tool that outlines 'high hazard' areas and could be used in coastal zone risk management and planning.
  - (Bangladesh) **Technology for monitoring & assessment of climate change impact on geomorphology in the coastal areas of Bangladesh**

    Development of the methodology for use of earth observation (EO) tool would enhance capacity of technical staff and decision makers to utilise modern EO techniques to monitor climate change challenges and provide early warning of bank erosion in the coastal zone of Bangladesh.

CTCN technical assistance for adaptation in Asia-Pacific (cont.)

- Infrastructure and urban planning sector
  - (Sri Lanka) **Development of Kurunegala as a climate smart city**

    Development of the adaptation action plan (water scarcity and heat stress) and the manual for local adaptation planning would help local government officials in Sri Lanka take action to reduce climate risk at city/local levels.
  - (Indonesia) **Hydrodynamic modelling for flood reduction and climate resilient infrastructure development pathways in Jakarta**

    Development of the high-resolution hydrodynamic model and socio-cultural survey would improve capacity of relevant government agencies to formulate policy and action plans to reduce flooding and support sustainable city planning in Jakarta.

Climate technology knowledge portal

- CTCN website www.ctc-n.org hosts nearly 17,000 publications, case studies, tools and webinars on climate change adaptation and mitigation, women and gender, etc.

Source: CTCN website

CTCN
CLIMATE TECHNOLOGY CENTRE & NETWORK

Thank you

Email: h.chon@unido.org

CTCN Secretariat
UN City, Marmorvej 51
DK-2100 Copenhagen, Denmark
www.ctc-n.org
ctcn@un.org
UNFCCC_CTCN
UNFCCC.CTCN

Supported by

INTRODUCTION TO THE GCF

GREEN CLIMATE FUND

Vladislav Arnaoudov | Climate Change Monitoring and Evaluation Specialist

2 March 2021

1 GREEN CLIMATE FUND

HISTORY OF THE GCF

2010 — Established by 194 countries (UNFCCC COP16)

2012 — First Board Meeting

2014 — Initial Resource Mobilization USD 10 billion

2015 — First project approval

2019 — First replenishment USD 9.9 billion

2020 — 159 projects approved, USD 7.2 billion invested

The largest specialized climate fund. Part of the UNFCCC financial mechanism. Supports countries to achieve paradigm shift toward low emission and resilient development

OUR PORTFOLIO

TOTAL
PROJECTS **$7.2 B in 123 countries**

USD 23.2B
total portfolio with co-financing

1.2
gigatons of CO_2 eq.

408
million people with increased resilience

EASTERN EUROPE
10 PROJECTs

LAC
38 PROJECTS

AFRICA
63 PROJECTS

ASIA
64 PROJECTS

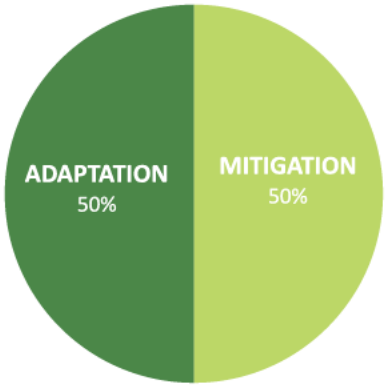
- Projects & Readiness/PPF
- Projects only
- Readiness/PPF only

Source: Green Climate Fund (September 2020)

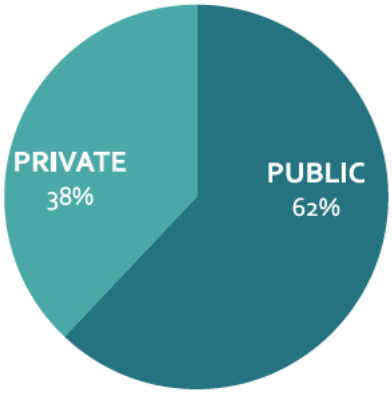
GREEN CLIMATE FUND

OUR PORTFOLIO

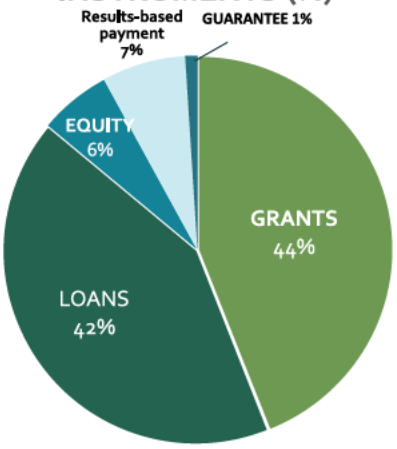
AREAS
(Grant equivalent terms)



PUBLIC AND PRIVATE SECTOR



FINANCIAL INSTRUMENTS (%)



GREEN CLIMATE FUND

WHAT WE LOOK FOR

Additionality of GCF Funding
- Why GCF?
- Projects must crowd-in additional financing on top of GCF

Strong Climate Rationale
- Climate Impact of investment is key
- Scientific evidence to provided

8 Results Areas
- Energy
- Transport
- Buildings, Cities, Industries
- Ecosystems
- Livelihoods of people & comm.
- Health, food and water security
- Forests and land use
- Infrastructure

Compliance with GCF Policies
- Fiduciary standards
- Risk Management
- ESS
- M&E Criteria
- Gender Policy
- Legal Standards

Country Driven Approach
- Alignment with NDCs
- Early country (NDA) engagement
- No-objection letter

Six Investment Criteria
1. Impact Potential
2. Paradigm Shift Potential
3. Sustainable development potential
4. Recipient needs
5. Country ownership
6. Efficiency & effectiveness

Completeness of documentation
- Feasibility study
- Financial Model
- Project Timetable
- Gender Analysis
- Environmental studies
- No-objection letter

GREEN CLIMATE FUND

HOW WE WORK

GCF invests in projects through accredited entities

2 PROJECT EXAMPLES

Cross-Cutting Projects

Green Affordable Housing and Resilient Urban Renewal

Country	GCF financing	Accredited entity	Financial instrument
Mongolia	USD 95 million	ADB	Loan

- Improving the climate resilience of the Mongolian capital Ulaanbaatar and reducing greenhouse gas emissions and air pollution by creating eco-districts
- Low-cost urban infrastructure, public facilities, and social housing units
- 350,000 beneficiaries
- 7.9 MtCO2 avoided

Co-Financing
Loan **USD 191 M**
Equity **USD 99 M**
Grant **USD 3 M**

Cross-Cutting Projects

Improving the resilience of vulnerable coastal communities to climate change related impacts

Country	GCF financing	Accredited entity	Financial instrument
Viet Nam	USD 29.5 million	UNDP	Grant

- Strengthening storm and flood protection for coastal communities in Viet Nam through resilient housing, planting and rehabilitation of mangrove forests, and systematized climate risk assessments
- New houses for 20,000 people and 4,000 ha of mangroves rehabilitated
- Emission reduction of 1.9 million tCO_2e
- 30 million beneficiaries reached

Co-Financing
Grant **USD 9.4 M**
Grant **USD 1.6 M**

GREEN
CLIMATE
FUND

Raising
ambition.
Empowering
action.

Attachment 3: Presentation Materials of International Information Dissemination (Vietnam)

(1) METI / Japan's Climate Change Policy
(2) MONRE / Key features of the National Adaptation Plan (NAP) for the period 2021-2030, and the resources needed for the implementation of NAP
(3) VCCI / Assessing the Impact of Climate Change on Vietnamese Businesses: Main finding from the enterprises survey in 2019
(4) Furuno Electric Co., Ltd. / FURUNO Weather Radar
(5) Sekisui Techno Molding Co., Ltd. / Plastic underground stormwater storage "CROSS-WAVE"
(6) ECOSYSTEM Inc. / Aiming for Sustainable Urban Development!: Turn construction waste into functional pavement using recycled bricks and roof tiles!
(7) CTCN / CTCN's support mechanism
(8) GCF / Introduction to the GCF

Note: (1), (4), (5), (6), (7), and (8) were same contents as "Attachment 2: Presentation Materials of International Information Dispatch (Bangladesh)," therefore the attachments were omitted.

MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT

DEPARTMENT OF CLIMATE CHANGE

Key features of the National Adaptation Plan (NAP) for the period 2021 - 2030, and the resources needed for the implementation of NAP

Mr. Vu Duc Dam Quang,

Head of Adaptation division,
Department of Climate Change, MONRE

Hanoi – Feb 2021

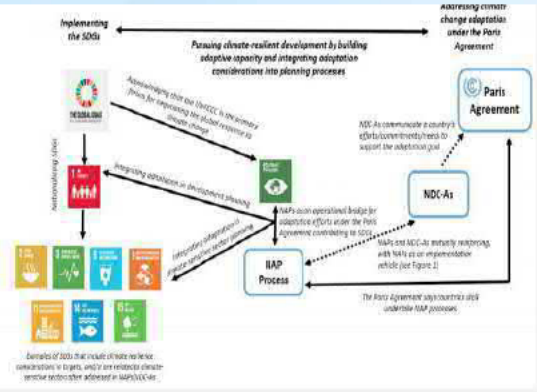
CONTENTS

1. CONTEXT OF DEVELOPING AND APOPTING NAP
2. MAIN CONTENTS OF NAP
3. RESOURCES MOBILISATION FOR THE IMPLEMENTATION OF NAP

PART I.

THE CONTEXT OF DEVELOPING AND ADOPTING THE NATIONAL ADAPTATION PLAN FOR THE PERIOD 2021-2030, WITH A VISION TO 2050

I.1. INTERNATIONAL CONTEXT



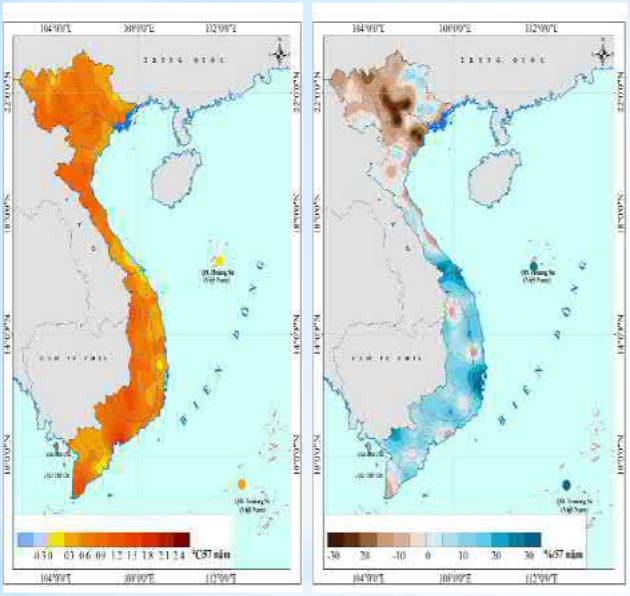
Linkage among NDC, NAP & SDG

Source: GIZ, 2017

At the COP21 in 2015, the Parties to the United Nations Framework Convention on Climate Change ratified the Paris Agreement. This is the historic agreement, the first global legal basis binding the responsibilities of all Parties to respond to climate change.

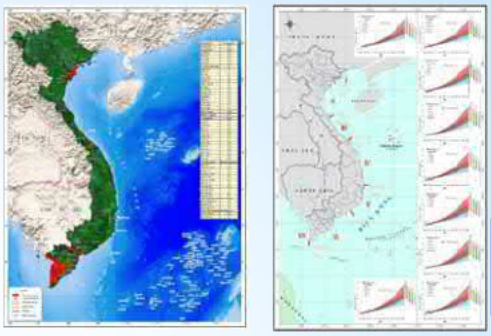
Viet Nam needs to identify climate change adaptation actions; gaps in strengthening institutional capacity, policy implementation, financial resources, human resources, and technology to adapt climate change; prioritized adaptation actions for the period 2021-2030.

I.2. NATIONAL CONTEXT

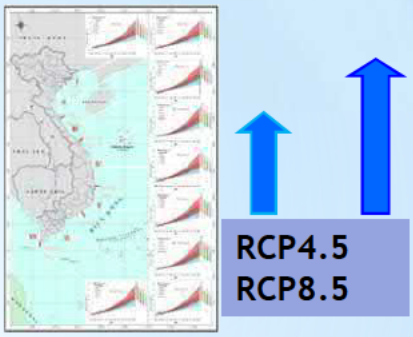


Changes in annual average temperature (°C) and annual rainfall (%) in the period 1958-2014

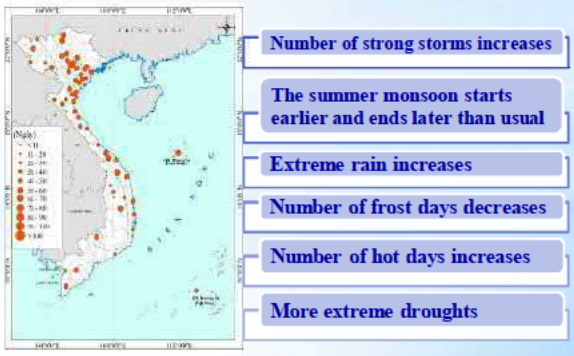
Source: IMHEN, 2016



Flood risk

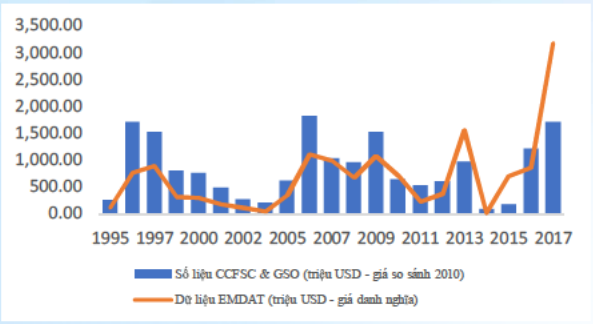


Sea level rise

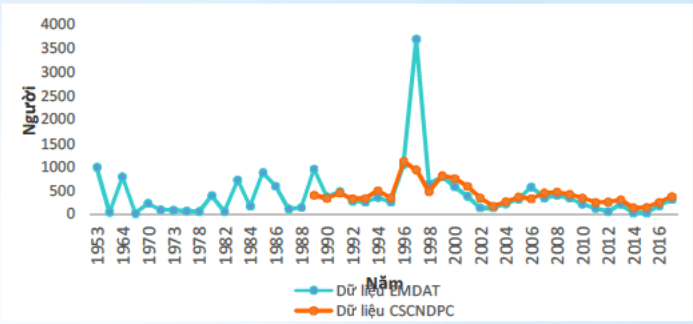


Extreme weather

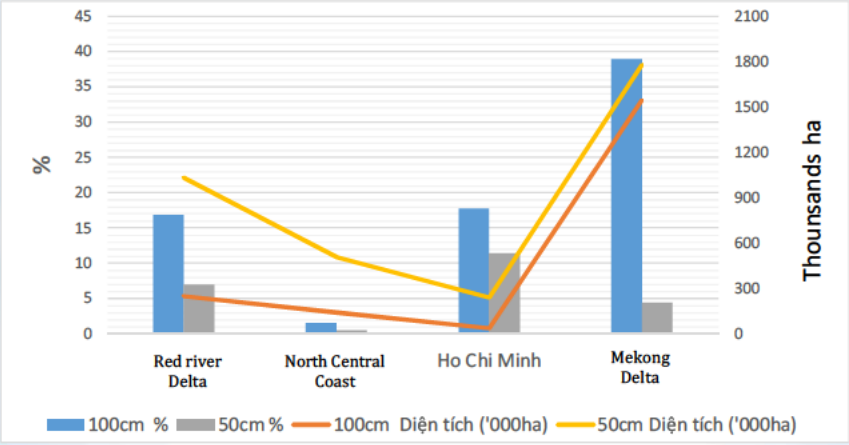
I.2. NATIONAL CONTEXT (cont.)



Damages caused by natural disasters in Vietnam

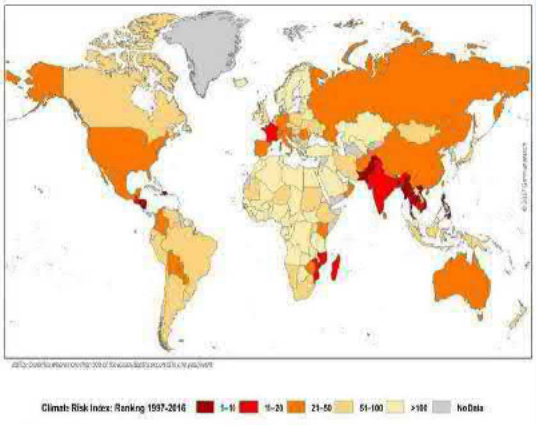


Death toll from natural disasters in Viet Nam



Area at risk of flooding due to sea level rise

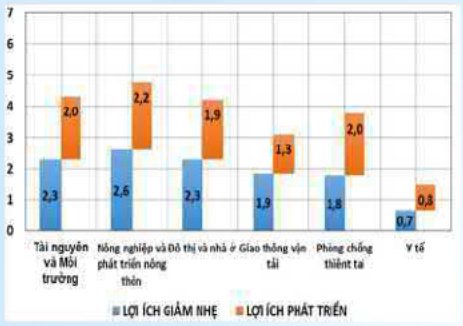
I.2. NATIONAL CONTEXT (cont.)



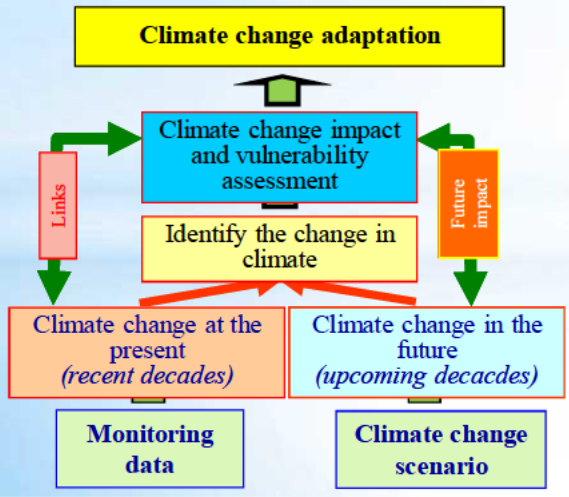
Vietnam is one of ten countries severely affected by climate change

- Requirements for climate change response, natural disaster prevention and control, resource management and environmental protection should be at the centre of development decisions.
- Climate change adaptation must be integrated in related legal documents, strategies, and planning.
- Climate change adaptation must be linked with sustainable development, enhancing the resilience of natural and social systems and taking advantage of the opportunities of climate change.

I.2. NATIONAL CONTEXT (cont.)



Synergy and co-benefits between climate change adaptation and socio-economic development



THỦ TƯỚNG CHÍNH PHỦ

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc

Số: 1055/QĐ-TTg

Hà Nội, ngày 20 tháng 7 năm 2020

QUYẾT ĐỊNH
Về việc ban hành Kế hoạch quốc gia thích ứng với biến đổi khí hậu giai đoạn 2021 - 2030, tầm nhìn đến năm 2050

THỦ TƯỚNG CHÍNH PHỦ

Căn cứ Luật Tổ chức Chính phủ ngày 19 tháng 6 năm 2015;

Căn cứ Nghị quyết số 93/NQ-CP ngày 31 tháng 10 năm 2016 của Chính phủ phê duyệt Thỏa thuận Paris thực hiện Công ước khung của Liên hợp quốc về biến đổi khí hậu;

Theo đề nghị của Bộ trưởng Bộ Tài nguyên và Môi trường.

QUYẾT ĐỊNH:

Điều 1. Ban hành kèm theo Quyết định này Kế hoạch quốc gia thích ứng với biến đổi khí hậu giai đoạn 2021 - 2030, tầm nhìn đến năm 2050.

Điều 2. Quyết định này có hiệu lực thi hành kể từ ngày ký.

Điều 3. Các Bộ trưởng, Thủ trưởng cơ quan ngang bộ, Thủ trưởng cơ quan thuộc Chính phủ, Chủ tịch Ủy ban nhân dân các tỉnh, thành phố trực thuộc trung ương và các cơ quan liên quan chịu trách nhiệm thi hành Quyết định này./.

Nơi nhận:
- Ban Bí thư Trung ương Đảng;
- Thủ tướng, các Phó Thủ tướng Chính phủ;
- Các bộ, cơ quan ngang bộ, cơ quan thuộc Chính phủ;
- HĐND, UBND các tỉnh, thành phố trực thuộc trung ương;
- Văn phòng Trung ương và các Ban của Đảng;
- Văn phòng Tổng Bí thư;
- Văn phòng Chủ tịch nước;
- Hội đồng Dân tộc và các Ủy ban của Quốc hội;
- Văn phòng Quốc hội;
- Tòa án nhân dân tối cao;
- Viện kiểm sát nhân dân tối cao;
- Kiểm toán Nhà nước;
- Ủy ban Giám sát tài chính Quốc gia;
- Ngân hàng Chính sách xã hội;
- Ngân hàng Phát triển Việt Nam;
- Ủy ban Trung ương Mặt trận Tổ quốc Việt Nam;
- Cơ quan trung ương của các đoàn thể;
- VPCP: BTCN, các PCN, Trợ lý TTg, TGĐ Cổng TTĐT, các Vụ, Cục, đơn vị trực thuộc, Công báo;
- Lưu: VT, NN (3b).

KT. THỦ TƯỚNG
PHÓ THỦ TƯỚNG

Trịnh Đình Dũng

PART II.

MAIN CONTENTS OF THE NATIONAL ADAPTATION PLAN FOR THE PERIOD 2021 - 2030, WITH A VISION TO 2050

II.1. GOAL AND OBJECTIVES

1. Goal

The National Adaptation Plan aims to minimize vulnerability to and risks of climate change by strengthening resilience, the adaptation capacity of communities, economic sectors and ecosystems and by promoting the integration of climate change adaptation into strategies and planning.

2. Specific objectives

To improve the effectiveness of climate change adaptation by enhancing the state management of climate change including adaptation activities and promoting the integration of climate change adaptation into strategies and planning.

To enhance the resilience and adaptation capacity of communities, economic sectors, and ecosystems through investments in adaptation actions, science and technology, and awareness raising for climate change readiness

To reduce disaster risks and mitigate damages, be ready to respond to increasing natural disasters and extreme climate events due to climate change

II.2. TASKS AND SOLUTIONS

1. Improving the effectiveness of climate change adaptation by enhancing the state management of climate change and promoting the integration of climate change adaptation into strategies and planning

Developing and completing the national legal framework on climate change; implementing activities to form a basis for the development of the Law on Climate Change

Reviewing, updating, and developing new socio-economic, sectoral planning based on climate change scenarios

Promoting the integration of climate change adaptation into strategies and planning

Monitoring and evaluating to enhance the effectiveness of climate change adaptation, including the promulgation of criteria in assessment of the effectiveness of adaptation activities; developing and operating a monitoring and evaluation system for climate change adaptation activities

Promoting adaptation actions with co-benefits in ensuring disaster prevention, reduction of climate change risks and economic, social, environmental effectiveness.

Strengthening international cooperation and fulfilling the obligations to the United Nations Framework Convention on Climate Change

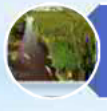
II.2. TASKS AND SOLUTIONS (cont.)

2. Strengthening resilience and enhancing adaptation capacity of communities, economic sectors, and ecosystems through investment in adaptation actions, science and technology and awareness raising for climate change readiness

Improving the natural systems and infrastructure to enhance resilience of sectors/fields to climate change

Improving the adaptability of natural ecosystems and biodiversity in the context of climate change through strengthening the management of ecosystems and biodiversity

Developing and upscaling ecosystem-based and community-based adaptation models; increasing the participation of local communities in biodiversity monitoring, conservation, and management



Managing and protecting forests and improving forest quality through solutions for forest regeneration, restoration, and enrichment.

Raising awareness and enhancing knowledge about climate change and natural disasters for different levels of authorities, social organizations and communities; enhancing capacity, developing female human resources and promoting gender equality in climate change adaptation.

Researching and developing technologies with a focus on new and advanced technologies in climate change adaptation

II.2. TASKS AND SOLUTIONS (cont.)

3. Disaster risk reduction, damage mitigation and readiness to respond to increasing natural disasters and extreme climate events due to climate change

Readiness to respond to climate change hazards through strengthening climate change monitoring, hydro-meteorological observation, forecast, warning and transmission of information on natural disasters and extreme weather

Ensuring safety for irrigation works and natural disaster prevention works in order to actively respond to natural disasters increasing both in frequency and intensity

Improving disaster risk management systems; identifying, zoning, and forecasting disaster risk levels; strengthening management capacity and measures and promotion of disaster risk reduction; focusing on the community-based disaster management solutions; promoting local knowledge in disaster prevention to minimize vulnerability; and enhancing readiness to cope with extreme weather and climate events

Mitigating damage caused by natural disasters due to short-term, medium-term, and long-term impacts related to climate change through timely and effective implementation of disaster prevention measures

Preventing erosion along river banks and coastlines; coping with increasing droughts and salinity intrusion; addressing losses and damages due to climate change impacts

II.3. IMPLEMENTATION PHASES

Phase 2021 - 2025

- Focusing on completing mechanisms and policies on climate change adaptation;
- Preparing the legal basis and technical conditions to promote the integration of climate change into policies, strategies, and planning;
- Implementing tasks and priority solutions to adapt to climate change, enhance the capacity to respond to natural disasters, and minimize damages caused by natural disasters and unusual climate and weather

Phase 2026 - 2030

- Strengthening the coordination and integrating activities in the implementation of tasks and solutions
- Improving the resilience capacity of the infrastructure system, the adaptability of natural ecosystems and biodiversity
- Enhancing the resilience of natural ecosystems, protecting and conserving biodiversity in the context of climate change.
- Promoting adaptation actions that have co-benefits in climate change mitigation and are economically, socially, and environmentally effective.

Vision to 2050

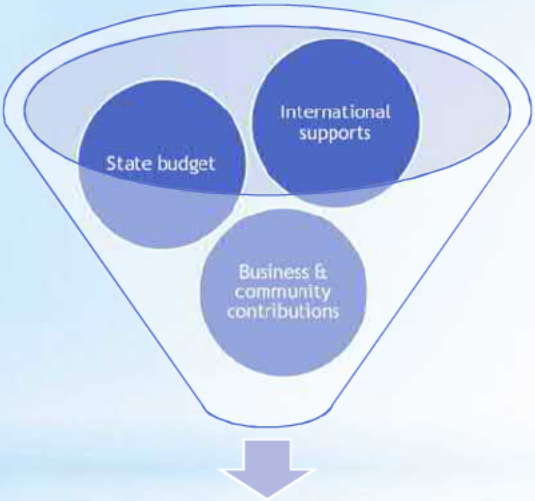
- Promoting the achievements of NAP implementation
- Enhancing the adaptation capacity to climate change
- Integrating climate change adaptation into all socio-economic activities, taking opportunities of climate change for socio-economic development

II.4. LIST OF TASKS FOR IMPLEMENTATION OF NAP

TÀI NGUYÊN VÀ MÔI TRƯỜNG

PART III.
RESOURCES MOBILISATION FOR THE IMPLEMENTATION OF NATIONAL ADAPTATION PLAN FOR THE PERIOD 2021 - 2030, WITH A VISION TO 2050

III. RESOURCES MOBILISATION FOR THE IMPLEMENTATION OF NAP



Resources for the implementation of NAP

- Mobilizing resources is important for the implementation of climate change adaptation activities.
- The implementation of NAP requires a variety of resources including financial, technical and human resources. Among these, financial resources are the most important for implementing adaptation actions at both national and local levels..
- Resources for the implementation of NAP are mobilized from different channels, in compliance with the provisions of the State Budget Law, the Law on Public Investment , the Law on Investment and other relevant laws..
- Financial resources for adaptation activities can be mobilized from channels including: State budget (including central and local budgets); international supports; businesses and community contributions.

III.1. MOBILISATION FROM STATE BUDGET

STATE BUDGET

To balance the fund from the central and local budgets.

To integrate in the implementation plans, strategies, planning, programs, schemes and projects of ministries, and local agencies

National science and technology programs.

National Science and Technology Development Funds.

III.2. MOBILISATION FROM BUSINESS AND COMMUNITY

The State creates a legal basis, applies economic and market tools to ensure effective implementation of climate change adaptation policies and laws, and encourages and facilitates financial institutions, domestic and foreign businesses to invest in and support the implementation of NAP.

III.3. MOBILISATION FROM INTERNATIONAL SUPPORTS

Global Environmental Fund(GEF)

- The GEF Fund is an executive organization of the financial mechanism of the UNFCCC.
- Climate change adaptation is an area in which the GEF holds great importance.
- Since 1998, Vietnam has received 17 projects supports from the GEF mainly for GHG emission reduction activities with a total grant of more than USD 50 million..

Adaptation Fund (AF)

- Operating since 2009, AF officially associated with the funds under the framework of the UNFCCC.
- The Fund's goal is to support climate change adaptation activities, and this is a financial channel which could be accessed in the implementation of the NAP.

Green Climate Fund (GCF)

- GCF was established in 2010 to support projects, programs, policies and other activities on climate change adaptation and GHG emission reduction in developing countries.
- To date, Vietnam has received 2 projects supports from GCF with a total funding of 115.8 million USD.

Bilateral and multilateral cooperation

- Bilateral support, including direct activities with ministries and provincial agencies.
- Multilateral technical assistance, provided by development banks and UN organizations on climate change, including the integration of climate change adaptation into sector activities.
- Support from NGOs includes support for climate change adaptation at community and local levels.

THANK YOU!

ASSESSING THE IMPACT OF CLIMATE CHANGE ON VIETNAMESE BUSINESSES

Main findings from the enterprises survey in 2019

Pham Ngoc Thach
Deputy General Director of Legal Department
Vietnam Chamber of Commerce and Industry

CONTENT

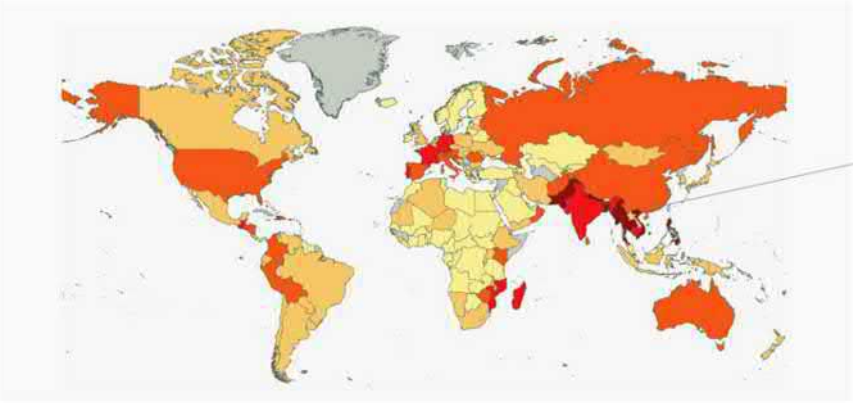
The Presentation Outline

1. Introduction
2. Signs of climate change through the view of businesses
3. Impact of climate change on businesses
4. Responding to climate changes
5. Opportunities to take actions

BACKGROUND

Global Climate Change

Vietnam is one of countries most affected by extreme climate events



Climate Risk Index: Ranking for 1999-2018

1-10 | 11-20 | 21-50 | 51-100 | >100 | No data

Source: Germanwatch, Global Climate Risk Index 2020

Countries most impacted by extreme natural disasters (1999-2018)

1	Puerto Rico	6	Vietnam
2	Myanmar	7	Bangladesh
3	Haiti	8	Thailand
4	Philippines	9	Nepal
5	Pakistan	10	Dominica

1.5% GDP

Climate change may affect about 1.5% of Vietnam's gross domestic product (GDP) each year and the damage may increase in the future

Source: The World Bank

BACKGROUND

Current situation

The National Goal Program on Climate Change in 2008, the national strategy in 2011 and other actions plan were approved by the Government.

? The gaps in policies and implementing situation?

Lack of information for enterprises and preparedness to respond to climate change. Sharing of information is limited.

? Policies for Climate change adaptation for enterprises?

Lack of surveys, assessments on impact of climate change to businesses→ *Inputs for policy development and implementation on climate change response*

? Impact of climate change on enterprises? Response plan? Actions needed?

CONTEXT

Implementing agencies and research objectives

VCCI The Asia Foundation UPS

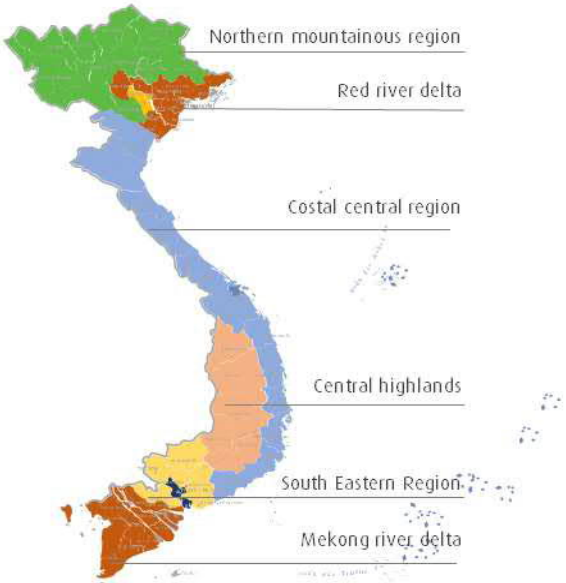
Objectives

1. Identifying disaster risks and climate change situation affecting businesses
2. Carrying out surveys to get information on businesses adaptation plan on disaster risks and climate change
3. Providing assessment of the role of State on promoting businesses better response to disaster risks and climate change through environment friendly activities.

METHODOLOGY

Stratified random sampling

Stratified random sampling is conducted in each of **63 provinces/cities** in Vietnam



Stratification

Type of enterprises

Private Co.	LLC	JSC

×

Time of establishment

<= 2005	2006 - 2015	2016 - 2019

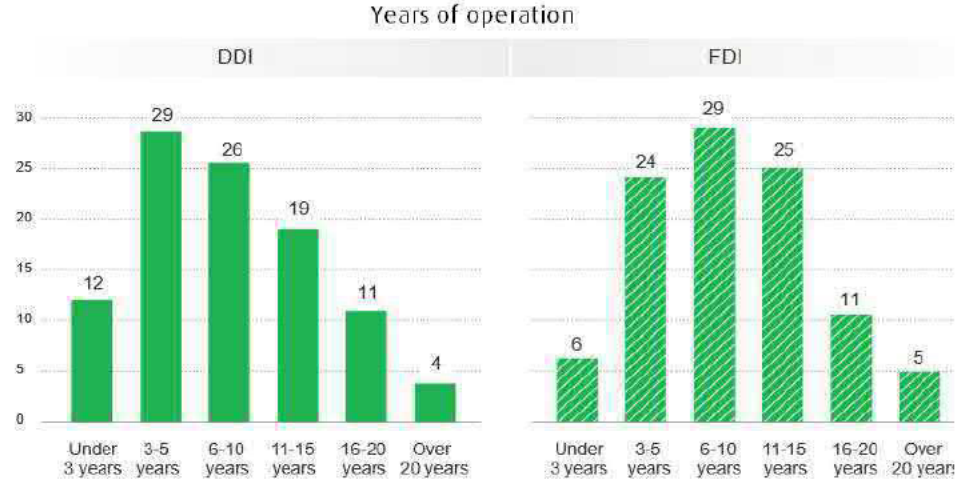
×

Business sectors

Manufacturing	Trading-Services	Agriculture
Mining	Construction	

CHARACTERTISTICS OF PARTICIPANT ENTERPRISES

Years of operation and main sectors



10,356
Enterprises responded

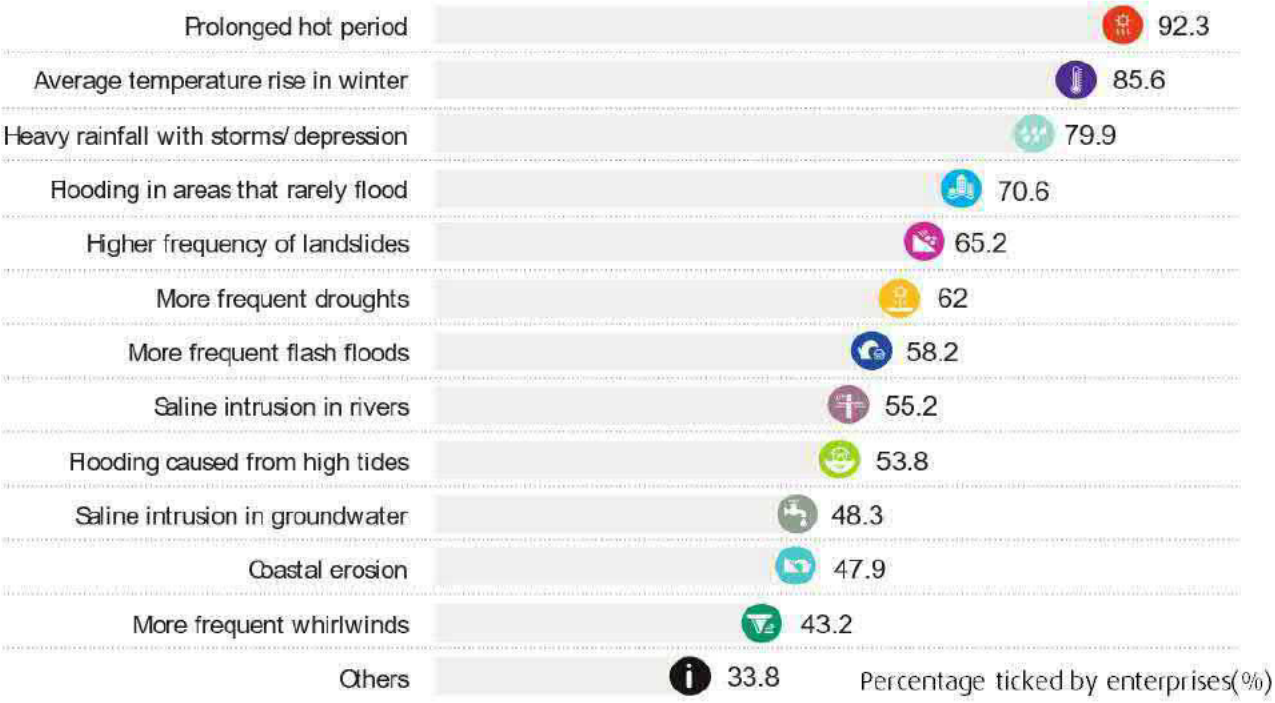
8,773
Private enterprises

1,583
FDI enterprises

OBSERVATIONS OF THE ENTERPRISES ON CLIMATE CHANGE PHENOMENA

Climate change happened more frequently in the past 5 years

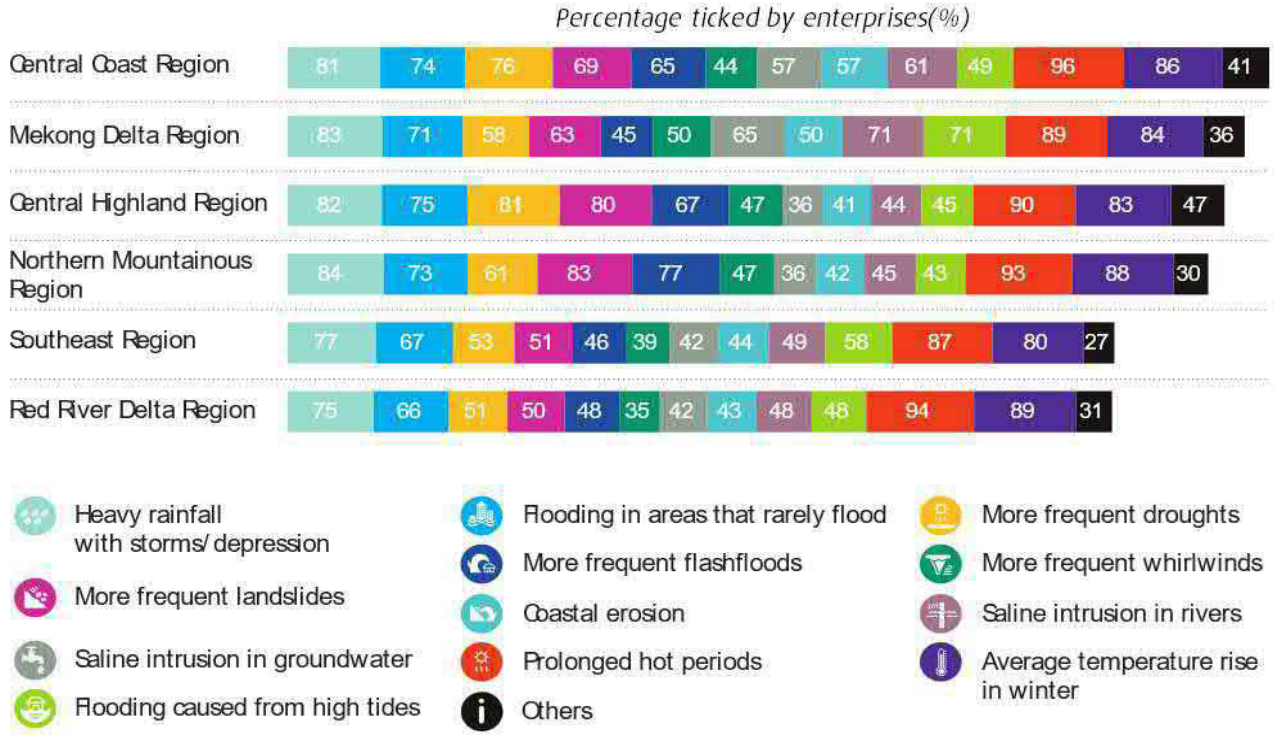
Prolonged hot sun and high average temperature in winter are the most popular phenomena



OBSERVATIONS OF THE ENTERPRISES ON CLIMATE CHANGE PHENOMENA

Climate change happened more frequently in the past 5 years

Enterprises in the Central coast and Mekong river delta are obviously affected by climate change



OBSERVATIONS OF THE ENTERPRISES ON CLIMATE CHANGE PHENOMENA

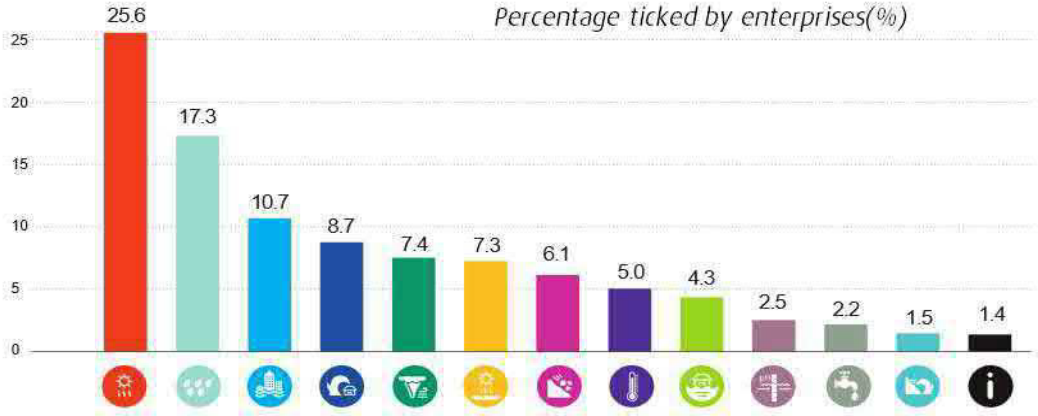
Climate change happened more frequently in the past 5 years

Agriculture and construction enterprises are obviously affected by climate change

EXTREME CLIMATE EVENTS ARE THE WORST FOR ENTERPRISES

Prolonged hot sun, Heavy rain with storms/tropical cyclones, floods are the worst extreme climate events for enterprises

The worst extreme climate events assessed by the enterprises?

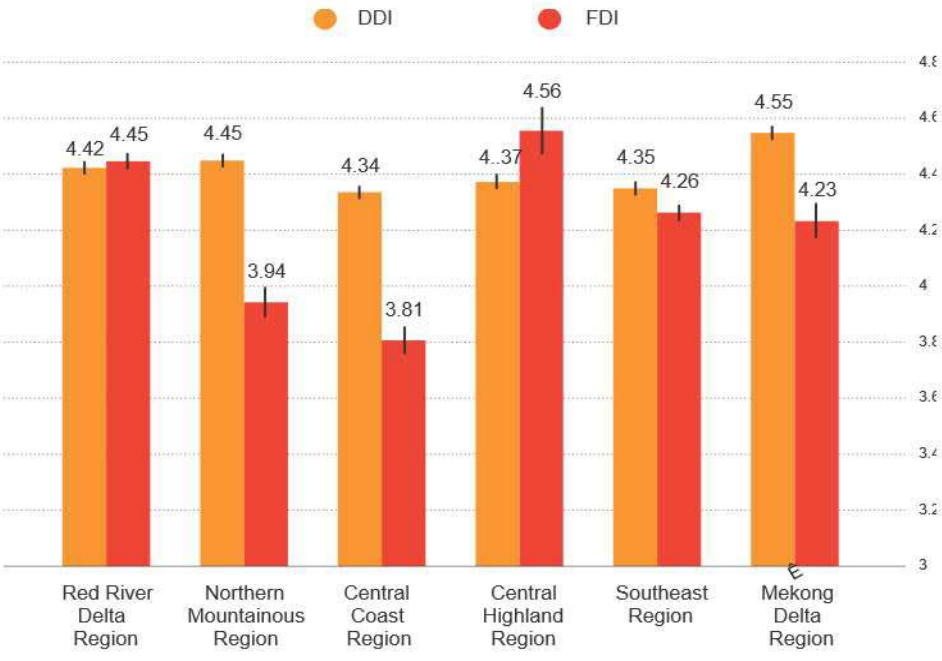


- Prolonged hot period
- Heavy rainfall with storm/ depression
- Flooding in areas that rarely flood
- More frequent flash floods
- More frequent whirlwinds
- More frequent droughts
- More frequent landslides
- Average temperature rise in winter
- Flooding caused from high tides
- Saline intrusion in rivers
- Saline intrusion in groundwater
- Coastal erosion
- Others

OVERALL IMPACTS

Negative impact by climate change to enterprises

In many regions FDI enterprises observed negative impacts to them than the private enterprises



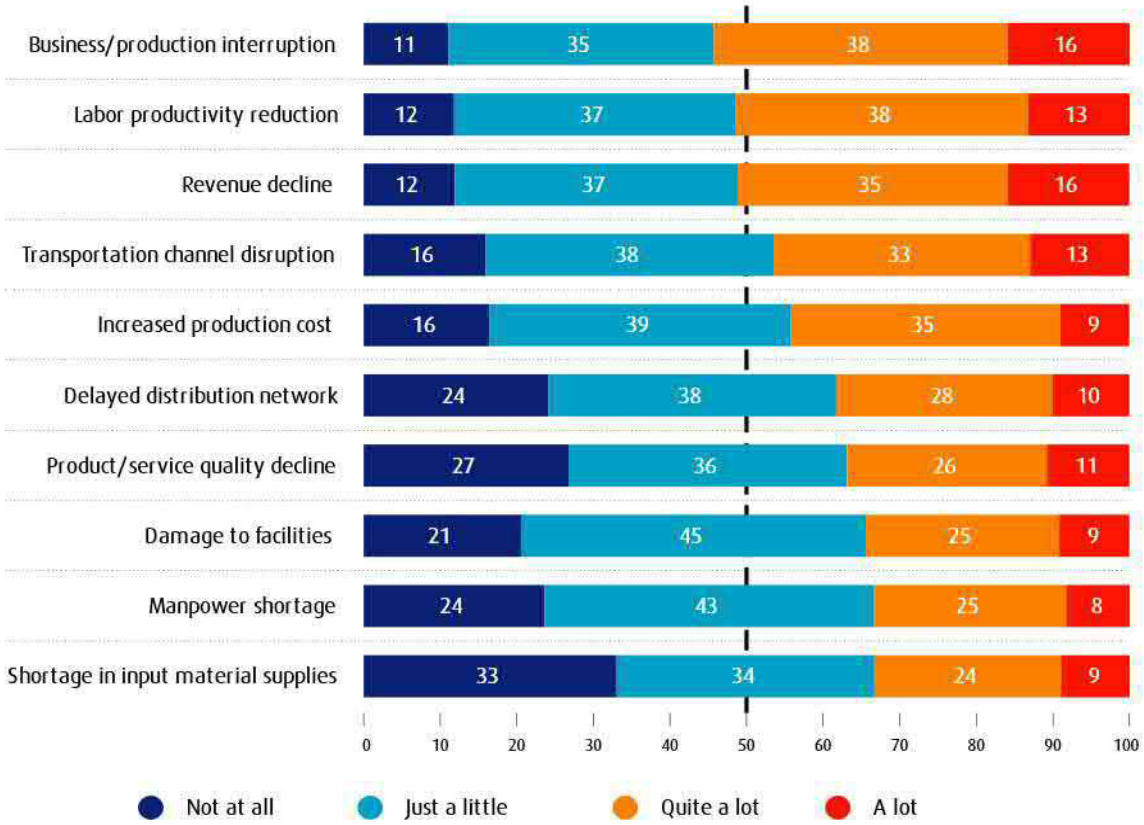
Impact (1. Absolutely negative – 10. Completely positive)

4.41 points
Private enterprises

4.3 points
FDI Enterprises

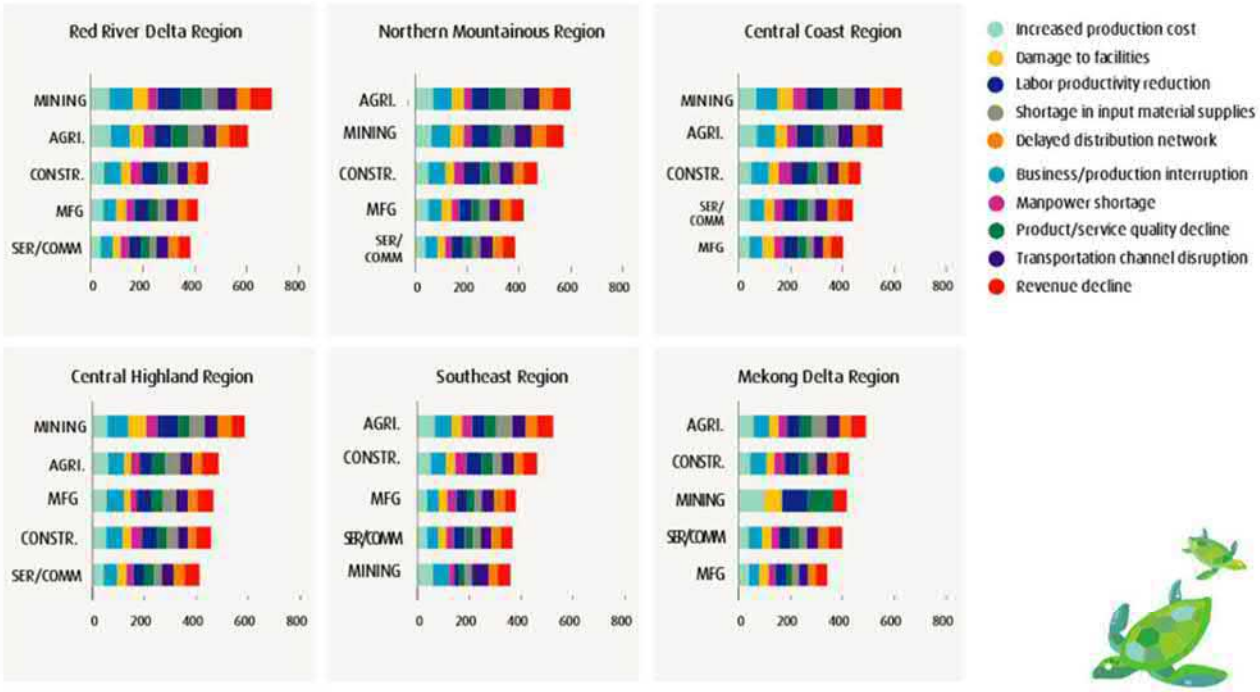
SPECIFIC IMPACTS ON PRODUCTION AND BUSINESS ACTIVITIES

Climate change is obstacles for business activities



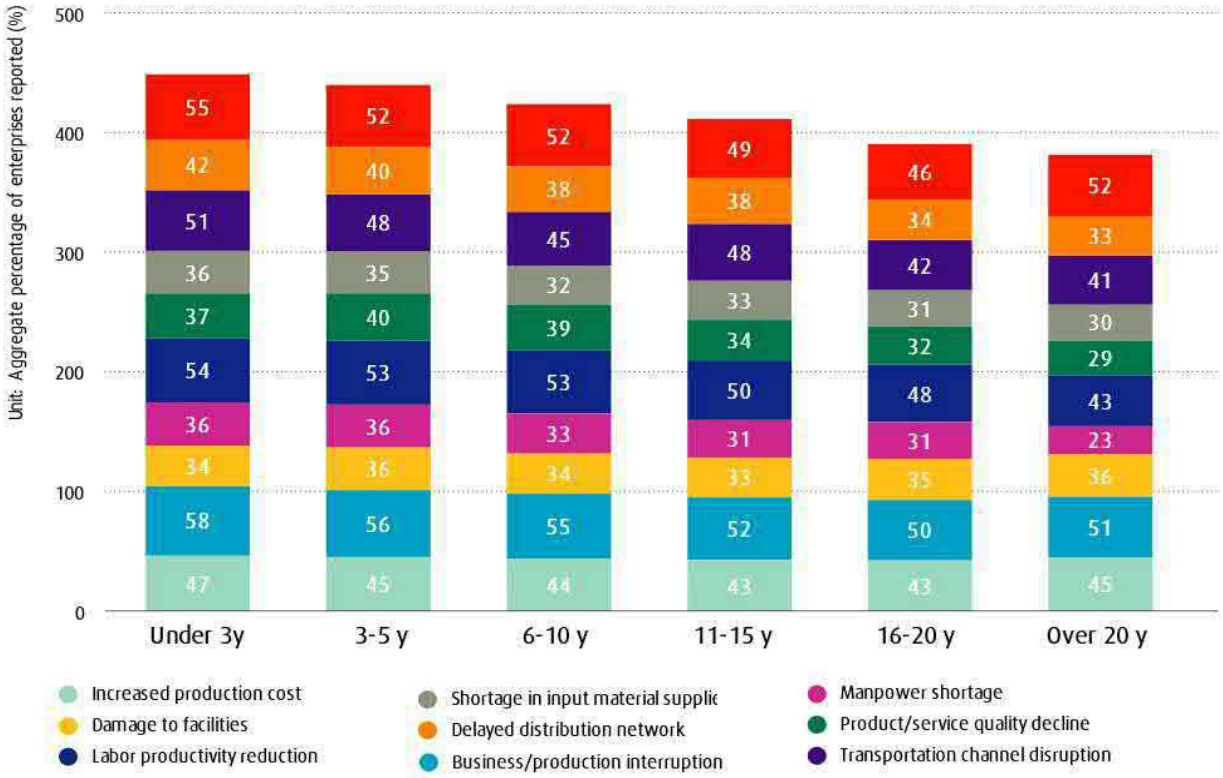
SPECIFIC IMPACTS ON PRODUCTION AND BUSINESS ACTIVITIES

Agriculture is the worst impacted by the climate change



SPECIFIC IMPACTS ON PRODUCTION AND BUSINESS ACTIVITIES

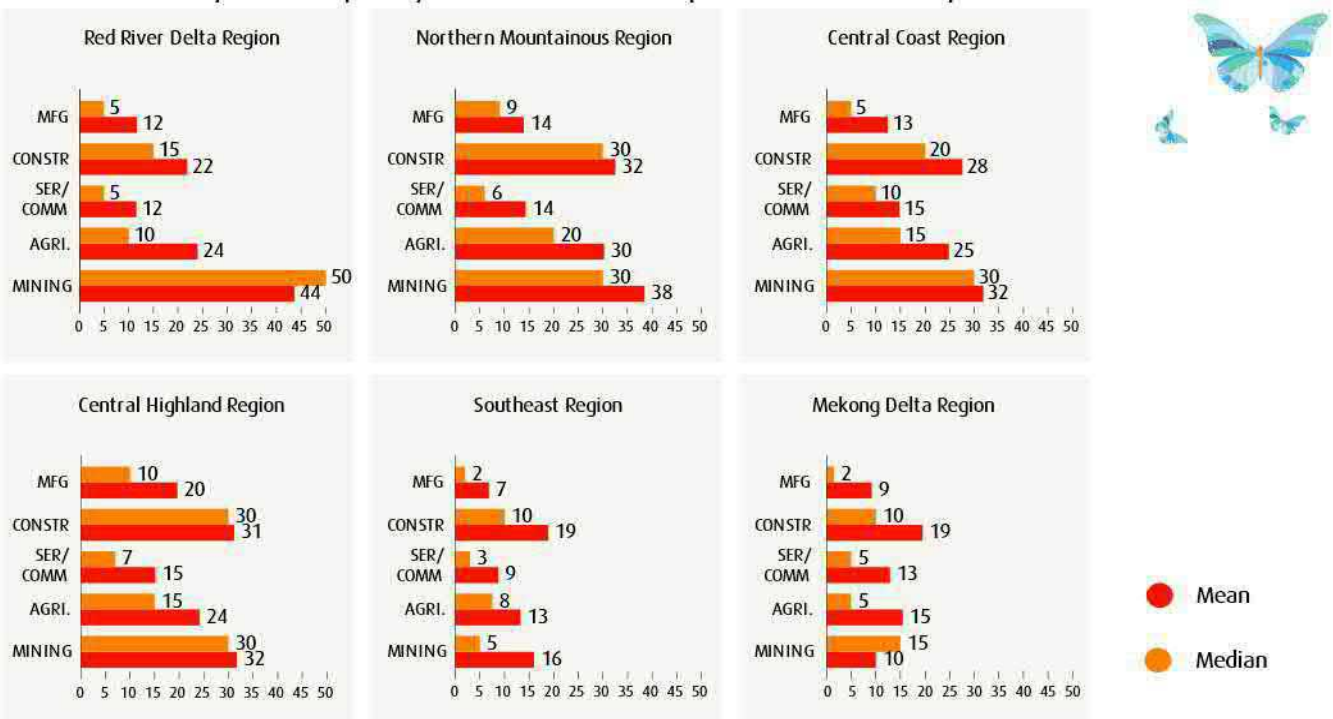
Start up enterprises are the most affected by climate change



BUSINESS AND PRODUCTION INTERRUPTION

A typical enterprise suffered from business and production interruption in 7 days due to the impact of climate change

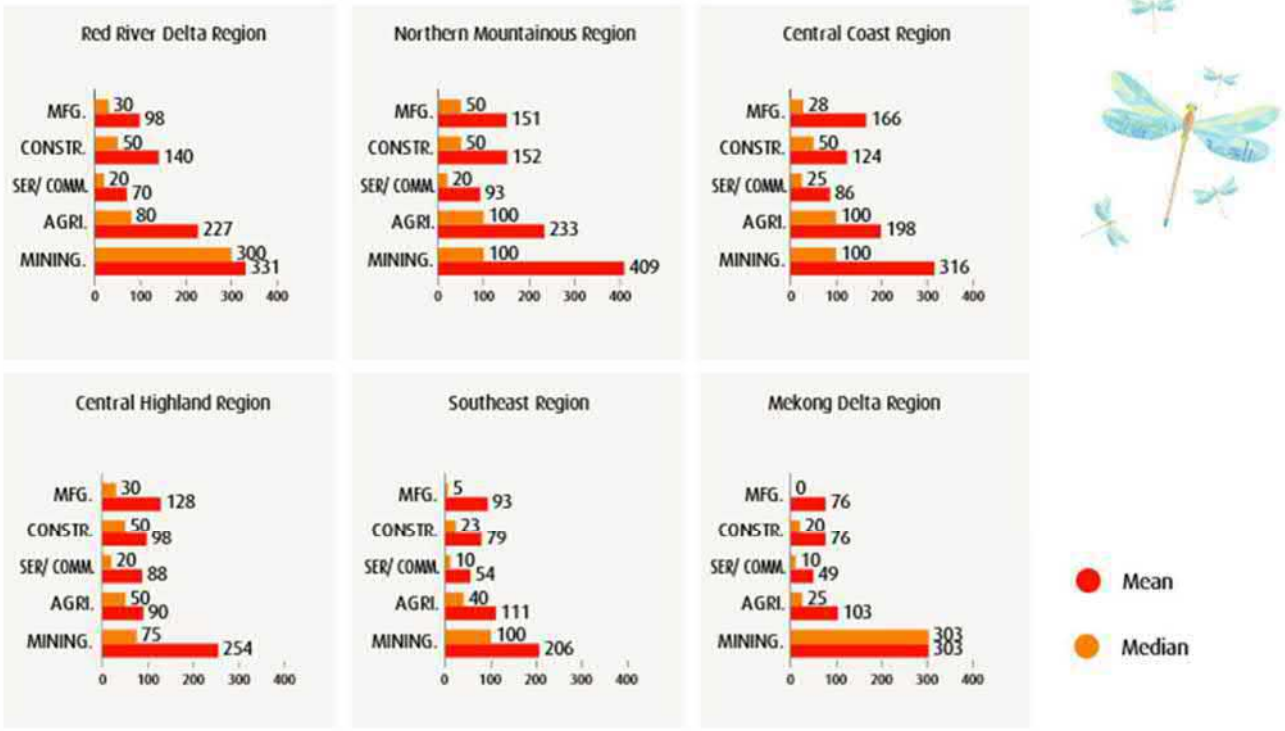
Number of days in the past year: business and production interruption



VALUE OF LOSSES

The average value of losses reported in the last year is about VND 20 million per enterprise

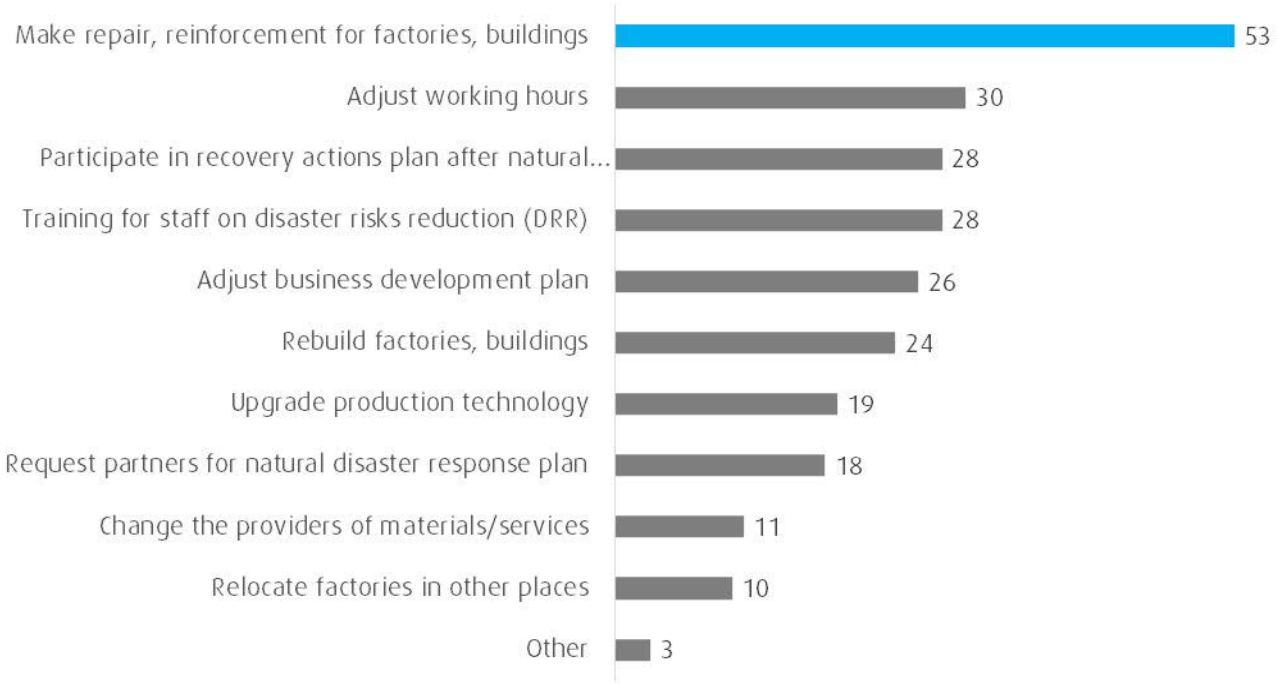
Loss value of enterprises in regions and business sectors



BUSINESSES' RESPONSES

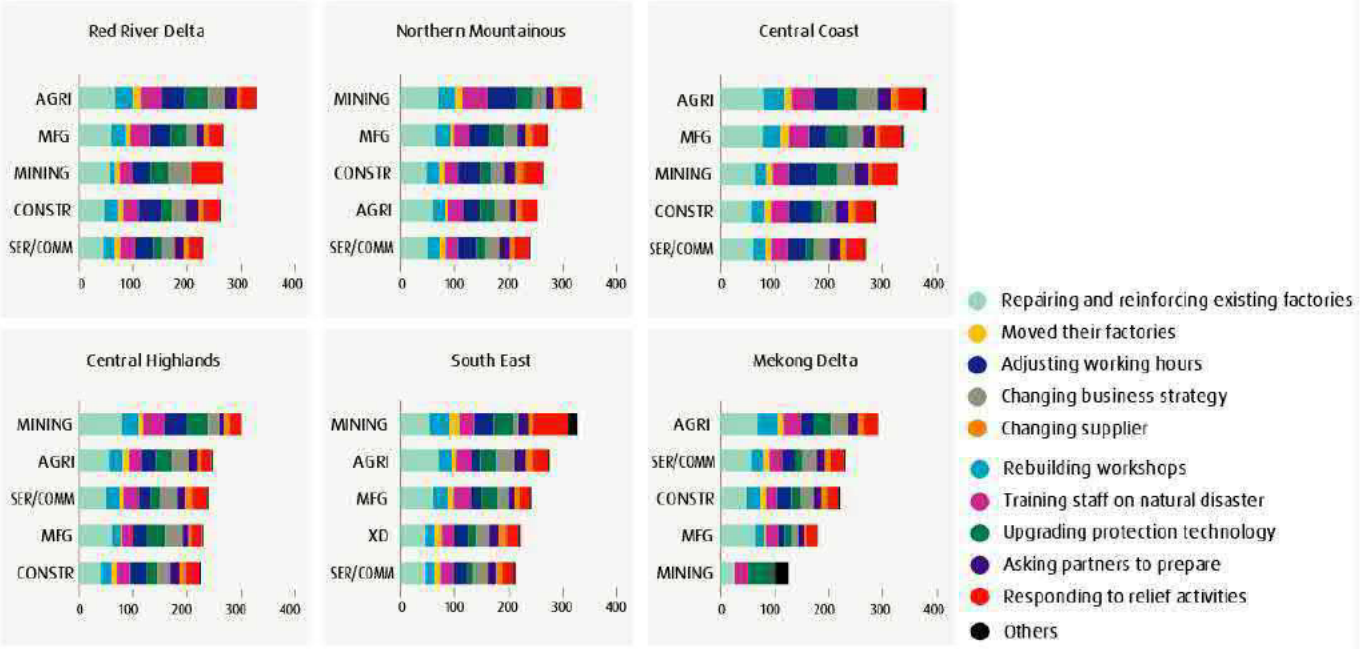
Majority of businesses prioritized simple response

Percentage of enterprises made response to natural disaster and climate change(%)



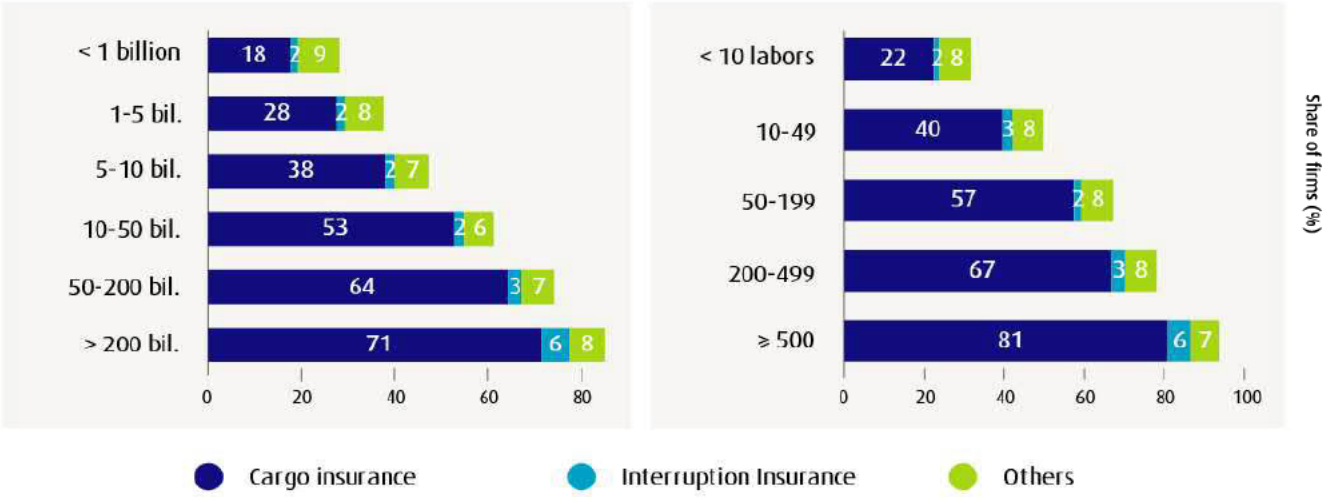
BUSINESSES' RESPONSES

Agriculture and mining enterprises are more proactive than others in response to climate change

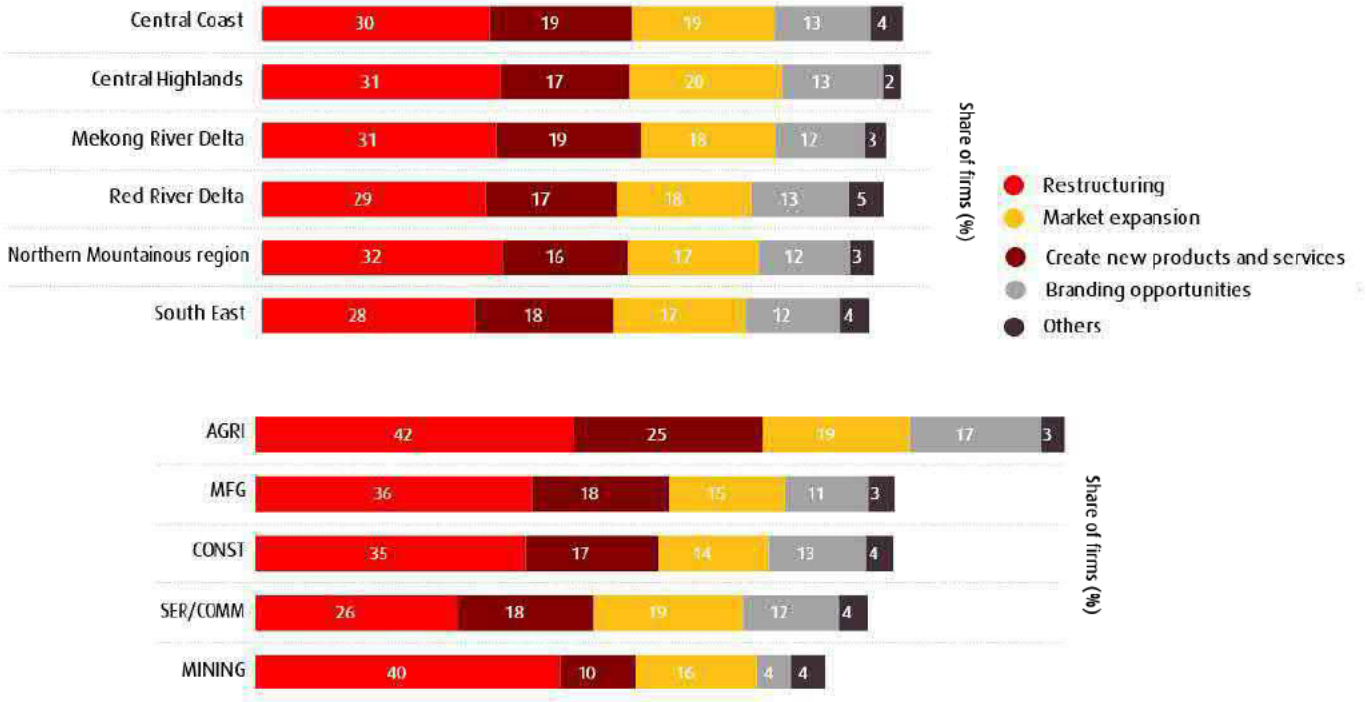


CLIMATE CHANGE-RELATED RISK PREVENTION AND DAMAGE REDUCTION

Large enterprises invest in risk insurance for natural disaster risks prevention.



Identifying opportunities in the context of natural disaster risks and climate change in the regions and in the sectors



Assessment on readiness to pay to become more environmentally friendly

Legal Tool	***Form A:*** *After recent environmental disasters, the national government has announced stricter environmental laws (i.e. environmental impact assessment for new investment projects, compliance review of environmental regulations). These laws involve high penalties, including the withdrawal of a firm's business license in case of violation.*
Evaluation of social organization (NGO)	***Form B:*** *A well-know, non-state organization in Vietnam has begun to publish a green list, ranking individual firms on the size of their environmental impact and classifying firms (including SMEs) as either green champions or dirty polluters. This ranking will be released to customers, who may make purchasing decisions based on a firm's environmental reputation.*

Based on this trend, please tell us the maximum amount of adjustments (as a share of operating costs) that you would be willing to make in order to make your company more environmentally friendly.

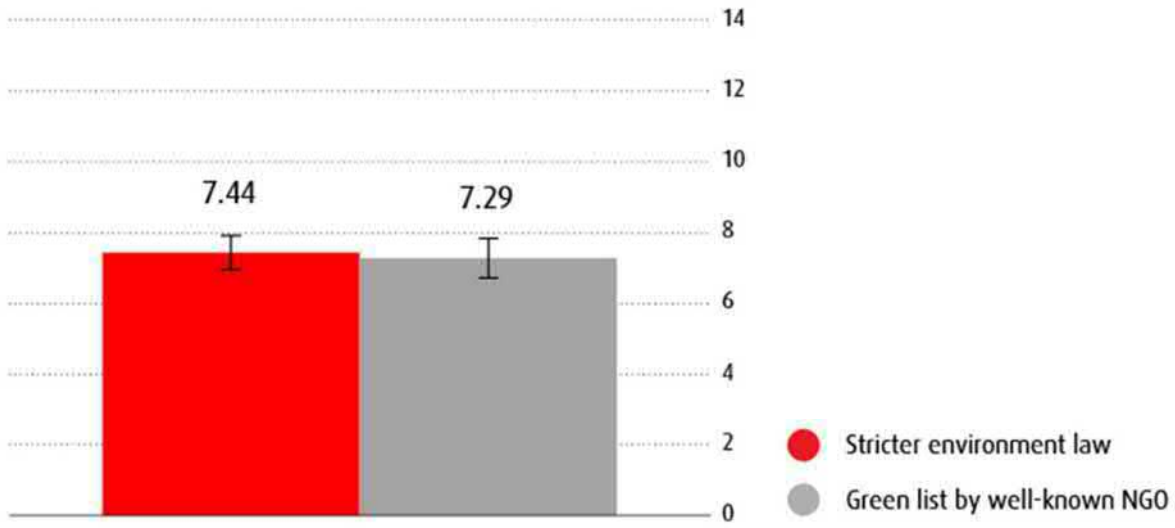
6a. Share of operating costs: (Please simply write the highest cost you would be willing to assume):

☐ ..% ☐ 0%

ACTIONS TO BECOME MORE ENVIRONMENTALLY FRIENDLY

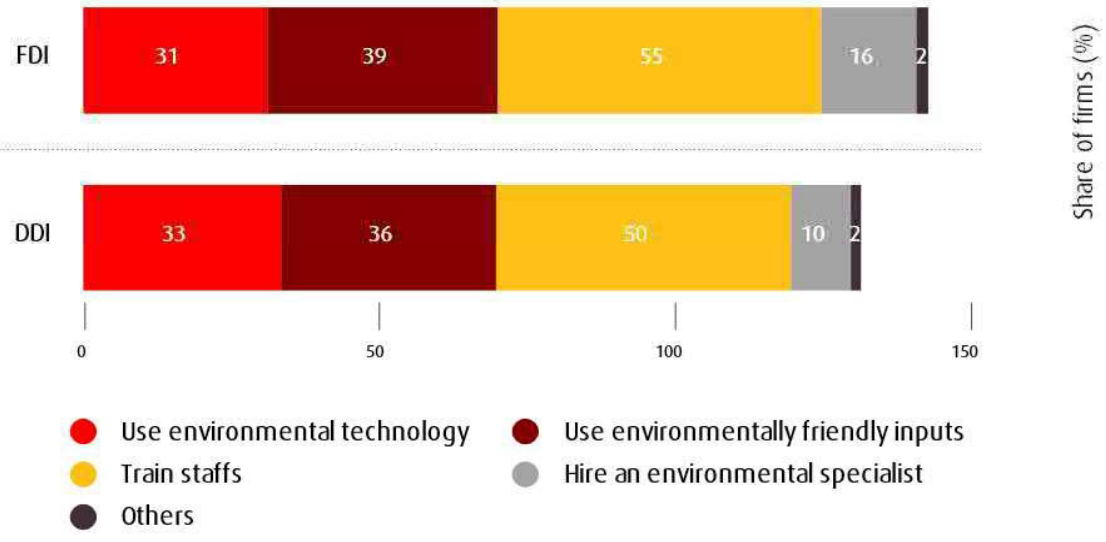
The solution of using voluntary social tools seems to be a good choice in Vietnam

Percentage of cost that enterprises pay to become more environmentally friendly is not significantly different between two approaches



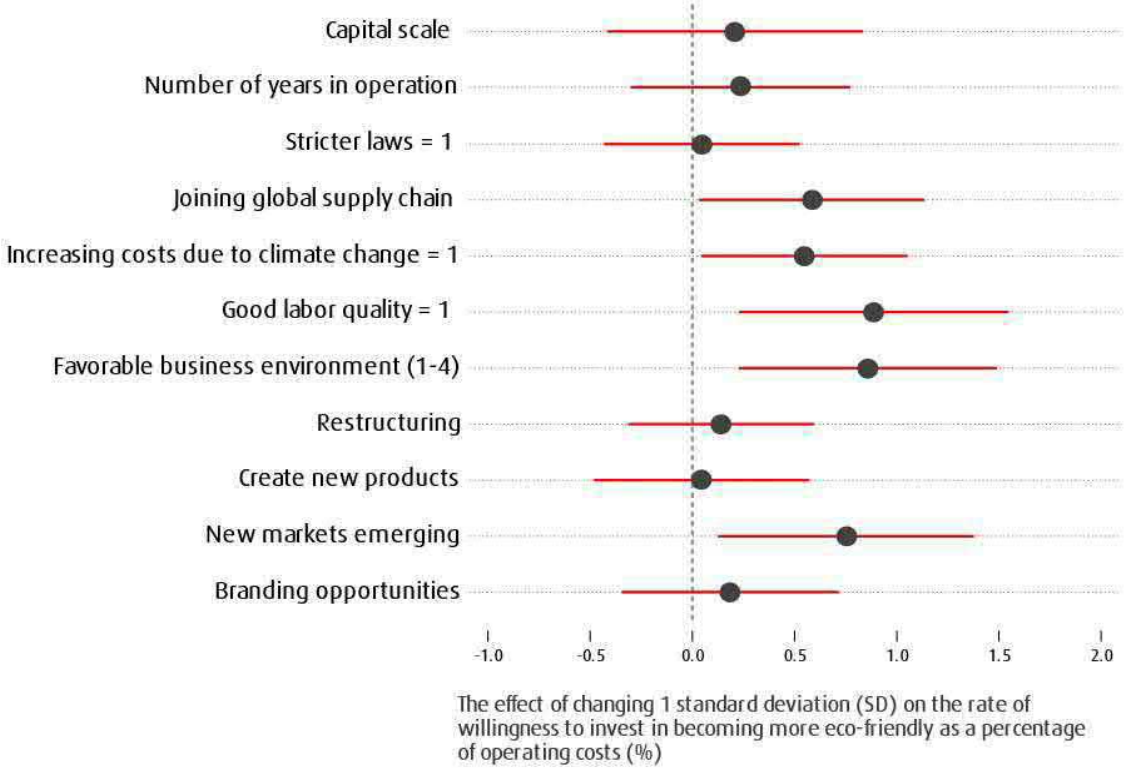
ACTIONS TO BECOME MORE ENVIRONMENTALLY FRIENDLY

Actions of enterprises to run business more environmentally friendly



MOTIVATIONS FOR BUSINESSES TO ACT

What is the motivations for business to invest in an environmentally friendly way?



CONCLUSION

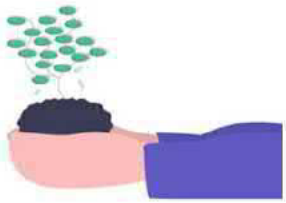
Summary of key findings

- Climate change has a multifaceted negative impact on business activities of enterprises: business disruption, labor productivity reduction, revenue reduction, transport channel interruption, increase in business and production costs. distribution network sluggishness, product quality deterioration, physical infrastructure damage, shortage of manpower, shortage of raw material supply
- Businesses in the Central Coast region are more affected by disaster risks and climate change than the other regions in the country. Agriculture, forestry and fisheries are the most affected sectors. Newly start up businesses are affected more than the other sectors
- Vietnamese businesses are implementing activities to respond to disaster risk and climate change. The most common ones include: reinforcing, repairing factories, existing work zones, adjusting working hours, training staff in response to disaster risks and climate change. A significant number of businesses reported changing their business practices due to challenges from disaster risk and climate change, rebuilding factories, upgrading production technologies and asking business partners to work together on disaster risk reduction and climate change response plan. A significant proportion of businesses purchased insurance to prevent disaster risks.

CONCLUSION

Summary of key findings

- The majority of enterprises are relatively optimistic about opportunities in the context of disaster risks and climate change: opportunities for restructuring, rearranging production, creating new products, services and technologies, developing markets for existing products, branding opportunities (such as environmentally friendly products) for businesses.
- Vietnamese enterprises are willing to invest in improving environmental compliance. On average, businesses are willing to pay up to 7.32% of their operating costs for being more environmentally friendly.
- The solution to using voluntary social tools will be a good choice in Vietnam for enhancing the role and promoting the participation of the business community in joint efforts to respond to climate change.
- Important incentives for businesses to increase investment to be more environmentally friendly include the quality of local labor, the business environment, participation in global supply chains and the cost for production of business.



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ups

Thank you!

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