METI
Ministry of Economy, Trade and Industry

Climate Change Adaptation
Good Practices
by Japanese Private Sector

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1. Resilient Infrastructure against Natural Disasters / Climate Monitoring & Early Warning

Examining the Earth as “Earth Doctor”

Kawasaki Geological Engineering Co., Ltd.

Related SDGs of the Project

【Contribution to Adaptation Challenges】

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

＜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

【Product & Technology】

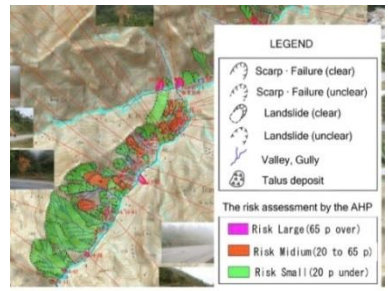
The Company renewed its existing technologies both in terms of hardware and software for the prevention and mitigation of incline disasters and enabled the technologies to be operated successively and sustainably in Vietnam.

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.

http://www.kge.co.jp/ (Japanese text only)

2. Resilient Infrastructure against Natural Disasters / Strengthening Food Supply and Production Base / Health & Sanitation

Water projects for realization of cooperative and rich society

Kubota Corporation

Related SDGs of the Project

【Contribution to Adaptation Challenges】

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. 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 Details】

＜Background & Business Model of the Project＞

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. 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.

▲ Ductile iron pipe

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.

▲ Dual purpose pump station

＜Project Showcases (Cont'd)＞

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.

▲ Drainage works by the Japan Disaster Relief Team

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

▲ Johkasou in hospital

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.

▲ 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.

https://www.kubota.com/

3. Resilient Infrastructure against Natural Disasters / Climate Monitoring & Early Warning

Protecting society and infrastructure from slope disasters

Kokusai Kogyo Co., Ltd.

Related SDGs of the Project

【Contribution to Adaptation Challenges】

Frequent land slides due to torrential rain triggered by climate change pose serious threats to socio-economic activities in many developing countries where know-how on countermeasures is not readily available. Kokusai Kogyo Co., Ltd. has contributed to the establishment of resilient infrastructure and monitoring/early warning system in developing countries, which serves as an adaptation measure against torrential rain and other issues caused by climate change.

【Project Details】

＜Background & Business Model＞

Kokusai Kogyo has introduced disaster prevention measures built on the geospatial information technology developed in Japan, frequently struck by natural disasters, in order to support the development of sustainable national infrastructure in developing countries faced with growing disaster risks. To counter slope disasters, Kokusai Kogyo has introduced both physical infrastructure initiatives such as river works (sabo dam), and 'soft' initiatives such as real-time measurement system and hazard mapping as well as organization of the administrative structure required for early warning/evacuation system and drafting of manuals. Projects in developing countries mainly consist of ODA projects by Japan International Cooperation Agency (JICA) and other profit-aimed SDGs activities.

＜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 economic obstacle during the rainy season that triggers frequent landslides along the route passing through the Abay River Gorge. Kokusai Kogyo participated in the JICA's ODA project for developing countermeasures against landslides. Measures implemented include streamlining of relevant administrative structures, preparation of handbooks, emergency countermeasures against landslides (survey, decision of countermeasure work and construction) and mid-to-long term countermeasures (survey/analysis, design, construction/maintenance and management).

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

＜Project Showcases (Cont'd)＞

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

Damage from landside disasters is on the rise in Brazil due to the expansion of habitats into disaster-risk areas under rapid urbanization and impact of climate change. Kokusai Kogyo participated in the technical cooperation project of JICA and implemented measures such as assessment of landslide disaster risks in the pilot area and urban expansion planning based on the assessment, preparation of disaster prevention manuals, as well as 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 manual project in areas outside the pilot area.

▲ Local training for developing hazard maps.

Bhutan: Measures for the management of road slopes ('soft' measure)

▲ On-site inspection training to prevent slope disasters

Bhutan is mostly made up of steep mountainous areas with most roads facing steep slopes. Frequent slope disasters caused by increasing extreme weather events hinder economic activities. Kokusai Kogyo participated in the technical cooperation project of JICA and implemented measures including topographic analysis, inspection/diagnosis of slope disasters, preparation and putting to use of disaster prevention manuals, establishment of slope disaster prevention database and seminars on technology transfer. As a result, regular inspection to prevent slope disasters, maintenance and updating of inspection records are being carried out.

【Key to Success & Challenges for Further Development】

- Contributing factors to growth in business include growing demand for disaster prevention measures in the target countries, recognition of high quality disaster prevention technologies of Japan and effects of slope disaster countermeasures that are easy-to-visualize.
- Inefficient communication due to the lack of coordination among relevant government agencies in the target countries was improved by supporting the relationship building through clarifying 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 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 prevention/mitigation and environmental and energy. Under the Group Mission of "Save the Earth, Make Communities Green" an regarding climate change as a solution for social challenges, the Company is engaged in various adaptation and mitigation activities including disaster prevention. The Company is a member of "United Nations Global Compact (UNGC)" since 2013 and private sector group of the "United Nations secretariat for International Strategy for Disaster Reduction (UNISDR)" since its inception in 2011.

http://www.kkc.co.jp/english/index.html

4. Resilient Infrastructure against Natural Disasters

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

TAISEI CORPORATION

Related SDGs of the Project

【Contribution to Adaptation Challenges】

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. 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 Details】

＜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.

【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.

▲ Bird's-eye view of Male Island

▲ 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.

http://www.taisei.co.jp/english/index.html

5. Sustainable Energy Supply / Climate Monitoring & Early Warning

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

Challenergy Inc.

Related SDGs of the Project

【Contribution to Adaptation Challenges】

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, delay in disaster recovery is a serious issue coupled with shutdown of power supply and communications after typhoons. It is urgently needed to establish resilient infrastructure, stable energy supply, weather observation and monitoring/early warning system. The project in combination of the Magnus Wind Turbine and communications satellite by Challenergy serves as an adaptation measure in the field of infrastructure and energy.

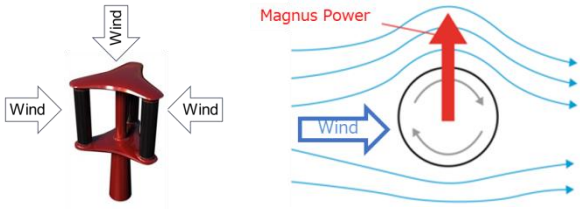
【Project Details】

＜Background＞

Challenergy Inc. has, since its inception targeted island countries in the Pacific where severe typhoon damage is feared due to climate change, and mountainous countries where installation of the conventional wind power generators is difficult. In August 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" 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 and mass production and sales of 10kW models is scheduled in the Philippines in 2019 and 2020 respectively.

＜Business Model of the Project＞

The project mainly targets areas where electricity and communications infrastructure is poor and provides sustainable and disaster-resilient communications system digitally-divided areas in combination with highly resilient, environmentally friendly and affordable wind power generation with communications satellite. The project has been executed in collaboration with the following partners.



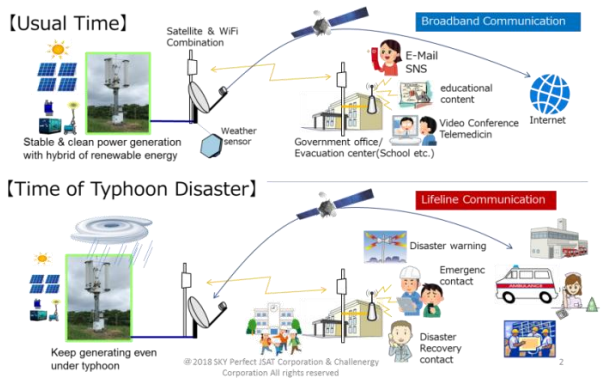
▲ Magnus x Vertical Axis Wind Turbine (left) and Magnus Effect (right)

- 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.

【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 high product price as compared to existing wind and solar power generation.
- The technology will be marketed overseas as a package of power 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 wind power venture 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. The Company was given the First Prize of the Tech Planter 1st Grand Prix in March 2014, the First Prize of the CLEANTECH OPEN Global Ideas Competition in February 2017, the Award of Excellence of the JR East Startup Program in January 2018 and selected as the “J-Startup” of a venture support program under METI in June 2018.

https://challenergy.com/en/

6. Sustainable Energy Supply

Introducing a resilient hybrid power generation control system against environmental changes

Kyudenko Corporation

Related SDGs of the Project

【Contribution to Adaptation Challenges】

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. 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.

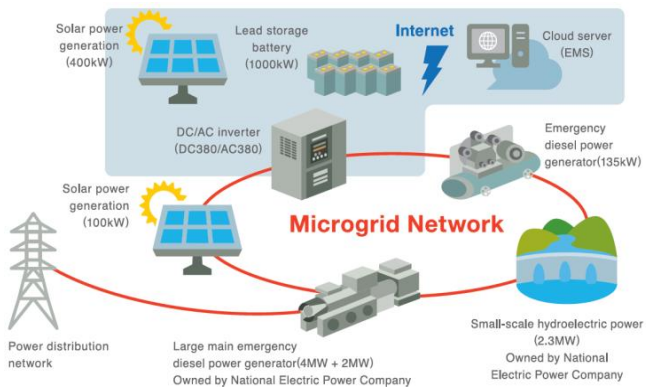
【Project Details】

＜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 has been conducted since.

＜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

【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.
- In an aim to extend its off-grid power generation control system largely leveraged on renewable energy in other islands of Indonesia, the Company also aims to introduce a system catering to areas without electricity or isolated power sources.

【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.

http://www.kyudenko.co.jp/english/index.html

7. Sustainable Energy Supply

Mitigating damage to energy supply system in times of disasters

Panasonic Corporation

Related SDGs of the Project

【Contribution to Adaptation Challenges】

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. 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 Details】

＜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.

【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 utilisation 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.

https://www.panasonic.com/global/home.html

8. Food Security & Strengthening Food Production Base

Contributing to sustainable agriculture through “Bio-cycle”

Ajinomoto Co., Inc.

Related SDGs of the Project

【Contribution to Adaptation Challenges】

In many developing countries where agriculture plays a key role for the economy, it is feared that climate change will bring shrinkage of arable farmland and subsequently results in drop in the agricultural yield. The Ajinomoto Group successfully improved the quality of agricultural produce and raised the profitability of farmland through the operation of its “Bio-cycle”, a resource-recycling production model. Furthermore, the Ajinomoto Group has achieved reduction of consumption of chemical fertilizers (nitrogen-content), emission of carbon dioxide, and wastes generated during the production process.

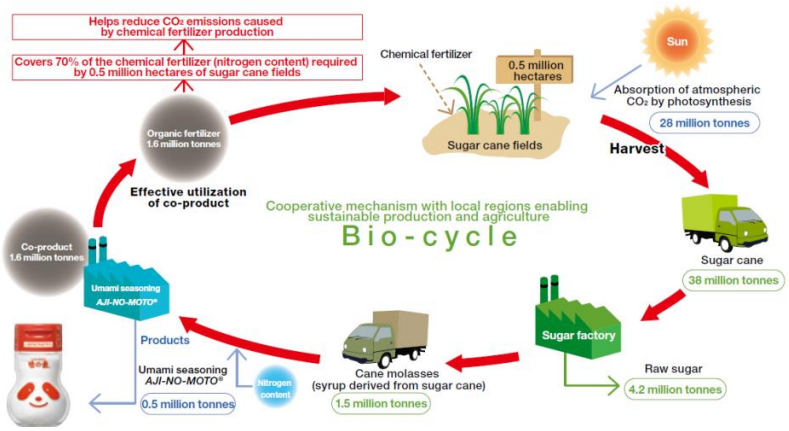
【Project Details】

＜Background＞

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 Project＞

“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.

【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.

https://www.ajinomoto.com/en

9. Food Security & Strengthening Food Production Base

Adapting to changing cultivation environment for traditional crops

Dari K Co., Ltd.

Related SDGs of the Project

【Contribution to Adaptation Challenges】

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. 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 Details】

＜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＞

▲ Local farmers

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.

【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.

▲ 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.

http://www.dari-k.com/en/

10. Food Security & Strengthening Food Production Base

High quality mung beans production in salinised lands

euglena Co., Ltd.

Related SDGs of the Project

【Contribution to Adaptation Challenges】

The issue of soil salinisation 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. By engaging in mung beans production utilizing agricultural technology based on appropriate cultivation management in regions affected by soil salinisation, 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.

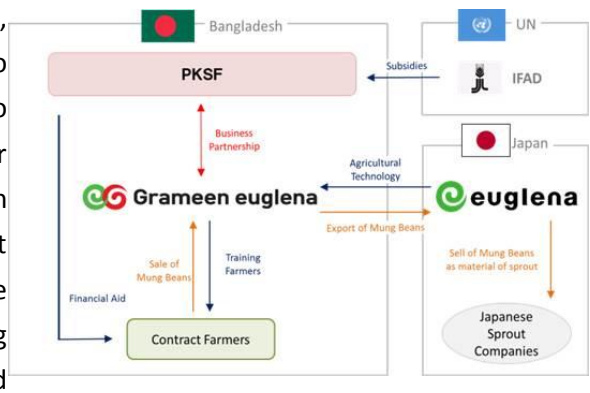
【Project Details】

＜Background＞

euglena Co., Ltd. established a joint venture with Grameen Group (currently Grameen euglena) in 2010 after Mr. Yuko Satake, Co-CEO of Grameen euglena joined a study tour in Bangladesh as part of the training organised by “Nippon Genki Juku”, a leadership academy on innovative business to which he is a member and conducted a field survey on local villages. A trial harvest 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 harvest and exports to Japan have started since 2012.

＜Business Model of the Project＞

Grameen euglena guides on harvest method to farmers, 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 will further be expanded through business cooperation agreed in 2016 with a Bangladesh governmental development institution, PKSF. PKSF encourages farmers to participate in the Project through its extensive network mobilizing approximately 20 million farmers. IFAD, a specialized agency of the United Nations, provides financial support necessary for the activities.



▲ Business model

* PKSF = Palli Karma-Sahayak Foundation
IFAD = International Fund for Agricultural Development

【Product & Technology】

Desalination work: Ploughing, irrigation

Development of salt-resistant variety: Test culture in pot by the salinity, test on the testbed

Quality enhancement in mass production: Plowing, calcium fertilizer, review of seeding period

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.
- With the stable growth of mung beans production, the number of farmers involved in the Project exceeded 8,600 in 2018 and the farmland stretches over 5,800 ha in total.
- 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.

http://www.euglena.jp/

11. Food Security & Strengthening Food Production Base / Health & Sanitation

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

from far east inc.

Related SDGs of the Project

【Contribution to Adaptation Challenges】

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. 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 Details】

＜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.

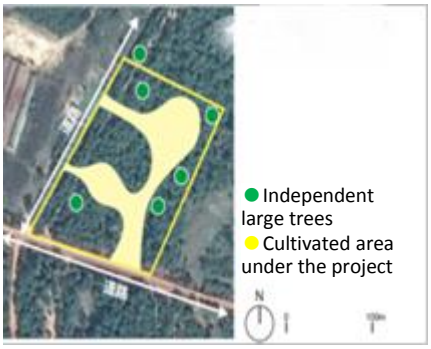
＜Business Model of the Project＞

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

【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.



▲ Visual Vegetation Plan

▲ Merchandize for Japan Market:
(Top Left) Moringa Tablet
(Bottom Left) Moringa Oil
(Right) Organic Shampoo

【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 16).

【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.

http://minnademiraio.net/ (Japanese text only)

12. Food Security & Strengthening Food Production Base / Climate Monitoring & Early Warning

Utilizing “REDD+” platform to build anti-disaster information system and streamline food supply infrastructure

Kanematsu Corporation / Hitachi Ltd.

Related SDGs of the Project

【Contribution to Adaptation Challenges】

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. 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 Details】

＜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.

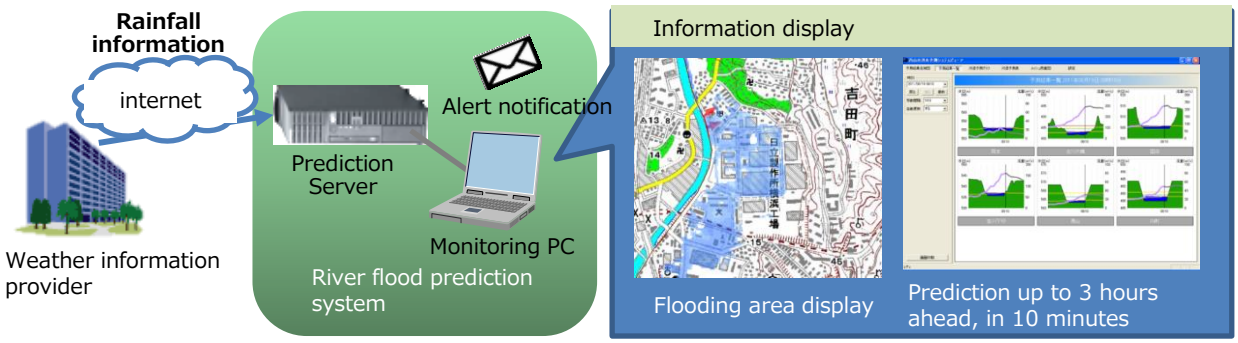
＜Business Model of the Project＞

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

【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.

http://www.kanematsu.co.jp/en/

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.

http://www.hitachi.com/

13. Food Security & Strengthening Food Production Base

Greater harvest through compost soil improver

Kawashima Co., Ltd.

Related SDGs of the Project

【Contribution to Adaptation Challenges】

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. 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 Details】

＜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 additional plants have been procured by the government of Sri Lanka.

＜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

▲ Vegetable cultivated using compost

【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"

▲ Active Microorganism Feed "BA-X"

【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.

http://www.kawashima.jp/ (Japanese text only)

14. Food Security & Strengthening Food Production Base

Rejuvenation of arid areas through high-molecule film farming method

Mebiol Inc.

Related SDGs of the Project

【Contribution to Adaptation Challenges】

Shortage of water and soil degradation triggered by climate change affect the stable food supply and food quality. 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 Details】

＜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 application made in 130 countries. For overseas business, "Imec®" is exported from Japan and farm facilities are procured locally. Marketing and agricultural training are provided by local agents or its European subsidiary, Mebiol Europe Ltd. in case of Middle East Region.

▲ Chairman Dr. Mori with "Imec®"

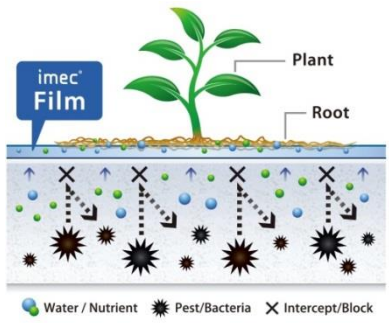
◀ Tomato Farming by local People

▶ Tomato Farm in Dubai Desert

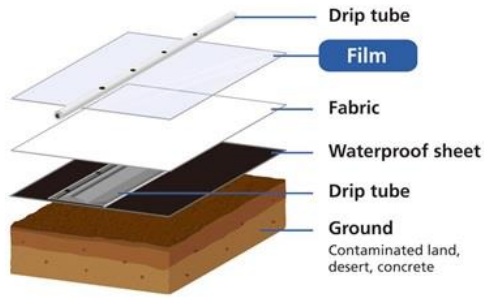
【Product & Technology】

"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 environmental technology database of the Tokyo Office of the United Nations Industrial Development Organization (UNIDO).

- 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.



▲ "Imec®" Film



▲ 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 25 acres. In overseas markets, the Company launched business in the Middle East, China, Africa and Europe. 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 and the "Japan Techno-Economics Society Chairman's Award" by the Japan Techno-Economics Society in 2018.

http://www.mebiol.co.jp/en/

15. Food Security & Strengthening Food Production Base

Greater resilience and higher income through “Agriculture sustainable for 100 years and beyond”

On The Slope Co., Ltd.

Related SDGs of the Project

【Contribution to Adaptation Challenges】

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. 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 Details】

＜Background＞

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 of Lao Republic. 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

【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.

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.

Marketing system: "Farm to Table"

Under the system, agricultural produce will be marketed as environment premium merchandize for export to Japan and at the same time, vegetables will be distributed locally for sale targeting high end market. 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.

▲ Coffee Plantation in Forests

▲ Cultivation as Part of Life

▲ 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】

On The Slope Co., Ltd. was founded in 2009 as a vegetable proposal company under the theme of "Agriculture sustainable for 100 years and beyond". By appealing clearly the concept of "Expansion of sustainable agriculture", the Company is growing rapidly by grouping with supporting farmers, restaurants and retailers. In addition to the mail order sales, wholesale, direct sale of the fresh vegetables produced by 200 supporting farmers in Japan, the Company provides support for agricultural technology as well as launching business in developing countries starting from Uganda in 2012. The Company was awarded the judges' honorable mention of the "T-VENTURE PROGRAM" Period 1 as well as several other awards. In 2018, the Company was selected as one of the enterprises to lead the future by METI.

https://www.on-the-slope.com/ (Japanese text only)

16. Food Security & Strengthening Food Production Base

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

Sunford Co., Ltd.

Related SDGs of the Project

【Contribution to Adaptation Challenges】

Anti-flood measures are imperative for addressing frequent serious damages from floods and typhoons caused by climate change in Cambodia where forest cover dipped from 73% in 1965 to 54% in 2015, and vulnerability to floods is growing. Sunford Co., Ltd. as a member of the afforestation project initiated by from far east inc. (Reference: Case Number 11), 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 Details】

＜Background＞

The Company joined the “Forest Wisdom” project consortium led by from far east inc. in 2016 and 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. Commercial sale will be launched partially in 2019 under the marketing network and will be full-fledged from 2022.

＜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 the 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 thus 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

【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.

【Key to Success & Challenges for Further Development】

- The project is currently focused on the exploration of marketing network and cultivation is under preparation locally while employment of local staff has begun.
- Sales will be launched using part of the network in 2019, and be commercialized in 2022. For this end, collaboration with local government, expansion of processing, product development and cultivation of land will be pursued.

▲ Seeds Removal from Cotton Harvest

▲ “minna de mirai o” Brand T-shirts for Pilot Marketing

【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”.

http://www.sunrallygroup.co.jp/group/sunford-co-ltd/

17. Food Security & Strengthening Food Production Base

Transforming desert into farmland with Roll Planters®

Toray Industries, Inc. / Mitsukawa Co., Ltd.

Related SDGs of the Project

【Contribution to Adaptation Challenges】

Desertification caused by climate change induced drought has eaten its way into farmland and triggered food shortage. Furthermore, in countries with a large mining industry, such as South Africa, mining business has left toxic chemical substances in the soil (mine dump) and dust flying from the mine dump due to rainfall scarcity and desertification are creating health threat to residents living near the mine dump and pollution of agricultural products. “Roll Planters®”, jointly developed by Toray Industries, Inc. and a knit fabric manufacturer/distributor Mitsukawa Co., Ltd, is a roll-shaped agricultural textile that effectively transforms desert and devastated land into farmland as well as preventing dust flying from and greening of the mine dump.

【Project Details】

＜Background＞

In response to the interest in Roll Planters® technology by embassy officials of the Republic of South Africa introduced at an exhibition in 2010, small demonstration test was carried out in the country which successfully transformed the mine dump into lush land. The Project was selected for the “Climate Change Adaptation Effect Visualization Project” by the Ministry of Economy, Trade and Industry (METI) of Japan in 2012 and 2013. Jointly with Mitsukawa and Netafim Japan, a drip irrigation company, Toray has worked on the development of “Business Model for Agriculture Promotion” since 2013 under the “Inclusive Market Development (IMD)” by United Nations Development Programme (UNDP).

＜Business Model of the Project＞

Toray has implemented demonstration cultivation using Roll Planters® in various areas of South Africa as part of the initiatives to familiarize the local community with the product. It started cultivating Sorghum in 2016 on the mine dump which is resistant to environmental stress and used as an feedstock of bio fuel. Sale of bio fuel is expected to raise the income of local residents in future. Knitting machines have been delivered to South Africa to establish local production system of Roll Planters®. Mitsukawa supervises and provides guidance on operation and maintenance of the machines for local workers.

▲ Roll Planter®

▲ Growing vegetables

【Product & Technology】

Roll Planters®: A roll-shaped agricultural material made of Toray's polylactic acid (PLA) filaments derived from plants and woven with Mitsukawa technology. PLA fiber, with great resistance to ultraviolet rays and superb durability, is suitable for vegetation. Made of corn starch, it is ultimately biodegraded into water and carbon dioxide, leaving no environmental impacts.

Roll Planters® filled with soil and arrayed on the land will help root the seeds on it. Water and air sufficiently retained by the Roll Planters® help maintain the temperature around the root at an adequate level and enable crops to grow even on the desert, devastated land or concrete surface. Combined with drip irrigation, Roll Planters® enable efficient supply of water and fertilizer.

▲ Degraded land before greening

▲ Mine dump after successful greening. Roll Planters® arrayed crisscross prevent dust flying into the air by enabling the environment for seeds to take root and fostering plant growth.

【Key to Success & Challenges for Further Development】

- Roll Planters® matched the demand of local community for its function to transform futile desert and devastated land into lush farmland as well as user-friendliness.
- For full-fledged development of the Project in the Republic of South Africa, efforts must be continued toward the future to familiarize local governments and relevant parties with the Project while building on repeated demonstration and trial.
- The Company plans to expand the Project into other African nations faced with similar challenges.

【Profile of Project Company】

Toray Industries, Inc. is a chemical manufacturer started in 1926. It has extensively launched a wide range of products covering from daily sundries to chemical products for industrial purposes such as nylon, polyester, acrylic textiles, plastic, chemical and information technology materials. The Company strives to establish a group corporate reputation of “Toray‘s Green Innovation” through the invention of revolutionary technology and products that halt the global warming and maximize resources. The Company takes the pilot project of Roll Planters® as one of its SDGs-related operations, which it pursues based on its corporate philosophy, “contributing solutions to social issues through business activities”. Roll Planters® won the Minister's Award from METI under the 24th Global Environment Award.

https://www.toray.com/

Mitsukawa Co., Ltd., established in 1973, is a knit fabric manufacturer and trader. The Company has strived towards developing its own unique new materials. In Japan, the Company is engaged in roof-top and school yard greening projects utilizing Roll Planters®, which contribute to mitigation of urban heat island effect.

http://mitsukawa.com/ (Japanese text only)

18. Health & Sanitation

Paints for sustainable life

Kansai Paint Co., Ltd.

Related SDGs of the Project

【Contribution to Adaptation Challenges】

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. 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 Details】

＜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 plans to launch sales in Uganda where a government approval is already obtained as well as Kenya and Tanzania as part of the global growth initiatives.

＜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

【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.

https://www.kansai.com/

19. Health & Sanitation / Food Security & Strengthening Food Production Base

Mitigating impact of frequent forest fire on plants and animals

Shabondama Soap Co., Ltd.

Related SDGs of the Project

【Contribution to Adaptation Challenges】

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. 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 Details】

＜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.

【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.

https://www.shabon.com/english/index.html

20. Health & Sanitation

Preventing spread of infectious disease associated with climate change

Sumitomo Chemical Co., Ltd.

Related SDGs of the Project

【Contribution to Adaptation Challenges】

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. 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 Details】

Olyset® Net

＜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, the product 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. "Olyset® Net" 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.

【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 , far reaching and contains little organic solvent.

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.

▲ Child elated with “Olyset® Net”

Photographs © M.Hallahan

▲ 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 translated the idea of “Creating Shared Value” into action where it coexists with economic activities. 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”.

https://www.sumitomo-chem.co.jp/english/

21. Climate Monitoring & Early Warning / Secure Resources & Sustainable Water Supply

Curbing damage from floods through ICT

FUJITSU LIMITED

Related SDGs of the Project

【Contribution to Adaptation Challenges】

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. "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.

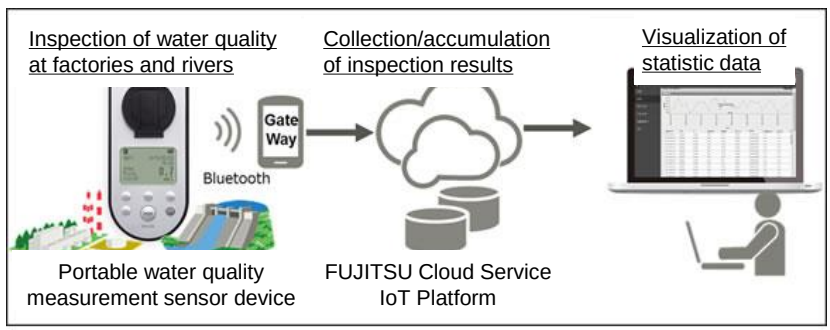
【Project Details】

＜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 This 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

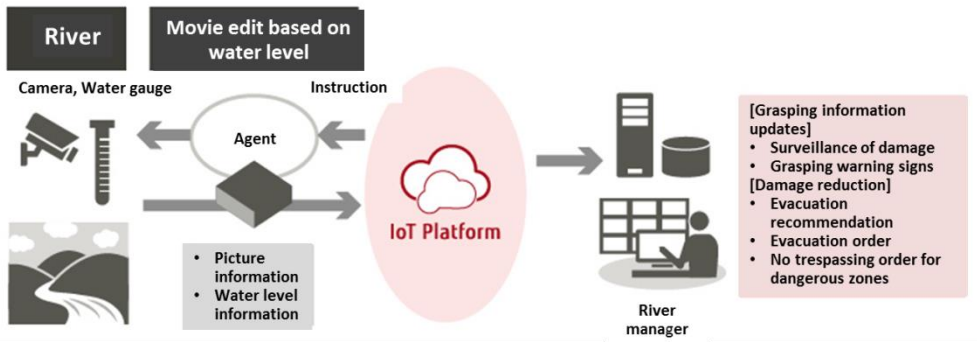
【Product & Technology】

"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.

http://www.fujitsu.com/global/

22. Climate Monitoring & Early Warning

Disaster Prevention & Reduction System leveraged on ICT

NEC Corporation

Related SDGs of the Project

【Contribution to Adaptation Challenges】

Climate change has led to rise and Intensifying floods and landslides caused by heavy rainfall, which are posing serious damage to residents in coastal areas, agriculture and business activities. NEC's advanced climate monitoring and early warning system leveraged on its ICT contributes to disaster prevention and reduction through refined disaster forecast and supporting fast and accurate evacuation.

【Project Details】

Flood Simulation System (Thailand)

＜Background＞

NEC Corporation was contracted by Japan's Ministry of Internal Affairs and Communications to carry out "Study of the development of a flood simulator in Thailand", which was based on the joint statement by the Ministry of Internal Affairs and Communications and Thailand's Ministry of Information and Communication Technology to confirm bilateral cooperation in the field of anti-disaster ICT utilizing Japan's advanced technology.

＜Business Model of the Project＞

The demonstration of NEC's flood simulation system to predict the inundation areas in Uttaradit Province in Northern Thailand was carried out jointly with Thailand's National Disaster Warning Center (NDWC) as the first Japan-Thailand cooperation project in disaster prevention ICT, with the cooperation of the Japanese Embassy in Thailand. Thereafter, another demonstration project was commissioned for a landslide simulator under the same scheme.

Landslide Forecast and Detection System (Taiwan)

＜Background＞

The project was initiated based on an approach made at an exhibition by a Taiwanese public railway company with business track record with NEC, helped by a growing demand to respond to frequent landslides caused by extreme weather events and trust in the NEC brand built on the past projects with the Taiwanese government, dating back to 1982 when NEC provided solution business, such as the disaster prevention and emergency information cloud system under the "Cloud system for the disaster prevention and recovery" program.

＜Business Model of the Project＞

Aiming at the first overseas business of the system, a field test was launched in collaboration with the Taiwanese public railway company. NEC Taiwan undertook installation, maintenance and servicing while the Headquarters managed the data servers and provided the services.

【Product & Technology】

Flood Simulation System: Hourly-based simulations for up to seven days in advance is conducted using a triangular mesh measuring 50m on each side, enabling prediction of flood inundation areas and maximum flood levels using meteorological, topographical, and river data. Issuance of early warning to threatened areas facilitates decision-making for disaster prevention including early guidance on the resident evacuation. The system is also effective in hazard mapping of identified risk areas through simulations using historical rainfall data.

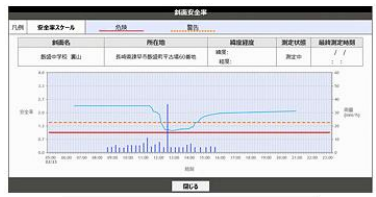
Landslide Forecast and Detection System: The system is based on the world's first data analysis technology developed by NEC enabling the calculation of four parameters (soil weight, cohesion force, friction, water pressure in the soil) required for soil analysis of landslide risks only from the amount of water retained in the soil. The system visualizes real-time changes in landslide risks, ensuring greater safety and longer time for evacuation compared to the conventional system while assisting in the issuance of prompt evacuation guidance and orders.

▲ Live Simulation

◀ Warning Function

◀ Visualized Installation of Sensor System

▼ Visualized Monitor of Landslide Forecast and Detection System



【Key to Success & Challenges for Further Development】

Key challenges are as follows. By overcoming these challenges through collaboration with local government from policy-making stage, the Company aims to create a business model centered on the expansion of high-quality technology reflecting lifecycle costs with the addition of view towards creating patent-based service.

- Priority in disaster prevention and adaptation in policies of host country governments
- Uncertainty of timing of occurrence and scale of major disasters as well as intensity of damages
- Level of infrastructure readiness in the project country such as communications and roads
- Inefficiency of communication due to the existence of multiple local agencies
- Utilization of public funds

【Profile of Project Company】

NEC Corporation was founded in 1899 as a joint venture with Western Electric Corporation. The Company focuses on social solution business and aims to contribute to the establishment of a safe and secure society through the provision of new technology and solution utilizing advanced anti-disaster ICT such as AI and IoT. The Company identifies eight risk areas including flood damage as the adaptation field to which NEC can contribute. The Company continues to strive for anti-disaster ICT to respond to floods and landslides both domestically and internationally.

http://jpn.nec.com/

23. Climate Monitoring & Early Warning / Food Security & Strengthening Food Production Base

Facilitating countermeasures against climate change through Big Data

Remote Sensing Technology Center of Japan

Related SDGs of the Project

【Contribution to Adaptation Challenges】

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. The Remote Sensing Technology Center of Japan (RESTEC) provides solutions to users in responding to climate change mainly through the visualization and statistic processing of satellite observation data.

【Project Details】

＜Background＞

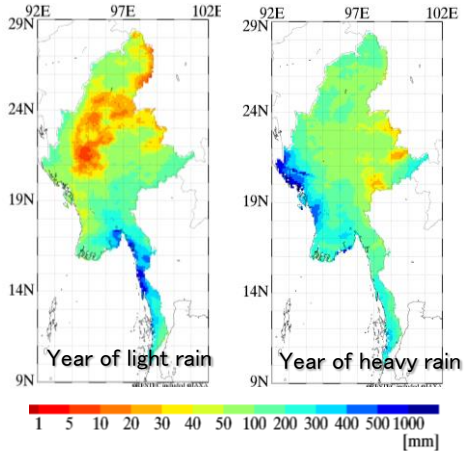
RESTEC has operated the satellite observation for over 35 years as a remote-sensing specialist agency, ranging from receiving and processing of the Earth observation data, development, revision and verification of the ground systems and data provision for users. As international cooperation is inevitable 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 Japan Nipponkoa Insurance Inc. (Sompo Japan) (Reference: Case Number 30) 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.

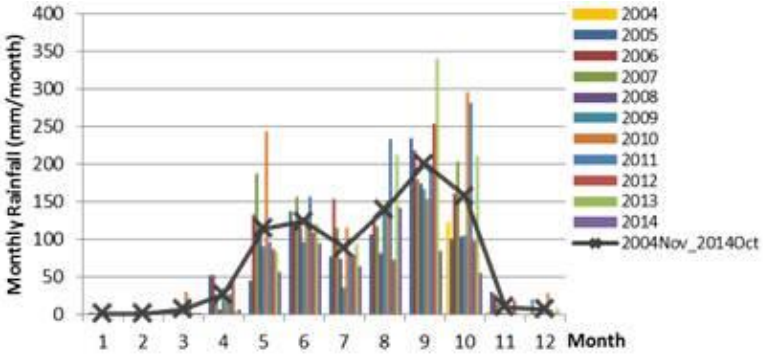
【Product & Technology】

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.



▲ 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.



◀ 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.

【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.

https://www.restec.or.jp/en/

24. Secure Resources & Sustainable Water Supply / Health & Sanitation

Securing sufficient and clean water through ion exchange membrane

AGC Inc.

Related SDGs of the Project

【Contribution to Adaptation Challenges】

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. 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 Details】

＜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 electro dialysis tank at the heart of the system and exports the core technology ion exchange membrane. The 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

【Product & Technology】

Electro Dialysis Purification System: By combination of electricity and ion exchange membrane developed by AGC called "SELEMION™", 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.

【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.

▲ Water treatment image

【Profile of Project Company】

AGC Inc. is a glass manufacturer 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. "SELEMION™" 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.

http://www.agc.com/en/index.html

25. Secure Resources & Sustainable Water Supply / Health & Sanitation

Securing safe water resources through Ozone water purification system

JGC CORPORATION

Related SDGs of the Project

【Contribution to Adaptation Challenges】

Industrialization and urbanization caused by rapid economic growth have led to deterioration of water quality especially severe eutrophication of lakes and ponds in China. In addition, climate change has led to rise in water temperature and period without rain, increasing concern over widespread and prolonged proliferation of algae. In response to these challenges, JGC CORPORATION contributes to securing safe drinking water with water purification system utilizing ozone.

【Project Details】

＜Background＞

The effectiveness of water purification using NAC system® was confirmed by a small-scale test implemented in Taihu, Jiangsu Province in 2008. The recognition of the test results by both the Japanese and Chinese governments led to the implementation of a joint demonstration project of water purification using the system in Dianchi, Yunnam Province, sponsored by the New Energy and Industrial Technology Development Organization (NEDO) from 2009 to 2010. Through the demonstration project, confirmation of the system's performance, collection of data on eco system and accumulation of operational know-how towards commercialization were carried out.

<Business Model of the Project＞

JGC CORPORATION developed its business based on the established business model of sourcing technical seeds externally and scaling them up through licensing and packaging. In this Project, the company sourced NAC system® from "Aqua Environmental Solutions Co., Ltd.", a start-up company in Fukuoka with an extended track record of introducing the NAC system® in Japan for separation and removal of algae in dam lakes and treatment of wastewater containing organic material from factories.

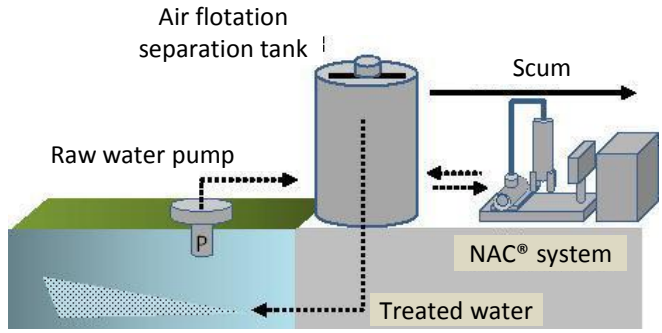
To promote the system for overseas market, the Company focused on water pollution in lakes and ponds in China and launched the project as a joint demonstration project with CHINA ENERGY CONSERVATION AND ENVIRONMENTAL PROTECTION GROUP (CECEP) under the agreement between NEDO and the National Development and Reform Council of China and Development and Reform Council of Yunnan Province. The Company aims to develop and commercialize water-saving and environmentally-friendly water recycling system in areas with serious water pollution issues.

▲ Ozone Water Treatment Facilities" under Demonstration Project in Dianchi, China

【Product & Technology】

NAC system®: The system was developed by Aqua Environmental Solutions Co., Ltd. utilizing its patented technology that enables efficient dissolving and reaction between gas and liquid to purify lakes and ponds. After directly pumping up polluted water, ozone oxidization is carried out for killing algae, deodorizing and discoloring. The system recovers residues of the algae with nitrogen compounds and phosphorus while turning the residues into valuable resources, such as compost. In addition, the process produces treated water with high-concentration oxygen and returns it to lakes and ponds, then system increases the oxygen concentration of the bottom water in the lake and enhances biological decomposition of organic material, which results in inhibition of algae proliferation. Through greater efficiency of ozone treatment, an energy-saving ratio of 30% was achieved as compared to the conventional ozone purification process while reducing exhaust ozone gas and sludge generation, leading to low running costs.

▲ Water Quality before and after Test



▲ Concept of lake clean-up by NAC System

【Key to Success & Challenges for Further Development】

The Japan-China joint project was realized as it was in line with the Chinese government's policy to improve water quality, supported by the Company's history of building relationship with the local government through projects for recovery/decomposing of chlorofluorocarbon gas under the Clean Development Mechanism (CDM) and Japan-China energy-saving funds. Envisaging a big potential market in China with three large lakes, the Company is aiming to not only introduce the system but also create values for removed inorganic nutrients (phosphates and nitrates). Further, upon commercialization in China, expansion to Southeast Asian countries will be considered.

【Profile of Project Company】

JGC CORPORATION was established in 1928 as Japan's first engineering contractor. As "Engineers without Borders", the Company has executed a wide range of Engineering, Procurement and Construction ("EPC") projects in 80 countries for 90 years. The EPC business fields cover from the energy infrastructure, industrial infrastructure to social infrastructure including hospitals and environmental facilities and the number of such projects amount to 20,000. Under the recognition that engineering is a fundamental business activity that contributes to environmental preservation, the Company regards nature conservation and harmonization with environment as important issues and promotes initiatives for preservation of the global environment under its "Environmental Policy".
https://www.jgc.com/en/

26. Secure Resources & Sustainable Water Supply / Health & Sanitation

Development of a tourism city through water treatment

Sanicon Co., Ltd. / Accrete Co., Ltd.

Related SDGs of the Project

【Contribution to Adaptation Challenges】

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

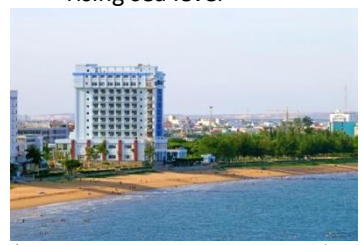
＜Background＞

Sakai City and Binh Dinh Province of Vietnam have enjoyed a long-term exchange, such as hosting the Vietnamese consulate and student exchange. 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, wastewater treatment 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.

＜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



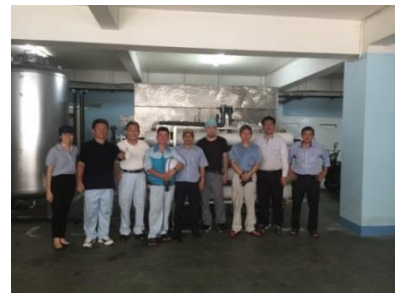
▲ Seagull Hotel along beautiful coast line

【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.

http://www.sanicon-group.com/ (Japanese text only)

27. Secure Resources & Sustainable Water Supply

Curbing flood damage and solving water shortage with rainwater storage system

SEKISUI CHEMICAL CO., LTD.

Related SDGs of the Project

【Contribution to Adaptation Challenges】

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. “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 while ensuring stable water supply at scarce rain.

【Project Details】

＜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 8,000 over deals both in the domestic and overseas markets as of 2017. 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 China where recycling of rainwater absorbed in the soil is encouraged in cities for urban afforestation and disaster prevention under the “Sponge City Program” and in Taiwan where the typhoon induces serious flood damage. Vietnam 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

【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, made of plastic storage 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.
- 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 and China 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.

▲ CROSS-WAVE

【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)” in 2018 and 2019 consecutively, for which the World Economic Forum (WEF) ranks 7,500 major companies around the world.

http://www.sekisuichemical.com/

28. Secure Resources & Sustainable Water Supply / Health & Sanitation

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

Wellthy Corporation

Related SDGs of the Project

【Contribution to Adaptation Challenges】

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. 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 Details】

＜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 growing restrictions on the use of well water in Yangon and other urban areas. Considering such situation, Wellthy Corporation has conducted field tests for one year utilizing the water purification technology that the Company has established so far. 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 field tests, 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.” in partnership with a private company in Myanmar, Myanmar Water Engineering and Products Co., Ltd. having a record of well-established numerous wastewater treatment projects and engineering. The joint venture extends an array of 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.

MWAS

MW AQUA SOLUTIONS

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

【Product & Technology】

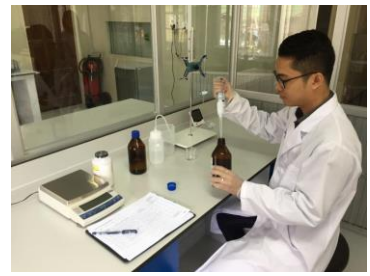
Water treatment System: The system is characterized by a customized design in combination of appropriate pre-treatment technology and membrane filtering technology according to the quality of raw water to enable safe drinking water to be secured irrespective of water source.

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 nine local personnel.
- The number of orders has been on the rise in the past year since the establishment of the joint venture along with the gradual rise in its reputation for high precision of water quality analysis.
- 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 s a member company of the Mitsubishi Chemical Holdings Group, Wellthy Corporation 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 filer underground water, 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 water treatment projects in Myanmar is positioned as a showcase of its sustainability projects.

https://www.wellthy.co.jp/en/

29. Secure Resources & Sustainable Water Supply / Health & Sanitation

Addressing water pollution caused by floods

Yamaha Motor Co., Ltd.

Related SDGs of the Project

【Contribution to Adaptation Challenges】

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. 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 Details】

＜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＞

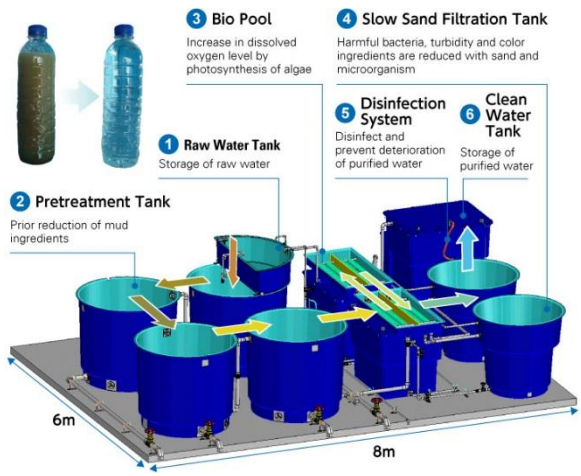
The system has been introduced by local governments and NGOs to medical and educational facilities and rural areas in countries vulnerable to water pollution such as Indonesia, Vietnam, Senegal and Mauritania, drastically reducing the outbreak of diarrhea, fever and other illnesses. The system has freed 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

【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.

https://global.yamaha-motor.com/

30. Climate Change Finance

Minimizing financial losses caused by extreme weather events

Sompo Japan Nipponkoa Insurance Inc.

Related SDGs of the Project

【Contribution to Adaptation Challenges】

Numerous studies have revealed that enormous economic losses is incurred by tornado, storm, snow disaster, drought and high temperature. Even a minor rise in temperature deals a severe economic blow particularly to developing countries with little resource to confront its impacts. “Weather Index Insurance” offered by Sompo Japan Nipponkoa Insurance Inc. is an effective means of minimizing financial risk incurred by extreme weather events, and it is also adaptation measures in the field of risk finance associated with climate change.

【Project Details】

＜Background＞

Sompo Japan Nipponkoa, 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＞

SOMPO Thailand has solicited applications for their product through the Bank for Agriculture and Agricultural Cooperatives of Thailand (BAAC). Weather Index Insurance has widely been accepted by Thai farmers and the product's sales area has grown from one province in northeast Thailand to twenty provinces across northeast Thailand. In 2014, Weather Index Insurance was developed for the Philippines in addition to Myanmar. A similar product is also currently underway in Indonesia.

▲ Explanation of Weather Index Insurance (Thailand)

【Product & Technology】

Utilizing expertise acquired by weather derivatives products, Sompo Japan Nipponkoa, in cooperation with JBIC, has carried out studies on risk finance approach to address climate change since 2007. Weather Index Insurance was developed for sale in 2010, which is aimed to compensate rice farmers in northeast Thailand for shortfall in crops caused by drought. In 2014, Weather Index Insurance was launched in Myanmar as the first-ever insurance that uses rainfall estimated from satellite observation data as index.

▲ Hearing survey (Myanmar)

【Key to Success & Challenges for Further Development】

- Sompo Japan Nipponkoa develops insurance products reflecting local demand through its initiatives to grasp the needs of each community and familiarize itself with local farmers.
- In launching new business, the company works in close cooperation with local governments and local offices of Japan International Cooperation Agency (JICA) as well as cooperation with local bank in order to disseminate the products widely.

【Profile of Project Company】

Sompo Japan Nipponkoa Insurance Inc. was established on 1 September 2014 upon merger of Sompo Japan Insurance Inc. and Nipponkoa Insurance Co., Ltd., becoming the single largest P&C insurance company in Japan. Prior to the merger, it has undertaken weather derivatives products both in and outside Japan as an adaptation measure to climate change in an attempt to accumulate advanced financial technology and expertise. It has participated in “Pacific Catastrophe Risk Insurance Pilot Program” in January 2013, jointly initiated by the World Bank and Japanese government. The Company is actively involved in initial preparation as part of the Pacific Islands Leaders Meeting held in Hokkaido in May 2009, leading a key role in the launch of Program as a private insurer. It has been committed to the program since the launch of Program up to the present.

https://www.sjnk.co.jp/english/

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