METI
Ministry of Economy, Trade and Industry

Climate Change Adaptation
Good Practices by Private Sector

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Mitsubishi UFJ Morgan Stanley

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1. Resilient Infrastructure against Natural Disasters / Weather Observation, Monitoring and Early Warning

Natural disasters associated with climate change deal a severe blow to buildings and other infrastructures and adversely affect the society and economy of developing countries including loss of social capital and damage to human life. Shimizu Corporation analyses potential disasters using its unique “Shimizu Global Hazard Evaluation System” in developing countries hit by massive disasters almost every year, based on which construction plans are drafted, designed and executed to accommodate measures against floods, torrential rain and various other disasters. Building disaster-tolerant structures serves as an adaptation measure in the field of infrastructure.

Shimizu Corporation

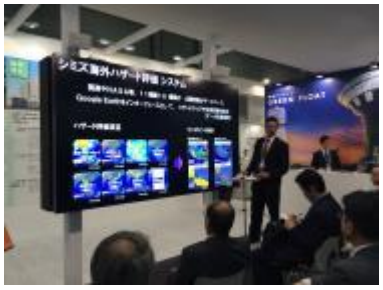
Protecting buildings and structures from disasters

[Product & Technology]

“Shimizu Global Hazard Evaluation System”, an integration of 16 open databases maintained by 11 world-famous research institutions, including the United Nations and the U.S. National Aeronautics and Space Administration (NASA). The System allows users to instantly view all the latest information needed for site-specific hazard assessments by selecting any location worldwide on Google Earth. Combined with the superb technology of Shimizu in construction and execution, the system enables selection of optimal site and construction of buildings highly resilient to anticipated disaster risks.

[Project Details]

Shimizu Corporation carried out a site analysis using “Shimizu Global Hazard Evaluation System” upon request from an Indonesian real estate developer based on high trust in anti-disaster technology of Shimizu developed in disaster-prone Japan. The request was part of a project of operating an office cum retail complex facility in Jakarta, Indonesia. The analysis revealed risks of torrential rain and lightning in the scheduled construction site. The design and execution of the project incorporate measures against risks of torrential rain such as sufficient rainwater drainage system, relocation of power system above the inundation level, and installation of flood barrier against underground inundation.



“Shimizu Global Hazard Evaluation System”

Flood Barrier

[Profile of Project Company]

Shimizu Corporation was founded in 1804 and earned high reputation in 1838 by participating in the construction of the West Wing of Edo Castle. The Company is built on several “first-ever” construction projects in Japan as a pioneer in construction of Western architecture. The Company’s business has expanded into global scenes in the third century of the company history. Embracing contribution to global society as its first management philosophy, the Company carries out various other projects for adaption to global warming including one aimed to halt a decline in harvest from dried peatland in Indonesia by introducing superb civil engineering technology such as water level control.

2. Resilient Infrastructure against Natural Disasters

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.

Taisei Corporation

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

[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 or underground structures) , etc.

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 robust and durable seawall for long use which helps mitigating maintenance burden while enhancing disaster preparedness.

[Project Details]

Male Island, the Capital of 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 was also at the brink of submersion due to the sea level rise associated with global warming. 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, and built the 6 kilometers seawall around the Island. 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.

Bird's-eye view of Male Island

Visual Illustration of Seawall

[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 underwater 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 to the outside of construction area, or restoration of seaweed bed).

3. Sustainable Energy Supply

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 that can be used for emergency utilizing environmentally-friendly renewable energy such as "Solar LED Lights", "Solar Storage" and "Power Supply Containers". It serves as 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.

Panasonic Corporation

Mitigating damage to energy supply system in times of disasters

[Product & Technology]
Panasonic Corporation offers an array of energy supply tools including "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, and "Power Supply Containers", a stand-alone photovoltaic power package capable of generating approximately 3kW of electricity.

[Project Details]
Panasonic Corporation provides Solar Lanterns and Solar Storage through its local agents in Myanmar, India, Kenya and Ethiopia 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 already 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 learning. 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.

Solar Storage


Brightness for Local Community (Ethiopia)

[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. In 2006, then Vice President of Uganda 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 as part of its CSR commitments in supporting growth of business activities.

4. Food Security, Agriculture / Strengthening Food Production Base

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 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.

Dari K Co., Ltd.

Adapting to changing cultivation environmental for traditional crops

[Product & Technology]
Dari K directly imports cacao grown in Indonesia, process and sell the final chocolate products.

[Project Details]
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. The Company takes on specific measures such as raising cacao farmers' awareness, introducing fermentation technology and securing exit through 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.

Quality Assurance by President & CEO Keiichi Yoshino with Local Staff

Growing cacao

[Profile of Project Company]
Dari K 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 in May 2016 as one of the "VIBRANT (HABATAKU) Small and Medium Enterprises 300".

5. Health and Sanitation

It is feared that the global rise in temperature associated with climate change will transform and expand the habitats of infectious disease vectors and host organisms, leading to outbreaks of infectious diseases in new territories and increasing numbers of patients. Sumitomo Chemical Co., Ltd. developed “Olyset® Net,” a mosquito net used to help prevent the spread of malaria. In 2001, the “Olyset® Net” was acknowledged by the WHO as the first long-lasting insecticidal net of its kind. Preventing the spread of infectious disease due to climate change is an adaptation measure in the field of health and sanitation.

Sumitomo Chemical Co., Ltd.

Preventing the spread of infectious disease due to climate change

[Product & Technology]
“Olyset® Net” was developed based upon extensive research and development that applied the technologies used for mesh screen employed in factories as a bug shield in an attempt to help prevent the outbreak of malaria. The net is made of polyethylene resin woven with insecticide agent for gradual surfacing, which helps maintain the repellant effect for a long period after repeated washing.

[Project Details]
Sumitomo Chemical provides “Olyset® Net” for regions where there are fears of an increase in infectious diseases transmitted by mosquitoes as a result of expansion in mosquito breeding areas due to climate change. The Company started local production in September 2003 through a grant of manufacturing technology to A to Z Textile Mills Limited in Tanzania. To meet surging demand, “Olyset® Net” Production Company was set up as a joint venture with A to Z Textile Mills Limited, through which as many as 7,000 job opportunities were generated and the regional economy was boosted. In 2010, the Company built a production framework that, combined with Asian production bases, is aggregately capable of manufacturing as many as 60 million units annually. The products are now supplied to more than 80 countries through such international organizations as The Global Fund and UNICEF. Furthermore, the Company has launched sales to general consumers through local supermarkets in Kenya and several countries in Asia since 2011 to develop diverse sales channels.


Child playing with “Olyset® Net”


Manufacturing plant

[Profile of Project Company]
Sumitomo Chemical was founded in 1913 to manufacture fertilizers from sulfur dioxide emitted by smelting operations at the Besshi Copper Mine in Niihama, Ehime Prefecture, Japan, with the aim of alleviating the air pollution caused by the emissions. The Company, together with its over 100 Group companies, currently supplies products worldwide to support a wide range of industries and enrich the daily lives of people in five sectors: Petrochemicals & Plastics, Energy & Functional Materials, IT-related Chemicals, Health & Crop Sciences and Pharmaceuticals.

6. Health and Sanitation / Food Security, Agriculture / Strengthening Food Production Base

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 accelerates 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, an eco-friendly yet high-performance fire extinguisher using natural (soap-origin) surfactant. The "Miracle Foam" is a foam mixed of water and air that performs quick fire extinction with less 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 and sanitation, food security, agriculture and stronger food production base.

Shabondama Soap Co., Ltd.

Mitigating impact of frequent forest fire on plants and animals

[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 vanishes upon combination with naturally-abundant minerals such as calcium and magnesium. It is a rinse aid product when used in building fire and highly credited for having no need to be washed away. In 2007, the product was awarded an award by Minister for Internal Affairs and Communications for its distinguished achievement in academic-industrial collaboration. It also attracts much attention as a potential contributor in forest and peat fire in vast land of Southeast Asia, Russia and Australia.

[Project Details]

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 JICA program to demonstrate fire extinguishing agent for peat land in Indonesia, started its sale in 2015 for major local supplier of fire extinguishing machinery and materials and also conducted market study in Indonesia with the support of JICA. The Company strives to conserve the habitat of plants and animals through 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.

Fire extinction

Briefing on the project to Local Affiliates

[Profile of Project Company]

Shabondama Soap was founded in 1910 as "Morita Hanjiro Shoten" (Shabondama Soap Co., Ltd. since 1987). Since 1971, the Company produces and sells additive-free soaps containing no chemical or synthetic additives. In 2001, upon request from regional fire department in north Kyushu 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 the soap-based fire extinguishing agent, which has been in the market since 2007.

7. Climate Monitoring and Early Warning

Rise in temperature associated with climate change is said to raise the sea level which adds to evapotranspiration and frequency of downpour, resulting in water-triggered disasters including more floods and severer landslides dealing an enormous blow to residential areas, agriculture and businesses along the rivers and coasts. NEC has demonstrated effectiveness of its flood simulation system in northern Thailand in collaboration with Thailand's National Disaster Warning Center (NDWC) as part of the countermeasures against frequent floods in Thailand. The System enables prediction of flood inundation areas and maximum flood levels. It serves as an adaptation measure in the field of climate monitoring and early warning to issue warnings to threatened areas before the flooding occurs and to help reducing potential damage.

NEC Corporation

Contributing to minimize damage caused by flood

[Product & Technology]

The flood simulation system is one of the flood disaster modules of NEC's "Integrated Risk Management System" covering a wide range of natural disasters including floods, landslides and earthquakes. The System consists of a shared risk management platform with such functions as data integration, visualization, and early warning, and disaster modules specialized for each particular disaster. The disaster modules and functions are selective for individual application as required or combined to predict multiple disasters simultaneously.

The flood simulation system is characterized as follows.

- Simulations based on meteorological data (observed rainfall and forecast rainfall), topographical data (elevation values, land use purposes), and watercourse data (river networks, water levels, sewer systems, etc.), making it possible to predict flood inundation areas and maximum flood levels.
- Detailed simulations using a triangular mesh measuring 50m on each side, hourly-basis prediction for a period of up to seven days in advance, allowing NDWC to issue pre-warnings to threatened areas.
- Identification of areas at risk of flooding even during periods when no disaster is forecast by performing simulations using previous rainfall data, contributing to hazard mapping.

[Project Details]

NEC Corporation in collaboration with Thailand's National Disaster Warning Center (NDWC) and Japanese Embassy of Thailand, has conducted a trial of its flood simulation system to predict the inundation areas in Uttaradit Province in Northern Thailand during the period from November 2015 to March 2016. It was the first Japan-Thailand cooperation project in the field of disaster reduction ICT conducted as part of the "Research and study for the development of a flooding simulator in Thailand" project commissioned by Japan's Ministry of Internal Affairs and Communications.

Live Simulation

Warning Function

[Profile of Project Company]

NEC Corporation, the first company in Japan associated with foreign capital was founded in 1899 as a joint venture with Western Electric Corporation. While focusing on social solution business, the Company has also promoted diagnosis for deterioration of social infrastructure using the cutting-edge ICT technology such as Big Data, anti-aging measures and disaster reduction. Its' upcoming initiatives include promotion of disaster reduction ICT counter floods and landslides in Thailand and also to Asian neighbors leveraging its pool of experience and expertise.

8. Sustainable Water Supply

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. Yamaha Motor Co., Ltd. has developed "Yamaha Clean Water Supply System" as a small-sized water purifier contributing to better health of people and socioeconomic growth through new business. The System has been introduced to several places since 2010 as an adaption measure in the field of water supply through addressing water pollution associated with climate change and to improve health of people and socioeconomic environment.

Yamaha Motor Co., Ltd.

Addressing water pollution caused by floods

[Product & Technology]
"Yamaha Clean Water Supply System" purifies water through "Slow Sand Filter" using sand and gravel. Physical dirt and rubbish are removed from surface water pumped through the pipe through "Filtration Tanks" embedded with sand and gravel. Dissolved oxygen levels are increased by photosynthesis of algae which naturally occurs inside the "Bio-Pool". 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.

[Project Details]
The System has been introduced 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 also transformed people's lives. Local residents are now released from the chore of pumping water from the well and they have shifted themselves to production and learning activities. Economic development in rural areas and villages has also been achieved through new businesses such as water delivery, flush cleaning and ice making. Eying the System as a contributor to social infrastructure development while enhancing corporate awareness at the same time, Yamaha Motor is actively introducing the System to areas with water supply but without purification technology in cooperation with other donors.

Water Purification (Before & After)

Children gulping Clean Water (Senegal)

[Profile of Project Company]
Yamaha Motor was set up in 1955 as a motorcycle manufacturer. Since then the Company aims at contributing to people's lives worldwide through its products. The first trigger to taking on water purification business was complaints received from expatriate families working in a motorcycle factory in Indonesia in 1980s. The complaints were on the murky color and rusty smell of local tap water. In response, the Company developed a tap water purifier for household and started marketing and operation tentatively in Indonesia in 2010, which became the prototype of the System at present.

9. Climate Change Finance

Numerous studies have revealed enormous economic losses 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 counter their impacts. “Weather Index Insurance” offered by Sompo Japan Nipponkoa Insurance Inc. is as an effective initiative of minimizing financial risk incurred by extreme weather related events and acts as adaptation measure in the field of risk finance associated with climate change.

Sompo Japan Nipponkoa Insurance Inc.

Minimizing financial losses associated with extreme weather related events

[Product & Technology]

Leveraging on expertise furnished from weather derivatives products, Sompo Japan Nipponkoa Insurance, 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 developed for sale in 2010 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 insurance product developed based on a rainfall index using satellite observation data.

[Project Details]

Sompo Insurance (Thailand) Public Company Limited offers weather index insurance to borrowers of Bank for Agriculture and Agricultural Cooperatives of Thailand (BAAC). Weather index insurance has since then widely been accepted by Thai farmers and the product's sales area has expanded from initial one province in Northeast Thailand to currently 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 products (Thailand)

Preliminary survey (Myanmar)

[Profile of Company]

Sompo Japan Nipponkoa Insurance is the single largest domestic non-life insurer founded on 1 September 2014 upon merger of Sompo Japan Insurance Inc. and Nipponkoa Insurance Co., Ltd. Prior to merger, it has undertaken weather derivatives contracts both in and outside Japan as an adaptation strategy to climate change in an attempt to accumulate advanced financial technology and expertise. It has committed itself to the launch of “Pacific Catastrophe Risk Insurance Pilot Program” in January 2013 jointly initiated by the World Bank and Japanese government. It 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 maintained its presence as a major insurer since the launch of program up to the present.