Submission by Japan to the UN Framework Convention on Climate Change

Communication on Japan's undertakings in adaptation

November 27, 2015

Adaptation to the impacts of climate change is nowadays essential for every country, as changes in climate have caused impacts on natural ecosystems and human societies on all continents and across the oceans. As a national adaptation planning process, the Central Environment Council conducted climate change impact assessments in March 2015, and based on the results, the Inter-Ministry Meeting for Climate Change Adaptation prepared a draft "National Plan for Adaptation to the Impacts of Climate Change" (abbreviated as National Adaptation Plan, or NAP), and after being communicated with public for the draft, the Government of Japan formulated the National Adaptation Plan which was decided by the Cabinet in November 2015.

Internationally, the Lima Call for Climate Action, from the twentieth session of the Conference of the Parties (COP 20) in December 2014, invites all Parties to consider communicating their undertakings in adaptation planning or consider including an adaptation component in their intended nationally determined contributions (paragraph 12 of Decision 1/CP.20). Japan adopted and submitted its intended nationally determined contributions on July 17, 2015; in addition, this document is a communication on the status of Japan's undertakings related to adaptation, based on that COP 20 Decision.

This document is structured as follows. Part I provides an overview of climate change impacts in Japan, based on the "Climate Change Impact Assessment Report" of March 2015. Part II, based on the National Adaptation Plan, describes Japan's basic strategies on adaptation, as well as sectoral measures, basic measures, international measures, and basic approaches. Part III provides a summary of specific examples of Japan's adaptation-related international assistance and contributions to date.

Going forward, Japan intends to actively contribute to enhanced adaptive capacity in other countries, by internationally sharing its knowledge, experience, and technologies for adaptation, including through this document.

I. Impacts of climate change in Japan

Japan has accumulated a body of scientific findings relating to matters including observation and monitoring, projections and assessments, studies and research in connection with climate change and its impacts. Utilizing these scientific findings, for the formulation of a National Adaptation Plan, the Central Environment Council assessed the impacts of climate change in

Japan in seven sectors, 30 categories, and 56 sub-categories, and formulated the "Climate Change Impact Assessment Report" in March 2015.

The report shows the following.

1. Climate change in Japan

(1) Current status

- Annual mean temperature has increased from 1898 to 2013 at a rate of 1.14°C per 100 years, and from 1931 to 2013 there is a clear increasing trend in the number of days with maximum temperatures of 35°C or higher.
- Regarding precipitation, no long-term changing trend is evident for annual precipitation, but year-to-year variations have become larger since the 1970s, and there is a clear trend from 1901 to 2013 showing increases in the number of days with daily precipitation of 100 mm or more and 200 mm or more, while the number of days with daily precipitation of 1.0 mm or more is decreasing.
- The rate of increases of area-averaged annual mean sea surface temperature around Japan in about 100 years up to 2013 was +1.08°C/100 years, and the accumulated sea ice extent and maximum sea ice extent in the Sea of Okhotsk showed a long-term decrease during the period 1971 to 2013.

(2) Future projections

- The higher the greenhouse gas emissions, the more the global mean temperature is expected to increase; by the end of the 21st century the annual mean temperature across Japan is projected to increase by 1.1°C (90% confidence interval is 0.5° C to 1.7°C) relative to the end of the 20th century, even if the necessary global warming measures are taken to limit the extent of warming to a relatively low level, and by 4.4°C (90% confidence interval is 3.4°C to 5.4°C) if greenhouse gas emissions are at a very high level.
- Regarding precipitation, the amount of annual precipitation is characterized by a large range of inter-annual variability, and both increases and decreases are projected, but projections are for an increase in the frequency of occurrence of heavy rainfall and short-term intense rainfall, an increase in the amount of precipitation from heavy rainfall (amount of precipitation in one day from the top 5% of precipitation events), and an increase in the number of days with no precipitation (less than 1.0 mm of precipitation in one day).
- Projections indicate further increases in sea surface temperatures, decreases in sea ice extent, decreases in snow cover and snow fall, and rises in sea levels; they also indicate increases in events such as the numbers of strong typhoons, the maximum intensity of typhoons, and precipitation intensity at the time of maximum intensity.

2. The impacts of climate change in Japan

(1) Current status

Associated with events such as increases in air and water temperatures and decreases in the number of days with precipitation, it has been shown that impacts already evident include changes in crop yields and decline in quality of agricultural products, changes in fish catches, shifts in distribution of flora and fauna, coral bleaching, and earlier flowering of cherry blossoms.

(2) Future projections

Projections of future impacts include significant declines in the quality of agricultural products, extinction of many species, increases in severe drought, increases in heavy rainfall events causing water-related disasters and sediment-related disasters, increases in risks of storm surges and storm waves, and increases in the occurrence of heat stress.

3. Results of assessment of climate change impacts

The impacts of climate change in Japan were classified into seven sectors, 30 categories, and 56 sub-categories. Based on over 500 items of literature regarding projections of climate change and its impacts, expert judgement was applied on the basis of scientific findings to make assessments of impacts from the perspectives of significance, urgency, and confidence. The results of the assessments are provided further below.

- These broad sectors included sub-categories where impacts were assessed as being particularly high in significance and also high in urgency: Agriculture, Forestry, Fisheries; Water Environment, Water Resources; Natural Disasters, Coastal Zones; Natural Ecosystems; Human Health; and Life of Citizenry, Urban Life.
- The following nine sub-categories were assessed as being particularly high in significance, high in urgency and also having a high level of confidence.

Sector	Category
Agriculture, Forestry, Fisheries	Paddy field rice
	Fruit trees
	Plant pests and weeds
Natural Ecosystems	Ecosystem(e.g. alpine zones) Shifts
Natural Disasters, Coastal Areas	Water-related disasters
	Storm surges, storm waves
	Sediment-related disasters
Human Health	Risk of mortality
	Heat stroke
Life of Citizenry, Urban Life	Impacts on life due to heat stress

II. Japan's basic strategies relating to adaptation

Based on the above-mentioned assessment of climate change impacts, the National Adaptation Plan was formulated in November 2015, in order to progress policies and measures for adaptation to climate change impacts systematically and comprehensively. The Plan covers approximately the next ten years, while keeping in mind a long-term perspective to the end of the 21st century.

1. Basic strategies

In order to minimize or avoid damage from the impacts of climate change, and create a secure, safe, and sustainable society that can quickly recover from those impacts, the Plan establishes the following basic strategies.

Basic Strategy 1: Mainstream adaptation into the relevant policies and measures of the Government, by building resilience, considering uncertainty, creating synergies (co-benefits), and developing and diffusing technologies, and address the current and future impacts of climate change.

While keeping in mind perspectives (i) - (iv) below and referring to the "Climate Change Impact Assessment Report," the Government will consider systematically mainstreaming adaptation into policies and measures relating to climate change impacts, implemented by the relevant government ministries and agencies.

(i) Improving adaptive capacity through building resilience

Secure the resilience of social systems and natural systems and improve adaptive capacity by reducing vulnerability and exposure to climate change impacts before they occur. When considering adaptation measures, it is important to consider the protection, restoration and creation of the natural environment—taking care to ensure that the adaptation measures themselves do not burden the environment—and, depending on the objectives and regional characteristics, to make use of the diverse functions of ecosystems.

(ii) Responding to climate risk involving uncertainty

Promote adaptation in flexible ways and with adaptive approaches; this involves striving to gather the latest scientific findings that can be obtained through efforts such as ongoing monitoring, observation and projections of climate change and its impacts; implementing regular assessments of climate change and its impacts, while also considering changes in the social environment such as population decline and aging of society. Based on the results of those impact assessments, it is important to consider and implement adaptation measures in each sector, in ways that avoid rework; to monitor progress; and to revise plans as necessary.

(iii) Promoting measures that have synergies (co-benefits) with adaptation

Promote measures that have synergies (co-benefits) with adaptation and have multiple policy objectives, including ecosystem based adaptation.

(iv) Research, development, and diffusion of adaptation technologies

Regarding technologies contribute to adaptation, promote research, development and diffusion of technologies, through collaborative research among the public and private sectors, and with consideration of how to actually apply research results in society.

Basic Strategy 2: Continuously enhance scientific findings, through ongoing implementation of observation and monitoring, projection and assessment, and promotion of studies and research.

To respond appropriately to the impacts of climate change under uncertainty, it is important to enhance scientific findings and continuously use the latest findings. For that, the relevant government ministries and agencies will accurately observe and monitor the state of climate change and its impacts, project climate change in the future and assess impacts on an ongoing basis.

Basic Strategy3: Promote understanding and cooperation of each actor through efforts such as organizing and sharing climate risk information and other information.

Facilitate each actor' access to climate risk and other information easily and get accurate and comprehensible information relating to climate risk and other information.

Regarding observation data that has been organized systematically and data and information relating to climate projections and impact assessments, the relevant government ministries and agencies collaborate to prepare an information platform and provide the information broadly to each actor.

Build the bridging function between scientific findings and policy making, so that actors can develop effective adaptation actions.

Basic Strategy 4: Promote regional adaptation efforts, through actions such as cooperation with local governments for climate change impact assessments, formulation of adaptation plans, and awareness-raising.

The content and scale of climate change impacts as well as vulnerability to the impacts will vary significantly depending on local characteristics, such as the climate conditions, geographical conditions, and socioeconomic conditions where the impacts are manifested. It is also important to see adaptation as an opportunity to create a new society by making use of

the respective characteristics of each region. In this context, the implementation of climate change impact assessments by local governments is to be promoted, as well as the formulation and implementation of adaptation plans by local governments.

Basic Strategy 5: Strongly promote international cooperation and contributions in the area of adaptation, through support for the formulation of adaptation plans and implementation of measures, and disaster risk reduction, as well as human resource development and the utilization of Japanese science and technology, to developing countries.

In order to promote adaptation in developing countries, Japan will strengthen international cooperation, by providing assistance for the formulation of adaptation plans (including the area of disaster risk reduction) and implementation of adaptation measures, while making use of its technologies, as well as human resource development in the area of adaptation.

Japan will increase its active engagement in international contributions through activities such as participation in international frameworks such as the Intergovernmental Panel on Climate Change (IPCC), making use of the scientific findings and technologies it has cultivated.

Toward the implementation of these basic strategies, through collaboration among the relevant government ministries and agencies, Japan will effectively promote sectoral measures, as well as the basic and international measures.

2. Sectoral measures

Japan will promote sectoral adaptation measures based on the findings of Japan's climate change impact assessment for each of the seven sectors indicated in the "Climate Change Impact Assessment Report" (agriculture, forestry and fisheries; water environment / water resources; natural ecosystems; natural disasters / coastal areas; human health; industrial / economic activities; and life of citizenry / urban life).

Below are examples of policies and measures.

(1) Agriculture, forest/forestry, fisheries

(Paddy field rice)

Develop and disseminate high-temperature-resistant varieties, as it is projected that if a shift to high-temperature-resistant varieties does not proceed, the ratio of first-class rice will decrease nationwide, due to high temperatures during the grain-filling period.

(Fruit trees)

Regarding apples and grapes, as poor coloring is reported, promote the introduction of

superior-colored varieties, and undertake development and diffusion of cultivation management technologies.
Regarding satsuma mandarin oranges, apples, and Japanese nashi pears, develop breeding materials adaptive to high temperature conditions.

(Plant pests and weeds)
It has been pointed out that damage to agricultural crops may increase due to the increasing occurrence of pests and diseases, and the expansion of their distribution areas. Moreover, there are concerns about serious damage resulting from the introduction of pests and diseases that have never been present in Japan, triggered by climate change. For those reasons, a pest forecasting program applicable to the specified pests will be continuously implemented, and while investigating changes such as the status of the occurrence and damage, such information will be disseminated for the purpose of timely and proper pest control.

(Mountainous disaster)
One prediction says that the annual maximum daily rainfall and the annual maximum hourly rainfall will increase by several dozens of percent compared to today. Under the premise that the rainfall conditions will become as harsh as predicted, disasters such as intensive landslides and debris flow will frequently occur, and impacts on the communities in hilly and mountainous areas will increase. For these reasons, promote implementation of forest conservation facilities and forest management work, and based on changes in the occurrence status of mountainous disasters due to intense heavy rainfalls of recent years, accurately ascertain the areas with high danger for occurrence of mountainous disasters, and undertake improvements in erosion control facilities to control landslides and sediment runoff .

(Marine fisheries)
In waters surrounding Japan, an impact forecast is reported concerning a distributed migration range and changes in the size of fish including salmon, yellowtail, Pacific saury, Japanese common squid, and sardine, whose catches are large. The distribution area is mostly projected to go north. The catch of some species is projected to decrease due to increased temperatures in adjacent waters. For those reasons, improve the precision of fishing ground prediction, and provide real-time monitoring information.

(2) Water environment and water resources

(Water environment)
Regarding the water environment, because changes that are expected to arise due to climate change include changes in water temperature, water quality, and characteristics of runoff (including nutrients from watersheds), promote measures to reduce the loads flowing into water bodies, including measures for wastewater from factories and business premises and

measures for domestic wastewater, in lakes and marshes expected to have changes in phytoplankton and worsening of water quality associated with increases in water temperature and changes in rainfall.

(Water resources)

Increases in the number of rainless days and decrease in the total amount of snowfall are projected. Thus, in order to prevent damage from droughts that could occur relatively frequently, in areas where development of water resources infrastructure are needed, initiatives for water resource development are promoted continuously. Moreover, fully utilization of existing facilities is considered, and efforts for such as encouraging the utilization of rainwater and reclaimed water are promoted. In addition, in order to mitigate damage from droughts that exceed the capacity of facilities, water sharing and special water delivery systems during times of drought are considered, and efforts to develop organizational systems for drought management, in collaboration with the stakeholders.

(3) Natural ecosystems

Because there are projections about possible reductions in the range of some trees and alpine plants, a northward shift in the distribution of corals and other species of flora and fauna, and reductions or disappearance of reef-building coral, implement priority monitoring and assessments of vulnerable ecosystems such as alpine zones, tidal flats, salt marshes, seagrass beds, and coral reefs where impacts have a high likelihood of occurring; furthermore important inland water ecosystems and marine priority areas.

In order to maintain ecosystems in a sound condition, reduce stresses not related to climate change (e.g., development, environmental pollution, overuse, invasion by alien species). Promote to build ecological networks which are expected not only to ensure ways through which species transfer but also to perform diverse functions. If necessary, promote to restore deteriorated ecosystems.

(4) Natural disasters and coastal areas

(Water-related disasters)

Regarding water-related disasters, due to climate change, there are growing concerns about the frequent occurrence of water-related disasters due to natural hazards (such as torrential rains and storm surges) natural hazards exceeding the capacity of facilities, and about the occurrence of water-related disasters on an extremely large scale, caused by natural hazards significantly exceeding the capacity of facilities but relatively rare.

Regarding natural hazards that could occur relatively frequently, continue to steadily promote improvements that have been ongoing to date for construction of facilities such as levee, flood

control structures, and sewerage, and conduct maintenance and upgrades as appropriate. Through these efforts, Japan aims steadily to prevent the occurrence of water-related disasters. When doing so, while referring also to measures of other countries and considering possible future climate-change-induced increases in natural hazards, promote efforts such as adaptive improvements and maintenance that can provide additional measures that—to the extent possible—avoid rework.

Regarding natural hazards that exceed the capacity of facilities, endeavor to reduce risk by making improvements in facilities' operations, design, and maintenance and upkeep procedures; promote urban and local development in ways that consider disaster risk reduction; and endeavor to enhance preparedness for actions such as evacuations, emergency operations, and business continuity. Through these efforts, aim to reduce to the greatest extent possible any loss of life or damage to property, society, and economy. Also, regarding promotion of measures concerning aspects such as urban design and evacuations, based on inundation scenarios for various natural hazards, promote measures with stakeholders such as local governments, businesses, and residents having an awareness of what kinds of damage can occur. In particular, for natural hazards that significantly exceed the capacity of facilities, aim for the protection of human life to the greatest extent possible and to avoid catastrophic damage to society and the economy.

(Storm surge and tidal wave)

In coastal areas, there are concerns about greater inundation damage on the land side, increased coastal erosion, and sea-level-rise-induced declines in port waterfront industries and logistics (including decreased cargo handling efficiency), due to factors such as increases in storm surge anomalies and stronger waves as a result of climate change-induced increases in typhoon strength, as well as a medium- and long-term sea level rise.

To address these impacts, implement accurate weather and marine monitoring, and promote measures strategically and adaptively with policies from perspectives of a combination of hard and soft, based on regular assessments of climate change impacts. In ports and harbors, implement adaptation measures for impacts on breakwaters, port functions, water-side areas, land-side areas, and the clearance under bridges. In coastal areas, promote measures including disaster risk assessments and adaptation measures in response to disaster risks, responses to natural hazards that exceed bank protection standards, strategic development of measures against increasing in natural hazards, and a strengthening of measures to address ongoing coastal erosion.

(Sediment-related disasters)

Regarding sediment-related disasters, major damage has occurred in many places in Japan in recent years, and there are concerns about increases in the frequency of occurrence.

In this context, promote construction of sediment-related disaster prevention facilities in locations that can be most effective in protecting human life, and that can protect evacuation sites and routes, public facilities, socioeconomic activities. Also, based on amendments to Act on Sediment Disaster Countermeasures for Sediment Disaster Prone Areas, promote the designation of sediment-related disaster hazard areas, publish the results of baseline survey even at the stage prior to that designation, and inform residents at an early stage regarding sediment-related disaster dangers. In addition, endeavor to improve and strengthen warning and evacuation systems through actions such as the provision of support for the formulation of hazard maps and disasters prevention action plan.

(5) Human health

Regarding heat stress, because the numbers of heat stroke patients transported by ambulance are projected to increase, under the Inter-Ministerial/Agency Liaison Committee on Heat Stroke and through collaboration among the relevant ministries and agencies, provide meteorological information, implement actions including appropriate information provision relating to topics such as cautionary alerts, awareness raising regarding prevention and treatment, and status of outbreaks of heat stroke, in various situations including emergency response, education, health care, labor, agriculture, forestry and fisheries industries, and everyday life.

(6) Industrial and economic activity

As projections have indicated increases in insured losses associated with growing number of natural disasters, increases in insurance payments, and increases in reinsurance premiums, continue to pay attention to initiatives to improve risk management among insurance companies, and efforts of the General Insurance Association of Japan.

A reduction of snow cover depth due to an increase of temperature, and the erosion of sandy beaches by rises in sea levels are projected. Because it is important to consider adaptation measures in the tourism industry such as skiing and coastal leisure based on local characteristics, facilitate adaptation planning by local governments.

(7) Life of citizenry and urban life

(Urban infrastructure and critical services)

Because there are concerns about impacts on infrastructure and critical services if climate change results in events such as an increase in short-term intense rainfall events and droughts, and an increase in the occurrence of strong typhoons, promote adaptation measures for distribution/logistics, ports and harbors, railways, airports, roads, water supply infrastructure, waste treatment facilities, and traffic safety facilities—for example, measures to prevent inundation in places such as underground stations; the preparation of business continuity plans (BCPs) for ports and harbors; and improvements to make waste treatment facilities

more resilient to natural disasters, including water-related disasters.

(Heat island effect)

Because there are concerns about an even greater range of temperature increases in urban areas in the future, due to the combination of the urban heat island effect and increased temperatures from climate change, promote improvements in ground cover by greening and utilizing water surfaces, reduce artificial exhaust heat, and improve urban design.

3. Basic measures

(1) Basic measures regarding observation, monitoring, studies and research

Promote land-, ship-, aircraft-, and satellite-based observation, enhance modeling technology and simulation technology using supercomputers and other equipment, and implement activities including studies and research relating to policies and measures that have co-benefits with adaptation.

(2) Basic measures for sharing and providing information related to climate risk

Discuss an information platform relating to climate change adaptation among the relevant government ministries and agencies. The relevant government ministries and agencies are to provide information relating to climate risk in a form that is useful for each actor, and to strive to develop and manage support tools to facilitate impact assessments and the development of adaptation measures.

(3) Basic measures for promoting adaptation in the region

Conduct model projects that assist implementation of climate change impact assessments and the formulation of adaptation plans, for local governments that are implementing innovative adaptation initiatives. In addition, summarize topics such as preparation procedures and issues for adaptation plans, based on knowledge obtained through the model projects, then formulate guidelines, and offer them to other local governments.

4. International measures

(1) Support for developing countries

Provide cooperation for climate change impact assessments and the formulation of adaptation plans in developing countries, through actions such as creating collaborative frameworks with partner governments and related institutions, based on Japan’s experience with adaptation plan formulation. Establish sustainable industries and promote initiatives that help maintain livelihoods, while overcoming climate change vulnerability utilizing Japanese corporate technologies. Support the implementation of adaptation measures while utilizing Japan’s technologies and experience in a variety of sectors, including water resources and disaster risk reduction, food and agriculture, the natural environment and ecosystems. Particularly for small island developing states, implement comprehensive support by providing the necessary

equipment and making use of Japan's experience and knowledge.

Relating to floods, provide assistance to speed reconstruction and strengthen disaster risk reduction capabilities from material and non-material perspectives, by means such as stand-by loans from the Government of Japan for disaster risk reduction and disaster reconstruction. Targeting representative river basins in Asia where there are concerns about water-related disasters, conduct water-related disaster risk assessments that consider climate change, and provide the necessary information for developing adaptation plans.

Regarding droughts, provide assistance to enhance resilience with regard to droughts in arid and semi-arid regions.

Regarding harbors and coastal areas, implement trainings for technical personnel in developing countries on climate change impacts and measures. Regarding coastal erosion, make proposals and other actions for coastal conservation utilizing local ecosystems, including coral reefs and mangrove forests. Make use of Japan's technologies for international cooperation in the area of adaptation, through efforts such as provision of global observation data and climate change projection data, and the provision of technologies and knowledge by industry, government and academia working together.

Regarding the proper ways of making contributions through the provision of Japanese technologies and products for adaptation actions by developing countries, as well as the feasibility of potential projects, continue to implement studies and publish the findings domestically and overseas.

(2) Assistance and contributions through international frameworks

Contribute to human resource development in the area of adaptation by broadly sharing Japan's experience and findings, through international networks such as the Asia Pacific Adaptation Network (APAN) and Global Adaptation Network (GAN). Also, strive to promote adaptation measures by improving the AMICAF framework (Assessments of Climate Change Impacts and Mapping of Vulnerability to Food Insecurity under Climate Change to Strengthen Household Food Security with Livelihoods' Adaptation Approaches), while also making use of South-South cooperative mechanisms.

Looking toward the preparation of the IPCC's Sixth Assessment Report, contribute to IPCC activities and report writing by providing findings through the dispatch of Japanese experts to IPCC Plenary Sessions and various other meetings.

Regarding international standardization related to adaptation, under the International Organization for Standardization (ISO) and other bodies, contribute based on Japan's

experience and technologies while following trends in the discussions.

In order to contribute to monitoring sea-level rise and others, Japan is being involved in international observation of Very Long Baseline Interferometry (VLBI) and developing a new VLBI observing system for higher accuracy. Japan also develops and updates framework basic geospatial information (global maps) with global coverage in collaboration with National Geospatial Information Authorities for better understanding of global environmental issues and formulating policy and measures to tackle with them.

5. Basic approaches

Adaptation will be promoted by using an adaptive approach that involves a repeated cycle of conducting ongoing observation, monitoring, and projection of climate change and its impacts; based on their results and on literature review and other actions, ascertaining the latest scientific findings; implementing regular assessments of climate change and its impacts; and based on the results of those impact assessments, considering and implementing adaptation measures in each sector, monitoring the state of progress, and making revisions as required.

Regarding management of progress with the National Adaptation Plan, after formulating the Plan, with a time frame of approximately one year, studies will be conducted to examine the approaches being used in other countries to manage progress, and based on the findings, there will be a systematic consideration of approaches to ascertain the state of progress of the Plan.

As for revisions of this Plan, an assessment of climate change impacts is to be implemented and formulated approximately every five years, while taking future international trends into account, and based on the results of the said impact assessment, the status of each measure and other factors, the Plan is to be revised as required.

III. Past and on-going practices on international cooperation for adaptation

Japan has provided and will continue to provide support to developing countries to reduce vulnerability, build resilience and increase adaptive capacity against the adverse impacts of climate change through bilateral and multilateral cooperation.

1. Bilateral cooperation

At the policy-level, Japan has assisted mainstreaming climate change adaptation in development planning as well as improving the policy environment to facilitate adaptation efforts. For example, development policy operations combined with technical cooperation has been implemented to assist vulnerable areas and/or countries in South East Asia, such as Vietnam and Indonesia, with formulating a national adaptation plan, integrating adaptation measures into national development plans, undertaking policy reforms to boost adaptation

efforts, and facilitating local governments to mainstream adaptation.

At the operational level, Japan has extended technical and financial support for investments in climate risk reduction, and enhancement of preparedness and coping capacity against climate impacts. Since 2000 in Asia and Pacific, for instance, Japan has financed investments in flood control infrastructure for Indonesia and Philippines, installation of meteorological radars and/or ground hydro-meteorological observation networks in 8 countries, and construction of cyclone shelters in Bangladesh. Such assistance is combined with technical cooperation for the operation of those facilities and equipment. Further support has been provided for the capacity development of government officials and local communities to facilitate their collaborative efforts to operationalize the early warning and evacuation system in 7 countries including Thailand and Fiji in Asia and Pacific since 2000. In Africa, Japan assisted Kenya and Tanzania in irrigation facilities to strengthen their drought resilience, and conducted projects for making agricultural and pastoral practices more drought-resilient in Kenya and Ethiopia, piloting an index-based weather insurance scheme in Ethiopia, and developing seed orchards to breed drought tolerant tree varieties in Kenya. For small islands where rising sea level threatens their coastal lands, Japan has assisted in coastal protection in Tuvalu, Seychelles, Mauritius and Bali, Indonesia.

2. Multilateral cooperation

Japan has also provided broad support with vulnerable regions through international organizations. Below are examples of cooperation.

(1) African Adaptation Programme (AAP)

Under the "Japan-UNDP Joint Framework for Building Partnership to Address Climate Change in Africa," established by Japan together with the United Nations Development Programme (UNDP) on the occasion of the Fourth Tokyo International Conference on African Development (TICAD IV) in 2008, Japan launched a program to provide financial support of $ 92.1 million as a part of the Japanese "Cool Earth Partnership" to support African countries' efforts for addressing and adapting to climate change at national, sub-national and community levels. The programme, the African Adaptation Programme (AAP), undertaken by UNDP in cooperation with UNIDO, UNICEF and WFP, made a number of achievements in all of its five programmatic areas below in 20 African countries.

1) Introduction of dynamic, long-term planning mechanisms to manage the inherent uncertainties of climate change
2) Leadership capacities building and development of institutional frameworks to manage climate change risks and opportunities in an integrated manner at the local and national levels
3) Implementation of climate-resilient policies and measures in priority sectors
4) Expansion of financing options to meet national adaptation costs at the local, national,

sub-regional and regional levels
5) Generation and share of knowledge on adjusting national development processes to fully incorporate climate change risks and opportunities

(2) Africa Climate Adaptation and Food Security project (ACA)

Japan also provided US$4.2 million for the Africa Climate Adaptation and Food Security project (ACA) in 2013 building on the results of the AAP. The project was implemented as a regional project of UNDP Regional Bureau for Africa. The ACA undertook a series of activities to strengthen climate information services, test and scale-up climate risk management measures and to further integrate climate change into national and local planning and budgeting processes in 5 African countries. Regional-level capacity for climate information services was also developed by addressing the needs of regional inter-governmental institutions.

(3) Project for Japan-Caribbean Climate Change Partnership

With regard to the Caribbean region, Japan provided US$ 15million for the "Project for Japan-Caribbean Climate Change Partnership". Through this project being implemented by the UNDP, Japan aims to assist Caribbean countries in developing and implementing climate change policies, to promote the transfers of adaptation and mitigation technologies through various pilot projects in selected countries, and to build a regional platform for information sharing. Japan expects that this project will enable small island developing states in the Caribbean region to enhance their adaptive capacity to climate change and natural disasters, and will further strengthen the partnership between Japan and these countries.

For more information about the impacts of climate change in Japan, and Japan's experiences of, and lessons learned from adaptation, both domestic and international, please refer to:

1. Sixth National Communication of Japan, Chapter 5: https://www.env.go.jp/en/focus/docs/files/20140319-81.pdf
2. Submission by Japan (Experience with the application of the initial guidelines for formulation of national adaptation plans(NAPs) as well as any other information relevant to the formulation and implementation of NAPs) http://www4.unfccc.int/submissions/Lists/OSPSubmissionUpload/39_12_130463728148145350-Japan's_submission_on_NAP_2014_0604.pdf