Japan's submission regarding its views on the content of research dialogue and on relevant information relating to technical and scientific activity in climate change research

Japan welcomes the opportunity to submit the following information as requested in paragraphs 13 and 17 of the conclusion reached at SBSTA 37 (FCCC/SBSTA/2012/L.25):

(1) Its views on possible items for consideration as part of the research dialogue during SBSTA38;

(2) Information on the technical and scientific aspects of emissions by sources, removals by sinks, and reservoirs of all greenhouse gases, including emissions and removals from terrestrial ecosystems such as steppe, savannah, tundra and peatlands, with a view to identifying and quantifying the impact of human activities.

- In the forthcoming research dialogue of SBSTA 38, Japan would like to present the results of its research on climate change projection. These include, for example, its development and improvement of the 20-km-mesh super-high-resolution global atmospheric model called MRI-GCM, which is able to simulate global distribution of observed tropical cyclones and extremely strong tropical cyclones (a task not possible with conventional models). A further example of Japan's research results is seen in near-term climate prediction using the high-resolution coupled atmosphere-ocean climate model named MIROC. Researchers found that effective prediction covering a period of about five years (or more depending on location) is possible with initialization based on observational data in regard to decadal-scale natural climate variability in the Atlantic and the Pacific.

- Additionally, afore-mentioned research program has also produced a number of outcomes contributing to (2) in the introduction above, which are detailed here. The research team has incorporated ecosystem dynamics, chemical processes and other variables into the MIROC to produce a new model called MIROC-ESM, which incorporates carbon cycle processes. The model estimated that CO_2 emissions from fossil fuels must be negative (thus, pointed out that artificial absorption of carbon is necessary) by the latter half of the 21st century in order to realize RCP 2.6 (to stabilize CO_2 concentration at 410 ppm or the CO_2 equivalent of 450 ppm with methane, etc. added). It should be noted that such research outcomes are inevitably accompanied by uncertainties, and it is essential to closely monitor IPCC AR5 assessments and also new research that address such predictions. In light of the importance of considering ways to deal with such uncertainties and to utilize the

knowledge for decision-making, Japan has leveraged its Environment Research and Technology Development Fund to begin a research program called Integrated Climate Assessment – Risks, Uncertainties and Society (ICA-RUS) with the aim of developing and proposing strategies for the global-scale management of climate change risk. Specifically, the program will involve consideration of constraints, uncertainties, risk management options and societal value judgments. It is expected to contribute to international consensus building, support domestic policy development, and raise general awareness of climate change issues.

- If (2) in the introduction above is accepted as a theme of the next research dialogue, the Japan- Indonesia joint research project (under SATREPS program) called Wild Fire and Carbon Management in Peat-Forest in Indonesia can provide innovative information on ecological carbon estimation as follows: (i) estimation of peat amounts at carbon flux from peatland degradation in Indonesia. The current rough estimation of carbon sequestration in the world's tropical peatlands is 80 GtC (as carbon). As Indonesia is home to two thirds of the world's tropical peatland, even carbon emissions (0.5 GtC) from a 1% loss of such peatland in the nation would exceed Japan's total annual carbon emissions; (ii) elucidation of the precise mechanisms behind the workings of large-scale greenhouse gas (GHG) emissions induced by the degradation of tropical peatland ecosystems; (iii) technological innovation in the estimation of carbon sequestration and flux in tropical peatland areas, for which an integrated monitoring, reporting and verification (MRV) system has been developed in combination with remote sensing data from satellites and long-term ground monitoring data. This modeling and simulation is being used to develop a real-time water level map of tropical peatland in Indonesia, which will enable the creation of spatial maps showing CO_2 emissions from the microbial decomposition process and wildfires in tropical peatland areas.

- Japan operates a number of satellites that collect information to contribute to (2). As part of the above research project with Indonesia, Japan is developing a multi sensor called hyper-spectral imager suite (HISUI) and a liquid crystal tunable filter camera. Another prime example is the Greenhouse-gases Observing Satellite (GOSAT) as it is used to calculate GHG global distribution, which is affected by anthropogenic emissions. GOSAT can now also be used to estimate monthly net fluxes (the difference between sources and sinks) by region*. As a result, it has become possible to estimate the net flux of Siberia's substantial forestland, which could not previously be measured. The Global Change Observation Mission – Climate (GCOM-C) satellite scheduled for launch in 2015 is expected to help clarify and quantify forestland's carbon fixation capacity by measuring amounts of photosynthesis and the biomass of vegetation on such land.

* The world is divided into 42 land regions (each covering 2,000 km^2) and 22 ocean regions.