UNOOSA
UNITED NATIONS OFFICE FOR OUTER SPACE AFFAIRS
LAPAN
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United Nations/Indonesia International Conference on

Integrated Space Technology Applications to Climate Change

Working Groups

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LAPAN

Introduction

This International Conference will bring together experts from the space, the climate change community, academia, international, regional and national organizations as well as decision makers to discuss methods to use space-based applications to support the identification and implementation of adaptation measures, as well as to share experiences and lessons learned on the use of such applications in the context of mitigation.

The **objective**s of this International Conference are:

1. To discuss ways in which countries affected by climate change can make better use of integrated space technology applications to assess vulnerability to climate change;
2. To discuss the use of integrated space technology applications to identify potential alternatives in the context of adaption to climate change as well as in mitigation efforts;
3. To improve synergies among space agencies and organizations targeting efforts on climate change;
4. To strengthen international, regional and national cooperation regarding the use of integrated space technology applications targeting mitigation and adaptation to climate change;
5. To raise awareness on the recent advances in space-related technologies, services and information resources which can be use to assess the impacts of climate change and the effects of measures implemented to reduce such impacts.

While remote sensing applications are already used to track some of the manifestations of climate change (weather & climate, sea-level rise, melting of ice in polar caps and glaciers, etc) and some processes which contribute to the emission of greenhouse gases (forest fires, industrial emissions and concentration of particular greenhouse gases in the atmosphere) and to carbon sequestration (through reforestation); there is a need to assess how such space applications could contribute to adaptation and mitigation.

Two elements that are essential when it comes to adaptation to climate change are:

- The vulnerability of communities
- Potential losses and damages

Working Group Sessions will be used to focus the discussions on nine different themes with the aim of identifying ways in which integrated space technology applications can be used to contribute to efforts related to mitigation and adaptation to climate change.

The following questions and other similar questions will be addressed during the discussions in these nine Working Group sessions.

1 - Climate Change and Environment


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Natural ecosystems play a vital role in our subsistence through the provision of a variety of services. Ministries of environment are already making use of remote sensing applications and global navigation and satellite services (GNSS) to assess the different types of manifestations of climate change in the environment, the impacts of climate change and to track ways to control such impacts.

Questions to be addressed may include:

- What types of applications or methods in the context of space applications need to be developed to assist decision makers to identify, visualize and assess alternatives or options for adaptation in environmentally protected areas?
- How can we use space applications, in combination with ground-based surveys, to assess the vulnerability of ecosystems and the services they provide?
- Is it possible to use space applications to contribute to the measurement or quantification of the services provided by natural forests? If so, what types of applications or methods in the context of space applications need to be developed for such a purpose?
- How can we facilitate the interaction between the space community, the ministries of environment and academia to target these issues?
- What activities could a “pilot project” in this area contemplate?

2 - Mitigation / REDD

Space applications are already used in efforts targeting mitigation. Space agencies have positioned satellites that track the concentration of gases in the atmosphere, and ministries of environment continually use remote sensing applications to track emissions of such green-house gases. Applications also include tracking emissions from forest fires, industries, and vehicles.

Questions to be addressed may include:

- What are the advantages and limitations of using remote sensing applications to track and to measure the amount of greenhouse gases that are absorbed through reforestation projects?
- What type of imagery works best to try to measure the amount of greenhouse gases absorbed in forests?
- What types of applications or methods in the context of space applications need to be developed to assist decision makers to identify, visualize mitigation efforts?
- How can we facilitate the interaction between the space community and ministries of environment and academia to target this issue?
- What activities could a “pilot project” in this area contemplate?


Credits: ESA

3 - Adaptation in Coastal Areas


Credits: ESA

Coastal areas include the coral reefs, beaches, estuaries, and portions of land which are heavily interlinked with the seas and oceans. Adaptation would cover ecosystems (corals, mangrove forests and those associated with sand dunes); livelihoods (fishing; shrimp, oyster, mollusk farming, etc); agriculture in coastal areas and coastal cities (urban & rural).

Questions to be addressed may include:

- What are the advantages and limitations of using remote sensing applications to track the effects of climate change in coastal areas?
- What type of imagery works best to try to assess such effects?
- How can we use space applications, in combination with ground-based surveys, to assess the vulnerability of coastal ecosystems, livelihoods, agriculture and urban and rural communities in coastal areas?
- How can we use space applications, in combination with ground-based surveys, to assess potential loss and damage in ecosystems, livelihoods, agriculture and coastal urban and rural communities due to sea-level rise, increased storm surges, increased wind speeds and precipitation due to more intense and frequent storms?
- What types of applications or methods in the context of space applications need to be developed to assist decision makers to identify, visualize and assess alternatives or options for adaptation in coastal areas?
- How can we facilitate the interaction between the space community and ministries of environment and academia to target this issue?
- What activities could a “pilot project” in this area contemplate?

4 - Climate Change and Disasters

IPCC experts have stated that as a result of climate change, more frequent and more intense hydrometeorological events can be expected (storms or droughts). Droughts have a severe impact on agriculture, livestock, farming, and water resources. Storms directly trigger floods, storm surges and in mountainous areas they can trigger landslides and debris flows.

Questions to be addressed may include:

- How can we use space applications, in combination with ground-based surveys, to assess the vulnerability of communities and their livelihoods; agriculture; and urban and rural communities?
- How can we use space applications, in combination with ground-based surveys, to assess potential loss and damage due to sea-level rise, increased and more frequent droughts, storms, and landslides and floods triggered by such storms?
- What types of applications or methods in the context of space applications need to be developed to assist decision makers to identify, visualize and assess alternatives or options for adaptation in areas exposed to such hydrometeorological phenomena?
- How can we facilitate the interaction between the space community, the disaster risk reduction and emergency response communities and academia to target this issue?
- What activities could a “pilot project” in this area contemplate?


Credits: ESA

5 - Mitigation&Adaptation in Mountain Environments


Credits: ESA

Mountainous environments host specific ecosystems and communities in mountainous areas implement their livelihoods in particular ways to make them sustainable. On a very general scale, one can differentiate between two types of mountain environments: those which include glaciers and those which do not.

Questions to be addressed may include:

- How can we use space applications, in combination with ground-based surveys, to assess the vulnerability of communities in mountainous areas and their livelihoods?
- How can we use space applications, in combination with ground-based surveys, to assess the effects of glacier melting in the livelihoods of communities in mountainous areas?
- What types of applications or methods in the context of space applications need to be developed to assist decision makers to identify, visualize and assess alternatives or options for adaptation in mountainous areas in the context of glacier melting?
- What types of applications or methods in the context of space applications need to be developed to assist decision makers to identify, visualize and assess alternatives or options for adaptation in mountainous areas in the context of more frequent and intense hydrometeorological events?
- How can we facilitate the interaction between the space community, the disaster risk reduction and emergency response communities and academia to target this issue?
- What activities could a “pilot project” in this area contemplate?

6 - Adaptation in Agriculture

Agriculture is the basis for many types of livelihoods around the world. When discussing how best to approach this theme, it’s important to keep in mind the particular case of subsistence agriculture and the types of crops that are targeted in different continents when it comes to subsistence agriculture.

Questions to be addressed may include:

- How can we use space applications, in combination with ground-based surveys, to assess the vulnerability of communities relying on subsistence agriculture and their livelihoods?
- How can we use space applications, in combination with ground-based surveys, to assess the vulnerability of crops and livelihoods when focusing on subsistence agriculture in mountainous areas?
- What types of applications or methods in the context of space applications need to be developed to assist decision makers to identify, visualize and assess alternatives or options for adaptation in the agricultural sector when focusing on subsistence agriculture?
- How can we facilitate the interaction between the space community, the disaster risk reduction and emergency response communities and academia to target this issue?
- What activities could a “pilot project” in this area contemplate?


Credits: ESA

7 - The role of Research


Credits: ESA

Academia and research centres can play an important role by establishing the theoretical frameworks and developing tools and instruments to support the practical work of decision-makers and implementers of climate change adaptation and mitigation efforts. The challenge is to ensure that researchers and other stakeholders complement each other.

Questions to be addressed may include:

- How can academia and research institutions best complement practical steps implemented by government agencies for climate change adaptation as well as mitigation?
- What are some examples of applications and methods developed by researchers that have successfully supported climate change adaptation or mitigation processes in practice?
- How can we facilitate the interaction between the space community and academia, with a particular focus on developing countries, so that academia in such countries makes use of methods and tools developed by the space community to target climate change related issues?
- How can the cooperation process between researchers and other stakeholders (political decision-makers, practitioners, satellite data providers, value-adders and end-users of space-based information for climate change) best be structured so as to best exchange and develop ideas together as well as to test and improve methods? What are possible obstacles? What can be the tools and methods to foster that cooperation? (For example online platforms, thematic groups of experts, publications, conferences, informal contacts...)

8 - Data Policy

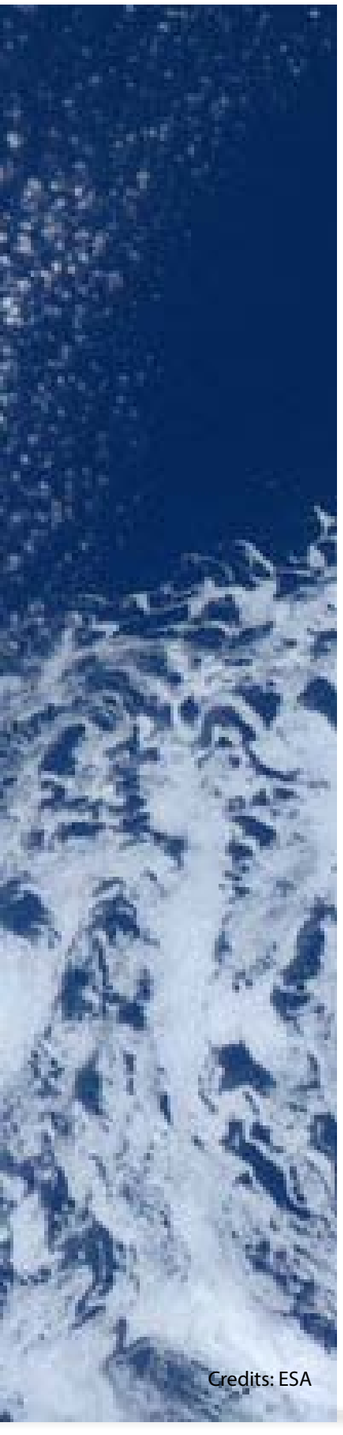
Access to space or ground-based data that is necessary for both assessments and decision making regarding climate change adaptation and mitigation can be a challenge due to lack of resources, lack of expertise to interpret and process such data and lack of access to such data. It is important to look at examples where data policies have been successfully put in place.

Questions to be addressed may include:

- How can spatial database infrastructures be established and developed to facilitate access to and sharing of data and derived information (such as maps and GIS layers) effectively? What are the obstacles?
- What should the role of non-governmental national and international actors be in this process: international organizations (such as United Nations agencies), Non-governmental Organisations (NGOs), or the private sector? Should they take an active role in sharing and accessing the data themselves?
- What role does data sensitivity play in this context? What are the challenges and consequences when data deemed sensitive by an agency in a country is not or cannot be shared? What could be possible solutions?
- What are good practices and examples of both national and international mechanisms to share and access data relevant to climate change adaptation and mitigation?
- How should freely-accessible crowd-sourced data be considered in this context? Is it reliable and useful in the context of climate change?


Credits: ESA

9 - Weather and Climate


Credits: ESA

In order to assess and monitor factors influencing climate change as well as to track adverse effects of climate change, remotely sensed data combined with ground data gives valuable input.

Questions to be addressed may include:

- In which ways can space applications contribute to understand the interaction between the ocean and the atmosphere when considering climate change?
- In which ways can space applications or space-based information allow decision makers and people in general to understand better how changing weather patterns due to climate change affect them?
- In which ways can space applications or space-based information allow decision makers and people in general to understand better how changing weather patterns due to climate change impact specific services which ecosystems and the environment provide?
- How can we facilitate the interaction between the space community, the meteorological offices or departments and academia to improve the use of space applications to address changes in the weather and climate that subsequently affect populations?


Credits: ESA