

Earth Observation for disaster risk management

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Distinguished Delegates, Colleagues, Ladies and Gentlemen.

We cannot prevent the occurrence of natural hazards; on the contrary as human pressure on the global ecosystem grows, it induces an increase in the frequency and intensity of natural hazards.

There is indeed no longer any serious scientific doubt about what is happening. The recent report by the Intergovernmental Panel on Climate Change makes clear that global warming will put hundreds of millions of people at increased risk from climate-related hazards; be it in developed or developing countries.

->But (if we cannot prevent natural hazards) we can prevent the occurrence of disasters to reduce the vulnerability of people, livelihoods and property. Actually, disasters only occur when natural hazards meet human vulnerability.

That is the aim UNOSAT pursues in applying space science to DRR.

UNOSAT is the operational satellite applications programme of the United Nations Institute of Training and Research (UNITAR). It is supported by CERN (European Center for Nuclear Research) and is based in Geneva.

Allow me a small digression at this stage: I would like to highlight the importance of our partnership with the CERN. As you may know the WEB was born at CERN. They developed this tool in order to allow scientists around the world to exchange their research. CERN continues to develop its IT capacity and this is precisely the way they support UNOSAT and its endeavours. They are providing us with one of the best IT infrastructures in the world, allowing us to process large amount of data, compress this data within hours so that our maps reach the field on time through the Internet, and to also store the data.

UNOSAT is the sole UN programme entirely dedicated to providing operational satellite applications to the humanitarian and development communities.

Our activities are organized to inform decisions and actions. We concentrate our efforts on the practical issue of transforming the data collected by satellites into vital, practical, concrete, result-oriented tools, and concrete actions on the ground.

->Satellite applications are indeed entering the day-to-day practice of humanitarian relief and disaster prevention both as strategic planning tools and operational decision support instruments.

The United Nations system is constantly increasing the number of space-related activities and studies. UNOSAT on the operational side and UNOOSA (Office for Outer Space Affairs) on the policy and coordination side are the two leading entities in this emerging area of work. With partnerships within the UN system and regional organisation for example with WMO, OCHA, UNEP and UNDP) and co-operation with the space sectors, UNOSAT is building a bridge between science and civil society in the areas of capacity development, vulnerability reduction and emergency response.

List of main initiatives in which UNOSAT is involved:

GEOSS (Global EO system of systems): The Group on Earth Observations (GEO) is leading this worldwide effort over the next 10 years. Earth observing systems participating in GEOSS retain their existing mandates and governance arrangements, supplemented by their involvement in GEOSS. Through GEOSS, they will share observations and products with the system as a whole and take such steps as are necessary to ensure that shared observations and products are accessible, comparable and understandable, by supporting common standards and adaptation to user needs. UNOSAT is a participating organisation in this endeavour.

GMES: stands for Global monitoring for environment and security. It is the main EU programme aiming to put space applications at the service of the protection of people and our environment. UNOSAT is a partner of GMES in the particular field of emergency response.

International Charter Space and major Disasters: this charter is an agreement between several Space agencies and aims to provide satellite data free of charge in real time when a disaster occurs, revealing its nature and impact. This Charter is brokered by UNOSAT within the UN system in close cooperation with UN OOSA, which is the accredited cooperative body). UNOSAT translates the data received into maps, and disseminates them through the Internet to the humanitarian community, and in particular to OCHA.

Sentinel Asia: As it has been mentioned earlier by Mr. Moriyama, I am pleased to inform you again that UNOSAT will take part in this initiative (by providing its operational capacity and technical expertise).

SPIDER: Mr. Stevens will explain it to you in few minutes. UNOSAT brings its direct support to the implementation of SPIDER by contributing through its operational capacity. Concretely, we are setting up a liaison office in Geneva in order to cooperate closely with the key players located there, i.e. mainly the GEO secretariat, OCHA and ISDR with whom we have decided to open, with the support of the Swiss Confederation, a joint unit on the theme of "Space applications for DRR" that aims to mainly support the National platforms in the integration of space based tools for the accomplishment of their mission.

What are these tools and why are they so important?

-Earth observations are the basis for informed decision making at the local, regional and/or global level.

Understanding the Earth system is crucial to reducing disaster losses. And Earth observations are critical to advancing this understanding. They provide us with new geographical, human, and ecological data. They give us the means to understand, act, and anticipate global issues, and their implications on territories.

Sound, rational management of disaster risk requires indeed relevant and timely information. Such information is obtained through observations of the Earth, collected mainly through satellites, and transformed into maps and other decision support tools (like modellisation of floods scenarios for example).

->Contrary to some opinions, satellite applications are not a sophisticated and difficult to use gadget. EO satellites are today common and affordable sources of information.

Satellites have a unique ability to provide a quick and reliable overview of even remote places in the world.

This wealth of information contributes to hazard mapping, vulnerability assessment and reduction, and urban or rural planning.

Satellite technology indeed represents a source of valuable and updated information that can be used through all phases of the disaster cycle.

All these phases are inter related and space applications provide specific tools for each phase.

For example:

-> Recent major disasters have shown with clarity that earth observation is becoming part of how we implement **emergency relief**.

UNOSAT gathers the data made available by the International Charter, and processes it to realize maps showing the localization and extent of the damages, allowing a better prioritization and coordination of the relief efforts. For example, Earth observations coupled with GIS allows the provision within hours of basic information such as population density and repartition, elevation model, and also the state of the communication infrastructures like roads and bridges.

In the particular case of the Earthquake that hit Pakistan in 2005, the humanitarian community faced a difficult challenge. A large part of the problem was the difficulty in locating and accessing villages. Satellites have been used at headquarters and in the field to help to “see” the localisation of and the level of destruction of affected villages. And, regarding the access to the villages: the winter was likely to cause more victims than the earthquake itself. And so in partnership with the WMO we have been able to provide snow cover forecasting. This allow the relief agencies and NGOs to plan more efficiently “where to go first” (where the snow will be) and then plan the snow cleaning of the roads to reach the villages concerned.

->In order to prevent the lapse into hazard vulnerability, the integration of resilience measures is highest during the period of time we have between the live saving operations and the recovery, what we call the **early recovery phase**.

UNOSAT is part of the UN CWGER and assures that:

- the wealth of information generated at the time of the crisis is at the disposal of the recovery and reconstruction effort, in which users involved are different from those involved in the emergency relief phase.

- and that DRR is taken into account since the very beginning of our ever-widening range of recovery and rehabilitation activities. We should not rebuild in risky areas. When floods occur for example, it is very easy thanks to satellite imagery to map the flood risk. We take an archival image and an image during the flood and thus we can compare the difference between the normal level of the river and the flood extent. This flood susceptibility mapping contributes towards reducing flood damage and risk to the population in the future (if our recommendations are taken into account).

Prevention:

What I have just mentioned relates to the prevention of disasters. In this domain, we also develop projects aimed at incorporating DRR concerns in land planning policy at the community level.

To do so we train local authorities in the use of satellite-based tools and GIS, because the main obstacles in the operational use of the data provided by satellite are neither technical nor economical, but are instead related to the capacity of organizations and

communities to absorb and digest the huge quantity of information. A special emphasis has to be given to the training and capacity development, especially at the local level where the risk is best addressed.

We have several projects focusing on the capacity development of vulnerable populations from developing countries to use and benefit from space related activities.

Actually the relevant and up to date geographic information will be useful only if it is provided to the right person, a person able to take full advantage of the information.

Moreover at the community level, satellite imagery can provide evidence of the vulnerability of a particular territory. So it can be of great support to participatory process. Decisions can be more restrictive on land use but they are much better understood and so accepted. These tools are essential for better knowledge and management of local territories, by local communities themselves.

->There is a need for decision support tools that can be handled by those who have to make decisions. These technologies are more and more used but their potential still remains largely unexploited. We work towards bringing results in the field; and this allows us to show how effective the use of space applications can be in solving issues related to the vulnerability to hazards. But these powerful tools still need to be actively and widely disseminated, and they are more effective when they are accompanied by training, technical support and international cooperation.

Collaborative partnerships involving university, research center, technological park, international and regional institutions, local communities, and supported by the donor community need to be developed.

As a training institute, we want to capitalize the existing knowledge and disseminate it, but also contribute to the research on new applications.

-> As it was underlined by Sir John Holmes, Under-Secretary General for Humanitarian Affairs, Emergency Relief Coordinator and Chair of the ISDR system, at the occasion of the first session of the GP/DRR held earlier this month in Geneva, "1 US\$ invested today in DRR saved 4US\$ in the future cost of relief and rehabilitation, while recognizing the fact that we can never put a price on human life. DRR is an imperative, it should become a top priority on the development agenda, and we cannot accept anymore the fatality.

Our scientific knowledge on the topic is sufficient (at least it clearly shows us the trends, even if many climate related phenomena still remain to be understood and assessed as they are changing faster than ever), technical solutions exist, but science is amoral, and its value resides in what we do with it.

Thank you for your attention!