

Topic 4d - Urban expansion and desertification

The world is getting increasingly urbanised. And we recognised that, probably in a few decades, if not sooner, 70% percent of the population is going to be concentrated in cities. Now this poses a challenge even currently and will increase over time. And understanding urban dynamics, doing urban risk assessments, and really planning accordingly is extremely important.

This is where satellite data can really help us, together with all the innovations we're coming up with. We have a few examples where we have used satellite data to understand the risks and to plan accordingly. One project that we used was in the mega cities in South Asia, where we applied satellite data to three cities-- in Dhaka, in Bangladesh, and in Mumbai and Delhi in India.

And we use satellite data to understand the extent of urban sprawl that was beginning to grow around cities. And it was through this use of data that we were able to understand the differences and the dynamics happening in each city. For example, in Dhaka, it was very much driven by residential sprawl, whereas in Mumbai and Delhi, it was actually industrial plots that were being set up. And this kind of evidence allows us to really have conversations to improve that land use planning.

Earth observation data are an essential tool in support of strategic sectorial areas. In fact, Earth observation is useful in support to not only European Union sectorial policies, national policies. You can use the data when you plan, for example, to expand the city, when you build a railway road, or even when you monitor forests from the satellite.

And this is all very useful, for example, in this implementation of the Top 21 agreements, the one recently happened in Paris. The satellite data can be not only useful for the stock taking parts, so the reporting by the member countries, the voluntary reporting that they do on greenhouse gases and CO2 emissions, but it can also be very useful in all the mitigation and adaptation measures associated with the implementation of such agreements.

In some areas, urban stations have the capability to produce anthropogenic changes due to the expansion of the cities is also an important aspect we need to monitor from space. One of the things which are now being particularly relevant in the context of climate change is to look at the string events.

Because really, the problem is that we have situations where we have very dry conditions, and that will bring us to the desertification problems, or conditions where there are too much rain, or too much water, and you may have flood or some other problems, particularly in some areas, particularly, for instance, in South Europe, desertification is still one big issue because the lack of water, and the way we've used the land, has been exploited-- deforestation, for instance-- has resulted in a situation where there is, on the one hand, areas which have already become a desert, and there are other areas where there is a desertification risk.

And we want to monitor those areas because, in the cases where there is already a desert, then there are little things we can do. But in the areas where we can identify the probability that that will happen, we can still do something for protecting those areas.

For that, we need to look very carefully at the soil properties, so, basically, what are the soil changes. The optical data are very useful for that because you will see changes in the colours. That will tell us that something is changing in the chemistry of the soils, being exposed, or some other problems.

But also looking at the vegetation over the areas, the vegetation is very scarce-- very, very little vegetation over those desertification threatened areas. But we can use this optical data-- particularly in rather high spatial resolution-- to monitor those changes in vegetation and identify the areas which are suffering from this desertification problem. This is a very important problem, particularly in the Mediterranean area.