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First, I want to thank Thierry de Montbrial and Ms. Kwon for asking me to speak here today. You must be wondering what this discussion has to do with the space industry, which is best known for its sovereignty, defense and exploration components. However, I would like to give some examples showing, as was previously said, how space technology and data allow a number of global food-related challenges to be met.

First, I would like to recall the characteristics of space data. In 1972, the United States launched Landsat, the first Earth observation satellite. It took pictures of the Earth's entire surface. Since then, thousands of satellites bristling with sensors have been orbiting over our heads taking pictures and measuring the atmosphere's composition, ground temperature, ocean salinity, etc.

Scientists pore over the data to study the Earth's evolution, in particular climate change. Satellites provide half of the 50 items the IPCC uses to understand and predict the effects of climate change, including sea level rise, which, as has been known for several years, is increasing three to four millimeters a year.

This information is obviously crucial for scientists, but it also leads to extremely concrete and very local applications, such as communications in white zones, navigation, the GPS we all have in our phones and the weather. Satellite data have considerably improved weather forecasting. Satellites can detect forest fires and give warnings within minutes and floods too. When natural disasters occur, they give first responders vital information to rescue populations.

These data are universal. Space data are global and have very long-time scales. Consequently, they are universally used. Space fosters cooperation, precisely because of this universal nature. Technology, miniaturization, digitization and the lower cost of access to space thanks to reusable launchers mean that we have more and more satellites and data are becoming less and less expensive, which is fundamental today. Sometimes they are even free. Every day, the European Union's Copernicus program delivers 30 terabits of data usable by everyone across the Earth's entire surface.

Three examples illustrate how space can meet food challenges. The first involves water, a critical resource. Satellites can measure water levels on Earth. They started out by measuring sea level rise. Today, lake and river levels can also be accurately measured every day down to the centimeter. This not only allows watershed levels to be estimated at any given time but also to forecast their yearly change using weather forecasting models and AI. When combined with measurements on the ground, this is extremely important to help decision makers decide on the use of resources for human consumption, agriculture or hydroelectric power. For example, objective, global measurements enable them to make informed decisions on the use of water

resources. This is especially important when watersheds are in different countries, which often clash over the use of water resources.

The second use of spatial data I would like to mention is in agriculture. This was also mentioned by my neighbor. Today, with spatial data we can accurately know about soil conditions on a global and local scale, allowing us to obtain data on individual plots. We can know soil moisture levels, which helps us make informed decisions on irrigation and inputs in order to minimize them. This optimizes water and input use. We can also forecast temperature trends on a plot-by-plot basis, enabling us to make decisions on crop development that will be adapted to global warming in a given region.

We may think this technology is only for rich countries that can afford costly agricultural equipment. But I would like to give the example of India, which has set up an extremely effective system for making space-based information available to every farmer, and not just for making decisions on the farm. How does it work? Every farmer in India can use a free phone number. When they call, an operator accurately detects the call's origin on screens containing satellite and non-satellite data that can give irrigation advice, weather forecasts and disaster risks. Farmers use the information to make daily decisions about their plots. As my colleague also said, now everyone can use this technology to improve farming operations.

The last example is using space data for oceans. Oceans account for 15% of the world's food supply, a figure that is naturally much higher in coastal areas. Space provides information on the state of the oceans in the context of global warming, which improves scientific forecasts. Satellites can also detect pollution very easily. They can be used to curb illegal fishing and detect ghost ships optically or by listening to and correlating radar emissions, which are all different depending on the boat. All of this means that ocean resources can be optimized for food and other applications.

On the occasion of a June 2025 United Nations conference in Nice, all the global space players will plan to create a spatial alliance for the oceans. The aim is to make all their spatial data available to understand and preserve the oceans better.

Lastly, I would like to mention the Space for Climate Observatory, an initiative that France proposed to all its international partners in 2019. Today, the observatory is supported by the United Nations and 50 countries participate, including the United Arab Emirates. It is a group of extremely local projects that make spatial data available for climate-related issues.

Here is an example. In Vietnam, the issue of how global warming and the influx of saline water will change rice paddies is extremely critical. A project we are conducting with Vietnam allows us to forecast what the conditions of farming the rice paddies will be in the next 10 years. This will enable farmers to make informed, extremely local decisions on where to plant them.

Thank you for your attention.

**Jean-Michel Severino, President of Investisseurs & Partenaires, former Vice President of the World Bank for Asia, former CEO of France's International Development Agency (AFD)**

Thank you so much, Jean-Marc for introducing us to a new innovation and dimension. In our sessions in the previous years we have mentioned other innovative dimensions, for instance, we have addressed the issue of cellular food and beyond agriculture nutrition. Now, there we are back to a certain extent to the basics of the agri-field, making agriculture itself more productive and efficient. It is wonderful to see that we have a new instrument to address this very important channel.