

In 2021, Indonesia succeeded in providing assistance to the re-entry of TELKOM-3 satellite by predicting the orbital evolution of the object using semi-analytical calculation by taking into account the latest publicly available orbital parameters and space weather conditions. We also performed coordination with ROSCOSMOS as the representation of launching country as well. Therefore, Indonesia pushes international collaboration on space debris mitigation and remediation including observation, characterization, and re-entry operation.

Indonesia also has developed capacity in space debris monitoring, such as:

1. Conducting new study on space debris population and its risk to Indonesian satellites;
2. Improving our predictive model to obtain higher accuracy; and
3. Developing its own optical telescope system for space debris observation in Kupang, East Nusa Tenggara Province which includes international collaboration for future activities.

Thank you.

### **Item Agenda 9 : Space-system based disaster management support**

Thank you Mr.Chair

Indonesia as a disaster-prone country, including the most flood-prone in the world, is aware of and supports the development of space-based disaster management. LAPAN plays an active role by providing information based on satellite data at the location of the disaster. The types of disasters monitored include earthquakes, tsunamis, landslides, floods, and volcanic eruptions. In addition, drought, and forest/land fires. In this disaster response, it is done by integrating several image data (multi-resolution and multi-sensor), according to the existing data availability conditions. LAPAN as member of Sentinel Asia and International Charter makes it easier to access data (especially high spatial resolution and near real-time) needed in disaster response.

Indonesia commits to develop remote sensing data widely applied in our national earth monitoring system particularly disaster mitigation, including early warning, emergency response and post-disaster management activities that coordinated through the Indonesian National Disaster Management Authority (BNPB). The information has monitored and delivered during 2021 includes: forest and land fire, flood and landslide, earthquake, oil spill, and covid-19 pandemic.

LAPAN develops disaster mitigation information system (SIMBA), an early warning and emergency response information service based on remote sensing data that could be access on <http://sipandora.lapan.go.id/>. Types of information presented: 1. Cloud coverage and rainfall conditions from satellite data 2. Fire Hazard Rating System (SPBK) 3. Monitoring of hotspot conditions 4. Fire haze, and information on burned land 5. Potential for flooding 6 Potential for flooding/drought in rice growing areas 7. Volcanic eruptions. Medium and high-resolution satellite data are used to provide disaster emergency response information during and after a disaster event.

LAPAN as regional support office of UNSPIDER triggered in 2021 the International Charter to get high resolution data to monitor the affected area by earthquake in West Sulawesi in January, flood and landslides by Seroja Cyclone in East Nusa Tenggara in April, also volcanic activity at Semeru in December. All these disasters have devastating impact to the population, infrastructure and livelihood. The efforts have taken place in addressing its impact.