

Managing Space Reliance Risks in Southeast Asia's Commercial Space Economy: A Technology Governance Perspective

Cattleya Delmaire

Excellence Center of Space Technology and Research, (ECSTAR), King Mongkut's Institute of Technology, Ladkrabang (KMIL), Bangkok, Thailand

Settapong Malisuwan

Excellence Center of Space Technology and Research, (ECSTAR), King Mongkut's Institute of Technology, Ladkrabang (KMIL), Bangkok, Thailand

Abstract:

Southeast Asian countries are entering a new phase of space activity driven by commercial satellite services, public-private partnerships, and rapid growth in communications, navigation, and Earth observation applications. As space-enabled services become embedded in economic activity and public infrastructure, the region is developing increasing reliance on space systems often controlled by external providers. While this reliance supports modernization and connectivity, it also introduces strategic, economic, and operational risks when resilience and governance lag behind. This paper examines space reliance as an underexplored risk factor affecting the sustainability of Southeast Asia's commercial space sector. Through a qualitative review of academic, policy, and institutional sources, it identifies four reliance-driven risk mechanisms: service disruption, supply-chain concentration, governance capacity gaps, and escalation risks linked to the dual-use nature of space technologies. To address these challenges, the study introduces the Space Reliance Risk Matrix (SRRM), a qualitative decision-support framework linking reliance intensity with resilience and institutional control, including redundancy, provider diversity, and recovery capacity. The findings show that dependence on space-enabled services is growing faster than resilience development, increasing exposure to market and geopolitical shocks. However, reliance itself is not inherently destabilizing; outcomes depend on how dependence is managed. From a commercial space policy and governance perspective, the SRRM offers a practical tool for governance, policy, and investment decision-making in space-dependent infrastructure environments.

Keywords:

Space reliance, Space Reliance Risk Matrix (SRRM), commercial space, technology governance, risk management, Southeast Asia.