Abstract

Satellite earth observation (EO) is a crucial part of disaster response. The data and information derived from EO systems provide the visual building blocks for activities such as making rapid damage assessments, guiding response efforts, and for planning recovery and reconstruction activities. As the utility of satellite EO continues to grow within the disaster management (DM) sector, disaster affected communities are increasingly faced with the task of acquiring timely, relevant and affordable data and products. Over the past few decades, an international regime has taken shape to address these needs through different governance mechanisms which function to bridge resources and efforts among space agencies, space system operators and stakeholders in the DM community. This thesis explores the ongoing development and effectiveness of the EO-based DM regime through a study of the operational and legal governance dynamics within it.

The thesis is guided by the conceptual intersection between international relations and international law, and explores how the dynamics among different actors, interests, rules and norms are playing out within the current EO-based DM regime. As a socio-legal research endeavor, the study is particularly interested in the relationship between social and legal norms, and the ways in which the law both reflects and defines the identities, interests and behaviors of relevant stakeholders. It further works to examine the legal and operational effectiveness of these developments through a select number of case studies.

The thesis is based on case studies of the International Charter for Space and Major Disasters, the efforts of a sub-working group on EO data licenses within the Committee on Earth Observation Satellites Recovery Observatory project, and a field study conducted in Haiti which examined ongoing processes and challenges for geospatial data sharing for DM purposes within the country. The study relies on the inputs from stakeholders at all levels of the EO data distribution and use chain, and employs an exploratory, mixed-methods research approach to the collection of qualitative and semi-quantitative data through document analysis, interviews, participatory observations and an online survey.

The thesis finds that over time, the EO and DM sectors have intertwined and, through the interplay among different actors, interests and socio-legal processes, created conditions for the establishment of a highly effective international regime for the distribution of EO data for disaster response purposes. The thesis argues that disasters provide for a normative reference point around which the legal and operational developments in the EO-based DM regime have converged. Nevertheless, rapid technological changes in the EO sector, as well as the growing monetary and applied values of EO data, are stimulating new political, economic, legal and technical processes and challenges for stakeholders at all levels. The study concludes that these ongoing developments are best observed through processes around EO data licensing which reflect the evolving dynamics among a growing network of actors and interest within the current regime.

Overall, the finding in this thesis provide unique insights for academics and practitioners interested in the legal and operational aspects of space-based DM, and may provide valuable examples of effective international governance dynamics for managing other common global affairs.