

Building Green Resilience through Innovation in the Oil & Gas based Ecosystems: Flood Risk-mitigating Capability and Organizational Coevolution

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Extended Abstract

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Abstract Summary

Amidst greater calls for innovative, safe and collaborative green transformation to support sustainability transition, we propose a framework that integrates contingency based dynamic capabilities, and organizational co-evolution theories to model flood risk (FR) induced firm-level green resilience built up, unique to the oil and gas (O&G) facility based commercial ecosystems. Motivated by preliminary causal evidence where historical flood events in China had led to an increase in carbon-emission reduction related patents, yet this sensitivity is stronger in regions housing systemically significant O&G facilities, we theorize: (i) FR induces anticipatory capability-building among small constituent firms, yet such learning can be disrupted by unexpected cross-site FR spillovers transmitted through pipeline connections; and (ii) organizational co-evolution with facility-owning O&G firms strengthens the translation of risk-mitigation capabilities into subsequent carbon-reducing innovation, while also buffering spillover-induced disruption. Using a 20-year panel of 127,410 constituent firms, we find quantitative evidence consistent with (i) and (ii). Overall, our findings reveal a FR induced green innovation mechanism distinctive to China's O&G sector, with implications for ecosystem-based climate adaptation and decarbonization governance.

Presenting Author Biography

Xuyan Gao is a third-year PhD student in Economics at the University of Liverpool. Her research focuses on climate risks and urban environments. She has advanced proficiency in GIS data processing and analysis, with expertise in handling single and multiple geographic layers for overlay, processing, and extraction, as well as applying spatial statistical methods and geospatial techniques to investigate complex environmental and socioeconomic interactions.