

# EVALUATING LAND USE POLICIES FOR FLOOD RISK REDUCTION IN RWANDA



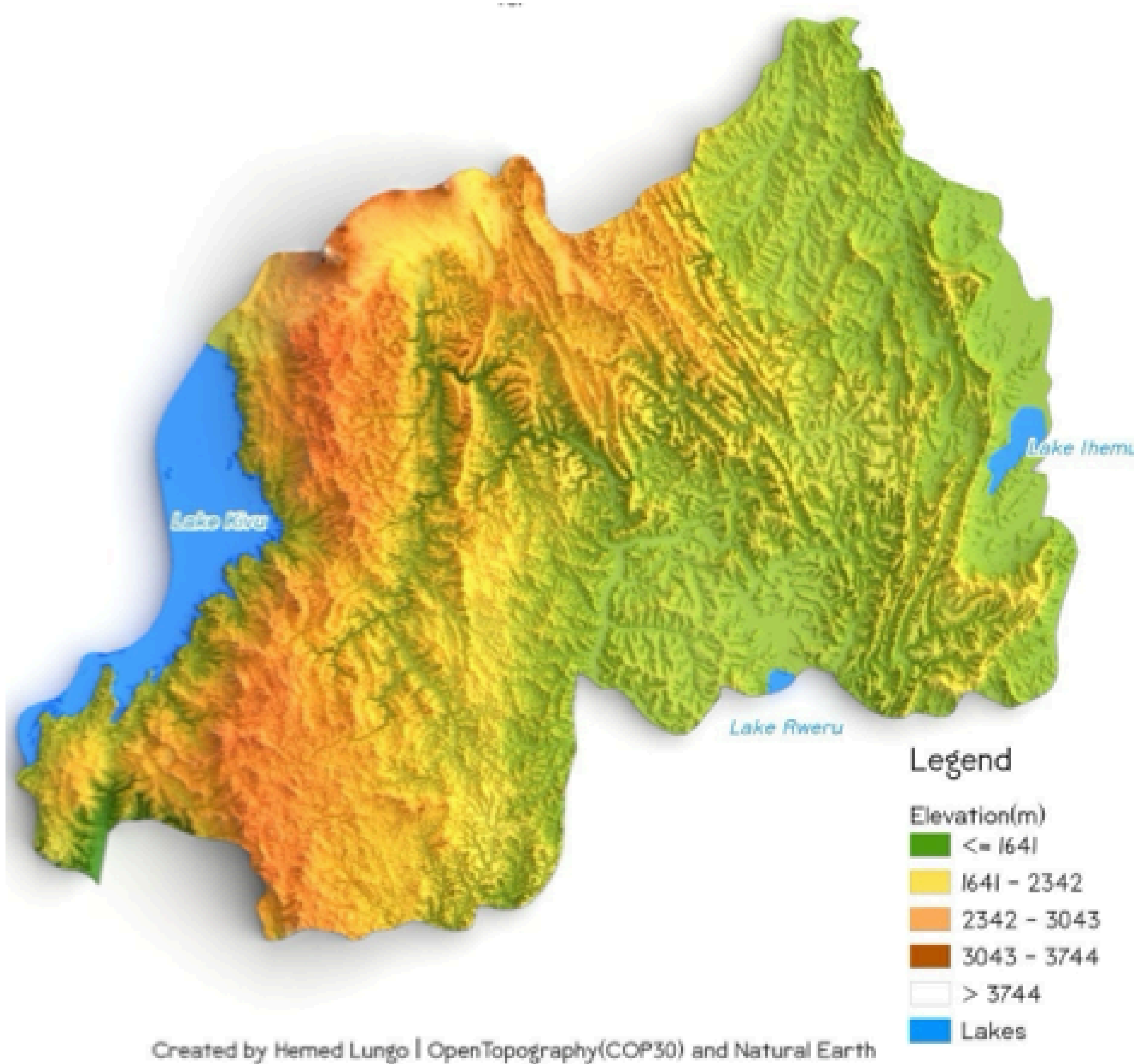
Shelley McMullen

University of Colorado Denver

PhD Candidate, PE, MPA, MURP  
Geography, Planning and Design  
Department of Urban and Regional Planning

## Introduction

- Support for land use planning as a tool for safeguarding human settlements from hazards and future climate risk is growing
- Established link between disaster risk and development issues (e.g. rapid population growth, rapid urbanization, extreme poverty) indicates that weather-related climate change impacts will disproportionately affect sub-Saharan Africa
- Rwanda the 9<sup>th</sup> smallest African nation by land area but most densely populated country on mainland Africa
- Severe land constraints due to high population density, dependence on agriculture, and steep topography
- History of floods and landslides, exacerbated by natural geology, land development and increasing storm severity
- Nearly 3/4 of working population relies on agriculture for livelihood, either via commercial or subsistence farming
- Rwanda has ambitious development targets to reach upper-middle-income country status by 2035 despite high levels of poverty
- The Rwandan National Land Use and Development Master Plan (NLUDMP) says land use efficiency is key to solving the “national spatial puzzle”



## Research Questions

To what extent are flood and landslide risk reduction policies incorporated into national land use planning in Rwanda? How do those policies influence physical or social vulnerability?

## Methodology

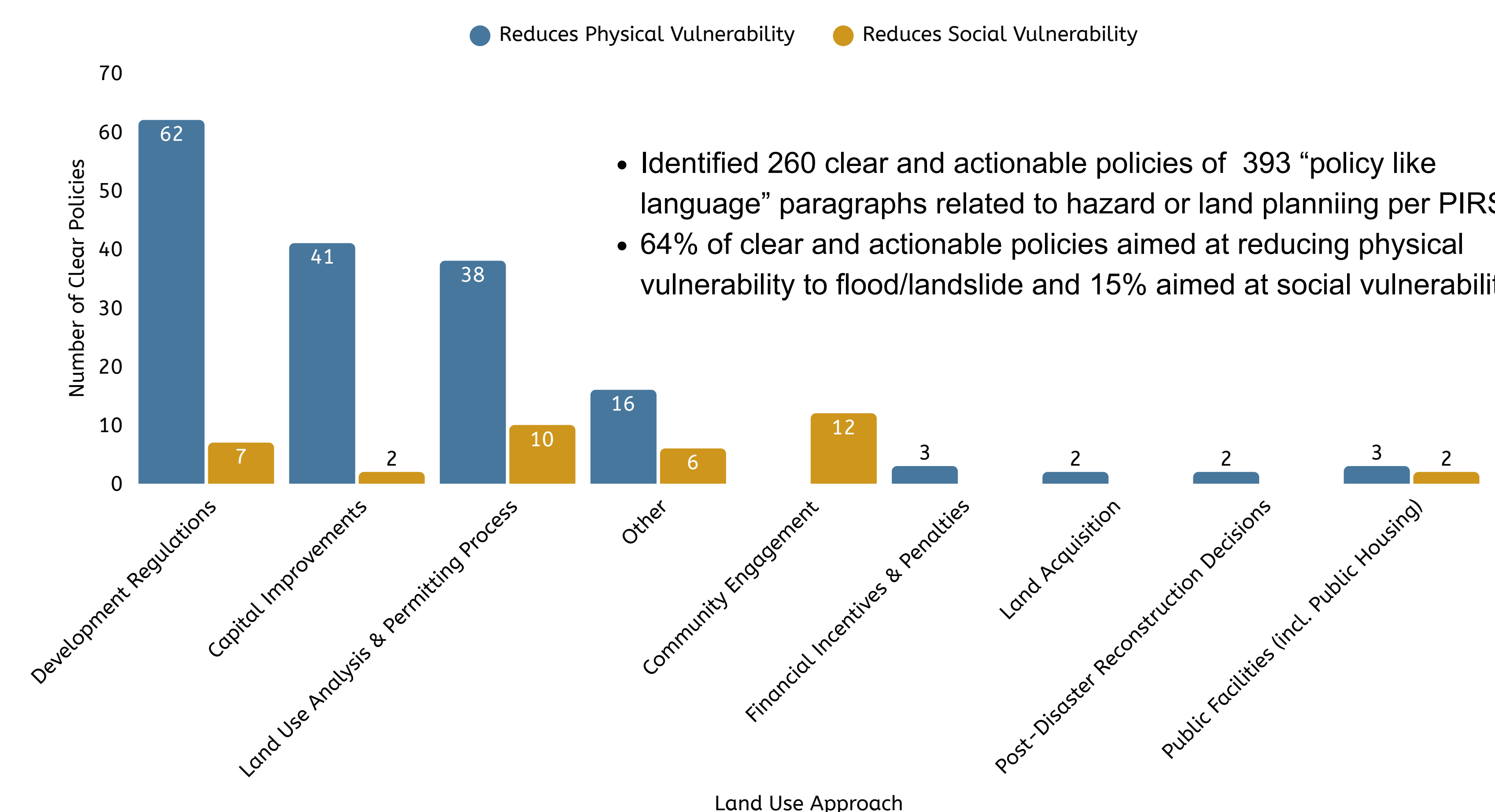
- 1 Content analysis of land regulations and planning documents to evaluate the cumulative impacts of land use policies on flood risk management - modified version of Plan Integration for Resilience Scorecard™,1 to incorporate both physical and social vulnerability
- 2 Paragraph level coding - Documents analyzed: 2020-2050 NLUDMP, Guidelines on Disaster and Climate Resilient Road Infrastructure & Disaster Management, Law governing land, Law governing the urban Planning and building, Law on Environment, National Disaster Risk Reduction and Management Policy, National Land Policy, National Land Use Policy Guidelines
- 3 Further analysis with emergent concepts



## Results

- While land use policies generally target physical vulnerability reduction; policies also reveal concerns over effective enforcement mechanisms, desires to improve regulatory processes, and capacities
- 20% of policies describe designating the most productive and sustainable uses for lands to support population growth and food production (“national spatial puzzle”)
- Only 60% of policies were associated with a specific land use category (agriculture, human settlement, wetland, etc.) and 20% regulate wetlands or waterbodies
- Nearly 10% of policies were related to implementation and enforcement - aimed at capacity-building, need for enforcement or need for funding/investment

Rwanda Land Use Policies



## Applications

Findings highlight lessons that may assist policymakers around the world with addressing some of the challenges of flood risk management through comprehensive land use planning and regulation in development contexts:

- PIRS™ method is a useful framework for analyzing resilience planning but availability of data in developing contexts limits analysis
- Land use planning is both spatial and social
- Resilience planning is only as good as capacity to implement and enforce

## Key Sources & Acknowledgements

1. Plan Integration for Resilience Scorecard™: Malecha, M., Masterson, J. H., Yu, S., & Berke, P. (2019). Plan Integration for Resilience Scorecard Guidebook: Spatially evaluating networks of plans to reduce hazard vulnerability - Version 2.0. Institute for Sustainable Communities, College of Architecture, Texas A&M University. <http://mitigationguide.org/wp-content/uploads/2018/03/Guidebook-2019.Sept-14.pdf>

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