Insurance Fund as an Adaptation Measure for Increasing Water Security in Basins Under Change

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INTRODUCTION

Extreme weather events are increasingly evident and widespread around the world due to climate change. These events are driven by rising temperatures and changes in precipitation patterns, which lead to changes in flood frequency, drought and water availability. To reduce the future impacts of natural disasters, it is crucial to understand the spatiotemporal variability of social, economic and environmental vulnerabilities related to natural disasters. Particularly, developing countries are more vulnerable to climate risks due to their greater economic dependence on climate-sensitive primary activities, infrastructure, finance and other factors that undermine successful adaptation. In this concept, adaptation plays the role of anticipating the adverse effects of climate change and taking appropriate measures to prevent or minimize the damage they may cause.

Thus, the insurance fund is a valuable adaptation tool for unexpected losses reimbursement, long-term impacts prevention and encouraging risk mitigation.

We will evaluate the implementation of an indexed multi-risk insurance fund integrated with water security parameters, as an instrument for adaptation to climate change.

STUDY DELINIATION

1 Calibration and Evaluation
   - Soil Moisture
   - Evapotranspiration
   - Streamflow

2 Multirisks (Floods and Droughts)
   - Vulnerability Module
   - Hazard Module
   - Equi-probable streamflow series

3 Financial Module
   - Insurance Payment
   - Optimized Premium

STUDY AREA

Jaguaribe Water Supply System

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HYDROLOGIC RISK TRANSFER MODEL - MTRH

1. Hazard Module
   - Flood Characteristics
     - Flood Maps and/or Water depth (hQmax)
   - Drought Characteristics
     - Low Flow parameters and/or Hydrological Drought Events
   - ‘N’ Equiprobable series generator and Damage Function

2. Vulnerability Module
   - Flooding scheme
   - Drought scheme
   - Estimation of the affected assets per water level
   - Water Deficit Estimation
   - Quantification of direct losses by event magnitude

3. Financial Module
   - Cash Insurance Flow Sequence
   - Optimization Insurance Sequence
   - Optimal premium and performance indexes of insurance

MTRH-SHS

EXPECTED RESULTS

- Our results will provide an Optimized premium in current and future scenarios for supporting adaptation plans to climate change based on the application of the multi-risk index-based insurance fund incorporated to water security indices.
- We will indicate how each basin is economically affected by climate change and the relationships between extreme events and economic losses
- A technical-scientific information addressing possible effects of climate change on the hydro-meteorological variables and their spatiotemporal variability

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More details see: Guzmán et al., 2017; Mohor and Mendiondo, 2017.

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