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Research Article

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The Financial Impact of Natural Disasters on Local Government: A Case Study Approach

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ABSTRACT

Natural disasters pose a significant threat not only to human life and infrastructure but also to the fiscal stability of local governments. This paper investigates the financial implications of natural disasters on municipalities, with a focus on emergency spending, infrastructure rehabilitation costs, revenue shortfalls, and long-term economic recovery. A case study of a mid-sized Greek municipality affected by a major flood event in 2023 is presented. The study employs both qualitative and quantitative methodologies, using budget reports, financial statements, and stakeholder interviews. Results highlight the pressing need for disaster risk reduction (DRR) investments and more resilient fiscal frameworks at the municipal level.

Introduction

In recent years, the frequency and severity of natural disasters have increased significantly due to climate change. Municipalities and regional authorities often bear the brunt of these disasters, both in terms of immediate emergency response and the long-term financial burden. Local governments, which typically operate with limited fiscal space, must navigate the financial complexities of recovery while maintaining essential public services. This study aims to quantify the financial impact of natural disasters at the municipal level, using a recent flood in a Greek municipality as a case study.

Literature Review

Previous research highlights the multifaceted impact of natural disasters on local economies. Studies such as Cavallo, Noy and Hallegatte emphasize both direct costs (e.g., infrastructure damage) and indirect effects (e.g., loss of tax revenue, population displacement) [1,2]. While national governments may offer financial assistance, the initial and residual burdens frequently fall upon local authorities, affecting their fiscal sustainability and policy choices.

In the Greek context, Professor Efthymios Lekkas has extensively studied the relationship between natural hazards and urban vulnerability. Lekkas notes the systemic deficiencies in Greece's disaster risk management, especially at the municipal level, where risk mapping and mitigation strategies are often inadequate [3]. His work underlines the necessity of integrating geospatial data and historical hazard patterns into local planning.

Methodology

This study adopts a mixed-methods approach:

- Quantitative Analysis: Budget and financial data from the municipality pre- and post-flood (2022–2024) were collected and analyzed.
- Qualitative Interviews: Semi-structured interviews were conducted with local officials, emergency response coordinators, and financial managers.
- Comparative Analysis: Financial impacts were benchmarked against municipalities unaffected by similar disasters.

Data were sourced from municipal records, the Hellenic Statistical Authority, and the Ministry of the Interior.

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Case Study: Municipality of Karditsa (Flood Event of September 2023)

Karditsa, a municipality in central Greece, experienced a catastrophic flood in September 2023 due to extreme rainfall associated with Storm Daniel. The event led to extensive infrastructure damage, loss of agricultural land, and temporary displacement of residents. Lekkas conducted a detailed post-disaster assessment, highlighting the disproportionate vulnerability of floodplain settlements and underscoring the importance of zoning reform [4].

Table 1: Summary of Financial Indicators Pre- and Post-Disaster

Indicator	2022 (Pre-Flood)	2023 (Year of Flood)	2024 (Recovery Phase)
Emergency Expenditure (€)	1.2 million	8.5 million	3.4 million
Infrastructure Rehabilitation (€)	0.8 million	12.3 million	9.1 million
Local Tax Revenue (€)	15.6 million	12.1 million	13.4 million
Central Government Transfers (€)	5.0 million	7.5 million	6.0 million

Results

- Emergency spending increased by over 600% in the year of the disaster.
- Infrastructure rehabilitation represented a long-term financial burden, requiring multi-year funding.
- Local tax revenues declined by 22.4% due to business closures and reduced property values.
- Central government transfers increased but were insufficient to cover total costs.
- The municipality reallocated funds from education, cultural programs, and maintenance to address immediate disaster needs.

Discussion

The findings demonstrate that natural disasters significantly disrupt municipal finances. The reallocation of funds compromises the delivery of essential services. While state transfers offer partial relief, they often arrive with delays and do not cover the full extent of damages. Financial resilience mechanisms, including contingency reserves and parametric insurance schemes, are either underdeveloped or entirely absent at the local level in Greece.

Lekkas emphasizes the critical role of pre-disaster investment in resilience as a cost- saving mechanism [5]. His models indicate that municipalities investing in flood barriers and early- warning systems experience up to 40% lower long-term financial impacts.

EU Financial Instruments for Disaster Recovery

The European Union provides several financial instruments to support member states and regions affected by natural disasters:

- EU Solidarity Fund (EUSF): Created in 2002, the EUSF provides financial assistance to EU countries in the event of major natural disasters. Greece has previously activated this fund after events such as the 2020 Mediterranean cyclone and the 2021 wildfires. Following the Karditsa flood, the Greek government submitted a formal request for EUSF support to cover immediate infrastructure rehabilitation and emergency response [6].
- Resilience and Recovery Facility (RRF): While primarily aimed at post-COVID recovery, the RRF also supports green and climate-resilient infrastructure investments, which can include flood defenses and disaster-resilient public infrastructure [7].
- European Regional Development Fund (ERDF): The ERDF finances risk prevention measures and climate adaptation infrastructure under cohesion policy, which municipalities like Karditsa can access in cooperation with regional authorities.
- Common Agricultural Policy (CAP): Offers financial relief to farmers affected by natural disasters through the Crisis Reserve and Rural Development Programs. In the Karditsa case, local farmers benefited from accelerated disbursements for crop damage compensation.

The integration of EU funding into disaster response planning can alleviate pressure on local budgets and speed up recovery efforts. However, accessing these funds requires administrative capacity and strategic alignment with EU priorities—areas where many Greek municipalities still face challenges [4].

Conclusions

This study underscores the urgent need for more robust local disaster preparedness and fiscal resilience. Municipalities must incorporate disaster risk into their financial planning and advocate for stronger intergovernmental support mechanisms. Policy recommendations include the establishment of local emergency funds, improved disaster risk assessments, and the introduction of insurance products tailored for local governments [8-10].

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