Disaster Response in Tagkawayan, Quezon: Before and After the Emergency Operation Center System

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INTRODUCTION

The Philippines is recognized as one of the world's most hazard-prone countries, ranking third globally in highest risks based on the World Risk Report 2018(UNDRR, 2019). Annually, the country is struck by approximately 20 typhoons, with hydrometeorological events accounting for 80% of its natural hazards. The municipality of Tagkawayan, situated in the southern part of Quezon Province in the Calabarzon Region, is frequently battered by typhoons, flooding, and landslides.

For years, Tagkawayan's community relied on localized efforts and the strong *bayanihan* spirit (community solidarity) to respond to emergencies. However, this approach, in the absence of a centralized and systematic disaster response mechanism, often led to gaps where manageable situations escalated into crises. Before the implementation of an Emergency Operations Center (EOC) system, disaster response was largely reactive, characterized by limited coordination and inefficient resource utilization.

In recent years, a shift has occurred with the establishment of the Municipal Disaster Risk Reduction and Management Office (MDRRMO) and the subsequent implementation of the EOC system. Faced with the increasing intensity of disasters, the local government began training the MDRRM Councils and established the EOC system in 2023. This initiative introduced technology-driven solutions, streamlined coordination, and proactive planning, marking a turning point in Tagkawayan's disaster management.

This case study investigates the evolution of disaster response in Tagkawayan, Quezon, specifically by exploring the stark contrast between the pre-EOC and post-EOC periods. The comparison involves the municipality's response to two specific events: Typhoon Kristine (2024), which occurred **Without an EOC System**, and Typhoon Pepito (2024), which occurred **With an EOC System**.

Objectives

This research aims:

- To document the disaster response mechanisms in Tagkawayan before implementing the EOC system.
- To evaluate the operational framework and functions of the EOC system in disaster management.
- To assess the improvements in response time, resource allocation, and interagency coordination after establishing the EOC.
- To analyze the overall impact of the EOC system on community resilience and recovery during disasters.

METHODOLOGY

The research was conducted in select barangays of Tagkawayan, Quezon. The location was chosen due to the prevalence of natural disasters within the municipality. The study used the **Descriptive Case Study** design. This design was deemed most appropriate as its goal is to provide a complete and accurate representation of a phenomenon—the change in disaster response—by comprehensively analyzing the transition from a non-EOC

to an EOC system in Tagkawayan. This study employs **data source triangulation**, collecting and cross-verifying information from different sources.

However, the design has limitations: it relies on existing and historical records, and a lack of consistent or complete data could affect its reliability. Additionally, it may focus primarily on short-term views and impact, potentially limiting the coverage of long-term perspectives.

A total of thirty (30) participants were selected using the **purposive sampling method**. The participants were purposely chosen from individuals involved in the Emergency Operations Center (EOC) in Tagkawayan.

The criteria for participation included:

- Must be a member of the MDRMM Council for at least a year.
- Age should be at least twenty-three years old and above.
- Should be residing in Tagkawayan, Quezon.

The main instrument used was a prepared **questionnaire** with a rating scale. The questionnaire was divided into two parts: the demographic profile of the respondents and the measurement of the evolution of disaster response in Tagkawayan, Quezon, before and after the EOC system's implementation.

The rating scale used the following verbal interpretation and assigned weights:

Scale	Assigned Weights	Verbal Interpretation
5	4.50–5.00	Strongly Agree
4	3.50–4.49	Agree
3	2.50–3.49	Neutral
2	1.50–2.49	Disagree
1	1.00–1.49	Strongly Disagree

STATISTICAL TREATMENT OF DATA

To analyze the gathered data, the researcher employed **percentage** and **weighted mean**. The weighted mean, a type of average where some data points contribute more weight than others, was used to scientifically discuss the study's findings. The collected data was tallied, tabulated, and analyzed.

Data Gathering Procedure

The procedure involved several steps:

1. **Literature Review:** The researcher first gathered relevant journals, articles, books, and studies on the Emergency Operations Center (EOC).
2. **Instrument Preparation:** Survey questionnaires were prepared and interview questions were submitted to validators for approval.
3. **Participant Selection:** Participants were scouted using the purposive sampling method based on established criteria.

4. **Informed Consent:** Prior to data collection, informed consent was provided to respondents, explaining the study's purpose and highlighting the voluntary nature of their participation with the right to withdraw at any time.

5. **Survey and Analysis:** The actual survey was conducted, and the collected data was then analyzed through statistical analysis. This approach emphasized ethical standards, participant freedom, and research integrity.

RESULTS AND DISCUSSION

This section presents an in-depth analysis and interpretation of the data collected through interviews, surveys, and local government records.

Response Mechanisms in Tagkawayan Before Implementing the EOC System

Disaster response in Tagkawayan during **Typhoon Kristine (2024)**, which occurred without an EOC system, faced several challenges:

- **Coordination:** There was **disunited coordination**, with barangays responding independently and differently.
- **Communication: Lack of communication** caused inconvenience, as vital information, updates, and evacuation orders often did not reach remote barangays in time, resulting in delays.
- **Resource Management:** Relief goods and rescue equipment were **insufficient and poorly distributed**.
- **Monitoring:** There were **no centralized systems** to monitor and track disaster developments, which made predicting appropriate mitigation actions harder.
- **Preparedness:** Residents were **largely unaware** of evacuation procedures and protocols.

The impact of Typhoon Kristine included:

- Over **7,895 families** were displaced.
- Significant **delays** in the delivery of aid and services.
- One **casualty**, and agricultural and agro-fishery damages due to late evacuations and uncoordinated efforts.
- **Lack of manpower** and **duplicating tasks**.
- A **Declaration of State of Calamity**.

Improvements in Response Time, Resource Allocation, and Interagency Coordination After Establishing the EOC

In contrast, during **Typhoon Pepito (2024)**, with the EOC system in place, disaster response in Tagkawayan generally improved.

- **Coordination and Decision-Making:** The EOC, managed by the MSWD officer, served as the **core for decision-making and coordination**, allowing for quicker responses.
- **Communication:** Monitoring disaster developments and status fostered a **unified communication** system, ensuring the timely dissemination of warnings, updates, and evacuation orders to all barangays.

- **Resource Allocation:** The **prepositioning and distribution** of relief goods and rescue equipment significantly progressed, arriving evenly and on time in different barangays. The EOC facilitated the **strategic allocation** of personnel and resources.
- **Preparedness:** Residents' awareness and preparedness increased through **disaster drills and community awareness programs** conducted by the MDRRMO.
- **Accessibility:** Assistance became more **accessible**, especially for vulnerable populations like the elderly and persons with disabilities.

The impact of Typhoon Pepito included:

- Over **6,641 families were evacuated safely** before the typhoon's landfall.
- **No casualties** and quicker delivery of aid and services.
- **Faster recovery** of infrastructure and resumption of normal activities.
- The collection of data became **easier and more organized**.

Table 1 summarizes the key differences between the Pre- and Post-EOC systems.

Table 1: Key Differences Between Pre- and Post-EOC Systems

Aspect	Without EOC (Typhoon Kristine)	With EOC (Typhoon Pepito)
Coordination	Fragmented	Centralized and streamlined
Communication	Inefficient and delayed	Timely and consistent
Resource Management	Poor allocation and tracking	Efficient and needs-based
Preparedness	Minimal community engagement	High awareness and participation
Response Time	Delayed	Rapid and proactive

OVERALL IMPACT OF THE EOC SYSTEM ON COMMUNITY RESILIENCE AND RECOVERY DURING DISASTERS

The EOC system demonstrably improved community resilience by resolving coordination and communication gaps. The absence of a centralized system during Typhoon Kristine worsened the disaster's impact due to an inefficient response. In contrast, the EOC system during Typhoon Pepito facilitated a more coordinated and organized resource management, leading to a faster response. The preparedness programs enhanced community resilience and reduced casualties. This evolution emphasizes the vital role of the EOC system in strengthening disaster response and recovery efforts.

CONCLUSION

The implementation of the Emergency Operations Center (EOC) in Tagkawayan, Quezon, has significantly improved the municipality's disaster response capabilities. By successfully addressing critical gaps in coordination and communication and fostering community resilience, the EOC has transformed disaster management from a reactive to a proactive approach. This case study underscores the importance of institutionalizing and continuously improving EOC systems as an essential mechanism for safeguarding lives and livelihoods during disasters.

RECOMMENDATIONS

Based on the findings, the following recommendations are suggested to further enhance Tagkawayan's disaster response capabilities:

- **Infrastructure Investment:** Further strengthen the EOC infrastructure by investing in updated tools for real-time monitoring and communication. Additionally, ensure the EOC is constantly operating, especially during disaster-prone seasons.

- **Community Engagement:** Conduct regular programs, such as disaster drills and awareness campaigns, that actively involve the community. Actively engage community leaders to participate in planning and decision-making processes.

- **Resource Management:** Enhance resource allocation by developing a comprehensive database that tracks the status of resources, equipment, and personnel to ensure efficient distribution during a disaster. Moreover, preposition essential supplies in remote areas to guarantee affected communities receive immediate response.

- **Training and Review:** Provide continuous training for MDRRMO staff, barangay officials, and volunteers to ensure the manpower is capable of providing adequate support to the community during disasters. Conduct annual reviews and updates of disaster response plans to track progress and identify areas for improvement.

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