

Developing a Community-Based Disaster Relief Management System

Gerina Rose M. Torno

Isabela State University, Cabagan, Isabela, Philippines

Author email: gerinatorno79@gmail.com

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Abstract. This study aimed to enhance disaster relief operations in Tuguegarao City by proposing a more efficient management system framework. Utilizing interviews and thematic analysis, researchers in 2017 identified problems in emergency management, such as inadequate equipment, budget constraints, and issues with relief distribution. The study highlighted confusion and political bias in relief operations, leading to mistrust in the local government. In response, the researchers developed a community-based Disaster Relief Management System (CBDRMS) framework, inspired by Foucault's power/knowledge analytics. This framework emphasizes transparency, communication, and good relationships among LGUs, NGOs, and recipients. The proposed online system includes a portal and a Facebook Page for data storage and communication, aiming to empower stakeholders and foster discourse for effective disaster relief management. The researchers believe that this approach can overcome barriers, leading to development and improved disaster response.

Keywords: Disaster relief; Management system.

1.0 Introduction

Proper relief management has consistently posed challenges during calamities and typhoons. In 2017, researchers from Tuguegarao City conducted a case study on emergency management in the most affected barangays during Typhoon Lawin's onslaught. The study revealed an inadequacy of information dissemination about the typhoon contingency plan before its landfall. During the study, the Barangay Disaster Risk Reduction Management Councils (BDRRMCs) identified issues such as insufficient equipment and facilities, budgetary constraints, and poor implementation of the Barangay Disaster Risk Reduction Management Plan (Maguidad et al., 2017).

Interviews conducted during the study exposed confusion and misconceptions in relief operation distribution. Respondents reported a lack of awareness regarding the distribution procedures and alleged political bias favouring registered voters in relief prioritization. Limited funding prevented the BDRRMC from fully meeting the recipients' needs at the barangay level.

With this, the researcher assumes that the mismanagement of relief operations in some Tuguegarao City barangays might led to distrust in the local government, particularly in the "Palakasan System" among barangay captains. In addition, Maguidad and colleagues' 2017 study underscores the urgency of an effective relief management system in the Philippines.

Tuguegarao City is among the most vulnerable areas in the Cagayan Valley Region during the wet season, ranking among the ten most at-risk globally (Gannaban et al., 2018). The city's geography, acting as a flood-

prone catch basin, affects residents, particularly farmers and those living near riverbanks, with annual flash floods.

Given this data, Maguidad et al.'s 2017 recommendation gains relevance. Their study emphasizes the need for Tuguegarao City to establish a robust barangay-based disaster risk reduction management program and contingency plan. Furthermore, barangays should adopt a disaster management system and intensify information dissemination efforts.

Building on this recommendation, the researcher developed a community-based Disaster Relief Management System (CBDRMS) framework. Inspired by Foucault's power/knowledge analytics, this conceptual framework advocates transparency, good relationships, and communication among LGUs, NGOs, and recipients in Tuguegarao City. The proposed online system layout includes a portal and a Facebook Page, serving as a data bank and communication medium for disaster relief management. Cornerstone (2010) suggests that organizations utilize a tracking database to maintain relationships with donors, supporting the CBDRMS framework's emphasis on effective communication and transparency.

2.0 Methodology

2.1 Research Design

The researcher in this study employed a qualitative approach, which extensively explores people's beliefs, experiences, characteristics, behavior, and connections. This approach values participants' voices, allowing them to share their stories and personal experiences (Pathak et al., 2013). Qualitative methods encompass interviews, document analysis, texts, and the researcher's reactions and impressions. Qualitative researchers conduct interviews to gather in-depth insights from participants. Through open-ended questions and probes, researchers can explore participants' perspectives, experiences, and emotions related to a particular topic. Meanwhile, document analysis helps researchers uncover patterns, themes, and discourse embedded within the texts, providing valuable context into the research topic. Furthermore, qualitative research acknowledges the role of the researcher in shaping the research process and outcomes. Researchers reflect on their own biases, assumptions, and experiences that may influence data collection, analysis, and interpretation (Denzin & Lincoln, 2018).

2.2 Research Participants

The participants in this study consist of representatives from Tuguegarao City's Local Government Units (LGUs), Non-Governmental Organizations (NGOs), and private companies. Specifically, the researcher interviewed four participants from the LGUs to gather valuable insights. Additionally, the researcher conducted interviews with the five most active private organizations in Tuguegarao City involved in volunteering and relief operations.

2.3 Research Instrument

During one-on-one interviews, the researcher employed interview guide questions and utilized a phone to present various research instruments in PowerPoint format. This approach aimed to assist participants in visualizing the concept of the proposed Community-based disaster relief management system. The presentation included images depicting the layout of the designed Tuguegarao Relief Operations Facebook Page, the layout of the Tuguegarao Relief Operations Center Portal, and the developed system framework for the disaster relief management system in Tuguegarao City.

2.4 Data Gathering Procedure

To collect essential data, the researcher initiated several steps. Beginning with courtesy letters sent to the City Mayor and barangay captains for interview requests, subsequent courtesy visits were conducted to introduce the researcher and outline the research objectives. Interview schedules were then coordinated with the participants. Invitation letters, including the research objectives and title, were sent, with additional communication with key connections for efficiency. Before posing guide questions, a practical explanation of the proposed Community-based disaster relief management system was provided using PowerPoint to visualize key elements. The researcher also assessed recipients' comments on Tuguegarao City's community and government Facebook pages, suggesting widespread dissatisfaction with past relief operations and reinforcing

the need for an enhanced relief management system. Throughout the process, ethical considerations were observed during data analysis to maintain participant privacy.

2.5 Data Analysis Procedure

The data collected was analyzed thematically.

3.0 Results and Discussion

3.1 Power Forms Knowledge

The proposed Community-Based Disaster Relief Management System (CBDRMS) Portal and Facebook Page are perceived by the researcher as crucial tools for knowledge enhancement among Local Government Units (LGUs), Non-Governmental Organizations (NGOs), and recipients. This belief stems from the anticipated positive impacts of improving existing knowledge and gradually transforming negative perceptions. The CBDRMS portal, serving as a comprehensive data bank, allows Tuguegarao City barangays to easily prioritize and map recipients based on their needs. The system enables monitoring of donor assistance, required quantities, and types of relief needed. Similarly, the CBDRMS Facebook Page informs recipients about distribution details, including venues, schedules, and specific beneficiary categories.

The researcher posits that the CBDRMS has the potential to enhance the existing knowledge of key persons in barangays, a proposition supported by the Validation of Existing Knowledge Theory (Sus & Drew, 2023). As validated knowledge increases, negative perceptions toward specific groups or individuals are anticipated to decrease. The Conceptual Framework and Concepts of this Study propose that the CBDRMS portal facilitates immediate discourse between LGUs and donors to address concerns. Drawing on Michel Foucault's Theory, discourse through the CBDRMS portal is seen as a means to promote transparency, communication, and good relationships among the LGUs, NGOs, and Recipients.

Anticipating a gradual change in key players' thinking, the researcher suggests that the CBDRMS can illuminate the reasons behind the distribution quantities and priorities. Acknowledging the influential role of those in power, the researcher underscores the potential for LGUs, NGOs, and recipients to positively exercise their influence through the proposed Community-Based Disaster Relief Management System. This approach recognizes that even individuals not in formal positions can exert a significant impact, as exemplified by the considerable influence of netizens on social media platforms (Indeed, 2022).

3.2 Knowledge Forms Discourse

As individuals acquire more knowledge, their desire for a deeper understanding increases (Brunner, 2019). The researcher posits that one positive impact of the proposed Community-Based Disaster Relief Management System (CBDRMS) is its potential to gradually shift negative perspectives among key individuals actively engaged in community initiatives. This group, often exposed to crucial information, includes politicians who play a vital role in addressing current trends and issues (Bene et.al., 2023). Considering this, the researcher explores common issues experienced during relief operations in Tuguegarao City and evaluates the CBDRMS's role in facilitating discussions on these issues.

Several issues contribute to redundancy among recipients during relief operations in Tuguegarao City. LGU (A) highlights the misconception that relief goods are an entitlement, not a privilege, leading to duplication. It is important according to her to clarify that relief goods are intended per household, not per family unit in the same residence whereas, LGU (B) points out redundancy caused by residents getting married and residing in different barangays, returning to their original barangay during relief operations to receive additional aid. In discussions with representatives from the LGU and private organizations, a recurring theme emerged regarding the presence of the "Palakasan or Kamag-anak System" during relief operations. LGU (C) attributes redundancy to the "Palakasan or Kamag-anak system," where personal connections lead to individuals not on the priority list receiving aid. LGU (D) acknowledges the same system and selectively includes family members based on their financial situation. Private organizations also recognize redundancy, citing issues with data gathering and the prevalence of politics at the grassroots level.

Conversely, the head of Organization 3 claimed not to have experienced redundancy, attributing their success to a well-defined strategy. In contrast, the representative of Organization 4 asserted the presence of redundancy due to the absence of a "stub system" in some barangays, with certain barangay captains prioritizing individuals present during relief operations over the actual list of intended recipients.

Significantly, on Community and Government Facebook Pages, recipients openly express their dissatisfaction with exclusion from relief operations. Comments range from complaints about unequal distribution to claims of relief goods not reaching certain municipalities like Solana and Enrile. Phrases like "Sana all" (I hope all) are recurrent, underscoring the desire for fair distribution.

The narratives from research participants and recipient comments on social media reveal several issues during relief operations, aligning with findings from a De La Salle University student research (Abalos et al., 2014). Discrepancies in relief goods accountability, delivery, allocation, and prioritization of high-risk areas were identified due to the manual nature of the municipality's relief management process. This observation suggests a systemic problem during data gathering, susceptible to manipulation, as acknowledged by LGU (A), who lamented the presence of "dishonest people" in the broader Filipino context.

Addressing existing issues through the proposed Community-Based Disaster Relief Management System (CBDRMS) Portal can contribute to a clearer perception for all stakeholders involved in relief operations. Anticipated changes might include a shift from negative perceptions regarding the redundancy of recipients, the "Palakasan System," and the issue of "Binulsa ni Kapitan" towards more positive thinking.

The proposed community-based disaster relief management system was introduced with two channels: the portal and the Facebook page. The portal holds a pivotal role in facilitating updates and discussions among administrators (LGUs), donors (NGOs), and barangay health workers.

The Facebook Page administrators, to be represented by the City Mayor's Office (CMO) and Barangay Captains, can gain quick access to records of all affected barangays in Tuguegarao City, enabling them to identify areas in urgent need of assistance. They can monitor donor trends, identify organizations involved, and track which barangays have yet to receive relief operations. This can probably empower LGUs to anticipate additional support requirements and foster open communication with donors and barangay captains.

Barangay Captains, utilizing the portal, can gain insights into prioritized zones needing immediate response and become aware of the City Mayor's office support particularly the technical office efforts such as the City Disaster Risk Reduction Management Office and the City Social Welfare and Development Office (CSWD). Barangay Captains can also identify instances of the "Palakasan or Kamag-anak system" among barangay health workers, promoting direct and transparent discussions to address issues.

Barangay health workers, who also help with profiling at the barangay level if there are no social workers available in barangays, will play a crucial role by updating records, ensuring an accurate representation of each family head, and listing profiles in their barangay records. They are responsible for verifying which families have received assistance to avoid redundancy during relief operations. Through the portal, health workers can also track the number of recipients in a specific zone, identify potential corruption, and verify household information during profiling.

Donors, as first responders, can rely on the records provided by each barangay through the portal. They register on the portal, review which barangays still require assistance, and input their relief operation schedules. The portal's checks and balances system can help maintain transparency, detect duplicate names, categorize barangay priorities, and identify high-risk areas, preventing rumors and fostering trust among recipients and donors.

The participants complimented the researcher's idea of integrating a Facebook Page into the community-based disaster relief management system. According to them, the Tuguegarao Relief Operations Center Facebook Page will serve as a platform for relief operation updates, concerns, and announcements. Families not yet served will

be given stubs based on the schedule posted on the Facebook page, ensuring an organized and transparent distribution process. The Facebook page will also facilitate interaction with netizens, providing a space for opinions, and reactions, and addressing concerns from residents.

3.3 Discourse Produces Power

Embedded in Foucault's philosophy, which posits that power is ubiquitous and dispersed within society, the conceptualization of the Community-Based Disaster Relief Management System (CBDRMS) aims to introduce a potent relief operations strategy. This system assists donors and Local Government Units (LGUs) in identifying the most affected families, determining precise recipient numbers for each barangay, providing immediate access to donors, and facilitating communication between the mayor, donors, and barangay captains. Consequently, it becomes a productive force in society.

The LGU (A) representative acknowledges the benefits of the proposed CBDRMS, emphasizing its capacity to swiftly identify barangays in need and those yet to receive relief operations. LGU (A) notes that such a system is advantageous as it can guide donors on where to conduct relief operations, enhancing transparency and building trust in the government. This centralized system likewise has the potential to streamline the donation process, promote accountability, and ensure that effective assistance reaches those in need, fostering donor confidence in making a meaningful impact. Meanwhile, when queried about their impressions of the CBDRMS functions, both the representatives of LGU (B) and LGU (C) expressed positive sentiments. LGU (B) lauds the design, emphasizing its significance for large barangays with multiple zones. He envisions increased organization, especially in their barangay with eight zones, and expresses enthusiasm about adopting the system once available in the city. Meanwhile, LGU (C) appreciates the fixed data provided by the proposed design and the immediate communication with donors. He highlights the system's capability to dispel doubts of mismanagement, such as the common accusation of "Binulsa ni Kapitan."

Private organizations, acting as first responders during relief operations, express positive perspectives on the proposed Community-Based Disaster Relief Management System (CBDRMS). A representative from Organization 4 highlights the system's benefits, serving as a valuable support system by ensuring quick outreach to barangays (accessibility) and maintaining consistency in providing the correct number and type of donations based on community needs (convenience). Furthermore, the representative of Organization 2 commends the researcher's proposal, considering it innovative and commendable, especially given Tuguegarao City's digitization efforts to become a smart city. Organizations 1 and 3 also anticipate that the CBDRMS will contribute to an organized list, serving as a data bank for all stakeholders.

Discussions with participants underscore the significance of the system design, emphasizing communication among LGUs, donors, and recipients through the portal and a Facebook Page (discourse). This approach ensures equal opportunities for all groups to voice their opinions, discuss issues, and take collective action.

The LGU (A) underscores the pivotal role of portal data in decision-making during calamities, emphasizing the importance of accuracy and reliability. Despite hands-on visits to barangays during disasters, LGU (A) acknowledges the value of combining portal data with on-the-ground assessments for a comprehensive understanding of the real situations in the grassroots communities. Regarding Facebook's role in information dissemination and feedback, LGU (A) sees it as a valuable tool for community communication and engagement. Employing a multi-faceted approach that incorporates data from the portal, on-site assessments, and community feedback through platforms like Facebook can enhance decision-making and boost relief operation efficiency during calamities. On the other hand, LGU (B) underscores the importance of discourse in the proposed CBDRMS, emphasizing its value for direct communication with donors. This direct interaction enables strategic distribution planning, preventing aid deficiencies—an ongoing concern among recipients. He sees the system as beneficial, particularly in cases where the barangay health worker cannot conduct house-to-house visits due to the large population. The Facebook Page's active monitoring aids in responding promptly to comments from netizens.

LGU (C) acknowledges the communication platform's potential to provide an equal chance to most barangays. Hence, it can likely eliminate the practice of prioritization based on alliances. He emphasizes the need to discuss and evaluate which barangays should be prioritized, upholding transparency and fairness. The Facebook Page, according to him, serves as a platform for suggestions, recommendations, and a call to action for both recipients and barangay officials. Conversely, the LGU (D) appreciates the system's transparency and validation capabilities, highlighting the importance of sharing their side amid challenges faced during profiling. She believes the CDRMS provides a platform for them to be heard and understood, addressing complaints from individuals not included in relief operations. Lastly, Private organizations find value in Facebook discourse for evaluation, recognizing the power of netizens' comments in reflecting community situations. Their insights emphasize the impact of feedback from different perspectives, often unheard or excluded from public discourse.

Overall, participants emphasize the transformative potential of the CDRMS in promoting open communication among LGUs, donors, and recipients. By addressing issues such as redundancy and the "clientele system," the proposed system aims to reform Tuguegarao City's current disaster relief management, catalyzing social change and community empowerment.

3.4 Viability of the Proposed CDRMS in Tuguegarao City

The Local Government Units (LGUs) and Private Organizations in Tuguegarao City express their willingness to embrace the proposed Community-Based Disaster Relief Management System (CDRMS). Recognizing the limitations of the current disaster relief management in some barangays, both LGUs and NGOs see the CDRMS as a powerful tool to address these shortcomings.

According to LGUs and NGOs, implementing the CDRMS can substantially enhance the city's disaster relief management capabilities, enabling more effective responses to emergencies and disasters impacting Tuguegarao City's barangays. The proposed system is viewed as a means to save lives, alleviate suffering, and enhance overall disaster resilience within the community.

Tuguegarao City Mayor acknowledges the existing database maintained by the Department of Social Welfare and Development but emphasizes the researcher's proposed CDRMS as a community-based alternative. Noting the variation in Internal Revenue Allotment (IRA) among barangays, she expresses her readiness to seek a supplemental budget and issue an Executive Order Ordinance to support the implementation of the CDRMS. This commitment highlights the city's dedication to adopting a more community-centric and effective disaster relief management approach.

3.5 The Possible Challenges that the LGUs and NGOs can meet in the Execution of this Relief Management Design

The Internal Revenue Allotment (IRA) is the annual share of local governments out of the proceeds from national internal revenue taxes. It is estimated at forty percent (40%) of the actual collections of national internal revenue taxes during the third fiscal year preceding the current year, as certified by the Bureau of Internal Revenue (BIR). If the barangay has a population of at least 100, the share should be at least P80,000 annually. The amount shall be chargeable against the 20% share of the barangays. This only means that the bigger the population of a barangay is, the more likely its IRA is higher. In Tuguegarao City, not all barangays have a big Internal Revenue Allotment (IRA). This means that not all barangays can have their own Information Technology Officer. The City Mayor said they would depend on how much the IT developers would offer the CDRMS. Suppose the cost of the developed system is excellent and amenable. In that case, the City Mayor is willing to ask for a supplemental budget and make an Executive Order Ordinance for the proposed Community-Based Disaster Relief Management System.

4.0 Conclusion

In Tuguegarao City, grappling with recurring flooding, especially during typhoons, has prompted relief operations by the city government. Despite these efforts, issues persist due to poor disaster relief management systems in some barangays, leading to problems like redundancy of recipients and the Palakasan System. Recognizing the need for improved communication and knowledge sharing among key players, the researcher developed a Community-Based Disaster Relief Management System (CDRMS). Informed by Michel Foucault's

Power/Knowledge Analytic, the CBRMS fosters discourse among Local Government Units (LGUs), Non-Governmental Organizations (NGOs), and recipients. Through interviews and a literature review, the study identifies the presence of the Palakasan System and asserts that the CBRMS can empower stakeholders, reform relief operations, and create a more efficient system in Tuguegarao City. The LGUs and private organizations express eagerness to adopt the proposed system, envisioning it as a powerful strategy to enhance disaster relief operations. Despite potential challenges, the City Mayor is optimistic about implementing the CBRMS with a supplemental budget and executive order, highlighting its viability. The study concludes that Foucault's concept of power/knowledge aligns with the idea that power forms knowledge, emphasizing the interconnectedness of power, knowledge, discourse, and societal productivity.

5.0 Contributions of Authors

There is only one author for this research.

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7.0 Conflict of Interests

The author declares that they have no conflicts of interest.

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