

# School-Based Disaster Preparedness and Response Measures of School Heads in Davao De Oro Division: A Mixed-Methods Study

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## ABSTRACT

This study examined the implementation of school-based disaster preparedness and response measures among school heads and School Disaster Risk Reduction and Management (SDRRM) coordinators in the Davao de Oro Division. Anchored on DepEd Order No. 033, s. 2021 and the Crisis Management Plan framework, the study used an explanatory sequential mixed-methods design. The quantitative phase involved 168 respondents composed of 84 school heads and 84 SDRRM coordinators from the First District of Davao de Oro, selected through stratified random sampling. A validated survey questionnaire adapted from DepEd Order No. 033, s. 2021 was used, and data were analyzed using mean and standard deviation. The qualitative phase involved in-depth interviews with 10 purposively selected participants consisting of five school heads and five SDRRM coordinators. Results showed a very high overall implementation of school-based disaster preparedness and response measures ( $M = 4.52$ ,  $SD = 0.57$ ). Disaster response measures obtained the highest mean ( $M = 4.57$ ,  $SD = 0.53$ ), followed by preparedness for response ( $M = 4.55$ ,  $SD = 0.54$ ) and preparedness in normal times ( $M = 4.44$ ,  $SD = 0.65$ ). Qualitative findings explained the high ratings through nine themes: participatory contingency planning, proactive physical mitigation, leadership commitment, preventive safety measures, community-based communication, strategic continuity planning, humanitarian response, instructional continuity, and adaptive learning strategies. The study concludes that school-based DRRM implementation is strongly institutionalized, but resource support, alternative communication systems, backup power, emergency equipment, and psychosocial response training still require strengthening.

**Keywords:** school-based disaster risk reduction, disaster preparedness, school heads, SDRRM coordinators, DepEd Order No. 033, crisis management, mixed methods

## INTRODUCTION

Schools are expected to protect learners, personnel, instructional resources, and learning continuity during weather-related hazards. In disaster-prone communities, school-based disaster preparedness and response measures refer to organized actions that reduce risk, guide emergency decision-making, and sustain education before, during, and after tropical cyclones, flooding, heavy rainfall, and rain-induced landslides. These measures usually include hazard identification, early warning systems, evacuation planning, preparedness drills, capacity building, coordination with local disaster authorities, and alternative delivery modes for learning continuity.

International studies consistently emphasize that preparedness is not limited to having written plans. Flood-related studies show that schools need continuous disaster education, early warning communication, learner participation, leadership support, and recovery mechanisms to reduce learning disruption (Lassa et al., 2023; Morote & Olcina, 2024; Syarif et al., 2024). In the Philippine context, disaster risk reduction and management (DRRM) is embedded in basic education through school-based policies and local implementation mechanisms. However, studies continue to report gaps in resources, training, coordination, and policy translation at the school level (Abenoja et al., 2023; Acierto et al., 2023; Cabuga & Canete, 2023).

DepEd Order No. 033, s. 2021 provides guidance for schools in implementing preparedness and response measures for tropical cyclones, flooding, and other weather-related disturbances. The policy assigns key

responsibilities to school heads, including the integration of preparedness protocols in school operations, communication systems, evacuation procedures, and learning continuity mechanisms. In Davao de Oro, where schools may be exposed to heavy rainfall, flooding, and landslide-related risks, school heads and SDRRM coordinators play a crucial role in translating policy into actual preparedness and response practices.

This study addressed the need to examine how school heads and SDRRM coordinators implement school-based disaster preparedness and response measures in the Davao de Oro Division. Specifically, it determined the extent of implementation in terms of preparedness in normal times, preparedness for response, and disaster response measures; explored the standpoints of school heads and SDRRM coordinators on the salient quantitative findings; and integrated both sets of findings to explain school-level DRRM implementation.

## METHODOLOGY

### Research Design

The study employed an explanatory sequential mixed-methods design. The quantitative phase was conducted first to determine the extent of implementation of school-based disaster preparedness and response measures. The qualitative phase followed to explain and elaborate the quantitative findings through the standpoints of selected school heads and SDRRM coordinators. This design was appropriate because the study intended to connect numerical ratings with contextual explanations from participants directly involved in DRRM implementation (Creswell & Plano Clark, 2018).

The study was anchored on the Crisis Management Plan framework of Reeves, Kanan, and Plog (2010), supported by Crisis Management Theory (Mitroff, 2005; Pearson & Clair, 1998). The framework guided the analysis of preparedness in normal times, preparedness for response, and disaster response measures.

### Locale and Participants

The study was conducted in the First District of the Division of Davao de Oro, covering Monkayo, Montevista, Compostela, New Bataan, and Maragusan. The locale was selected because of its exposure to weather-related hazards and the relevance of school-based preparedness and response measures in protecting learners and sustaining school operations.

For the quantitative phase, 168 respondents were selected from a population of 294 school personnel using stratified random sampling. The sample was composed of 84 school heads and 84 SDRRM coordinators. For the qualitative phase, 10 participants were purposively selected from the quantitative respondents, consisting of five school heads and five SDRRM coordinators with direct involvement in DRRM activities.

| Municipality | Population | Sample | School Heads | SDRRM Coordinators | IDI: SH | IDI: SDRRM |
|--------------|------------|--------|--------------|--------------------|---------|------------|
| Monkayo      | 100        | 58     | 29           | 29                 | 1       | 1          |
| Montevista   | 48         | 26     | 13           | 13                 | 1       | 1          |
| Compostela   | 36         | 20     | 10           | 10                 | 1       | 1          |
| New Bataan   | 52         | 30     | 15           | 15                 | 1       | 1          |
| Maragusan    | 58         | 34     | 17           | 17                 | 1       | 1          |
| Total        | 294        | 168    | 84           | 84                 | 5       | 5          |

Table 1. Distribution of respondents by municipality. SH = school head; SDRRM = School Disaster Risk Reduction and Management.

### Research Instruments

The quantitative instrument was a validated survey questionnaire adapted from Enclosure No. 2 of DepEd Order No. 033, s. 2021. It measured three indicators: preparedness in normal times, preparedness for response, and disaster response measures. Respondents rated each item using a five-point Likert scale, where higher scores

indicated higher implementation. The instrument obtained a Cronbach alpha of 0.90, indicating high internal consistency.

The qualitative instrument was an in-depth interview guide designed to explore participants' standpoints on the salient quantitative results. The guide included open-ended questions on leadership practices, safety measures, communication systems, learning continuity, resource constraints, and response strategies. Both instruments underwent expert validation and pilot testing before use.

### Data Collection and Analysis

After securing administrative and ethical clearances, the researcher administered the survey to the selected respondents. Completed questionnaires were checked, coded, and encoded for statistical analysis. Means and standard deviations were computed to describe the extent of implementation. The qualitative phase was conducted through 30- to 45-minute in-depth interviews, which were audio-recorded with consent, transcribed, translated when necessary, and analyzed thematically following the procedures of data familiarization, coding, theme development, theme review, and interpretation (Braun & Clarke, 2021; Miles et al., 2020).

Integration was conducted through a joint display analysis. Quantitative results were compared with qualitative themes to generate meta-inferences explaining the implementation of school-based disaster preparedness and response measures.

### Ethical Considerations

Ethical principles of voluntary participation, informed consent, confidentiality, anonymity, and the right to withdraw were observed. Participants were assigned codes, and data were reported in aggregate form to protect identities. The study involved minimal risk because it relied on survey and interview data only.

### Results and Discussion

#### Extent of Implementation of School-Based Disaster Preparedness and Response Measures

The quantitative results showed that school-based disaster preparedness and response measures were very highly implemented across the three indicators. The overall mean was 4.52 (SD = 0.57), indicating that respondents perceived the practices as strongly evident in their schools. Among the indicators, disaster response measures obtained the highest mean (M = 4.57, SD = 0.53), followed by preparedness for response (M = 4.55, SD = 0.54) and preparedness in normal times (M = 4.44, SD = 0.65).

| Indicator                    | Mean | SD   | Interpretation |
|------------------------------|------|------|----------------|
| Preparedness in Normal Times | 4.44 | 0.65 | Very High      |
| Preparedness for Response    | 4.55 | 0.54 | Very High      |
| Disaster Response Measures   | 4.57 | 0.53 | Very High      |
| Overall                      | 4.52 | 0.57 | Very High      |

Table 2. Level of school-based disaster preparedness and response measures. Scale: 4.20-5.00 = Very High; 3.40-4.19 = High; 2.60-3.39 = Moderate; 1.80-2.59 = Low; 1.00-1.79 = Very Low.

These results suggest that schools have institutionalized preparedness planning, response readiness, and disaster response practices. The highest rating for disaster response measures indicates strong emphasis on actions taken during and immediately after disaster events, including learner safety, coordination, reporting, and continuity mechanisms. The comparatively lower, although still very high, score for preparedness in normal times suggests that routine preventive practices may vary more across schools due to differences in infrastructure, resources, and local conditions. Similar findings have been reported in Philippine school DRRM studies, where implementation is generally evident but often constrained by resource availability and uneven local support (Acierto et al., 2023; Ronquillo, 2020; Tizon & Comighud, 2020).

## Standpoints of School Heads and SDRRM Coordinators

The qualitative phase explained the high quantitative results by identifying concrete practices behind the ratings. Nine major themes emerged across the three indicators. For preparedness in normal times, the themes were participatory contingency planning, proactive physical mitigation, and leadership commitment. For preparedness for response, the themes were preventive safety measures, community-based communication, and strategic continuity planning. For disaster response measures, the themes were humanitarian response, instructional continuity, and adaptive learning strategies.

| Indicator                    | Major Themes                                                                             | Core Ideas                                                                                                                                                                                                  |
|------------------------------|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Preparedness in Normal Times | Participatory contingency planning; proactive physical mitigation; leadership commitment | School-specific DRRM planning, alignment with division mandates, drainage maintenance, infrastructure reinforcement, waste management, and active leadership support.                                       |
| Preparedness for Response    | Preventive safety measures; community-based communication; strategic continuity planning | Inspection of electrical systems, emergency kits, and classrooms; use of Facebook pages and group chats; barangay coordination; safekeeping of records and learning resources.                              |
| Disaster Response Measures   | Humanitarian response; instructional continuity; adaptive learning strategies            | Prioritization of learner and personnel safety, use of schools as evacuation centers, standardized reporting, Alternative Delivery Modes, flexible classroom use, modular learning, and learner monitoring. |

**Table 3. Qualitative themes and core ideas generated from the in-depth interviews.**

Participatory contingency planning demonstrated that schools prepared and updated DRRM plans through collaboration among school heads, SDRRM coordinators, teachers, and barangay officials. This finding supports the role of leadership and stakeholder coordination in crisis preparedness. Proactive physical mitigation was reflected in drainage maintenance, facility checks, concrete perimeter improvements, and school cleanliness routines. Leadership commitment emerged as a central enabling factor because participants emphasized that DRRM implementation depends on how school heads value, direct, and monitor preparedness activities.

Preparedness for response was supported by advance safety checks, warning dissemination, and continuity planning. Schools reportedly inspected electrical systems, emergency kits, and classroom safety before disaster onset. Communication relied heavily on digital platforms such as Facebook and group chats, supported by barangay coordination. However, participants also recognized that internet interruptions and power outages may weaken communication during disasters. This points to the need for backup tools such as radios, walkie-talkies, SMS trees, and barangay-based information relays.

Disaster response measures were characterized by humanitarian response, instructional continuity, and adaptive learning strategies. Schools prioritized the safety of learners and personnel, coordinated with local partners, and used reporting protocols during disaster events. Because some schools may also function as evacuation centers, school leaders had to balance community shelter functions with instructional continuity. Alternative Delivery Modes, modular learning, advance learning materials, flexible classroom arrangements, and learner monitoring were used to sustain education during disruptions. This finding aligns with literature emphasizing that disaster-resilient education systems must protect both physical safety and learning continuity (Dayagbil et al., 2021; Lassa et al., 2023).

## Integration of Quantitative and Qualitative Findings

| Quantitative Result | Qualitative Explanation | Meta-Inference |
|---------------------|-------------------------|----------------|
|---------------------|-------------------------|----------------|

|                                                              |                                                                                               |                                                                                                                                                                          |
|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Preparedness in Normal Times: M = 4.44, SD = 0.65, Very High | Participatory contingency planning, proactive physical mitigation, and leadership commitment. | The high rating is explained by regular school planning, routine mitigation activities, and strong administrative support.                                               |
| Preparedness for Response: M = 4.55, SD = 0.54, Very High    | Preventive safety measures, community-based communication, and strategic continuity planning. | The high rating is supported by early safety checks, active warning dissemination, and protection of records and learning resources before disasters occur.              |
| Disaster Response Measures: M = 4.57, SD = 0.53, Very High   | Humanitarian response, instructional continuity, and adaptive learning strategies.            | The highest rating is explained by prioritization of life safety, use of alternative learning modalities, and flexible strategies to sustain education during disasters. |

**Table 4. Joint display of quantitative results, qualitative explanations, and meta-inferences.**

The joint display analysis shows that the high quantitative ratings were not merely numerical indicators of compliance; they were explained by actual school-level practices. The findings suggest that DepEd Order No. 033, s. 2021 functions as both a compliance framework and an operational guide for preparedness and response. Nevertheless, the qualitative findings clarified that very high implementation does not mean that all gaps are absent. Participants identified needs for additional first aid kits, hard hats, backup power, stable internet connection, communication equipment, and training in Psychological First Aid. These gaps indicate that policy implementation can be strengthened through resource standards, monitoring, and capacity-building support.

## LIMITATIONS

The study was limited to school heads and SDRRM coordinators in the First District of the Davao de Oro Division. Because the quantitative data were self-reported, responses may have been influenced by social desirability bias, especially because respondents were directly involved in DRRM compliance. The study did not include technical assessment of school buildings, direct observation of drills, disaster-loss measurements, or external audits of DRRM documents. Thus, the findings should be interpreted as perceived and explained implementation rather than a full technical evaluation of school safety performance.

## CONCLUSION

The study concludes that school-based disaster preparedness and response measures in the Davao de Oro Division are very highly implemented as perceived by school heads and SDRRM coordinators. DepEd Order No. 033, s. 2021 has contributed to the institutionalization of preparedness systems, response readiness, and disaster response practices at the school level.

The qualitative findings explain the high implementation ratings by showing that schools engage in participatory contingency planning, proactive physical mitigation, leadership-driven preparedness, preventive safety checks, community-based communication, record protection, humanitarian response, instructional continuity, and adaptive learning strategies. These practices demonstrate that school heads and SDRRM coordinators translate national DRRM policy into local school actions.

At the same time, the findings reveal that strong implementation still requires stronger operational support. Resource gaps, unstable communication systems, limited backup power, lack of emergency equipment, and insufficient psychosocial response training may affect the depth and consistency of implementation. Therefore, school-based DRRM should move beyond documentation toward sustained, resource-supported, and community-coordinated preparedness and response.

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## RECOMMENDATIONS

1. DepEd and the Division Office may establish clearer minimum resource standards and monitoring mechanisms for emergency supplies, first aid kits, hard hats, backup power, and communication devices.
2. School heads may regularly review and update contingency plans through participatory planning with teachers, learners, parents, barangay officials, and local DRRM partners.
3. Schools may strengthen alternative communication systems, including SMS trees, radios, walkie-talkies, printed advisories, and barangay-based information relays, especially for periods of power or internet interruption.
4. SDRRM coordinators and teachers may receive continuing training on disaster response, learner monitoring, continuity of learning, Psychological First Aid, and post-disaster mental health support.
5. Local government units and barangay DRRM offices may strengthen coordination with schools used as evacuation centers by supporting evacuation management, security, sanitation, supplies, and post-disaster clearing.
6. Future researchers may validate self-reported findings through observation, document analysis, DRRM implementation audits, and the inclusion of learners, parents, teachers, LGU officials, and external evaluators.

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