



# Analysis of Inclusive Communication Guidelines in Emergency and Disaster Risk Preparedness for Functional Groups with Disabilities

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**Abstract.** An estimated over 16 percent of the world's population (1 in 6) lives with some form of disability, yet around half of them are considered functional groups in emergencies and disasters. The potential to incorporate meaningful participation by people with disabilities to productively support themselves and others in surviving the lethal situation becomes the aim of this paper. This research focuses on formulating an accessible communication guideline that is well suited to educate the functional group with disabilities carrying out emergency and disaster mitigation. A comparative study through a literature review was undertaken to evaluate two potential disaster manuals and analyze their strategy, which was divided into three aspects: content, communication, and visualization. The finding plays an essential role as the basis of the following project: developing indigenous disaster educational material that is equipped with inclusive verbal and visual communication for people with disabilities.

**Keywords:** Disaster; Preparedness; Inclusive.

## 1 Emergency and Disaster Preparedness

The increased number of emergencies and disasters has been alarming. In recent decades, this risk has impacted more than 200 million people and killed more than 70,000 people annually in the Asia-Pacific region, contributing to 90% and 65% of the world's total [1]. In the framework of this risk, an emergency is termed an unexpectedly dangerous situation requiring immediate response by exploiting any resources available, such as local floods, fires, explosions, building collapses, transport crashes, etc. On the other hand, a disaster is a predictable or unpredictable calamitous event that can be caused by natural phenomena or human factors, especially one causing overwhelming damage and loss of life. In a disaster, like wildfires, earthquakes, tornadoes, landslides, volcano eruptions, tsunamis, blizzards, etc., there is a need for external efforts to cope with its impacts [2] [3].

These impacts highly depend on pre-existing circumstances and underlying risk factors, including the level of awareness, preparedness, and participation in the community. Furthermore, the impact is also disproportionate from one group to another. The

more an individual or group is secluded from society and not fully exposed to the intervention, the greater the havoc that will affect them [4]. In this regard, the vulnerable community, such as children, older people, pregnant women, and especially people with disabilities, needs further education and training to increase their understanding, technical knowledge, and practical skills in serving their functions efficiently and continuously in hazardous situations [5]. This local and inclusive knowledge is a crucial factor that ensures all community groups develop equal agility and adaptability in responding to emergencies and disasters [6].

Based on the United Nations Office for Disaster Risk Reduction (UNDRR) survey, the majority encountered difficulties evading danger or had communication issues. Only 20 percent of people with disabilities could evacuate independently in the event of an emergency, while 72 percent stated that they were not aware of the preparedness strategy in the event of a disaster. Despite that, more than half of the respondents indicated the motivation to actively contribute to disaster capacity building and training, though 85 percent of them have not yet participated in community-based Disaster Risk Management (DRM). It was concluded that there is a gap in the readiness of people with disabilities and their participation in the management community, despite their willingness to engage in preparedness activities [7].

There are four keys in the Disaster Management Cycle of Disaster Risk Reduction (DRR): (1) Mitigation, (2) Preparedness, (3) Response, and (4) Recovery [8]. The preparedness phase is the aim of this study, which consists of developing disaster preparedness plans, disseminating information and manual guidelines, performing plans through learning and training, and identifying possible vulnerabilities. More than half of the people with disabilities are categorized as a functional group that can play an active role in the preparedness phase, including handling disaster impacts as well as responding to the occurrence of disasters. They can support field activities involving themselves and the people around them, yet they are infrequently involved in strategic decision-making at the disaster management level [9]. This group is recently considered to be potentially trained through the utilization of customized intervention methods, communication strategies, and learning materials.

## **2 Functional Groups with Disabilities in Disaster**

Following the high prevalence of emergencies and disasters in Asia-Pacific, this region also has a tremendous number of people with disabilities, around 650 million. This number is nearly two-thirds of the world's population (1.3 billion, or 1 in 6 people), which is expected to rise over the next decades due to pollution, climate change, and many other internal and external factors [10]. In general, a disability is a state of the body or mind that results in activity limitation (intrapersonal level) and participation restrictions (interpersonal level). Though often termed a single existence, people with disabilities are a diverse group that consists of physical, sensory, intellectual, and mental limitations equipped with varied spectrums and a wide range of needs [11].

Based on the International Classification of Functioning, Disability, and Health (ICF) by the World Health Organization, disabilities are classified based on two factors:

1. Activity is the ability to perform an action as an individual, such as learning and applying knowledge, mobility and managing tasks, executing self-care activities, and carrying out domestic life.
2. Participation is the competence to engage in social roles, such as developing relationships or interactions, managing education, employment, or finances, and engaging in community, social, or civic life.

According to this, people with disabilities are at higher risk due to the combination of activity and participation limitations, as in many cases, the disaster intervention is not designed to address accessibility needs and inclusive strategies, such as services, knowledge, community networks, and resources [12]. The implications are life-threatening, caused by inaccessibility to information, resulting in impossible decision-making and swift action in the face of disasters. In this case, the lack of inclusive and disability-friendly disaster intervention needs to be tackled through cooperation among the community, associations, and government, especially for the functional group with disabilities.

The recent practice of the Global Facility for Disaster Reduction and Recovery addressed five barriers experienced by people with disabilities: (1) Physical barrier; (2) Information and communication barrier; (3) Regulatory barrier; (4) Policy barrier; and (5) Attitude barrier. Among those barriers, information and communication barriers is the focus of this research, which is also the determining factor in carrying out a disaster preparedness plan to benefit society in an equal manner. It was believed that the most important part is to ensure all of the disaster materials are accessible to people with disabilities, especially individuals with sensory and intellectual limitations [13].

### **3 Comparative Method of Inclusive Communication Guidelines**

In this study, potential inclusive disaster guidelines were assessed using a comparative method concerning their target group, disaster scope, and purpose. Generally, a comparative study carries out a number of essential functions that are closely related and then solicits the advantages across diverse settings, thereby contributing to the development of universal or localized applicable theory [14]. The reason for preferring the selected two guidelines was the unique communication approach that was implemented in explaining the complex information about disabilities in disaster and disability-inclusive materials. This distinctive approach was not yet fully explored and was rarely implemented in the present day, so a comparative study was conducted to extract the essence and benefits of these guidelines that could be replicated in the future.

In a comparative study, the objects of analysis must be compared using a proven theoretical framework to fully reap the benefits. Therefore, a visual and verbal processing communication strategy by Wyer, Hung, and Jiang [15] was implemented as the main framework for exploring the advantages and disadvantages of two selected inclusive disaster guidelines. A supported framework by the American Psychological Association (APA) which are: (1) Respect for human rights and dignity, (2) Need, (3) Delineation of Scope, (4) Avoidance of Bias, (5) Educational Value, (6) Internal Consistency, (7) Flexibility, (8) Basis, (9) Feasibility, (10) Aspirational Language, (11)

Clarity, and (12) Compatibility then also become the basis for summarizing the analysis [16].

### 3.1 Training Manual by Handicap International and European Commission Humanitarian Aid (ECHO)

This guideline was published in 2009 in Nepal under the title "Mainstreaming Disability Into Disaster Risk Reduction: A Training Manual." This was designed in a logical modular sequence to facilitate the varied needs of individuals with disabilities [17]. All of the contents are also available in an audio version (CD) to facilitate people with visual limitations. Each piece of content is also equipped with details of time, method, tools, and learning objectives to ensure the aim of each phase is achieved. The content of the manual is divided into four main sessions and two additional sessions: (1) Introduction to Disability, (2) National and International Frameworks and Policies on Disability, (3) Disability and Disaster Management: Situation Analysis, (4) Mainstreaming Disability into DRR: Practical Recommendations, (5) Making Materials Disability-Inclusive, and (6) Networking: Specialist Services.

**Table 1.** Contents of Training Manual by Handicap International and ECH

<b>Contents</b>	<b>Sub-contents</b>
1.1. Disability Terminology	Appropriate language Common terms
1.2. Types of Impairments	Definition of disability Classifications of impairments Disability barriers
1.3. Needs of Persons with Disabilities	Needs of individuals Needs of person with disabilities
1.4. Disability Models	Charity model Human rights model
3.1. Disaster Management	Types of disaster Effects of disaster Disaster management phase
3.2. Experiences of Disability in Disaster	Past experiences Positive stories
3.3. Disaster and Emergency Frameworks	Hyogo Framework Sphere Standard The UN Convention Biwako Millenium
4.1. Identifying Guidelines	Screening form

4.2. Communication Guidelines	Communication strategy for the four categories of disabilities
4.3. Vulnerability and Capacity Assessment	Hazard risk Disaster Vulnerability Capacity
4.4. Early Warning System (EWS) Guidelines	Criteria of EWS for the four categories of disabilities
4.5. Search, Rescue, and Evacuation Guidelines	Potential problems and possible measurements for the four categories of disabilities
4.6. Shelter Management	General principles Physical environment Information and communication Food security Water and sanitation General security
4.7. Accessibility Guidelines	Accessible public spaces Accessible routes Doorways Building entrances Ramps Handrails Water and sanitation Signage

The first session aims to properly align the perspective of disabilities before moving forward to the context of disaster risk management. In most of the explanation, there are tables provided to streamline the complexity of the contents and simplify the reading experience. On the other side, the third session concentrates on the conscientious explanation of disaster. Throughout this part, much information is provided in the form of imagery and tables to alleviate the tension from readers, which is considered remarkably meaningful. The last session that was analyzed is the most complex part of this training manual that implements the Twin Track Approach. It consists of the effort to mainstream DRR services (assessment, information, facilities, and training programs) and specialist DRR services to empower people with disabilities (rehabilitation, assistive device, inclusive information system, support services, and disability community activation).

### 3.2 Practitioner Guidelines for Capacity Building for Disability Inclusive Disaster Risk Reduction in Indonesia by the University of Sydney and Australian Aid

This guideline is part of a funded project by the Australian Government Department of Foreign Affairs and Trade Australian Development and Research Awards in 2013-2015, under the title "Promoting the Inclusion of People with Disabilities in Disaster Management in Indonesia: Practitioner Guidelines for Disability Inclusive Disaster Risk Reduction in Indonesia" [18]. The contents of these guidelines are divided into five work packages equipped with a step-by-step tutorial, study cases, and training activities in each session: (1) Basic Disaster Risk Reduction, (2) Disability and DRR Policy Frameworks, (3) DiDR Tool with a Person with Disability, (4) Identifying at-risk Communities Including People with Disability, and (5) Research Findings on DDR and Disability. This was designed to build the capacity of persons with disabilities, especially in Indonesia, to comprehend and participate in DRR.

**Table 2.** Contents of Practitioner Guidelines by University of Sydney and Australian Aid

Contents	Sub-contents
How to Use This Guidelines	Step-by-step tutorial
All Work Packages	Objectives Expected output Training content Description of Activities: objectives, importance, activities summary, media, and method Anticipated Issues and Risks
Summary	Learning summary and reflection

The nature of this guideline is quite distinctive compared to the previous guideline. The aim is the capacity of people with disabilities to develop through a consistent and dynamic practical method. Throughout the explanation, there are all texts, and no images, colors, or graphics are provided to emphasize the contents. On the other side, the practice is rather general instead of focusing on the treatment and strategy of people with disabilities. The explanation is also remarkably brief and not fully facilitating the different needs and spectrums of people with disabilities.

### 3.3 Comparison in Communication and Visualization Strategy

It was stated that a literature review and comparative study is an exquisite method to analyze and summarize the uncovered areas in which more research is needed, which is essential as the initial step in creating frameworks and conceptual models [19]. According to this, the advantages and disadvantages of the communication and visualization approach of these guidelines were compared and synthesized to form guidance in creating inclusive disaster communication guidelines that can be localized and customized for each country.

**Table 3.** Comparison in Communication and Visualization Strategy

Categories	Training Manual	Practitioner Guidelines
<b>Communication</b>	<ol style="list-style-type: none"> <li>1. Focus on the ethical side and refer to person-first, not disability.</li> <li>2. Use informal terms and non-judgmental communication.</li> <li>3. Mostly implement a fact exploratory that is short and uncomplicated.</li> <li>4. The explanation is employed with an encouraging statement.</li> </ol>	<ol style="list-style-type: none"> <li>1. Focus on the practical side through training/ practice.</li> <li>2. Formal and straightforward.</li> <li>3. Most of the contents are general and do not fully support people with disabilities.</li> <li>4. The explanation is short, practical, and outspoken.</li> </ol>
<b>Visualization</b>	<ol style="list-style-type: none"> <li>1. There are tables, graphics, points, numbering, and imageries to support the explanation.</li> <li>2. Colors are mostly utilized to differentiate rows or sections.</li> <li>3. There are illustrations to visualize each disaster though the damages are not explained fully.</li> <li>4. No graphic to explain the relationship of disaster management cycle.</li> <li>5. There is a checklist form equipped with explanations and suggestions.</li> <li>6. The step-by-step illustrations for each measurement is beneficial.</li> <li>7. Cover the basic standard for architectural design and infrastructure accessibility through colored illustrations, details of dimension, and size measurements.</li> </ol>	<ol style="list-style-type: none"> <li>1. All consists of text only.</li> <li>2. There are no specific colors to emphasize the contents.</li> <li>3. There is no illustration or graphics provided.</li> <li>4. The information is categorized and structured in a table with points and numbering that increases the comfort in the reading experience of the user.</li> <li>5. There is a checklist equipped in the last session of the summary and reflection.</li> <li>6. The step-by-step process is not explained in the illustration.</li> <li>7. There are no details of measurements in the guidelines.</li> </ol>

## 4 Discussion

Appropriate teaching materials, training manuals, and practice of self-habitation that are tailored to the needs of people with disabilities is the key to increasing disaster total

preparedness and reducing their vulnerability to disasters [20]. In achieving this level of preparedness, the findings declared above were studied based on three main categories: (1) content, (2) communication, and (3) visualization.

**Table 4.** Summary and Suggestions of The Studied Guidelines

Categories	Training Manual	Practitioner Guidelines
<b>Content</b> [21] Valuable Research-driven Original Actionable Comprehensive	The overall content of the manual is considered important and based on careful field testing. As the contents are based on the localized study in Nepal, the approach is quite specific and distinctive yet still holds the possibility to be applied universally. Most of the instructions are practical and able to be implemented. The content has also covered almost all aspects of disabilities in DRM, but it lacks relevance as this information is needs to be updated.	The content of the guidelines is remarkably practical and can be easily put into action as this is based on fully conducting research. However, the explanation is still general and can not completely cover the needs and complexity of people with disabilities. However, the novelty can be seen in the training method explored in this guideline that encouraged the use of role-play, ranking and discussion, group work, etc.
<b>Communication</b> [22] Clear Concise Concrete Correct Coherent Complete Courteous	The manual has fulfilled most of the criteria as the writing manner is majorly clear and concise through the utilization of short and simple sentences, consistent colored tables, and bullet points to sort the content. The overall tone is respectful, encouraging, and unbiased.	The information provided is short and clear by implementing formal speech to instruct and guide the users for an unbiased approach. The tone of voice is quite distanced and rigid to some extent.
<b>Visualization</b> [23] Composed Emphasized Representative Consistent	The bold approach in implementing a visualization is the main strength of this manual that can not be found in other guidelines thus far. The composition is also well organized and emphasized, especially in persisting the colors and style. However, the color combination is suggested to be taken into careful consideration as they are not color-blind friendly and quite distractive to some extent. Occasionally, the illustration also tends to be inadequately representative or unnecessary.	As there is no visualization implemented, the information is still arranged and structured neatly. The font size is quite small, and no color emphasis. In this regard, it is suggested to take the varied needs and characteristics of people with disabilities into consideration by providing an audio-visual version, changing the colors to be color-blind friendly, putting a larger font size, and visualizing the text proportionally to help people with reading difficulties.



## 5 Conclusion

The study echoes the UNDRR's new Strategic Framework for 2022-2025 that stated disability-inclusive DRR strategic objectives, including deliverables and systematic implementation in real cases [24]. Based on the analysis of these two guidelines, there are two findings. Firstly, the importance of contextual and customized content, communication, and visualization in disaster training manuals for people with disabilities is still an underlying issue that has not yet been explored fully. This is also emphasized by the American Psychological Association (APA), which highlights the importance of an aspirational and compatible communication approach [16] that still needs improvement. Secondly, there is an urgent need to develop inclusive multiplatform learning/ training materials for people with disabilities to be able to learn and train independently in the disaster preparedness process. This is also aligned with the World Health Organization (WHO) commitment to develop normative tools, such as guidelines and modules, to strengthen disability inclusion [25]. The framework resulting from this research should then be verified further to be the basis for designing the suggested inclusive disaster training materials in the near future.

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