

CHALLENGES AND STRATEGIES FOR ENHANCING DISASTER RESILIENCE AND SERVICE RELIABILITY IN FICELCO'S OFF-GRID SYSTEM

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ABSTRACT

This study employed a descriptive research design to determine the challenges and strategies for enhancing disaster resilience and service reliability in the off-grid system of the First Catanduanes Electric Cooperative, Inc. (FICELCO). Using a structured survey, the study assessed the respondents' demographic and professional profile, the challenges encountered during and after disasters, and the effectiveness of existing disaster resilience strategies. The analysis further examined whether statistically significant differences existed in the respondents' perceptions when grouped according to age, sex, job position, length of service, department, and number of disaster-related trainings attended. The results served as the basis for formulating a strategic intervention plan aimed at strengthening FICELCO's disaster preparedness and operational reliability. Findings showed that most respondents were aged 36–45, predominantly male (85.14%), and commonly employed as linemen (20.95%), with the majority serving for over 10 years. The Technical Services and Administrative Departments comprised 31.08% of the sample. Regarding challenges, Infrastructure Vulnerability and Damage and Public Expectations and Communication were rated the most severe, both posting a weighted mean of 3.55, followed by Environmental and Geographical Challenges (3.53), Resource Limitations (3.52), and Communication and Coordination Issues (3.47). The overall mean of 3.52 indicated that all challenges were perceived as “very challenging.” In terms of strategy effectiveness, Emergency Response and Restoration Protocols obtained the highest weighted mean of 3.58, followed closely by Workplace Training and Capacity Building (3.57), Infrastructure Hardening and Redundancy (3.56), Real-Time Monitoring and Early Warning Systems (3.54), and Community Engagement (3.53), with an overall mean of 3.56, indicating “highly effective.” Significant differences were identified in several domains based on age, job position, length of service, department assignment, and number of trainings attended, with department/unit of assignment emerging as a consistent influential factor (p-values ranging from 0.0005 to 0.0492). A comprehensive intervention plan was developed to address weaknesses in infrastructure, communication, resource readiness, staff capability, and community involvement. In conclusion, the study highlights that FICELCO personnel face considerable challenges in disaster operations, especially related to infrastructure damage and communication demands. Despite these constraints, the organization's strategic measures are widely regarded as effective. The variations in perceptions across demographic and professional groups further justify the need for a targeted and department-sensitive intervention plan to enhance disaster resilience and sustain reliable service delivery.

Keywords: disaster resilience, service reliability, off-grid operations, emergency response, FICELCO