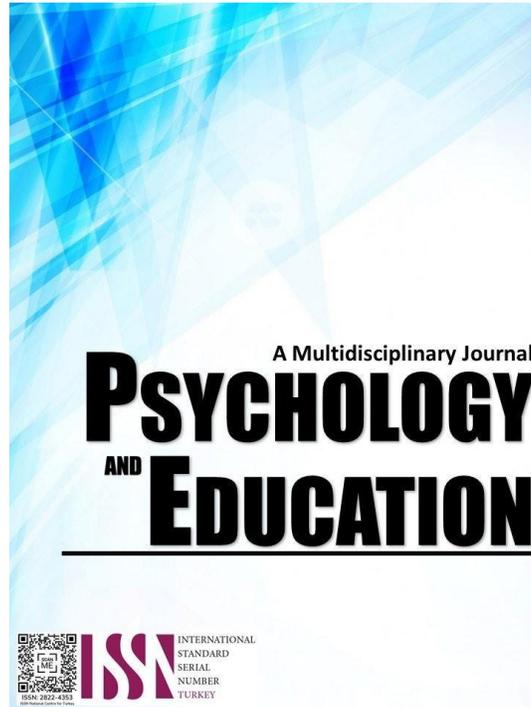


**EFFECTIVENESS OF MANAGEMENT STRATEGIES ON ENVIRONMENTAL
SHOCKS AMONG DOT-ACCREDITED ACCOMMODATION
ESTABLISHMENTS**



PSYCHOLOGY AND EDUCATION: A MULTIDISCIPLINARY JOURNAL

Volume: 43

Issue 9

Pages: 1133-1147

Document ID: 2025PEMJ4221

DOI: 10.70838/pemj.430905

Manuscript Accepted: 07-14-2025

Effectiveness of Management Strategies on Environmental Shocks among DOT-Accredited Accommodation Establishments

Darwin V. Mendoza,* Gynyn G. Gumban

For affiliations and correspondence, see the last page.

Abstract

This study examined the effectiveness of management strategies in mitigating environmental shocks among DOT-accredited accommodation establishments in the Zamboanga Peninsula. Utilizing quantitative research design, this study involved 314 respondents from 30 establishments across Zamboanga del Norte, Zamboanga del Sur, and Zamboanga Sibugay. Descriptive and inferential analyses revealed that environmental shocks, specifically climate change, natural hazards, and pandemics, are frequently encountered, with natural hazards and pandemics occurring “often” across all provinces. Climate change impacts were reported as occurring “sometimes,” with Zamboanga del Norte registering the highest mean perception. Overall, management strategies were rated “highly effective,” particularly in organizational resilience, disaster/crisis preparedness, and community engagement. Significant differences in strategy effectiveness emerged across enterprise characteristics, including location, years of operation, and number of employees. Medium-sized establishments and those in growth-stage operations (7–15 years) consistently demonstrated higher strategic effectiveness. Younger respondents (≤ 29 years) also perceived management strategies as more effective than their older counterparts. Correlation analysis indicated a significant moderate relationship ($r = 0.514$, $p < .01$) between the frequency of environmental shocks and the effectiveness of management strategies. These findings underscore the vital role of proactive, scalable, and context-sensitive crisis management strategies in ensuring the resilience of the hospitality sector amid escalating environmental disruptions.

Keywords: *environmental shocks, crisis management, resilience, accommodation establishments, tourism, disaster preparedness, Zamboanga Peninsula*

Introduction

As a key driver of tourism, the hospitality industry plays a vital role in economic development, employment generation, and regional identity. However, this sector is increasingly vulnerable to environmental shocks such as climate change, natural hazards, and pandemic disruptions that threaten operational continuity, service delivery, and long-term sustainability (Baum & Hai, 2020).

The Philippines, a nation frequently exposed to typhoons, earthquakes, and health emergencies, presents a particularly high-risk environment for accommodation establishments. These challenges necessitate the development of effective and scalable management strategies tailored to local vulnerabilities.

In response to these risks, the Department of Tourism (DOT) has instituted accreditation standards to promote quality, resilience, and sustainability among accommodation providers. While such standards offer a baseline for service and safety, the degree to which accredited establishments have translated these into effective crisis management strategies remains largely underexplored. Previous research highlights the importance of organizational resilience and disaster preparedness (Chaudhary & Piracha, 2021).

However, evidence on how these strategies perform across various environmental threats and whether they differ by enterprise profile remains limited. Studies suggest that enterprise size, location, and lifecycle stage may influence a business’s capacity to anticipate, respond to, and recover from environmental shocks (Prayag et al., 2018; Diers-Lawson, 2019).

Despite growing attention to sustainability and risk management in tourism, there is a lack of empirical data specific to DOT-accredited establishments in high-risk regions such as the Zamboanga Peninsula. The region’s exposure to natural and socio-environmental threats and the growing demand for resilient tourism infrastructure underscores the need for evidence-based evaluation of current management strategies.

This study addresses this gap by quantitatively assessing the perceived effectiveness of management strategies on environmental shocks among DOT-accredited accommodation establishments in the Zamboanga Peninsula. Specifically, it examines the relationship between enterprise and respondent profiles, the frequency of environmental shocks, and the effectiveness of organizational resilience, disaster/crisis preparedness strategies, and community engagement.

The study hypothesizes significant differences in environmental shock experiences and management strategy effectiveness based on organizational and demographic factors. It further posits a positive correlation between the frequency of environmental shocks and the perceived effectiveness of management responses.

By identifying strategic strengths and vulnerabilities, this study aims to inform the development of a more resilient and responsive crisis management framework for the hospitality sector in the Philippines.

Methodology

Research Design

This study adopted a quantitative research design to evaluate the effectiveness of management strategies on environmental shocks among Department of Tourism (DOT)-accredited accommodation establishments in the Zamboanga Peninsula. This design allowed the researcher to measure differences in strategy effectiveness and environmental shock exposure across organizational and demographic variables, enabling generalizable and data-driven insights relevant to crisis management planning in the tourism sector.

Respondents

The target population included employees of DOT-accredited accommodation establishments operating in Zamboanga del Norte, Zamboanga del Sur, and Zamboanga Sibugay. A total of 314 respondents were selected using stratified random sampling, which ensures proportional representation based on key characteristics such as location, years of operation, and organizational size.

Stratified sampling is widely recognized for enhancing the precision and representativeness of findings in organizational research (Etikan & Bala, 2017). The sample size was deemed sufficient based on the recommendations of Krejcie and Morgan (1970), considering a confidence level of 95% and a margin of error of 5%.

Instrument

Data were collected using a researcher-made structured questionnaire developed based on theoretical constructs from disaster management theory (Coppola, 2015), the resource-based view (Barney, 1991), and stakeholder theory (Freeman, 1984). The instrument comprised three sections: (1) profile of the establishment and respondents, (2) environmental shocks experienced (climate change, natural hazards, and pandemics), and (3) perceived effectiveness of management strategies in three dimensions of organizational resilience, disaster/crisis preparedness, and community engagement.

Each item was measured on a four-point Likert scale: environmental shocks ranged from 1 = Never, 2 = Sometimes, 3 = Often, to 4 = Always; strategy effectiveness ranged from 1 = Very Low Effect to 4 = Very Highly Effective. The instrument underwent content validation by three hospitality and disaster risk management experts, ensuring its alignment with the research objectives. A pilot test was conducted with 20 respondents from non-participating establishments, yielding a Cronbach's alpha coefficient of 0.973, indicating excellent internal consistency (Tavakol & Dennick, 2011).

Procedure

Following approval from relevant authorities and establishment managers, the validated questionnaires were distributed to the selected respondents in person. The researcher provided clear instructions and was available to clarify queries to ensure the accuracy and completeness of responses. The data collection was completed within one month to maintain temporal response consistency and reduce potential recall bias.

Data Analysis

Data were coded and analyzed using IBM SPSS Statistics Version 26.0. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were employed to summarize the demographic characteristics of respondents and the organizational profiles of the participating DOT-accredited accommodation establishments. These measures also facilitated an understanding of the central tendencies in the data, particularly in assessing the prevalence of environmental shocks and the perceived effectiveness of management strategies.

Inferential statistical techniques were utilized to examine significant differences across various profile variables such as location, years of operation, number of employees, and respondent demographics. Specifically, independent sample t-tests and one-way analysis of variance (ANOVA) were conducted to determine whether significant differences existed in the experiences of environmental shocks and the effectiveness of management strategies.

Furthermore, Pearson's correlation coefficient (r) was computed to assess the strength and direction of the relationship between the frequency of environmental shocks and the perceived effectiveness of strategic responses. All statistical analyses were performed at a 0.05 significance level, by accepted standards in behavioral and social science research (Noguchi et al. 2021).

Ethical Considerations

The study adhered to established ethical standards for research involving human participants. Before participation, informed consent was obtained from all respondents, who were assured of voluntary participation, confidentiality, and the right to withdraw without penalty.

Data were anonymized and stored securely to protect the respondent's identity. The study protocol was reviewed and approved by the institutional ethics review board to ensure compliance with ethical guidelines prescribed by the Research Ethics Review Board (RERB) of the Central Philippine University.

Results and Discussion

Table 1 provides a comprehensive profile of the Department of Tourism (DOT)-accredited accommodation establishments included in the study, based on their location, years of operation, number of employees, and size of capitalization.

Table 1. *DOT-accredited accommodation establishments in terms of locations, years of operations, number of employees, and size of capitalization*

Variables	f	%
Location		
Zamboanga Del Sur	6	20.0
Zamboanga Del Norte	21	70.0
Zamboanga Sibugay	3	10.0
Total	30	100.0
Years of Operation		
<7 years (emerging)	6	20.0
7-15 (growth stage)	21	70.0
>15 (established)	3	10.0
Total	30	100.0
Number of Employees		
10-99 (small)	25	83.0
>=100 (medium)	5	17.0
Total	30	100.0
Size of Capitalization		
>3M to 15M (small)	2	7
>15M to 100M (medium)	28	93
Total	30	100.0

The majority of these establishments are located in Zamboanga del Norte (70%), indicating the province's prominence as a key destination for tourism-related businesses, likely due to its more developed infrastructure and tourist attractions. In comparison, Zamboanga del Sur accounts for 20%, and Zamboanga Sibugay comprises 10% of the total. Most establishments have been operating for 7 to 15 years (70%), placing them in the growth stage, while 20% are in their early years, and 10% have been established for more than 15 years, reflecting a mix of experienced and emerging players in the sector.

In terms of size and financial capacity, 83% of the establishments are considered small, employing 10 to 99 workers, which may suggest that many are modest-sized inns or family-run businesses. Only 17% are medium-sized with 100 or more employees. Regarding capitalization, a vast majority, 93%, fall within the medium investment range of ₱15 million to ₱100 million, showing significant financial resources dedicated to maintaining quality services and facilities required for DOT accreditation. The remaining 7% operate with a smaller capitalization between ₱3 million and ₱15 million. These findings suggest that while most accommodation businesses in the region are small in size, they are financially capable and positioned for sustained growth, especially in Zamboanga del Norte.

Table 2. *Demographic profile of respondents from DOT-accredited accommodation establishments in terms of sex, age, and rank.*

Variables	f	%
Sex		
Male	167	53.2
Female	147	46.8
Total	314	100.0
Age		
<=29	197	62.7
30-39	112	35.7
40-49	5	1.6
Total	314	100.0
Rank		
Supervisor and Associate	13	4.1
Staff	301	95.9
Total	314	100.0

Table 2 presents the demographic profile of the respondents in terms of sex, age, and job rank. The data reveal that a slight majority of the respondents are male, comprising 53.2% (n=167) of the total sample, while females account for 46.8% (n=147), indicating a relatively balanced gender distribution among the participants. In terms of age, the majority of the respondents are relatively young, with 62.7% (n=197) falling within the age group of 29 years old and below. This suggests that the workforce represented in the study is predominantly composed of young professionals. Meanwhile, 35.7% (n=112) of the respondents are aged between 30 and 39 years,

and only a small portion, 1.6% (n=5), belong to the 40–49 age group.

As for the respondents' job rank, the vast majority occupy staff-level positions, accounting for 95.9% (n=301) of the sample, while only a small proportion, 4.1% (n=13), hold supervisory or associate-level roles. This distribution implies that the data primarily reflect the perspectives and experiences of rank-and-file employees rather than those in higher-level management positions. Overall, the demographic data suggest a young, slightly male-dominated workforce that is largely composed of staff-level personnel.

Table 3. *Environmental shocks experienced by DOT-accredited accommodation establishments in terms of climate change, natural hazards, and pandemic.*

Variables	SD	Mean	Description
Climate Change			
Zamboanga Del Sur	2.26	.426	Sometimes
Zamboanga Del Norte	2.46	.605	Often
Zamboanga Sibugay	2.18	.492	Sometimes
Total	2.32	.513	Sometimes
Natural Hazards			
Zamboanga Del Sur	3.03	.704	Often
Zamboanga Del Norte	3.14	.794	Often
Zamboanga Sibugay	2.96	.516	Often
Total	3.06	.716	Often
Pandemic			
Zamboanga Del Sur	3.03	.704	Often
Zamboanga Del Norte	3.14	.794	Often
Zamboanga Sibugay	2.96	.516	Often
Total	3.06	.716	Often
Over-all			
Zamboanga Del Sur	2.77	.559	Often
Zamboanga Del Norte	2.91	.661	Often
Zamboanga Sibugay	2.70	.405	Often
Total	2.81	.583	Often

Legend: 1.00–1.74 – Never, 1.75–2.29 – Sometimes, 2.50–3.24 – Often, 3.25–4.00 – Always

Table 3 shows that environmental shocks were generally experienced "often" across all provinces. Climate change was experienced "sometimes" overall, with the highest frequency reported in Zamboanga del Norte (mean = 2.46). Natural hazards and pandemics were both rated as occurring "often" in all locations, with Zamboanga del Norte again showing the highest mean scores. The overall mean across all shock types and provinces was 2.81, indicating frequent exposure.

Table 4 *Perceived effectiveness of the management strategies on environmental shocks among DOT-accredited accommodation establishments in terms of organizational resilience, disaster/crisis preparedness, and community engagement.*

Variables	SD	Mean	Description
Management Strategy on Organizational Resilience			
Zamboanga Del Sur	3.44	.686	Very Highly Effective
Zamboanga Del Norte	3.18	.704	Highly Effective
Zamboanga Sibugay	3.23	.445	Highly Effective
Total	3.32	.675	Very Highly Effective
Management Strategy on Disaster/Crisis Preparedness			
Zamboanga Del Sur	3.47	.688	Very Highly Effective
Zamboanga Del Norte	3.13	.887	Highly Effective
Zamboanga Sibugay	3.32	.429	Very Highly Effective
Total	3.33	.752	Very Highly Effective
Management Strategy on Community Engagement			
Zamboanga Del Sur	3.46	.762	Very Highly Effective
Zamboanga Del Norte	3.17	.833	Highly Effective
Zamboanga Sibugay	3.18	.582	Highly Effective



Total	3.32	.777	Very Highly Effective
Over-all			
Zamboanga Del Sur	3.46	.677	Very Highly Effective
Zamboanga Del Norte	3.16	.754	Highly Effective
Zamboanga Sibugay	3.24	.348	Highly Effective
Total	3.32	.685	Very Highly Effective

Legend: 1.00–1.74 – Very Low Effect, 1.75–2.49 – Low Effect, 2.50–3.24 – Highly Effective, 3.25–4.00 – Very Highly Effective

Table 4 shows that management strategies on environmental shocks were perceived as "very highly effective" overall (mean = 3.32). Zamboanga del Sur consistently rated the highest across all dimensions organizational resilience (3.44), disaster/crisis preparedness (3.47), and community engagement (3.46). In contrast, Zamboanga del Norte and Zamboanga Sibugay rated their strategies as "highly effective," with mean scores ranging from 3.13 to 3.24.

Table 5.1 Differences in the environmental shocks experienced by the DOT-accredited accommodation establishment when enterprises are classified according to location.

Variables	SD	Mean	Description	F-value	df	P-value
Environmental Shocks on Climate Change						
Zamboanga Del Sur	3.44	.686	Always	6.701	2	.001*
Zamboanga Del Norte	3.18	.704	Often			
Zamboanga Sibugay	3.23	.445	Often			
Total	3.32	.675	Always			
Environmental Shocks on Natural Hazards						
Zamboanga Del Sur	3.47	.688	Always	1.300	2	.274
Zamboanga Del Norte	3.13	.887	Often			
Zamboanga Sibugay	3.32	.429	Always			
Total	3.33	.752	Always			
Environmental Shocks on Pandemic						
Zamboanga Del Sur	3.46	.762	Always	1.300	2	.274
Zamboanga Del Norte	3.17	.833	Often			
Zamboanga Sibugay	3.18	.582	Often			
Total	3.32	.777	Always			
Over-all						
Zamboanga Del Sur	3.46	.677	Always	2.847	2	.060
Zamboanga Del Norte	3.16	.754	Often			
Zamboanga Sibugay	3.24	.348	Often			
Total	3.32	.685	Always			

Table 5.1 shows a statistically significant difference in the environmental shocks experienced in terms of climate change across locations (F = 6.701, p = .001), with Zamboanga del Sur rated as experiencing it "always" (mean = 3.44), while Zamboanga del Norte and Zamboanga Sibugay rated it as "often." No significant differences were found in the experiences of natural hazards (p = .274), pandemic (p = .274), and the overall environmental shocks (p = .060), although mean scores in Zamboanga del Sur remained slightly higher than the other provinces.

Table 5.2 Differences in the environmental shocks experienced by the DOT-accredited accommodation establishments when enterprises are classified according to years of operations.

Variables	SD	Mean	Description	F-value	df	P-value
Environmental Shocks on Climate Change						
<7 years (emerging)	.336	2.13	Sometimes	7.244	2	.001
7-15 (growth stage)	.532	2.38	Often			
>15 (established)	.421	2.10	Sometimes			
Total	.513	2.32	Sometimes			
Environmental Shocks on Natural Hazards						
<7 years (emerging)	.609	3.05	Often	9.361	2	.000
7-15 (growth stage)	.710	3.12	Often			



>15 (established)	.693	2.55	Often			
Total	.716	3.06	Often			
Environmental Shocks on Pandemic						
<7 years (emerging)	.609	3.05				
7-15 (growth stage)	.710	3.12	Often			
>15 (established)	.693	2.55	Often	9.361	2	.000
Total	.716	3.06				
Over-all						
<7 years (emerging)	.487	2.74	Often			
7-15 (growth stage)	.579	2.87	Often			
>15 (established)	.553	2.40	Sometimes	10.072	2	.000
Total	.583	2.81	Often			

Table 5.2 reveals statistically significant differences in the environmental shocks experienced by DOT-accredited accommodation establishments when grouped according to years of operation. Significant differences were found for climate change ($F = 7.244, p = .001$), natural hazards ($F = 9.361, p = .000$), pandemic ($F = 9.361, p = .000$), and the overall environmental shocks ($F = 10.072, p = .000$). Establishments in the growth stage (7–15 years) consistently reported higher frequencies of environmental shocks, rating them as “often,” compared to emerging (<7 years) and established (>15 years) enterprises, which rated most shocks as “sometimes.”

Table 5.3 Differences in the environmental shocks experienced by the DOT-accredited accommodation establishments when enterprises are classified according to number of employees.

Variables	SD	Mean	Description	F-value	df	P-value
Environmental Shocks on Climate Change						
10-99 (small)	.508	2.32	Often	.011	308	.918
>=100 (medium)	.523	2.32	Often			
Environmental Shocks on Natural Hazards						
10-99 (small)	.713	3.01	Often	.630	308	.428
>=100 (medium)	.718	3.13	Often			
Environmental Shocks on Pandemic						
10-99 (small)	.713	3.01	Often	.630	308	.428
>=100 (medium)	.718	3.13	Often			
Over-all						
10-99 (small)	.574	2.78	Often	.310	308	.578
>=100 (medium)	.594	2.86	Often			

Table 5.3 shows that there are no statistically significant differences in the environmental shocks experienced by DOT-accredited accommodation establishments when classified according to the number of employees. For all variables climate change ($p = .918$), natural hazards ($p = .428$), pandemic ($p = .428$), and overall environmental shocks ($p = .578$) both small (10–99 employees) and medium-sized (≥ 100 employees) establishments rated their experiences as “often.”

Table 5.4 Differences in the environmental shocks experienced by the DOT-accredited accommodation establishments when enterprises are classified according to size of capitalization.

Variables	SD	Mean	Description	F-value	df	P-value
Environmental Shocks on Climate Change						
>3M to 15M (small)	.336	2.20	Sometimes	2.500	308	.115
>15M to 100M (medium)	.522	2.33	Often			
Environmental Shocks on Natural Hazards						
>3M to 15M (small)	.518	3.05	Often	3.759	308	.053
>15M to 100M (medium)	.727	3.06	Often			
Environmental Shocks on Pandemic						
>3M to 15M (small)	.518	3.05	Often	3.759	308	.053
>15M to 100M (medium)	.727	3.06	Often			
Over-all						
>3M to 15M (small)	.389	2.77	Often			
>15M to 100M (medium)	.593	2.81	Often	4.219	308	.041



Table 5.4 shows that there is a statistically significant difference in the overall environmental shocks experienced by DOT-accredited accommodation establishments when grouped by capitalization size ($F = 4.219, p = .041$). Medium-sized enterprises (₱15M to ₱100M) reported slightly higher exposure (mean = 2.81) compared to small enterprises (₱3M to ₱15M) with a mean of 2.77, though both fall under the "often" category. No significant differences were found for climate change ($p = .115$), natural hazards ($p = .053$), and pandemic ($p = .053$), despite medium-sized enterprises reporting slightly higher mean scores across these variables.

Table 6.1 *Differences in the environmental shocks experienced by the DOT-accredited accommodation establishments when respondents are classified in terms sex*

Variables	Sex			t	df	P-value
	SD	Mean	Description			
Environmental Shocks on Climate Change						
Male	.518	2.32	Often	-	305.66	.937
Female	.510	2.32	Often	.079	0	
Environmental Shocks on Natural Hazards						
Male	.728	3.06	Often	-	306.35	.961
Female	.706	3.06	Often	.049	9	
Environmental Shocks on Pandemic						
Male	.728	3.06	Often	-	306.35	.961
Female	.706	3.06	Often	.049	9	
Over-all						
Male	.585	2.81	Often	-	305.03	.950
Female	.582	2.81	Often	.063	8	

Table 6.1 shows that there are no statistically significant differences in the environmental shocks experienced by DOT-accredited accommodation establishments when respondents are classified by sex. For all variables climate change ($p = .937$), natural hazards ($p = .961$), pandemic ($p = .961$), and overall environmental shocks ($p = .950$) both male and female respondents reported the same mean ratings of "often" with negligible differences in standard deviations.

Table 6.2 *Differences in the environmental shocks experienced by the DOT-accredited accommodation establishments when respondents are classified according to age.*

Variables	Age			f	Df	P-value
	SD	Mean	Description			
Environmental Shocks on Climate Change						
<=29	.515	2.35	Sometimes	4.148	2	.017
30-39	.494	2.29	Sometimes			
40-49	.563	1.72	Never			
Total	.513	2.32	Sometimes			
Environmental Shocks on Natural Hazards						
<=29	.707	3.11	Often	1.520	2	.220
30-39	.705	2.97	Often			
40-49	1.207	2.92	Often			
Total	.716	3.06	Often			
Environmental Shocks on Pandemic						
<=29	.707	3.11	Often	1.520	2	.220
30-39	.705	2.97	Often			
40-49	1.207	2.92	Often			
Total	.716	3.06	Often			
Over-all						
<=29	.577	2.86	Often	2.098	2	.124
30-39	.575	2.74	Often			
40-49	.853	2.52	Often			
Total	.583	2.81	Often			

Table 6.2 shows a statistically significant difference in environmental shocks experienced in terms of climate change based on respondents' age ($F = 4.148, p = .017$). Respondents aged ≤ 29 reported higher exposure (mean = 2.35, "sometimes"), while those aged 40–49 reported the lowest (mean = 1.72, "never"). However, no significant differences were found for natural hazards ($p = .220$), pandemic ($p = .220$), and overall environmental shocks ($p = .124$), with all age groups rating their experiences as "often."



Table 6.3 Differences in the environmental shocks experienced by the DOT-accredited accommodation establishments when respondents are classified according to rank

Variables	Rank			f	Df	P-value
	SD	Mean	Description			
Environmental Shocks on Climate Change						
Supervisor and Associate	.366	2.20		1.496	2	.226
Staff	.488	1.96				
Total	.516	2.33	Sometimes			
Environmental Shocks on Natural Hazards						
Supervisor and Associate	.887	3.01		2.600	2	.076
Staff	.456	2.34				
Total	.711	3.07	Often			
Environmental Shocks on Pandemic						
Supervisor and Associate	.887	3.01		2.600	2	.076
Staff	.456	2.34				
Total	.711	3.07	Often			
Over-all						
Supervisor and Associate	.688	2.74		2.781	2	.064
Staff	.401	2.21				
Total	.579	2.82	Often			
Total	.583	2.81	Often			

Table 6.3 shows that there are no statistically significant differences in the environmental shocks experienced by DOT-accredited accommodation establishments when respondents are classified by rank.

For all variables climate change (p = .226), natural hazards (p = .076), pandemic (p = .076), and overall environmental shocks (p = .064) both supervisors/associates and staff members reported similar experiences, mostly falling under the “sometimes” to “often” categories.

Inferential Data Analyses

The t-test, ANOVA, and Pearson’s R were used in the inferential analyses.

Table 7.1 Differences in the management strategies among DOT-accredited accommodation establishments when enterprises are classified according to location.

Variables	location			f	df	P-value
	SD	Mean	Description			
Management Strategy on Organizational Resilience						
Zamboanga Del Sur	.686	3.44	Very Highly Effective	5.434	2	.005
Zamboanga Del Norte	.704	3.18	Highly Effective			
Zamboanga Sibugay	.445	3.23	Highly Effective			
Total	.675	3.32	Very Highly Effective			
Management Strategy on Disaster/Crisis Preparedness						
Zamboanga Del Sur	.688	3.47	Very Highly Effective	6.996	2	.001
Zamboanga Del Norte	.887	3.13	Highly Effective			
Zamboanga Sibugay	.429	3.32	Very Highly Effective			
Total	.752	3.33	Very Highly Effective			
Management Strategy on Community Engagement						
Zamboanga Del Sur	.762	3.46	Very Highly Effective			
Zamboanga Del Norte	.833	3.17	Highly Effective			



Zamboanga Sibugay	.582	3.18	Highly Effective	5.431	2	.005
Total	.777	3.32	Very Highly Effective			
Over-all						
Zamboanga Del Sur	.677	3.46	Very Highly Effective			
Zamboanga Del Norte	.754	3.16	Highly Effective			
Zamboanga Sibugay	.348	3.24	Highly Effective	6.701	2	.001
Total	.685	3.32	Very Highly Effective			

Legend: 1.00-1.74 – Very Low Effect; 1.75-2.49 – Low Effect; – Highly Effective; 3.25-4.0 – Very Highly Effective

Table 7.1 reveals statistically significant differences in the perceived effectiveness of management strategies among DOT-accredited accommodation establishments when classified by location. Specifically, significant variations were observed in organizational resilience ($F = 5.434, p = .005$), disaster/crisis preparedness ($F = 6.996, p = .001$), community engagement ($F = 5.431, p = .005$), and overall management strategies ($F = 6.701, p = .001$).

Zamboanga del Sur consistently rated these strategies as “very highly effective,” reflecting the highest mean scores across all categories. In contrast, establishments in Zamboanga del Norte and Zamboanga Sibugay rated their strategies as “highly effective,” indicating notable regional differences in the implementation and perceived success of environmental management efforts.

Table 7.2 Differences in the management strategies among DOT-accredited accommodation establishments when enterprises are classified according to years of operation.

Variables	Years of operation			f	df	P-value
	SD	Mean	Description			
Management Strategy on Organizational Resilience						
<7 years	.709	3.26	Very Highly Effective			
7-15	.648	3.38	Very Highly Effective			
>15	.685	2.86	Very Highly Effective			
Total	.675	3.32	Very Highly Effective	8.803	2	.000
Management Strategy on Disaster/Crisis Preparedness						
<7 years	.665	3.22	Very Highly Effective			
7-15	.760	3.37	Very Highly Effective			
>15	.759	3.13	Highly Effective			
Total	.752	3.33	Very Highly Effective	1.858	2	.158
Management Strategy on Community Engagement						
<7 years	.724	3.19	Highly Effective			
7-15	.780	3.38	Very Highly Effective			
>15	.751	3.03	Highly Effective			
Total	.777	3.32	Very Highly Effective	3.581	2	.029
Over-all						
<7 years	.560	3.23	Highly Effective			
7-15	.697	3.38	Very Highly Effective			
>15	.640	3.01	Highly Effective			
Total	.685	3.32	Very Highly Effective	4.639	2	.010

Table 7.2 shows statistically significant differences in the perceived effectiveness of management strategies among DOT-accredited accommodation establishments when classified by years of operation. Significant differences were observed in organizational resilience ($F = 8.803, p = .000$), community engagement ($F = 3.581, p = .029$), and overall management strategies ($F = 4.639, p = .010$).

Establishments in the growth stage (7–15 years) consistently rated strategies as “very highly effective,” while those with more than 15 years in operation reported lower effectiveness, particularly in community engagement and overall strategy. No significant difference was found in disaster/crisis preparedness ($p = .158$), although younger and growth-stage enterprises still reported higher mean scores. These findings suggest that newer and mid-aged enterprises may be more proactive or adaptive in implementing environmental management strategies compared to older establishments.

Table 7.3 indicates statistically significant differences in the perceived effectiveness of management strategies among DOT-accredited accommodation establishments based on the number of employees. Establishments with ≥ 100 employees consistently rated their strategies as “very highly effective,” while those with 10–99 employees rated them as “highly effective.”

Table 7.3 Differences in the management strategies among DOT-accredited accommodation establishments when enterprises are classified according to number of employees

Variables	Number of employees			t	df	P-value
	SD	Mean	Description			
Management Strategy on Organizational Resilience						
10-99	.696	3.15	Highly Effective	-5.502	308	.014
>=100	.561	3.56	Very Highly Effective	-5.733	298.447	
Management Strategy on Disaster/Crisis Preparedness						
10-99	.809	3.19	Highly Effective	-4.105	308	.000
>=100	.604	3.54	Very Highly Effective	-4.338	304.935	
Environmental Shocks on Pandemic						
10-99	.832	3.19	Highly Effective	-3.787	308	.000
>=100	.642	3.52	Very Highly Effective	-3.978	302.562	
Over-all						
10-99	.720	3.18	Highly Effective	-4.755	308	.001
>=100	.564	3.54	Very Highly Effective	-4.982	301.235	

Significant differences were found in organizational resilience ($t = -5.502$, $p = .014$), disaster/crisis preparedness ($t = -4.105$, $p = .000$), community engagement ($t = -3.787$, $p = .000$), and overall strategy effectiveness ($t = -4.755$, $p = .001$). These results suggest that medium-sized establishments may have greater capacity or resources to implement more effective environmental management strategies than smaller ones.

Table 7.4 Differences in the management strategies among DOT-accredited accommodation establishments when enterprises are classified according to size of capitalization

Variables	Size of Capitalization			t	df	P-value
	SD	Mean	Description			
Management Strategy on Organizational Resilience						
>3M to 15M	.535	3.34	Very Highly Effective	.172	308	.158
>15M to 100M	.684	3.32	Very Highly Effective	.213	20.583	
Management Strategy on Disaster/Crisis Preparedness						
>3M to 15M	.548	3.46	Very Highly Effective	.736	308	.056
>15M to 100M	.763	3.32	Very Highly Effective	.985	21.285	
Management Strategy on Organizational Resilience						
>3M to 15M	.539	3.46	Very Highly Effective	.766	308	.009
>15M to 100M	.790	3.32	Very Highly Effective	1.070	21.770	
Over-all						
>3M to 15M	.527	3.42	Very Highly Effective	.616	308	.104
>15M to 100M	.694	3.32	Very Highly Effective	.785	20.816	

Table 7.4 reveals that there is a statistically significant difference only in the community engagement strategy ($t = 0.766$, $p = .009$) among DOT-accredited accommodation establishments when classified by size of capitalization. Establishments with capitalization between ₱3M to ₱15M rated community engagement as more effective than those with larger capital. For organizational resilience ($p = .158$), disaster/crisis preparedness ($p = .056$), and overall management strategies ($p = .104$), no significant differences were found, although all establishments rated these strategies as “very highly effective.” This suggests that capitalization size has minimal impact on perceived strategy effectiveness, except in how smaller enterprises engage with their communities.



Table 8.1 *Differences in the management strategies among DOT-accredited accommodation establishments when respondents are classified according to profile in terms of sex.*

Variables	Sex			f	df	P-value
	SD	Mean	Description			
Management Strategy on Organizational Resilience						
Male	.672	3.34	Very Highly Effective	.049	308	.825
Female	.680	3.29	Very Highly Effective			
Management Strategy on Disaster/Crisis Preparedness						
Male	.696	3.40	Very Highly Effective	5.160	308	.024
Female	.804	3.25	Very Highly Effective			
Management Strategy on Community Engagement						
Male	.706	3.39	Very Highly Effective	7.242	308	.008
Female	.847	3.26	Very Highly Effective			
Over-all						
Male	.639	3.38	Very Highly Effective	6.354	308	.012
Female	.730	3.27	Very Highly Effective			

Table 8.1 presents the significant differences in the perceived effectiveness of management strategies among DOT-accredited accommodation establishments when respondents are grouped by sex. While both male and female respondents rated all strategies as “very highly effective,” significant differences were found in disaster/crisis preparedness ($F = 5.160, p = .024$), community engagement ($F = 7.242, p = .008$), and overall management strategy effectiveness ($F = 6.354, p = .012$), with male respondents reporting higher mean scores.

No significant difference was noted in organizational resilience ($p = .825$). These findings suggest that male respondents tend to perceive the effectiveness of preparedness and community strategies more favorably than female respondents.

Table 8.2 *Differences in the management strategies among DOT-accredited accommodation establishments when respondents are classified according to profile in terms of age.*

Variables	Age			f	d	P-value
	SD	Mean	Description			
Management Strategy on Organizational Resilience						
<=29	.621	3.40	Very Highly Effective	4.169	2	.016
30-39	.720	3.18	Highly Effective			
40-49	1.212	3.06	Highly Effective			
Total	.675	3.32	Very Highly Effective			
Management Strategy on Disaster/Crisis Preparedness						
<=29	.695	3.43	Very Highly Effective	4.887	2	.008
30-39	.798	3.16	Highly Effective			
40-49	1.245	3.10	Highly Effective			
Total	.752	3.33	Very Highly Effective			
Management Strategy on Community Engagement						
<=29	.735	3.43	Very Highly Effective			



	30-39	.805	3.16	Highly Effective			
	40-49	1.228	3.06	Highly Effective	4.513	2	.012
	Total	.777	3.32	Very Highly Effective			
Over-all	<=29	.637	3.42	Very Highly Effective			
	30-39	.712	3.17	Highly Effective			
	40-49	1.225	3.07	Highly Effective	5.236	2	.006
	Total	.685	3.32	Very Highly Effective			

Table 8.2 reveals statistically significant differences in the perceived effectiveness of management strategies among DOT-accredited accommodation establishments when respondents are classified by age. Younger respondents aged 29 years and below consistently rated management strategies as “very highly effective” across all dimensions, including organizational resilience ($F = 4.169, p = .016$), disaster/crisis preparedness ($F = 4.887, p = .008$), community engagement ($F = 4.513, p = .012$), and overall effectiveness ($F = 5.236, p = .006$). In contrast, older age groups (30–39 and 40–49) rated strategies as “highly effective.” These results suggest that younger personnel may perceive their organizations’ environmental management strategies more favorably than older colleagues, possibly due to generational differences in attitudes, adaptability, or involvement in implementation.

Table 8.3 *Differences in the management strategies among DOT-accredited accommodation establishments when respondents are classified according to profile in terms of rank.*

Variables	Rank			f	d f	P- value
	SD	Mean	Description			
Management Strategy on Organizational Resilience						
Supervisor and Associate	.569	2.91	Low Effect		2	.094
Staff	.671	3.33	Very Highly Effective	2.388		
Total	.675	3.32	Very Highly Effective			
Management Strategy on Disaster/Crisis Preparedness						
Supervisor and Associate	.709	3.21	Highly Effective		2	.758
Staff	.754	3.33	Very Highly Effective	.277		
Total	.752	3.33	Very Highly Effective			
Management Strategy on Community Engagement						
Supervisor and Associate	.707	3.15	Highly Effective		2	.455
Staff	.781	3.33	Very Highly Effective	.789		
Total	.777	3.32	Very Highly Effective			
Over-all						
Supervisor and Associate	.556	3.09	Highly Effective		2	.394
Staff	.687	3.33	Very Highly Effective	.935		
Total	.685	3.32	Very Highly Effective			

Table 8.3 shows that there are no statistically significant differences in the perceived effectiveness of management strategies among DOT-accredited accommodation establishments when respondents are classified by rank. While both supervisors/associates and staff rated the strategies as effective, staff members consistently reported higher mean scores, rating all strategies as “very highly effective.” In contrast, supervisors and associates gave lower ratings, with organizational resilience receiving a mean of 2.91, interpreted as “low effect.” Despite these differences in perception, none of the strategies showed significance across ranks, with p-values above 0.05 in all dimensions. This suggests general agreement in perceived effectiveness regardless of rank, though slight variations in viewpoint may exist.

Table 9. Relationship between management strategies and environmental shocks experienced by the DOT-accredited accommodation establishments.

Variables	Organizational Resilience		Disaster/Crisis Preparedness		Community Engagement		Overall	
	r	p-value	r	p-value	r	p-value	r	p-value
Climate Change	0.189**	.001	.170**	.003	.181**	.001	.193**	.001
Natural Hazards	.558**	.000	.525**	.000	.484**	.000	.559**	.000
Pandemic	.558**	.000	.525**	.000	.484**	.000	.559**	.000
Over-all	.513**	.000	.480**	.000	.450**	.000	.514**	.000

Table 9 reveals a statistically significant positive relationship between the management strategies and the environmental shocks experienced by DOT-accredited accommodation establishments. Across all environmental shock types climate change, natural hazards, and pandemic and all management strategy dimensions organizational resilience, disaster/crisis preparedness, and community engagement Pearson correlation coefficients (r) ranged from 0.170 to 0.559, all with p -values less than .01.

The strongest correlations were observed between management strategies and natural hazards and pandemic-related shocks ($r \approx 0.558$ – 0.559), suggesting that establishments experiencing more frequent shocks were also those with stronger, more proactive management strategies. The relationship with climate change was weaker but still significant ($r \approx 0.17$ – 0.193). Overall, the results indicate that effective environmental management strategies are closely linked to the frequency and intensity of shocks encountered, emphasizing the importance of strategic readiness and adaptive capacity in the tourism accommodation sector.

This study explored the effectiveness of management strategies in addressing environmental shocks, such as climate change, natural hazards, and pandemics, among DOT-accredited accommodation establishments in the Zamboanga Peninsula. The findings highlight notable patterns and statistically significant relationships between establishment profiles, respondent demographics, and the perceived effectiveness of strategic responses. These results align with, and in some aspects extend, prior research on organizational resilience and crisis preparedness in tourism and hospitality contexts (Chaudhary & Piracha, 2021; Baum & Hai, 2020).

First, the frequent occurrence of environmental shocks across the region, with mean values consistently falling within the "Often" category (2.50–3.24), confirms the exposure of tourism establishments to recurring operational risks. Natural hazards and pandemics were especially prominent, echoing previous findings that point to the Philippines' geographic susceptibility to climate extremes and public health emergencies (Diers-Lawson, 2019). The slightly higher perceptions in Zamboanga del Norte may be attributed to its concentration of accommodation establishments, thereby intensifying operational sensitivity.

Despite this exposure, establishments rated their management strategies as "Very Highly Effective" (3.25–4.00) overall, particularly in organizational resilience and disaster/crisis preparedness. This supports the proposition by Prayag et al. (2018) that resource allocation and adaptive capacity are critical components of effective risk management. Zamboanga del Sur, which demonstrated significantly higher effectiveness scores across all strategic dimensions, appears to benefit from stronger local governance coordination or institutional readiness, an inference consistent with regionally coordinated disaster risk reduction frameworks.

Significant differences in strategy effectiveness by years of operation reveal that growth-stage establishments (7–15 years) perceived themselves as more responsive to shocks. This observation corroborates the organizational life cycle theory, which suggests that businesses in mid-development stages often invest more heavily in formal systems and adaptability due to active scaling (Barney, 1991). Conversely, established enterprises (>15 years) reported lower effectiveness, possibly due to bureaucratic inertia or outdated risk management protocols.

About firm size, medium-sized establishments (≥ 100 employees) consistently outperformed smaller ones in terms of management strategy effectiveness. This may be linked to greater financial resources, diversified human capital, and the ability to institutionalize practices such as digital integration or staff drills, factors also emphasized in Freeman's (1984) stakeholder theory. Interestingly, small enterprises with lower capitalization reported stronger community engagement scores. This supports the idea that smaller firms may leverage close-knit networks and local legitimacy as resilience strategies, compensating for limited internal resources.

Demographic patterns also revealed meaningful insights. Younger employees (≤ 29 years) consistently rated management strategies as more effective across all dimensions. This finding may be attributed to their greater receptiveness to digital systems, training, and procedural compliance factors observed in recent post-pandemic organizational studies (Baum & Hai, 2020). Moreover, the lack of significant differences in environmental shock perception between male and female respondents suggests gender neutrality in risk awareness within hospitality settings, contrasting with earlier findings in broader disaster literature (UNISDR, 2019).

The results also show moderate but statistically significant correlations between the frequency of environmental shocks and the effectiveness of management strategies ($r = 0.514$, $p < 0.001$). Notably, natural hazards and pandemic events exhibited stronger relationships with all strategy dimensions ($r > 0.48$), implying that establishments reinforce their strategic frameworks when

confronted with sustained or high-impact disruptions. While perceived as occurring "sometimes," climate change had weaker yet still significant correlations, suggesting that its slower onset may result in more reactive than proactive responses.

One key implication is that environmental shocks have transitioned from being treated as episodic events to structural features of the hospitality operating environment. As such, strategy effectiveness may no longer be a function of event-specific planning but of institutionalized resilience, a notion aligned with Diers-Lawson's (2019) argument for embedding crisis-readiness into routine management systems. This shift in operational paradigm warrants the DOT's re-evaluation of accreditation standards to incorporate long-term adaptation metrics alongside immediate response indicators.

Despite these insights, the study acknowledges certain limitations. Self-reported data may be subject to perceptual bias, and excluding qualitative narratives may constrain the depth of contextual interpretation. Nonetheless, the statistical robustness and strong internal consistency of the instrument ($\alpha = 0.973$) affirm the reliability of the results. Future studies could extend this research by integrating longitudinal data or exploring digital and technological factors that mediate strategy effectiveness.

This study contributes to the growing body of empirical evidence supporting the need for adaptive, context-sensitive, and resource-scalable crisis management in the hospitality sector. Identifying statistically supported relationships between environmental shocks and management strategies provides actionable insights for policy, training, and organizational reform within DOT-accredited establishments operating in high-risk regions.

Conclusion

This study advances how Department of Tourism (DOT)-accredited accommodation establishments in the Zamboanga Peninsula respond to environmental shocks through targeted management strategies. By employing a robust quantitative approach, the research establishes a statistically grounded link between organizational characteristics and the perceived effectiveness of resilience-building practices across three key dimensions: organizational resilience, disaster/crisis preparedness, and community engagement.

The findings confirm that environmental shocks, especially natural hazards and pandemics, are no longer isolated occurrences but recurring stressors that demand strategic institutional responses. Medium-sized enterprises and establishments in the growth stage (7–15 years) demonstrated the highest levels of perceived strategy effectiveness, highlighting the role of organizational maturity and resource availability in shaping crisis readiness. Meanwhile, the consistently higher ratings from younger employees suggest a generational shift in risk awareness and responsiveness, which holds implications for future workforce training and digital integration in risk governance.

This work contributes to the field by providing empirical validation that effective crisis management in hospitality must be both structurally embedded and context sensitive. It reinforces the relevance of aligning crisis strategies with organizational life cycles, local environmental exposure, and workforce dynamics insights that are particularly valuable for tourism policymakers, accreditation bodies, and hotel managers operating in disaster-prone regions.

As environmental volatility intensifies under the pressures of climate change and global health risks, there is a compelling need to institutionalize resilience beyond compliance. This entails updating accreditation frameworks and integrating long-term adaptation planning into tourism operations. Future research should adopt longitudinal designs to track how strategy effectiveness evolves, investigate the role of digital resilience tools, and examine inter-organizational collaboration as a buffer against systemic shocks.

The study affirms that resilient hospitality is no longer a competitive advantage but a foundational requirement for sustainable tourism development in the Philippines and beyond.

References

- Barney, J. B. (2021). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120.
- Baum, T., & Hai, N. T. T. (2020). Hospitality, tourism, human rights, and the impact of COVID-19. *International Journal of Contemporary Hospitality Management*, 32(7), 2397–2407.
- Chaudhary, M.T., & Piracha, A. (2021). Natural Disasters - Origins, Impacts, Management. *Encyclopedia*. 1(4), 1101–1131. <https://doi.org/10.3390/encyclopedia1040084>
- Coppola, D. P. (2015). *Introduction to International Disaster Management*. Butterworth-Heinemann.
- Diers-Lawson, A. (2019). Strategically planning crisis response messages. In *Crisis communication*. 255–272. Routledge. <https://doi.org/10.4324/9780429437380-21>
- Etikan, I., & Bala, K. (2017). Sampling and sampling methods. *Biometrics & Biostatistics International Journal*, 5(6), 00149.
- Freeman, R. E. (1984). *Strategic Management: A Stakeholder Approach*. Boston: Pitman.
- Krejcie, R. V., & Morgan, D. W. (1970). Sample size determination table. *Educational and psychological Measurement*, 30(3), 607–610.



Noguchi, K., Konietzschke, F., Marmolejo-Ramos, F., & Pauly, M. (2021). Permutation tests are robust and powerful at 0.5% and 5% significance levels. *Behavior Research Methods*, 53(6), 2712-2724.

Prayag, G., Chowdhury, M., Spector, S., & Orchiston, C. (2018). Measuring the resilience of tourism to disasters: Scale development and validation. *Journal of Travel Research*, 57(5), 604–619. <https://doi.org/10.1177/0047287513482775>

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International journal of medical education*, 2, 53.

United Nations Office for Disaster Risk Reduction (UNISDR) (2015). Sendai Framework for Disaster Risk Reduction 2015-2030, 32. <https://www.unisdr.org/we/inform/publications/43291>

Affiliations and Corresponding Information

Darwin V. Mendoza

Central Philippine University – Philippines

Gynnyn G. Gumban, PhD

Central Philippine University – Philippines