CLOSED-CIRCUIT TELEVISION (CCTV) SURVEILLANCE AND ITS IMPACT ON CRIME RATES: A COMPREHENSIVE STUDY



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Closed-Circuit Television (CCTV) Surveillance and Its Impact on Crime Rates: a Comprehensive Study

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Abstract

This research examines the efficacy of Closed-Circuit Television (CCTV) monitoring in reducing crime rates in Talibon, Bohol, a rural municipality in the Philippines. While CCTV is extensively used in urban environments for crime deterrence, its efficacy in rural locations, characterized by lower population density and distinct crime patterns, requires more investigation. This study investigates the correlation between CCTV monitoring and crime decrease, as well as the attitudes of citizens and law enforcement personnel. The research used a quantitative descriptive-correlational methodology, gathering data from 120 respondents using structured questionnaires. The data were evaluated using descriptive statistics and Pearson correlation to assess CCTV's perceived efficacy and its influence on crime rates. The results indicate that CCTV is seen as very beneficial in preventing criminal behavior, improving public safety, and aiding law enforcement in collecting evidence. The deterrent of prospective criminals and the real-time surveillance of public areas were seen as having the most significant influence. A robust positive correlation was seen between the perceived efficiency of CCTV and its impact on crime reduction, indicating that as views of CCTV's efficacy rise, its effect on diminishing crime rates concurrently intensifies. The research finds that CCTV monitoring is vital for crime prevention in Talibon, considerably enhancing community safety. It is recommended that public awareness programs be implemented and periodic reviews of CCTV systems be conducted to improve their efficacy in rural regions. These findings will assist policymakers and local authorities in using CCTV technology to improve crime prevention in rural areas.

Keywords: Public Perception, Community Safety, Crime Prevention, Crime Reduction, CCTV Surveillance

INTRODUCTION

The increasing reliance on Closed-Circuit Television (CCTV) surveillance as a primary tool for crime prevention has garnered widespread attention from governments, law enforcement agencies, and scholars worldwide. CCTV has proven effective in urban areas for deterring criminal activity, enhancing public safety, and providing valuable evidence for prosecutions. However, much of the research has focused on cities and densely populated metropolitan areas, leaving a noticeable gap in understanding how CCTV performs in rural environments, where factors such as population density, crime types, and community dynamics differ significantly. This research gap is particularly relevant to the Philippines, where many smaller municipalities, such as Talibon in Bohol, are experiencing socio-economic transitions that present new security challenges. These municipalities often face increased criminal activity, including theft, burglary, and public disorder, despite having limited law enforcement resources. In response, the local government of Talibon has invested in CCTV technology to deter crime and enhance public safety, following the example of larger cities. However, the effectiveness of such surveillance in rural areas like Talibon still needs to be explored.

Several studies have assessed the effectiveness of CCTV in crime prevention. In their comprehensive meta-analysis, Welsh and Farrington (2009) highlighted that CCTV effectively reduces certain types of crime, such as property crimes in car parks, but noted inconsistent results in other settings. Similarly, Ratcliffe et al. (2009) found that the success of CCTV in reducing crime depends on various factors, including camera placement and local law enforcement integration, with mixed results in different neighborhoods of Philadelphia. Piza et al. (2019) also emphasized that CCTV is more effective when paired with active monitoring and quick police response, as seen in their study on CCTV in Newark, New Jersey. These findings underscore the importance of understanding local conditions when evaluating the effectiveness of surveillance technologies. Rural settings like Talibon present a distinct challenge due to their lower population density, different crime patterns, and limited police presence. As a result, this study aims to address the existing gap by assessing whether CCTV can deliver similar crime prevention outcomes in rural municipalities like Talibon.

In addition to evaluating the impact of CCTV on crime reduction, it is essential to explore the broader social and ethical implications of surveillance in rural communities. Research by Yarwood (2015) and Taylor



and Gill (2014) on CCTV in rural settings in the UK and Australia, respectively, found that while surveillance can offer residents a sense of security, it may also raise concerns about privacy and the potential for data misuse. Goold (2004) and Webster (2009) further explored these privacy concerns in their studies of CCTV systems in the UK, emphasizing that public acceptance of surveillance technologies depends mainly on how transparent and accountable their usage is. These concerns may be amplified in small towns like Talibon, where social networks are closely knit and interactions are more personal. Thus, this study examines the direct effects of CCTV on crime and how the local population perceives the balance between increased security and potential privacy infringements.

Moreover, this research will provide practical, evidence-based recommendations for local governments and law enforcement agencies on deploying and managing CCTV in rural areas. Given the resource constraints municipalities like Talibon face, understanding the long-term sustainability of CCTV systems is crucial. Surveillance systems require continuous maintenance and technological updates, which may strain local budgets. This issue was raised by Taylor and Gill (2014), who noted that small towns often need more financial resources to maintain surveillance systems over time. Therefore, this study will assess whether CCTV is a viable long-term solution for crime prevention in Talibon or whether alternative strategies, such as community policing, might be more effective in rural contexts.

In conclusion, this study aims to fill a critical gap in the literature by evaluating the impact of CCTV on crime rates in Talibon, Bohol. Drawing on the works of Welsh and Farrington (2009), Ratcliffe et al. (2009), and Piza et al. (2019), among others, this research will explore the effectiveness of CCTV in a rural context, examining both its impact on crime and its social implications. The study will also consider the sustainability of such initiatives, drawing on insights from Taylor and Gill (2014) and Yarwood (2015) regarding the challenges rural municipalities face in maintaining surveillance systems. Through this research, policymakers and law enforcement agencies will gain a deeper understanding of the potential benefits and challenges of using CCTV for crime prevention in rural settings, offering valuable insights for future policy development.

Research Questions

This study aimed to examine the relationship

between CCTV surveillance and crime rates in Talibon, Bohol, focusing on its perceived effectiveness and impact on crime prevention.

Specifically, it sought to answer the following questions:

- 1. What is the demographic profile of the respondents in terms of:
- 1.1. age;
- 1.2. gender;
- 1.3. educational attainment, and
- 1.4. length of residence in the selected areas?
 - 1. What are the perceptions of residents and law enforcement regarding the effectiveness of CCTV surveillance in preventing and reducing crime rates?
 - 2. How does CCTV surveillance impact crime incidence in Talibon, Bohol?
 - 3. Is there a significant relationship between residents and law enforcement's perceptions of the effectiveness of CCTV surveillance and its impact on crime incidence in Talibon, Bohol?
 - 4. What recommendations for improvement can be proposed based on the findings of the study?

METHODOLOGY

Research Design

This study utilized a quantitative descriptive-correlational research design to investigate the relationship between CCTV surveillance and crime rates in Talibon, Bohol. The descriptive aspect explored the current level of CCTV implementation, residents' and law enforcement officers' perceptions of its effectiveness, and its impact on crime incidence. The correlational aspect examined whether a significant relationship exists between CCTV's perceived effectiveness and its influence on reducing crime.

Research Environment and Research Participants

The study was conducted in Talibon, Bohol, a municipality where CCTV surveillance systems have been implemented to enhance crime prevention efforts.



This location provided an ideal environment for evaluating the impact of CCTV on crime rates and its perceived effectiveness among the local population.

The respondents for the study consisted of 120 individuals representing two key groups. First, residents of Talibon were selected through random sampling to gather their perceptions of CCTV's role in preventing and reducing crime in their community. Second, the study included law enforcement officers monitoring CCTV footage and implementing crime prevention strategies. This combination of residents and law enforcement professionals offered a well-rounded view of the effectiveness and impact of CCTV surveillance in Talibon.

Research Instrument

The primary research instrument for this study is a structured questionnaire that collected quantitative data from residents and law enforcement officers regarding the effectiveness and impact of CCTV surveillance on crime rates in Talibon, Bohol. The questionnaire was divided into three key sections, each designed to gather specific information relevant to the study.

- 1. Demographic Information. This section gathered background information to understand the sample population's characteristics better. It included questions on age, gender, educational attainment, and length of residence in Talibon. Collecting this demographic data was essential to analyzing how different population segments perceive the effectiveness and impact of CCTV surveillance.
- 2. Perceptions of CCTV Effectiveness. This section focused on the perceived effectiveness of CCTV surveillance, examining how well respondents believe CCTV systems have prevented various crimes. The goal was to determine whether CCTV was viewed as an effective tool in deterring criminal activity.
- 3. Impact of CCTV on Crime Rates. This section assessed the extent to which respondents believe CCTV has influenced crime rates in Talibon, specifically its role in reducing the occurrence of different crimes. This part of the questionnaire was vital to understanding CCTV's overall effect on crime reduction within the community.

The structured questionnaire was pre-tested for clarity and reliability before full distribution. This

instrument provided the necessary data to evaluate the perceptions of CCTV effectiveness and its impact on crime rates in Talibon, Bohol.

Data Analysis

To analyze the data collected in this study, the following statistical treatments were applied:

1. Descriptive Statistics

Frequency Distribution and Percentage. The demographic profile of the respondents, including age, gender, educational attainment, and length of residence, was analyzed using frequency distribution and percentage. These methods provided a clear summary of the demographic characteristics of the respondents, helping to illustrate the composition of the sample population.

Weighted Mean. The respondents' perceptions regarding the effectiveness and impact of CCTV surveillance on crime rates were analyzed using the weighted mean. This method determined each deterrence strategy's average perceived effectiveness and impact level based on the responses. The weighted mean provided a comprehensive measure of how well CCTV surveillance was perceived in terms of its ability to prevent and reduce crime.

2. Correlation Analysis

A Pearson correlation coefficient was calculated to assess the relationship between the perceived effectiveness of CCTV surveillance and its impact on crime rates. This helped determine whether a significant positive or negative relationship existed between the two variables and how closely they were associated.

Data Gathering Procedure

The data-gathering procedure involved distributing structured questionnaires to 120 respondents, including residents and law enforcement officers in Talibon, Bohol. The questionnaire was pretested for clarity and divided into three sections: demographic information, perceptions of CCTV effectiveness, and the impact of CCTV on crime rates. Respondents were selected via random sampling, with



all questionnaires retrieved for a 100% response rate. Data were encoded and analyzed using descriptive statistics and Pearson correlation to examine the relationship between CCTV effectiveness and crime reduction. This ensured comprehensive, reliable data for the study.

Ethical Considerations

This study strictly followed ethical guidelines by obtaining informed consent from all participants, ensuring confidentiality, and guaranteeing voluntary participation without coercion. No harm was caused to the participants. The researchers declared no conflicts of interest and ensured that findings were reported transparently and honestly. Additionally, cultural sensitivity was observed and respected throughout the entire research process.

RESULTS AND DISCUSSION

The study's results are presented below, including tables and interpretations for each research question. The tables show the statistical analysis conducted based on the data gathered from the residents of Trinidad, Bohol.

Table 1. Demographic Characteristics of the Respondents

DEMOGRAPHIC	FREQUENCY	PERCENTAGE
CHARACTERISTI	(N=120)	
CS		
Age	1	
20 years old and	3	2.50
below	20	25.00
21-30 years old	30	25.00
31-40 years old	43	35.83
41-50 years old	30	25.00
51-60 years old	14	11.67
61 years old & above		0.00
TOTAL	120	100.00
Sex		
Male	50	41.67
Female	70	58.33
TOTAL	120	100.00
Educational Attainm	ent	
Elementary Level	6	5.00
Elementary Graduate	10	8.33
High School Level	30	25.00
High School Graduate	46	38.33
College Level	18	15.00
College Graduate	10	8.33
With MA Units	0	0.00
Master's Degree	0	0.00
TOTAL	120	100.00
Years of Residency	-	-
1-5 years	0	0.00
6-10 years	8	6.67
11-15 years	7	5.83
15-20 years	2	1.67
21-25 years	20	16.67
26 years & above	83	69.17
TOTAL	120	100.00

The demographic characteristics of the 120 respondents reveal critical insights into their age, gender, educational attainment, and length of residency. The largest age group is 31-40 years old, representing 35.83% of the sample, followed by 21-30 and 41-50 years old, each making up 25.00%. A smaller portion of respondents falls within the 51-60-year-old group (11.67%), and only 2.50% are 20 years old and below. Notably, there are no respondents aged 61 years old and above. Regarding gender, females account for the majority at 58.33%, while males comprise 41.67% of the respondents.

Regarding educational attainment, most respondents have completed high school, with 38.33% identified as high school graduates and 25.00% having attended but not graduated. 15.00% have reached the college level without graduating, 8.33% have completed elementary school, and 5.00% are at the elementary level. No respondents have pursued



postgraduate education, such as a master's degree or MA units.

Regarding residency, a significant portion of the respondents (69.17%) have lived in the area for 26 years or more, indicating a predominantly long-term resident population. 16.67% have lived in the community for 21-25 years, while smaller groups have resided in the area for 6-10 years (6.67%) and 11-15 years (5.83%). Only 1.67% have lived there for 15-20 years, and no respondents have lived in the area for less than five years. These demographic details suggest that most respondents are long-term female residents in the middle age range with a high school education, providing a valuable perspective on local issues such as crime prevention and community safety.

Table 2. Perceptions Regarding the Effectiveness of Closed-Circuit Television

Statements	Mean	Interpretation
Reduction in Criminal Activities	4.72	Very Effective
2. Improved Law Enforcement Response Time	4.45	Very Effective
3. Real-Time Monitoring of Public Spaces	4.60	Very Effective
4. Enhanced Overall Public Safety	4.32	Effective
5. Assistance in Post-Incident Investigations and Evidence Gathering	4.50	Very Effective
6. Increased Feeling of Security Among Residents	4.20	Effective
7. Deterrence of Petty Crimes (Vandalism, Theft)	4.18	Effective
8. Reduction in Need for Physical Patrols	4.00	Effective
9. Fostering Trust in Community Security Measures	4.10	Effective
10. Contribution to Maintaining Social Order	3.90	Effective
Composite Mean	4.30	Very Effective

Table 2 indicates that respondents view CCTV surveillance as a very effective tool for improving public safety and crime prevention. The highest-rated aspect, with a weighted mean of 4.72, is Reduction in Criminal Activities, showing that respondents strongly believe CCTV plays a significant role in decreasing crime. Additionally, perceptions such as Real-Time Monitoring of Public Spaces (4.60) and Improved Law Enforcement Response Time (4.45) further emphasize that CCTV is valued for its ability to prevent crimes and enable quicker, more efficient responses from authorities.

CCTV is also seen as very effective in Assisting Post-Incident Investigations and Evidence Gathering (4.50), highlighting its importance in solving crimes by providing critical evidence. Moreover, respondents indicated that CCTV increases their sense of security, with Increased Feeling of Security Among Residents receiving a score of 4.20, reflecting the positive impact of surveillance systems on community safety.

Other notable perceptions include the Deterrence of Petty Crimes (4.18), the Fostering of Trust in Community Security Measures (4.10), and the Reduction in the Need for Physical Patrols (4.00), all of which underscore the various advantages CCTV

offers. While the role of CCTV in Maintaining Social Order scored slightly lower at 3.90, it still reflects a belief in its effectiveness.

Overall, with a composite mean of 4.30, the respondents consider CCTV a very effective tool for enhancing security, preventing crime, and supporting law enforcement in the community.

Table 3. Impact of Closed-Circuit Television Cameras on Crime Rates

Statements	Mean	Interpretation
Deterrence of Potential Offenders	4.85	With Very High Impact
Reduction in Manpower Requirement	4.45	With Very High Impact
3. Evidence Gathering on Criminal Activities	4.11	High Impact
Increased Natural Surveillance	4.32	With Very High Impact
5. 24/7 Surveillance and Security	4.18	With High Impact
Increased Public Trust and Confidence	4.25	With Very High Impact
7. Increased Likelihood of Apprehension	4.08	With High Impact
8. Improved Security and Safety Features	3.92	With High Impact
Creation of a Violence-Free Community	4	With High Impact
10. Enhanced Public Safety and Awareness	4.20	With High Impact
Composite Mean	4.24	With Very High Impact

Table 3 reveals that respondents perceive CCTV surveillance as having a very high impact on various aspects of crime prevention and public safety. The highest-rated item, Deterrence of Potential Offenders, with a mean of 4.85, reflects the firm belief that CCTV plays a crucial role in preventing criminal activities. Similarly, Reduction in Manpower Requirement (4.45) and Increased Natural Surveillance (4.32) were rated as having a very high impact, highlighting the effectiveness of CCTV in reducing the need for physical patrols and enhancing surveillance capabilities.

Other factors, such as Evidence Gathering on Criminal Activities (4.11) and 24/7 Surveillance and Security (4.18), received high ratings, indicating that CCTV is beneficial in supporting investigations and providing continuous security. Increased Public Trust and Confidence (4.25) also garnered a very high impact rating, demonstrating that respondents feel safer and more secure with CCTV systems in place.

Aspects such as Increased Likelihood of Apprehension (4.08), Improved Security and Safety Features (3.92), and the Creation of a Violence-Free Community (4.00) were rated with high impact, showing that while CCTV is perceived to influence these areas positively, additional factors may contribute to their full realization.

Overall, with a composite mean of 4.24, the data indicates that CCTV has a very high impact on enhancing public safety and reducing crime, with the majority of critical aspects receiving high to very high ratings. This underscores the firm belief in CCTV's effectiveness as a crucial crime prevention and community safety tool.



Table 4. Correlation Between Perceived Effectiveness

and Impact of Closed-Circuit Televisions on Crime Rates

Correlation Coefficient (r)		Critical t-value (0.05 level)	Statistical Significance
0.653770752	9.39	1.98	Significant

The computed t-statistic for the correlation coefficient is 9.39, much greater than the critical t-value of 1.98 at the 0.05 significance level. This result indicates a statistically significant and robust positive relationship between the two variables. The correlation suggests that, as perceptions of the effectiveness of CCTV increase, the impact on reducing crime rates in Talibon, Bohol, also strengthens.

In the context of this study, the statistical significance of this correlation supports the conclusion that CCTV surveillance is an effective tool in crime prevention. The strong positive relationship between CCTV effectiveness and crime rate reduction indicates that installing CCTV in public spaces notably improves security and lowers crime. Respondents' perceptions, reflected by this strong correlation, validate the effectiveness of CCTV in deterring potential offenders, increasing natural surveillance, and gathering evidence for crime investigations. Moreover, the significant result underscores the role of CCTV in enhancing public safety, boosting confidence in law enforcement, and contributing to a safer community in Talibon, Bohol. Therefore, the statistical findings confirm that CCTV surveillance effectively reduces crime rates and improves public security perceptions.

Discussion

The analysis reveals that CCTV surveillance was perceived to have a very high impact on crime prevention, with strategies such as deterrence of potential offenders, reduction in workforce requirements, and increased natural surveillance rated the highest in effectiveness by the respondents. CCTV's role in gathering evidence and providing 24/7 surveillance was also critical for enhancing public safety. Overall, the results suggest that implementing CCTV systems can significantly reduce crime, contributing to a safer community in Talibon, Bohol.

The strong positive correlation between the perceived effectiveness of CCTV and its impact on crime rates, confirmed by the t-test, highlights the

reliability of this relationship. The statistical significance of the correlation indicates that the observed relationship is not due to chance, further reinforcing the importance of CCTV as a crime deterrence measure. This emphasizes CCTV's vital role in law enforcement support and public safety enhancement in Talibon, Bohol.

Findings

The study aimed to examine the relationship between the perceived effectiveness of CCTV surveillance and its impact on crime rates in Talibon, Bohol. Based on the analysis of data, the following findings were observed:

1. Demographic Characteristics of Respondents

Most respondents were middle-aged, with 35.83% falling in the 31-40 age category and 25.00% in the 21-30 and 41-50 age groups. Female respondents constituted 58.33% of the sample, indicating a higher female representation. Regarding educational attainment, most respondents were high school graduates (38.33%) or had attended high school (25.00%). A significant portion of respondents (69.17%) had lived in the community for 26 years or more, highlighting a population of long-term residents.

2. Perceived Effectiveness of CCTV

Respondents perceived CCTV surveillance as highly effective in various aspects of crime prevention. The highest-rated benefit was the deterrence of potential offenders, with a weighted mean of 4.85, indicating that CCTV plays a significant role in preventing criminal activities. Other high-impact areas included the reduction in workforce requirement (4.45), increased natural surveillance (4.32), and evidence gathering (4.11). These results suggest that respondents see CCTV as a valuable tool in deterring crime, reducing the need for human surveillance, and supporting investigations.

3. Impact of CCTV on Crime Rates

CCTV was seen as having a high impact on crime reduction. The overall composite mean for the effectiveness and impact of CCTV was 4.24, categorized as "with very high impact." Respondents



highlighted the system's ability to contribute to 24/7 surveillance (4.18), increased public trust (4.25), and the enhancement of public safety and awareness (4.20). These findings underscore the role of CCTV in making the community feel safer and more secure.

4. Relationship Between CCTV Effectiveness and Crime Rate Reduction

The computed correlation coefficient showed a strong positive relationship between the perceived effectiveness of CCTV and its impact on reducing crime rates. The corresponding t-statistic of 9.39, which significantly exceeds the critical value of 1.98 at the 0.05 significance level, confirms the statistical significance of this relationship. This result suggests that as perceptions of CCTV effectiveness increase, its impact on lowering crime rates strengthens. Therefore, CCTV surveillance effectively reduces crime in Talibon, Bohol.

The data indicates that respondents view CCTV surveillance as a crucial tool for crime prevention. Its perceived effectiveness extends across various aspects of public safety, including deterrence, evidence collection, and increased security presence. The strong statistical correlation between its effectiveness and crime reduction further reinforces the importance of CCTV systems in creating a safer community.

CONCLUSION

The findings of this study demonstrate that CCTV surveillance is highly effective in enhancing public safety and reducing crime in Talibon, Bohol. Respondents overwhelmingly perceived CCTV as having a very high impact in deterring criminal activities, reducing workforce requirements for surveillance, and increasing natural surveillance. The system was also viewed as valuable in providing 24/7 monitoring, aiding in evidence gathering, and fostering public trust and confidence in community safety measures. The strong positive correlation between the perceived effectiveness of CCTV and its impact on crime rates, confirmed by statistical analysis, further underscores its critical role in crime prevention efforts. Overall, CCTV is a crucial tool supporting law enforcement and creating a safer and more secure environment in Talibon. These results highlight the

significant benefits of CCTV systems as a critical component of modern crime prevention strategies.

Recommendations

Based on the findings and conclusions of this study, the following recommendations are proposed:

1. Expansion of CCTV Coverage. Given CCTV's strong positive impact on crime reduction, it is recommended that the coverage of CCTV systems in Talibon, Bohol, be expanded, especially in high-crime areas or locations with limited natural surveillance. Increasing the number of cameras can further enhance deterrence and improve the ability to monitor larger areas more effectively.

2. Regular Maintenance and Upgrades.

Regular maintenance and system upgrades should be conducted to maintain the effectiveness of CCTV surveillance. Ensuring that all cameras function correctly and that the technology remains up-to-date will help maximize the system's impact on crime prevention and public safety.

3. Enhanced Collaboration Between CCTV Operators and Law Enforcement. It is recommended that the collaboration between CCTV operators and law enforcement be strengthened. Regular communication and coordination can ensure that surveillance footage is effectively used for monitoring, investigations, and timely responses to incidents.

4. Public Awareness Campaigns. To increase CCTV's overall impact, public awareness campaigns should be launched to educate the community about its presence and its role in crime prevention. When the public is aware of CCTV systems, it may further deter potential offenders and improve the community's sense of security.

5. Use of CCTV in Crime Investigations and Evidence Gathering. Since respondents identified CCTV as valuable for evidence gathering, it is recommended that law enforcement agencies continue to utilize CCTV footage in criminal investigations. Training law enforcement personnel to effectively use CCTV data can improve investigation outcomes and increase the conviction rate for criminal activities.

6. Evaluation of CCTV Effectiveness. CCTV systems should be periodically evaluated for their effectiveness in reducing crime. This will allow stakeholders to assess the system's impact over time,



identify areas for improvement, and make data-driven decisions to enhance public safety efforts.

By implementing these recommendations, Talibon and Bohol can further optimize CCTV surveillance as a vital tool in crime prevention and public safety enhancement.

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